Stimulating Lifelong Learning: The ePortfolio in Dutch Higher Education
Credits

Stimulating Lifelong Learning: The ePortfolio in Dutch Higher Education

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Editors
Wijnand Aalderink and Marij Veugelers, SURF NL Portfolio

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<table>
<thead>
<tr>
<th>Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>7</td>
</tr>
<tr>
<td>1  Introduction: The ePortfolio, a promise of lifelong learning?</td>
<td>9</td>
</tr>
<tr>
<td>2  The ePortfolio landscape in Dutch higher education (2006)</td>
<td>13</td>
</tr>
<tr>
<td>2.1 Method</td>
<td>13</td>
</tr>
<tr>
<td>2.2 Response</td>
<td>13</td>
</tr>
<tr>
<td>2.3 Questionnaires</td>
<td>14</td>
</tr>
<tr>
<td>2.4 Institution-wide portfolio systems</td>
<td>14</td>
</tr>
<tr>
<td>2.5 Example of elaboration of questions related to the topic “educational concept”</td>
<td>14</td>
</tr>
<tr>
<td>2.6 Maturity model</td>
<td>16</td>
</tr>
<tr>
<td>2.7 ePortfolio maturity model applied</td>
<td>18</td>
</tr>
<tr>
<td>2.8 Conclusions</td>
<td>20</td>
</tr>
<tr>
<td>2.9 Recommendations</td>
<td>21</td>
</tr>
<tr>
<td>3  ePortfolio practice and opportunities in the Knowledge Exchange countries (Denmark, Germany, the Netherlands and the United Kingdom)</td>
<td>23</td>
</tr>
<tr>
<td>3.1 Introduction</td>
<td>23</td>
</tr>
<tr>
<td>3.2 General impression of ePortfolio in the Knowledge Exchange countries</td>
<td>23</td>
</tr>
<tr>
<td>3.3 ePortfolio functions</td>
<td>25</td>
</tr>
<tr>
<td>3.4 Differences across disciplines in using ePortfolios</td>
<td>26</td>
</tr>
<tr>
<td>3.5 Use of ePortfolios by staff</td>
<td>27</td>
</tr>
<tr>
<td>3.6 Level of implementation</td>
<td>27</td>
</tr>
<tr>
<td>3.7 Important issues in ePortfolio development</td>
<td>29</td>
</tr>
<tr>
<td>3.8 Opportunities for cooperation</td>
<td>30</td>
</tr>
<tr>
<td>4  The use of ePortfolios in academic programmes</td>
<td>33</td>
</tr>
<tr>
<td>4.1 Introduction</td>
<td>33</td>
</tr>
<tr>
<td>4.2 Research questions</td>
<td>33</td>
</tr>
<tr>
<td>4.3 Development of a generic framework for portfolio outcomes, academic objectives and the learning environment</td>
<td>33</td>
</tr>
<tr>
<td>4.4 Questionnaire and method</td>
<td>35</td>
</tr>
<tr>
<td>4.5 Results</td>
<td>35</td>
</tr>
<tr>
<td>4.5.1 General results</td>
<td>35</td>
</tr>
<tr>
<td>4.5.2 Intended educational benefit and perceived relevance of main objectives</td>
<td>36</td>
</tr>
<tr>
<td>4.5.3 Features of the learning environment and assessment of learning outcomes</td>
<td>37</td>
</tr>
<tr>
<td>4.6 Conclusions and discussion</td>
<td>41</td>
</tr>
<tr>
<td>5  Mentoring in portfolio-based learning: What is an effective mentor?</td>
<td>43</td>
</tr>
<tr>
<td>5.1 Introduction</td>
<td>43</td>
</tr>
<tr>
<td>5.2 Research questions</td>
<td>43</td>
</tr>
<tr>
<td>5.3 Context</td>
<td>44</td>
</tr>
<tr>
<td>5.4 Instruments</td>
<td>45</td>
</tr>
<tr>
<td>5.5 Subjects</td>
<td>45</td>
</tr>
<tr>
<td>5.6 Results</td>
<td>46</td>
</tr>
<tr>
<td>5.7 Conclusion and implications for educational practice</td>
<td>50</td>
</tr>
</tbody>
</table>
6. The ePortfolio as an instrument for summative competency assessment
6.1 Introduction
6.2 Research question
6.3 Study
6.4 Preliminary study: literature search and expert interviews
6.4.1 Introduction
6.4.2 Results
6.4.3 Conclusion
6.5 Case studies
6.5.1 Introduction
6.5.2 Method
6.5.3 General conclusions
6.5.4 Conclusions relating to the research questions
6.6 Recommendations

7 Portfolio assessment in undergraduate medical education
7.1 Introduction
7.2 The Internal Medicine clerkship in the third year of the undergraduate programme
7.3 Validity
7.4 Reliability
7.5 Impact on student learning
7.6 Transparency and acceptability
7.7 The effect of the medium
7.8 Methods
7.9 Results and discussion
7.10 Conclusions

8 ePortfolio: Images and evidence of teacher competency
8.1 Introduction
8.2 Development over time
8.2.1 Intentions
8.2.2 Realisation
8.2.3 Conclusions and recommendations
8.3 ePortfolio: Peer learning and assessment
8.3.1 Intentions
8.3.2 Realisation and evaluation
8.3.3 Conclusions and recommendations
List of tables

Table 1: Dominant education concept ................................................................. 15
Table 2: Dominant educational concept and type of institution ......................... 15
Table 3: Relationship between curriculum embedding and educational concept ... 15
Table 4: Number of times portfolios are used per objective and type of programme 36
Table 5: Relevance of objective as perceived by students and tutors ..................... 37
Table 6: Frequency with which requirements are set for step 1 to 5 of the reflection process 38
Table 7: Explanation of reflection task and portfolio objectives ............................ 38
Table 8: Learning lines and portfolio objectives .................................................... 39
Table 9: Embedding within programme and main objectives ................................. 39
Table 10: Frequency of portfolio use and main objectives ..................................... 39
Table 11: use of peer feedback/requirements for feedback and portfolio objectives 40
Table 12: Preparation of students and tutors ....................................................... 40
Table 13: Interview scheme ................................................................................. 45
Table 14: Outcomes of literature study ................................................................. 46
Table 15: Perceive essential competencies and characteristics of an effective portfolio mentor in early and final phase of the programme ........................................ 49
Table 16: Pitfalls with regard to mentoring in portfolio-based learning .................. 50
Table 17: Inter-rater reliabilities ............................................................................ 72
Table 18: Survey of student opinions (N=16; response = 76%) ............................... 73

List of figures

Figure 1: University of Amsterdam "ePortfolio concept model", Veugelers (2005). (Adapted from Van Tartwijk et al., 2003) ....................................................... 9
Figure 2: Process of ePortfolio construction .......................................................... 80
Figure 3: Interpretive model of competent performance (after Roelofs & Sanders, 2003) 82
Figure 4: Examples of framework ....................................................................... 83
Figure 5: Sequence of activities ........................................................................... 84
Preface

Institutions for higher education in the Netherlands have shown and continue to show a strong interest in the theme of ePortfolios. There is therefore a great need for expertise and experience in this area. The mission of the NL Portfolio Expertise Group (part of the SURF Foundation) is to combine, share and improve our expertise on ePortfolios. To this end, NL Portfolio seeks to collaborate in the educational sector and with professionals in the field. In 2005, NL Portfolio assessed the results of national and international educational research on the effects of portfolio use. On the basis of this assessment, it identified existing gaps in our knowledge in order to ascertain what additional research is needed. This study, carried out on behalf of the SURF Foundation, was conducted in late 2006 and early 2007 at five institutions for higher education in the Netherlands. The outcomes of this study are included in the present publication.

The NL Portfolio Expertise Group hopes this publication will take the development and use of the ePortfolio to a higher level. It will be distributed within and outside the Netherlands and will be used within the context of activities that NL Portfolio has planned for the coming period. In addition to ongoing activities aimed at knowledge sharing, for example its publications, website and meetings, NL Portfolio has planned two new projects. The first specifically involves participation of those institutions that are ready to scale the ePortfolio up to an institution-wide level. Making the ePortfolio available to 35,000 to 50,000 active users will raise various issues that the project participants hope to resolve together. The second new project involves bringing together researchers who are active in the ePortfolio field. The purpose is to enable them to join forces by setting up a network of researchers.

Stimulating Lifelong Learning: The ePortfolio in Dutch Higher Education may provide a significant impetus towards increasing our knowledge and sharing what we know. I hope the research results reported here will lead to further research and encourage even more institutions to use the ePortfolio.

Ans Gielen
Chair of the NL Portfolio Steering Group
1 Introduction: The ePortfolio, a promise of lifelong learning?

Wijnand Aalderink and Marij Veugelers, SURF NL Portfolio

The ePortfolio continues to attract interest at Dutch institutions of higher education. This is in part due to the focus on competency-oriented education at Dutch universities of applied sciences [hogescholen], where the emphasis is on student development, but it is also because research universities are interested in fostering academic maturity. In the process of educational innovation, the ePortfolio is frequently used to guide the learning process or as an assessment tool. It also offers the “net generation” students of today the possibility of presenting themselves to various target groups.

ePortfolios appear to have the potential to offer clarity and flexibility in both pedagogic and administrative processes, something required by various stakeholders in education. They may appear to have that potential, but what we have learned in more than ten years of development and implementation is that, although we have explored much ground, many questions remain regarding the most efficient and effective use of ePortfolios. At the same time, ePortfolio systems are in a state of flux from the technological point of view; this also applies, for example, to their relationship to digital learning environments and programme registration systems.

The question is whether the concept of the ePortfolio will simply remain promising without ever becoming reality. The Netherlands has acquired much useful experience working with ePortfolios in both national projects and initiatives set up by most of the Dutch institutions of higher education. We have described portfolio practice in the Low Countries in more detail elsewhere (Aalderink and Veugelers, 2006)

Typical of the “Dutch” multi-perspective approach to ePortfolios is the model illustrated in Figure 1, which seeks to balance the different areas of attention and makes the ePortfolio concept a rich subject that should be approached in interrelated ways.

![Figure 1: University of Amsterdam “ePortfolio concept model”, Veugelers (2005). (Adapted from Van Tartwijk et al., 2003)](image-url)
Several of the projects described in this book show that there is hope for the future: ePortfolios can be implemented successfully if this is done hand-in-hand with educational, organisational and technical development.

The article by Wilfred Rubens and Alex Kemps shows where the ePortfolio stands in Dutch higher education at macro level. Rubens and Kemps review portfolio practice at the institutional level, indicating that it is used at institutions in a wide variety of different ways. Generally speaking, the institutions seem to be in the process redesign phase as regards the consistency of their policy and practice and the embedding of ePortfolios in their curricula. The maturity model they present shows that the Netherlands has moved beyond the point of exploration and can be considered an ePortfolio country (although ePortfolios do not yet compete with tulips, clogs and windmills). The authors describe the present state of affairs and the aims of the different institutions for higher education. Their model shows differences in functionality and implementation strategy that can be used by universities in the process of making or reconsidering their ePortfolio policies.

The following article, by Wijnand Aalderink, surveys ePortfolio use in the countries that participate in the Knowledge Exchange programme on information technology in higher education: Denmark, Germany, the Netherlands and the United Kingdom. As in Rubens and Kemps' case, the picture is one of a completely fragmented "portfolio scene" with major differences in tools, functional use and level of implementation. The ePortfolio prophets engaged in the lifelong learning discourse have said that the ePortfolio enables students to facilitate and track their personal development in an open European educational space. Most institutions, however, continue to define their own concepts and choose or develop their own tools, so it is fair to say that ePortfolios are by no means the milestones on the road to Bologna yet. Quite apart from ensuring technical interoperability and resolving standardisation issues on the conceptual side, this would call for an ePortfolio policy as appears to be emerging in Britain, where various regional projects are considering the topic of transition portfolios for lifelong learning and lifewide participation.

In the meantime, most institutions and departments within institutions generate their own portfolio pathfinders, resulting in good, better and best practices that are qualitatively interesting. Janke Poortinga and Sanne Meeder describe the use of ePortfolios within university programmes in the Netherlands. They look at portfolio use in terms of academic performance, academic career management and professional behaviour, the latter being assessed as the most fruitful with respect to learning outcomes and suitability in the pedagogic design.

Quite a lot of the work done on portfolios in the Netherlands has been in the field of medicine, where there is a keen interest in professional conduct. One example is given in the article by Anouk Prop, Erik Driessen, Jaine Shacklady and Timothy Dornan. Based on both a literature review and interviews with different focus groups, they note the key properties for adequate mentoring in portfolio-based learning. The profile they describe answers the question "What is an effective mentor?". It is clear that it is important to define the role of the mentor role properly and to provide mentors with quality training.

Two of the studies in this book focus on the ePortfolio and assessment. Ida Oosterheert, Sabine van Eldik and Marijke Kral investigate and describe summative competency assessment in three different educational models. They argue that tightly prescribed curricula limit the value of ePortfolios. A more open approach that gives students more individual freedom appears to be more stimulating and leads to better results. The authors formulate a trade-off between holistic competency assessment using portfolios and the additional requirement of a limited number of "isolated" tests. Another issue they discuss is one that is frequently raised in portfolio discussions: whether to separate guidance and assessment.

Hanno van Keulen and Edith ter Braak offer a literature review and an empirical experiment involving portfolio assessment in medical education. They describe the well-known and persistent debate concerning the validity and reliability of portfolios. Their conclusion is that portfolio assessment is not really a measurement instrument. Another finding worth noting, however, is that the main strength of portfolios lies in their positive impact on student learning activities. The portfolio approach makes students more active and enables instructors to provide feedback on performance, results and reflection, something that is difficult to organise in traditional approaches.

Ellen van den Berg describes a portfolio practice at the Edith Stein Teacher Education College that uses video recordings. Quite apart from being a positive motivator for the students, video recordings in portfolios make it possible to assess teacher competence in a context-sensitive manner and in authentic professional situations. Van den Berg reports that portfolios can facilitate
learning, but that teachers should be the ones to actively facilitate the in-depth processing of subject matter and pedagogical content knowledge as cognitive tools for analysis and reflection. There is a need to establish evaluation procedures for ePortfolios, particularly for high-stake assessments.

In addition to the various projects described in this book, there are several portfolio issues ahead that require our attention from an educational, organisational and/or technical point of view. On the educational side, institutions continue to struggle with such issues as how best to improve the expertise of teachers, career coaches and students in alternative pedagogical paradigms. An important issue on the organisational side is that of scaling up portfolio use so as to link administrative and educational stakeholders in sophisticated and transparent workflows. On the technical side, there is the issue of positioning ePortfolios at the heart of the information architecture and technical infrastructure.

Educational policy-makers at supra-institutional level will have their role to play, encouraging the use of open standards to clear the way for the interoperability of ePortfolios. At strategic level, a national or European agenda is needed to turn the ePortfolio into a concept and a tool that fosters the promise of lifelong learning across educational sectors and in the field.

There is a lot we can learn from the various cases described in this book, a lot that is worth sharing. This is what we are attempting to do at the SURF Foundation in our special interest group, NL Portfolio, as we have done in the past three years. It is important that we know who the different key players are, so that we can take up these challenges together in our own interest and in the interests of lifelong learners. We intend to seek more structured forms of cooperation that allow us to work towards a common agenda for dealing with the issues we will face in the future.

References

2 The ePortfolio landscape in Dutch higher education (2006)

Wilfred Rubens, Utrecht University and Alex Kemps, INHOLLAND University

SURF’s NL Portfolio Special Interest Group asked Alex Kemps (INHOLLAND University) and Wilfred Rubens (Utrecht University) to carry out desk research exploring and opening up the “ePortfolio scene” in Dutch higher education. A survey was conducted at each institution, assessing which tool/system it uses, which materials and templates it has, and where it stands in terms of ePortfolio practice. The research makes it possible to conduct a broad survey of portfolio applications in Dutch higher education and to describe the current ePortfolio landscape.

2.1 Method

The researchers drafted a questionnaire for this research. Most of questions were multiple choice, while others were open-ended. The draft questionnaire was discussed with Prof. Robert-Jan Simons (IVLOS, Utrecht University) and Dr Jeroen Onstenk (reader at INHOLLAND University). The researchers then surveyed who could be considered the "portfolio contact persons" at each SURF-connected institution. The survey was carried out among the contacts of SURF’s ICT and Education Platform and NL Portfolio SIG. The questionnaire was then sent to a total of 38 "portfolio contact persons". The researchers also reminded the recipients of the questionnaire a number of times by e-mail and telephone. Most respondents replied in writing. In five cases, their responses were recorded during telephone conversations.

The questions were scored in SPSS. The researchers gratefully made use of the advice offered by Dr Heinze Oost (IVLOS). Frequencies were calculated and, where possible, averages (and standard deviations) and contingency tables (if a connection between variables was suspected). A draft report was discussed with Prof. Robert-Jan Simons (IVLOS, Utrecht University) and Dr Jeroen Onstenk (reader INHOLLAND University).

The researchers then developed an ePortfolio maturity model (including data from their literature review). The institutions were positioned in this model on the basis of the completed questionnaires. The respondents had the opportunity to comment on the positioning. This is explained in more detail in section 3.

This article presents an overall picture of the current ePortfolio landscape in Dutch higher education. A "random picture" has also been included of each institution. The descriptions can be found at http://wiki.ossite.org/index.php?title=SIG_NL-Portfolio:_Portfolio landscape

2.2 Response

The questionnaire was completed by 27 institutions (21 universities of applied sciences [HBO] and six research universities). The HBO institutions predominate, which may have led to a distorted picture. One questionnaire was returned after the tables and the text had been revised for the second time and was therefore not incorporated into the quantitative analysis, but it was included in the qualitative descriptions. Five institutions provided information that has been incorporated into the qualitative data, but they did not complete the questionnaire.

A number of respondents indicated that it was very difficult to express an opinion on the institution as a whole. The way in which the educational process is designed and the ePortfolio is used varies greatly. This paper provides a general outline of the dominant applications within the institutions. It will undoubtedly fail to report certain exceptional cases for that reason.

In one case, two questionnaires were returned by one and the same institution. Since the two sets of responses were very different, they have been incorporated separately. It is also worth noting that the size of the institutions varies considerably. Some teacher training colleges (PABOs), for instance, are still organised as separate institutions, whereas other institutions (such as INHOLLAND University and Utrecht University) comprise many different faculties/schools (but still filled in only one questionnaire). A distinction has therefore been made between smaller institutions
and larger ones. The first category includes the separate PABOs or faculties that responded, a total
of nine institutions. Among the larger institutions are “broad” colleges or universities (with several
faculties/schools). Seventeen of the questionnaires were submitted by large institutions.

2.3 Questionnaires

The questionnaires were designed on the basis of the following topics:
• Policy-based assumptions
• Use of portfolio
• Institution-wide portfolio systems
• Freedom of choice regarding student’s portfolio
• Roles associated with portfolios
• Curriculum embedding
• Support
• Assessment
• Educational concept
• Freedom of choice regarding student’s educational programme

Below we list the institution-wide portfolio systems applied and include an example of an
elaboration of the topic “educational concept”.

2.4 Institution-wide portfolio systems

The systems mentioned are:
• Topshare (intranet environment as portfolio environment) (2x)
• Sharepoint (5x)
• Portfolio portal (self-developed application to open up portfolio)
• WebCT
• Blackboard (courses per student) (2x)
• Blackboard CMS (4x)
• Own faculty system (3x)
• Netschool (5x)
• ID Portal
• Studyweb
• First Class
• Amico
• Concord
• DU Portfolio
• Self-developed system
• Portfolio on the basis of the CMS Roxen
• OSP (2x)

A great variety of different systems are used. Some respondents also indicate that the system is
still in the pilot phase. In well over 60% of the institutions, faculties/schools are limited in their
choice of portfolio systems. Of the 26 respondents, 23 indicated that institution-wide choices are
managed at central level (in almost 60% of the cases by a limited project organisation).

2.5 Example of elaboration of questions related to the topic “educational concept”

Admiraal et al. (2002) distinguish between three educational concepts (“educational orientations”):
• Guided learning (comparable with “organised travelling”, for example in the form of
  lectures/tutorials);
• Experiential learning (comparable with “backpack tourism”, for example in the form of problem-
  based education);
• Active learning (comparable with “explorers” who go out and investigate and take a lot of
  responsibility for their own learning process, for instance in the form of competency-based
  education).
The questionnaire asked which educational concept is leading within the institution, on the basis of the above-mentioned description. The following picture emerged:

**Table 1: Dominant education concept**

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guided learning</td>
<td>2</td>
<td>7.7</td>
</tr>
<tr>
<td>Experiential learning</td>
<td>2</td>
<td>15.4</td>
</tr>
<tr>
<td>Active learning</td>
<td>12</td>
<td>61.5</td>
</tr>
<tr>
<td>Collaborative/experiential learning</td>
<td>1</td>
<td>65.4</td>
</tr>
<tr>
<td>All</td>
<td>8</td>
<td>96.2</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td></td>
</tr>
</tbody>
</table>

A large group of respondents (46.2%) indicated that active learning is the dominant educational concept within their institution. Almost 31% indicated that their institution uses a mix of guided learning, experiential learning and active learning. Those institutions that claim to use purely "active learning" as an educational concept are HBO institutions.

**Table 2: Dominant educational concept and type of institution**

<table>
<thead>
<tr>
<th></th>
<th>HBO</th>
<th>Univ.</th>
<th>Total</th>
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<tbody>
<tr>
<td>Guided learning</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Experiential learning</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Active learning</td>
<td>12</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Collaborative/Experiential learning</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>All</td>
<td>5</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Those institutions that use "active learning" as their educational concept often see the portfolio as being at the heart of the programme.

**Table 3: Relationship between curriculum embedding and educational concept**

<table>
<thead>
<tr>
<th></th>
<th>Guided learning</th>
<th>Experiential learning</th>
<th>Active learning</th>
<th>Collaborative/Experiential learning</th>
<th>All</th>
<th>Other</th>
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<td>Portfolio separate from</td>
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<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>regular educational</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>programme</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portfolio assignments</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>within subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Learning line/skills</td>
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<td>1</td>
<td>5</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Portfolio at heart of</td>
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<td>0</td>
<td>5</td>
<td>0</td>
<td>2</td>
<td>0</td>
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<td>programme</td>
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<td></td>
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<td>Several variants</td>
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<td>0</td>
<td>3</td>
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<td>Total</td>
<td>2</td>
<td>2</td>
<td>12</td>
<td>1</td>
<td>7</td>
<td>1</td>
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</table>

Total 25
2.6 Maturity model

"Maturity models" are developed to support the improvement of processes, products and services. IBM was among the first to use a maturity model to describe the relationship between the quality of the software and the quality of the development process. IBM discovered that development takes place step-by-step (Becta, 2005). Today, "maturity models" are more often used to map the step-by-step development of technology and change processes. The British Becta, for instance, composed an ICT Maturity model for education. Marshall and Mitchell (2002) have developed an e-learning maturity model. KPMG Consulting (2002) described the use of ICT within professional and adult education through a "variant model".

Here, we wish to describe the portfolio landscape on the basis of an "ePortfolio maturity model" that we developed ourselves. A central point of departure is that flexibilisation, personalisation and "lifelong learning" should be essential in higher education and, in fact, already are. The ePortfolio will have to be considered within this framework. We also want to emphasise that this is basically a random snapshot taken in the winter of 2005/2006.

To divide the "ePortfolio maturity model" into phases, we used Becta’s classification and also incorporated various elements of the use of ePortfolios uncovered in our research. In our opinion, they mainly consist of a number of – as Becta calls it – "key organisational features". For the use of ePortfolios in higher education, we have identified the following core elements:

- Consistency between policy/practice: do the policy-based basic assumptions of the ePortfolio match the implementation in practice?
- ICT infrastructure: is a suitable ICT-infrastructure available to develop, store and distribute ePortfolios? By this we mean (within this framework) the application (software) and the server on which this application is installed.
- Freedom of choice regarding portfolio: assuming that the ePortfolio is a tool within a flexible education system, the question is how much freedom of choice students have in using the ePortfolio.
- Freedom of choice regarding educational programme: assuming that the ePortfolio is a tool within a flexible education system, the question is how much freedom of choice students have in designing their educational programme (e.g. learning targets, learning activities).
- Curriculum embedding: to what extent is the ePortfolio integrated into the curriculum?

An institution may find itself in various different phases for each core element, and this could lead to tensions within the organisation. It is better to have a balance between the various elements. The model therefore also indicates the priorities for taking action, for instance if the institution is in phase 3 as regards “freedom of choice: portfolio” and in phase 2 as regards “freedom of choice: educational programme”.

Each core element is described for each phase. Below is a description of the core element "Freedom of choice: portfolio" for three phases.

<table>
<thead>
<tr>
<th>Phases</th>
<th>Description of core element “Freedom of choice: portfolio”</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Local use</td>
<td></td>
</tr>
<tr>
<td>2: Process redesign</td>
<td>The faculty/school formulates frameworks regarding freedom of choice in the use of the portfolio. Within these frameworks, schools are allowed to make their own choices. The chosen ICT application places limits on this freedom of choice. Students are allowed to determine some of the material to be included in their portfolios and who will have access to their ePortfolios. The school also indicates who must have access to the portfolio. Students can also adapt the layout of the portfolio to a limited extent.</td>
</tr>
<tr>
<td>3: Network redesign and embedding</td>
<td>The faculty/school indicates to what extent there is freedom of choice in the use of the portfolio. Schools are allowed to make their own choices to a limited extent. The chosen ICT application places limits on this freedom of choice. Students can largely determine themselves which material they include in their portfolios and who has access to their ePortfolios. On the basis of the material collected, students can use several portfolios (for several purposes). They can also adapt the structure, within the limits set by the faculty/school. The school also indicates who must have access to the portfolio. Students may also be able to allow others access to their portfolios. They can also adapt the layout of the portfolio to a limited extent.</td>
</tr>
<tr>
<td>4: Network redesign and embedding</td>
<td>The faculty/school formulates frameworks regarding the freedom of choice in the use of the portfolio. Within these frameworks, the student (in consultation with the coach) can make choices of his own. The ePortfolio environment does not place any limits on this freedom of choice. Students themselves can determine which material they include in their portfolios and who will have access to their ePortfolios. On the basis of the material collected, students can use several portfolios (for several purposes). They can also adapt the structure, and determine who has access to the portfolios. Students also determine which functionalities/services are used and when they work on the portfolio. The student makes decisions about this in consultation with the coach. Furthermore, students can adapt the layout of the portfolio.</td>
</tr>
<tr>
<td>5: Redefinition and innovative use</td>
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We then attempted to position the various institutions within this model, thus creating a "portfolio scene". This model appears to be very well suited to more complex organisations, so we have not included the smaller institutions, nor, for that matter, institutions from which we did not receive sufficient information.
In summary, the ePortfolio maturity model looks like this.

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<tbody>
<tr>
<td>5 Redefinition and innovative use</td>
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<td></td>
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<td></td>
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<tr>
<td>4 Network redesign and embedding</td>
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<tr>
<td>3 Process redesign</td>
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<td></td>
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<tr>
<td>2 Internal coordination</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1 Local use</td>
<td></td>
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Not every institution need aim to achieve phase 5; some might not even consider that desirable.

2.7 ePortfolio maturity model applied

In this stage of the study we positioned the institutions within the ePortfolio maturity model, doing so on the basis of the individual questionnaires. The respondents then had the opportunity to comment on the positioning, after which we finalised it. The point of this exercise was to obtain their personal assessment/estimation of the positioning.

Some respondents did not complete the questionnaire and could therefore not be positioned in the model below. Smaller institutions were not placed in the model either; we indicated earlier that the ePortfolio maturity model appears to be suitable primarily for mapping larger, more complex organisations.

The point is not to get every institution to match the above-mentioned descriptions precisely; the point is to gain an overall picture. Some institutions may also have schools/programmes that are in different phases with respect to certain core elements. As mentioned earlier, institutions may also be in different phases in each core element, or in several different phases on a number of core elements.
### Phases:

<table>
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<th>Phases</th>
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</thead>
<tbody>
<tr>
<td>5 Redefinition and innovative use</td>
<td>HR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Network redesign and embedding</td>
<td>HAN, Fontys HAN, HR, INHOLLAND, UU, VU, WUR</td>
<td>Avans, Fontys HAN, HR, INHOLLAND, UvA, VU, WUR</td>
<td>HAN, HR, HAN, HR, UU</td>
</tr>
<tr>
<td>3 Process redesign</td>
<td>Avans, Fontys HAN, Hanze HR, UU, UvA, VU</td>
<td>HU</td>
<td>Avans, Fontys HAN, INHOLLAND, UvA, VU</td>
</tr>
<tr>
<td>2 Internal coordination</td>
<td>HU, VU</td>
<td>Hanze HU, UU</td>
<td>HAN, Hanze HU, INHOLLAND UU, VU, WUR</td>
</tr>
<tr>
<td>1 Local use</td>
<td>WUR</td>
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<td>WUR</td>
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</table>

**Consistency policy/practice | ICT infrastructure | Freedom of choice: portfolio | Freedom of choice: educational programme | Curriculum embedding**


It is striking that not one institution is positioned entirely in the redefinition and innovative use phase. It is also remarkable that several institutions are in more advanced phases as regards ICT infrastructure and freedom of choice regarding the portfolio than they are as regards the other core elements. In general, the institutions tend to be in the process redesign phase when it comes to consistency of policy/practice and curriculum embedding.

The ePortfolio maturity model is an effective tool for mapping the portfolio landscape in Dutch higher education. It can also play a role in developing scenarios in this field.
2.8 Conclusions

We can draw a number of conclusions on the basis of our research.

- It is a complex matter to examine, at an institutional level, how the portfolio is used in education. Respondents find it difficult to express an opinion on the whole – often large – organisation. The portfolio is thought to be used in a large variety of different ways within institutions.
- Schools/programmes play a relatively important role in determining how the portfolio is used, whereas in many cases the ePortfolio’s technical use is often determined at institutional level.
- In many cases, a small, central project organisation guides the introduction of the portfolio system.
- Students have a reasonable amount of freedom of choice in the way they use the portfolio. It is notable that large institutions allow them comparatively greater freedom of choice than do smaller institutions.
- The portfolio is mainly used for student learning (and not, for instance, to improve employee expertise). The focus is on guiding the student’s individual development, reflecting on that development and collecting materials.
- It appears that the portfolio is used to support the student’s individual learning process, and not very often for peer feedback and collaborative learning. That may also explain why students have relatively poor access to one another’s portfolio. It also appears that the portfolio is mainly used to coach students and help them to reflect on their individual development. This is remarkable, as recent views of knowledge and knowledge acquisition in educational science and educational psychology have promoted the concept of learning in powerful, flexible learning environments with complex tasks, one in which learning is considered to be a social process. The introduction of the ePortfolio in fact anticipates the introduction of more flexible, personalised forms of education.
- The portfolio appears to play an important role in higher education; it has a key position within learning lines/skills lines or is even at the heart of the programme. In many cases, students spend more than 25 hours a year working with the portfolio, and institutions often make major investments in its implementation. The portfolio is also compulsory for students. This finding was influenced by the overrepresentation of HBO institutions within the group of respondents, where competency-based learning is gaining an ever-firmer foothold. The portfolio is often considered a major tool in competency-based learning.
- Policy and practice in the use of the portfolio are generally consistent. The respondents see the greatest consistency between policy and practice when it comes to the application options “reflection on development” and “guiding the student’s individual development”.
- In the majority of cases, professionals working in the field are not involved in portfolio implementation. That is remarkable, as it is in professional practice that the level of competency must be demonstrated (and professionals working in the field are the best judges of that).
- There is a tremendous diversity in the way portfolio assessment is organised. Many of the institutions use the portfolio both diagnostically and for certification.
- A large number of different portfolio systems are used. The market for “ePortfolios” is seriously fragmented. Some respondents also indicated that their system was still in a pilot phase.
- In general, the freedom students have to design their educational programme is limited. It is remarkable that they have relatively little freedom of choice in their educational programme, as the portfolio is often seen as a tool that shows the progress of a student who has a great deal of freedom of choice in determining his learning targets and learning activities.
- It appears that there is no connection between the educational concept and the freedom of choice students have to design their educational programme. The concept “Active learning” is mentioned most often; this implies a great deal of freedom. It may be that the concept has not been widely implemented as yet. It may also be that there is a difference between the concept (“espoused theory”) and educational practice (“theory in use”), as one respondent indicated explicitly.
- The ePortfolio maturity model appears to be a meaningful tool for mapping the development of the portfolio landscape.
- The ePortfolio maturity model shows that institutions are often in a more advanced phase as regards ICT infrastructure and freedom of choice: portfolio. These are also the aspects that tend to be arranged at institutional level.
- In general, institutions appear to be in the process redesign phase when it comes to consistency between policy/practice and curriculum embedding.
2.9 Recommendations

On the basis of our research, we have arrived at the following recommendations.

- The ePortfolio maturity model is a method for mapping the portfolio landscape in Dutch higher education. Our advice is to continue developing this model, to substantiate it (through research, for instance a Delphi study) and also to use it at institutional level. It would also be advisable to perform such a “scan” about every two years, to enhance our insight into the development of the portfolio landscape.
- We recommend performing a comparable scan not at institutional level but at programme level. This is where educational leadership has an impact and where the responsibility for educational development generally lies. Doing so will allow a more complete and balanced picture of the portfolio landscape to emerge and may also promote the development of networks. Such a scan would be very labour-intensive, however.
- The very fragmented market for ePortfolio systems creates an opportunity to work on standardisation at central level. At the same time, the very diverse wishes concerning the content-wise use of the ePortfolio must be taken into account. An obvious solution is to set up a “service-oriented architecture”. Such services can be offered centrally at a national level, for instance through the SURF Foundation.
- The introduction of the ePortfolio cannot be disassociated from the didactic concept. If the conclusion is that education should be more flexible and personalised, and there should be more learning in interaction with others, then more extensive research should be performed exploring whether and how the ePortfolio can play a more prominent role in flexibilisation and collaborative learning.
- The introduction of the ePortfolio means that schools and faculties, the “owners of educational development”, need more scope to employ the portfolio flexibly – to customise it.
- Professionals working in the field should be more closely involved in supporting and developing the ePortfolio. Among other things, that implies that persons who are not working at an institution for higher education will need to have access to student ePortfolios.
- The ePortfolio can be further embedded within the organisation, for instance by also using it for employee professionalisation and possibly also for school accreditation purposes.

References


3 ePortfolio practice and opportunities in the Knowledge Exchange countries (Denmark, Germany, the Netherlands and the United Kingdom)

Wijnand Aalderink, SURF NL Portfolio/University of Groningen

3.1 Introduction

This report deals with ePortfolio practice and opportunities in the countries taking part in the Knowledge Exchange initiative (http://www.knowledge-exchange.info). It describes the current state of affairs in a general sense, providing links to various examples. It is not intended to present a complete overview of everything that is happening in the four countries, but rather offers a global introduction to the portfolio scene, describing similarities and differences and suggesting opportunities for future cooperation in the context of the Knowledge Exchange programme or otherwise.

The report is based on information provided by ePortfolio specialists in Denmark, Germany, the United Kingdom and the Netherlands (see the questionnaire in appendix I), on a limited amount of additional desk research based on that information, and on previous reports of several expert meetings in the context of the JISC-SURF cooperation.

The author wishes to thank Henrik Helms (DK), Lise Agerbaek (DK), Martin Somik (D), Ingo Dahn (D), Janet Strivens (UK) and Peter Rees Jones (UK) for their very helpful contributions to this report.

3.2 General impression of ePortfolio in the Knowledge Exchange countries

Before taking a look at more detailed aspects of ePortfolio, the portfolio specialists in the various countries were asked to briefly describe the ePortfolio situation in their country. From their answers, we may conclude that the ePortfolio is still in the early stages of development in Germany, whereas the other three countries already have a considerable amount of experience to build on. Typical of the UK is the strong government support for ePortfolio programmes.

a) Denmark

The ePortfolio is widely used in higher education in Denmark. It is used extensively in Bachelor-level programmes and in short-cycle non-university programmes (diploma level). It has been used for a wide variety of purposes in pedagogical programmes (teacher training, social education, nursing), but multimedia design and similar programmes also use ePortfolios.

Another area where the use of ePortfolios is becoming more common is in programmes in which the student spends time in a practical setting; in other words where part of the programme consists of students developing their professional skills in an actual professional environment (e.g. primary school teachers spend 10% of their training time actually teaching in primary schools). Here the ePortfolio serves as a knowledge-sharing platform between the educational programme and the professional organisation (e.g. a primary school). There are no examples reported of ePortfolios being used in Master’s or PhD programmes.

Outside of higher education, it is important to mention that portfolios are compulsory at junior secondary level, and are also being implemented at senior secondary level. There is some resistance to this, especially from teachers. Many different types of support software are being developed.

A number of Bachelor-level pedagogical programmes and short-cycle non-university programmes in multimedia design have recently begun to cooperate by establishing a Danish ePortfolio consortium
b) Germany

While portfolios are used in some fields of higher education, they play a fairly small role in other fields. This is even more the case for electronic portfolios. ePortfolios are not widely known as such in Germany, and ePortfolio research/use is almost nonexistent except for single test beds. There are only a few institutions of higher education where initial attempts are being made to use dedicated electronic portfolios (e.g. Oldenburg University, Passau University, the University of Koblenz-Landau, Saarland University). Where portfolios are used, they are increasingly maintained electronically as an individually structured set of files. These do not normally contain reflections by the learner.

The main purpose of portfolios in German higher education is to enable academic staff to assess the student’s performance. In arts programmes, portfolios are usually requested prior to admission.

As far as we know, there is no special interest group or platform organisation in Germany that facilitates cooperation on ePortfolios. Some colleagues in Germany participate in activities organised by EIFEL, which holds conferences on ePortfolios on a European scale.

c) United Kingdom

ePortfolio practice in the UK is quite mature in some areas, as many reports on ePortfolios show. Janet Strivens recently reported on ePortfolio practice in British higher education.

One important basis for ePortfolios in the United Kingdom lies in the support provided by the government. Interest in progress files and personal development grew in the 1990s, in the light of policies that attempted to achieve wider participation and to match the demand for and the supply of graduates with desired competencies. Portfolios first appeared in a paper form, but due to the growing demand for portfolio systems and portfolio services within Virtual Learning Environments, the use of ePortfolio services grew into an ICT-supported practice that is now quite common in the United Kingdom. Although it is still patchy, effective and innovative practice can be found in all subject areas in all categories of higher education. Most institutions are working on their own ePortfolio solutions, but there is some interest in transition ePortfolios, for example in projects that foster regional cooperation.

d) The Netherlands

Most Dutch institutions of higher education, and especially universities of applied sciences, are in the process of implementing ePortfolio systems. Although there are various different forms of cooperation between universities, the ePortfolio “scene” is rather fragmented, both in terms of the tools used and the functional use of ePortfolios. SURF encourages the sharing of ePortfolio practices by running various project activities and maintaining a special interest group, NL Portfolio.

Portfolio projects were started up some ten years ago in the Netherlands, with varying success. It generally takes a long time to develop and implement ePortfolios that fit well in the specific context where they are to be applied. An encouraging and simultaneously complicating factor in implementing ePortfolios is the often close link to educational and organisational change. Because it is generally difficult to change educational organisations, it is also difficult to introduce ePortfolios, especially when the aim is to use them at corporate level, which is the case at quite a few universities in the Netherlands.
3.3 ePortfolio functions

Three main ePortfolio functions can generally be distinguished: the showcase function, the development function, and the assessment function.

a) Showcase function
Some universities provide non-formal portfolio services for their students, giving them a platform for showing potential employers what they done and, in some cases, their reflections on their performance. Sometimes showcase ePortfolios are used to show generic rather than formal competencies. Showcase (or presentation) portfolios are used in all four countries, enabling students to present a profile of themselves in their own terms.

A growing number of students have their own websites, digital CVs, weblogs, and personal learning spaces. One growing German site is http://StudiVZ.net, which is very popular among German students because it serves a community function. Students have a profile and can create or join groups. They describe their current studies, including their participation in extra-curricular activities.

b) Development function
The term “learning portfolio” is often used in the UK. Its primary function is to help students understand how and what they are learning so that they can take responsibility for their own learning process within the higher education institution and throughout their lives. While portfolios are commonly used in practice, there is only limited use of ICT to support this practice, and consultants have concluded that portfolio use is immature in terms of ICT but not necessarily in terms of practical application. Work is being done on a transition ePortfolio for lifewide learning, which charts a student’s development within episodes of learning, for example during an internship with an employer as part of their university studies. “Integrative learning” is one of the themes emerging from English Centres of Excellence in Learning and Teaching (CETLs), which are supported by the Higher Education Academy in the UK. A number of CETLs are linked to JISC projects and informal meetings are held in addition to the practical support available from the CRA. A domain map of the services supporting the development portfolio has been produced showing how they also support the transition ePortfolio (http://www.nottingham.ac.uk/epreferencemodel/keydocuments/regpartnersthenep.pdf).

Personal development plans (PDPs) and ePortfolios are also closely connected in the Netherlands, and in some fields (for example medicine) are closely linked to professional skills. At various universities, ePortfolios focus on academic achievement across the curriculum, and especially on higher-level competencies such as academic writing, analytic thinking, etc. Universities of applied sciences use the ePortfolio to document personal development in generic and field-based competencies, but it is also used by career coaches to support students in their personal learning track at the university. In this sense, institutions try to link the ePortfolio technically to the administrative systems for planning and recording achievement.

In Denmark, development portfolios are used primarily in the field of pedagogy, where they can support group-based, problem-oriented work. They mainly serve as a shared medium for reflection and knowledge-sharing.

It is worth noting that PDP plays only a very small role in German higher education as a guided activity. Although staff are formally obliged to advise students after their first year of study, students seldom request this or appreciate staff doing so. On the contrary, many students perceive such advice as “meddling” in their personal business. Consequently, PDP is not likely to play a major role in inspiring the embedding of the ePortfolio in German higher education.

c) Assessment function
The four countries involved differ in the way they use portfolios as an assessment tool. Only a few programmes in Denmark work with portfolios in this way. ePortfolio-based assessment tends to be informal and focuses on assessing generic competencies rather than formal ones. It is seen as supplementary to examinations rather than as a substitute.

In the Netherlands, portfolios are commonly used for assessment purposes, both in paper-based and digital form. Sometimes portfolios are used to assess performance in individual courses, but increasingly they are also used to assess cross-curricular competencies, sometimes in the form of
peer assessments that have a formal status in the organisation. NL Portfolio is currently involved in two research projects that deal with this topic, one in medicine and one in teacher education.

In Germany, the commercial vendor IMC (http://www.im-c.de/) offers a complete learning environment for schools, universities and businesses that has been tested and introduced at several German universities, for example in Munich and, very soon, Saarland University. The learning management system is called CLIX and it offers some ePortfolio functionality for assessment.

The traditional route to university in Britain for people without formal qualifications, the Accreditation of Prior Experiential Learning (APeL), requires the development of an assessment portfolio. Some PDP practice has always involved modules that are assessed summatively. In other areas, ePortfolios are formatively assessed, for example for medical students. Overall, there is less emphasis on assessing ePortfolios in higher education than in secondary schools and colleges. An assessment service plays a significant role in other types of ePortfolio; for example, assessing a transition ePortfolio’s “person specification” against a set of job requirements may involve marking, and the primary function of assessment portfolios is often development. The e-framework (http://www.e-framework.org) has been useful in identifying how patterns of behaviour within one type of ePortfolio recur within another type, suggesting that the ICT for one is often re-useable for another.

d) Other functions
Another function of portfolios in the Netherlands is that of an institutional portfolio that can serve as a showcase or play a role in the accreditation process, as is the case in the SURF DigOport project. (http://www.eife-l.org/publications/eportfolio/proceedings/ep2005/PS3B_geers_ravet.ppt/view).

Denmark reports that portfolios are used as groupware, often to get students to reflect on their own learning and that of others. In this case, the ePortfolio becomes a place where students can share observations, reflections and knowledge.

Germany also has examples of community showcases that demonstrate the results of their joint work and focus on collaborative learning. In Lehrer-online (http://www.lo-net2.de), each student has a private room and can collaborate in group rooms. Each room type offers different tools; for instance, the group room has forums. ePortfolios do not exist as such but resemble the folders used to store learning items in the students’ private rooms.

The fourth category, one often used in the UK, is the “transition ePortfolio”. The learner presents herself in terms of the requirements set by an institution or employer; for example the “person specification” setting out the essential and desirable requirements for a job. The function for which a transition ePortfolio is developed depends however on the services provided by the development portfolio, and that makes it hard to distinguish between the two categories. In the past, attempts have been made to use transition portfolios for sequential transitions (e.g. school to college to university to employment). There is a growing interest in simultaneous “lifewide” learning in which a learner must present himself to an employer to apply for an internship.

3.4 Differences across disciplines in using ePortfolios

In all four countries, some disciplines tend to be ahead of others when it comes to using ePortfolios. The pedagogical and medical sectors are clearly in the vanguard; it has been suggested that this is because they have a practical focus on specific professions and furthermore require reflection. In Germany it is art and in Denmark multimedia studies that are reported as being other early adopters. Science, humanities and engineering lag behind somewhat, but it is difficult to present a clear picture based on such general data. As mentioned above, there are still many institutions and departments in Germany that do not use ePortfolios at all.
3.5 Use of ePortfolios by staff

There are various examples of ePortfolio implementation in the United Kingdom, where teacher involvement is the first and often successful step in changing practice, under the motto “practise what you preach”. The responses to the questionnaire distributed in this study indicate that not many staff members use ePortfolios themselves; only a few teachers use them to present their reflections and views on the subjects they teach, as well as to showcase their actual work (articles, curriculum). In some cases, the learning management system used by the school/university provides space for this, while other institutions do so on websites, for example, but staff appear to be wary of using portfolios, perhaps because it would make their work and achievements more transparent. Only a few pioneers have created their own ePortfolio, sometimes because they are interested in IT and the potential it has for their teaching practice.

If teachers were more industrious in using ePortfolios, they would have an opportunity to express their views on the subjects they teach to students (and fellow teachers). This would make it easier for the students (and fellow teachers) to understand and discuss their views, which are now more of a “subtext” in the teaching situation.

In the Netherlands, a growing number of university employees maintain personal development plans as part of their formal annual academic career planning, although often in paper-based form. There may be a role for human resource management to play in this regard; HRM staff such as career advisors help to link pedagogical practice to human resource practice, as there are a number of parallels between the two.

There may also be a need to establish a relationship between ePortfolios and the work of building repositories, which is often headed by librarians, particularly in the case of merged repositories. In addition, librarians could ensure that their unique information-finding competencies are more widely understood (and used) by presenting their work in an ePortfolio.

Some researchers have websites showcasing their publications and introducing their field of research, but very few would define those sites as an ePortfolio. In the United Kingdom, funding is available specifically to improve career structures for research staff, and a case has been prepared to facilitate discussion. Researchers could validate their work and publications by allowing viewers to comment on and discuss their work, and perhaps even their findings as the research is being carried out. The researchers would have the opportunity to reach a larger audience and to share reflections about their own work. ePortfolios could become an important tool for enhancing personal collaboration in scientific communities, and – if used for finding/hiring staff and setting up joint project teams – for strengthening ties between research and industry.

Although staff members may not be active users of ePortfolios when it comes to presenting themselves and their achievements, teachers in particular will have to work with portfolios on a daily basis as coaches or assessors. This is an issue that is being explored in the Netherlands in a number of different projects dealing with such questions as “What makes a good portfolio coach?” and “How can peer assessment be organised in electronic form?”

3.6 Level of implementation

a) Germany

There are some notable local examples of ePortfolio use in Germany, for instance at Oldenburg University, which has incorporated ePortfolio use into the Master of Distance Education (MDE) curriculum, making it a graduation requirement. Passau University is working on the BMBF project InteLeC. Its intention is to develop a web-based ePortfolio tool that can be integrated into a campus-wide learning platform. The first target group will be teacher education students. Most projects are in the early stages of exploration. There are further interesting initiatives outside of higher education, such as the “ePortfolio Hessen” school development project, which is testing the use of ePortfolios in school lessons (http://www.eportfolio-hessen.de) at a number of selected schools. Teachers attend training courses conducted by the Institute of Education (Department of School Education) at Jusus-Liebig University in Giessen. Students will learn how to reflect on and present their skills and competencies. They will also acquire constructive and productive abilities by
learning to use new media (e.g. weblog, social software). One goal of this project is to build and invigorate these competencies in secondary school by using an ePortfolio. ePortfolios will be evaluated to find out more about the students’ individualised, differentiated, and self-reflective learning.

There are no examples in Germany of scaled up or fully implemented ePortfolios at corporate level. In general terms, knowledge of ePortfolios (and ePortfolio concepts) is limited and the attitude towards them is not always positive. Teachers appear to be reluctant to invest a lot of time in portfolio coaching and tracking student progress. Moreover, privacy is an important issue, including in the trade unions, where there is the fear that an employer might exploit ePortfolios to track data about its employees.

b) Denmark
Quite a few interesting pilots have been carried out in Denmark, for example in teacher education at CVU Sonderjylland and in social education at CVU Fyn. One interesting example of more highly developed ePortfolio implementation can be found in teacher education at CVU Jelling (http://www.cvujelling.dk/page466.asp). Two examples of full implementation have also been mentioned: the short-cycle non-university programme in multimedia design at Odense Technical College (http://www.multimediedesigner.ots.dk) and the Social Educator programme at CVU Sonderjylland (http://www.cvusonderjylland.dk/index.php?cccpage=Intp2).

c) The Netherlands
There have been a large number of pilots in the Netherlands since the late 1990s, both at institutional level and in national projects headed by the digital university http://www.du.nl/portfolioimplementation (rich source in English) and by SURF. For an overview, see Aalderink & Veugelers (2005), “EPortfolios in the Netherlands: Stimulus for Educational Change and Lifelong Learning”, a paper presented at the EDEN 2005 conference in Helsinki, Finland (http://www.surf.nl/portfolio). Universities of applied sciences, for example HAN, Fontys, INHOLLAND and Windesheim, are currently scaling up their use of ePortfolios and tackling the organisational and technical issues that go along with corporate implementation.

Various initiatives have emerged concentrating on the standards needed to ensure the interoperability of ePortfolios. In a national project launched by Kennisnet (http://www.kennisnet.nl), the IMS portfolio specifications have been tailored to the Dutch situation and various pilots have been introduced focusing on the transition between various different educational sectors, which in some cases also involves input from professionals working in the field.

d) The United Kingdom
There is a significant amount of new local activity in Britain, much of it involving regional JISC projects and Lifelong Learning projects using ICT to join up practice across a number of partners, typically schools, colleges, universities and, increasingly, employers. This is an important development reflecting the British government’s commitment to lifelong learning, rather than the use of ePortfolios limited to a single episode of learning. The Northwest and East Midlands regions are in the vanguard of this work in England, as well as some Transformation projects in Scotland.

The thin ePortfolio architecture enabled by the e-Framework appears to correspond well with the ePortfolio work the Open University is undertaking using Moodle (which is widely used in colleges). Further discussions will take place with the British Educational Communications and Technology Agency (Becta) (http://www.becta.org.uk), allowing schools, colleges and universities to provide integrated support for young learners as they move through the education system and for people learning simultaneously in education and employment. The local pilots mentioned above may have a key role to play in this respect.

Three of the universities funded by the British Ministry of Education in 1997 produced e-Progress Files that have been widely adopted by other universities and in an increasing number of subjects. In the UK, this represents the first generation of “Progress File practice”, currently being replaced by “ePortfolio practice” in which integrative learning is emerging as a key issue. Many universities are using the ePortfolio services bundled into virtual learning environments (VLEs). If a core function of the ePortfolio is to integrate learning, the restrictions imposed by some VLEs will be a potentially serious constraint in the medium term: the JISC strand on Learning Environments will be relevant to ePortfolios here.
3.7 Important issues in ePortfolio development

Because the various countries are at different stages of implementation and also differ in other respects, it is not easy to summarise in general terms what the most important issues are for future development. What follows is an attempt to categorise some of the responses in terms of organisational, educational and technological aspects.

a) Organisational
Management support is crucial, as is the allocation of adequate means needed to establish not only the digital platform but also the organisation surrounding it. A certain level of managerial pressure is also required to change the attitudes of teacher/educators who dislike the ePortfolio concept. This is an organisational issue at institutional level, but there are issues at stake at regional, national or even international level. For example: how can one scale up from institutionally bound ePortfolio systems to an ePortfolio model capable of supporting learners’ lifelong and lifewide development, so that all types of learners can benefit from and contribute to the development of a knowledge economy?

b) Educational
In some ways the use of ePortfolios points to a change in the education system. In many places, ePortfolios are used to achieve a greater level of individualisation in education. Increasingly, each student is looked upon as the owner of his or her own individual education. ePortfolios are a very functional means of keeping track of this “individual” educational process.

Another angle is the belief that the most important competency today is to be aware of your own competencies: being aware of and being able to steer your own development has become a competency in itself. ePortfolios allow people to reflect on and present examples of their own work, making it possible for students (or teachers) to present themselves (with all their insecurities and doubts, as these are often the result of reflection). The ePortfolio provides unparalleled scope for self-presentation, which not only makes it possible for the reader of the ePortfolio to learn something about the owner, but also for the owner to realise who he or she is (or is becoming).

All of this is based on a very important and popular assumption in ePortfolio paradigms: the individual should always be the owner of the portfolio – and the only one with the power to change it. On the other hand, when the idea is to use the ePortfolio for assessment and to keep track of progress, the ownership discussion is influenced by the needs of the organisation that monitors and records its student’s achievements.

One new challenge facing institutions is that students already have access to IT and a digital identity when they enter the university. The “web 2.0” technologies being developed offer a wide range of opportunities that can be exploited. Examples include lifelong and lifewide learning and the link between formal learning and social software.

c) Technical
Teachers and students working through courses and in classrooms have a clear need for flexible tools with high usability. The current portfolio scene is fragmented in terms of the tools used, indicating that it is still in a state of flux, with many universities working on their own systems. No market leader can be identified yet, and the tools that score best on self-configurability and openness may attract the most users. Perhaps universities should simply abandon the idea that they have to provide technology that replaces what the students already use.

One important question is how the e-Framework or other recent approaches based on information architecture can enable better communication between the technicians and teachers, and reduce complex problems such as the ePortfolio for lifewide learning to simpler terms in which practical implementation becomes possible.
3.8 Opportunities for cooperation

When we survey the entire field of ePortfolio use, we see much that is worth sharing, especially because there are various common points of concern and similarities between all four countries involved. We have only been able to discuss some of those issues above.

One way of putting experts in touch with one another so as to create access to mutual ePortfolio resources is to organise expert meetings at which teaching and learning practices are shared. JISC and SURF have already organised two such successful meetings, as have SURF and the Association for Learning Technology (ALT); all the reports and presentations are available at [http://www.surf.nl/portfolio](http://www.surf.nl/portfolio). These and other meetings have fostered relationships between individual experts and led to special interest groups being established. Other activities might focus on specific fields such as medicine or teacher education, where there is a solid basis for sharing between different countries. One interesting issue would be to find out more about the possible relationship between portfolios and the roles of specific stakeholders in the organisation, for example librarians and researchers, a question which is still relatively unexplored.

Since ePortfolio practice in Germany lags behind somewhat, a portfolio field trip for German practitioners to one of the other countries might be useful. Both Britain and the Netherlands have active special interest groups on ePortfolios, a concept that fosters sustainable development in the field both within and between the countries. This may be something for Germany and Denmark to explore.

Co-operation at a European level is another possible avenue. There are two projects that are closely linked to portfolio practice and aims. TENCompetence ([http://www.tencompetence.org](http://www.tencompetence.org)) will support individuals, groups and organisations in Europe in lifelong competency development by establishing the most appropriate technical and organisational infrastructure, using open source standards-based, sustainable and innovative technology. The TENCompetence infrastructure will support the creation and management of networks of individuals, teams and organisations in Europe actively involved in the various occupations and domains of knowledge. These “learning networks” will support the lifelong competency development of the participants from the basic levels of proficiency up to the highest levels of excellence. The network consists of learners, educational institutions, libraries, publishers, domain-specific vendors, employers, associations, and all others who deliver services or products in the specific field.

Europass ([http://europass.cedefop.europa.eu/](http://europass.cedefop.europa.eu/)) is a potentially robust set of instruments that can serve as a tool for facilitating a European work and learning space for students and institutions, once national bodies like the members of the Knowledge Exchange support this idea. Whether students are planning to enrol in an education or training programme, looking for a job, or acquiring experience abroad, it is important for them to be able to make their skills and competencies transparent. Europass tries to enable mobility by providing standardised documents that make an individual’s skills and qualifications transparent throughout Europe. A National Europass Centre in each country coordinates all activities related to the Europass documents. It may be interesting to bring representatives of these Centres together with ePortfolio experts from the four Knowledge Exchange countries and explore relationships and opportunities in the context of lifelong learning.
### Questionnaire

**Questionnaire on ePortfolio practice in the Knowledge Exchange countries (Denmark, Germany, the United Kingdom and the Netherlands)**

*Please answer the following questions by describing the situation in your country in a general sense, and by providing figures, examples, relevant links, names of contact persons and relevant organisations, etc.*

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To what extent are student ePortfolios used by institutions of higher education in your country? (Please give your general impression on where your country stands in this field in about 150 words.)</td>
<td></td>
</tr>
<tr>
<td>2. For what functions are ePortfolios used by students in higher education in your country?</td>
<td></td>
</tr>
<tr>
<td>• Showcase portfolios?</td>
<td></td>
</tr>
<tr>
<td>• Development portfolios?</td>
<td></td>
</tr>
<tr>
<td>• Assessment portfolios?</td>
<td></td>
</tr>
<tr>
<td>• Other functions?</td>
<td></td>
</tr>
<tr>
<td>3. Are there any differences (qualitative or quantitative) in the way ePortfolios have been adopted in the various disciplines (social sciences, life sciences, linguistics, etc.) in your country?</td>
<td></td>
</tr>
<tr>
<td>• Which disciplines are ahead of the others?</td>
<td></td>
</tr>
<tr>
<td>• Which disciplines lag somewhat behind?</td>
<td></td>
</tr>
<tr>
<td>• Which disciplines do not use ePortfolios (yet)?</td>
<td></td>
</tr>
<tr>
<td>4. Are ePortfolios used by staff members too, and if so, for what purpose?</td>
<td></td>
</tr>
<tr>
<td>• By teachers?</td>
<td></td>
</tr>
<tr>
<td>• By researchers?</td>
<td></td>
</tr>
<tr>
<td>• By librarians?</td>
<td></td>
</tr>
<tr>
<td>• Other staff members?</td>
<td></td>
</tr>
<tr>
<td>5. What is the possible impact of ePortfolio developments on professions/procedures?</td>
<td></td>
</tr>
<tr>
<td>• For teachers?</td>
<td></td>
</tr>
<tr>
<td>• For researchers?</td>
<td></td>
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<tr>
<td>• For librarians?</td>
<td></td>
</tr>
<tr>
<td>• For other staff members?</td>
<td></td>
</tr>
<tr>
<td>6. In what stage of implementation are ePortfolios in the different institutions of higher education in your country?</td>
<td></td>
</tr>
<tr>
<td>• Local pilots?</td>
<td></td>
</tr>
<tr>
<td>• Scaling up use?</td>
<td></td>
</tr>
<tr>
<td>• Implemented at corporate level?</td>
<td></td>
</tr>
</tbody>
</table>
7. What do you consider to be the most important issues in ePortfolio implementation in higher education in your country?
   - Organisational?
   - Educational?
   - Technical?
   - Other?

8. What examples are there in your country of ePortfolio co-operation between institutions of higher education and other organisations, and how do you assess their value?
   - In the pedagogical sector?
   - In government?
   - In the professional arena or working life?

9. What examples are there of ePortfolio co-operation between institutions of higher education and how do you assess their value?
   1. At a national level in your own country?
   2. At an international level?

10. What new possibilities do you see for ePortfolio co-operation between institutions of higher education?
    - At a national level in your own country?
    - At an international level in the context of the Knowledge Exchange or at a European level?

Space for your comments, etc.
4 The use of ePortfolios in academic programmes

Janke Poortinga and Sanne Meeder, Vrije Universiteit Amsterdam, Centre for Educational Training, Assessment and Research

4.1 Introduction

Ever since the Bachelor-Master structure was introduced in the Netherlands, there has been a growing need to stimulate critical reflective thinking in order to distinguish university programmes from vocationally-oriented Bachelor’s and Master’s programmes. At the same time, communication skills, learning skills and professional behaviour need to be given more explicit attention alongside cognitive learning goals. Portfolios are generally considered a suitable tool for structuring and supporting instruction in those skills. However, initial experience of working with portfolios to achieve academic goals shows that maximum use is not always made of their added pedagogical value.

4.2 Research questions

This experience has led us to formulate the following questions: Is full advantage being taken of the portfolio instrument? Do students and tutors see the learning objectives for which the portfolio is used as relevant? Are the learning environments appropriate for achieving these objectives? To answer these questions, we examined the ways portfolios are used at research universities in the Netherlands.

4.3 Development of a generic framework for portfolio outcomes, academic objectives and the learning environment

In order to develop a generic framework for portfolio outcomes, academic objectives and the learning environment, we performed a quick scan of the Dutch literature on these subjects. (We restricted ourselves to the Dutch situation: portfolio use in the Netherlands generally has less to do with career management than in the UK or USA, for instance.) The main goals of this scan were:

a) to ascertain what the added value of ePortfolios is generally considered to be. Or, in other words: which specific learning objectives or student outcomes can be achieved by using portfolios;

b) to find a generic description of academic objectives;

c) to identify the features of the portfolio learning environment that are currently known to enhance intended outcomes.

a) What is considered to be the added value of ePortfolios?

The ePortfolio is an instrument with which students can document and organise feedback on their development. The archive and communication functions are the core features of this tool. The archive function allows a student to document and analyse a variety of comparable products and experiences, allowing him to discover patterns in his performance, his style, and his underlying views and attitudes. Recognition of patterns is a necessary condition for self-directed growth. Students learn to analyse what they experience, to obtain a deeper understanding of connections, of their own role in and contribution to the common achievement, and to draw conclusions at a higher level of abstraction.

The communication function is useful in two ways. Firstly, it enables the student to compare his estimate of his capacities and his ideas about the direction of his development with the opinions of others, and to ask for any specific guidance he might need. Secondly, students can show their portfolio, for example for midterm assessments or as part of a job application. “From the qualitative research into the functions portfolio can fulfil, we conclude that those functions mainly
can be found in the communication which arises with students about the demands for ‘self-steering’ and development of competencies, in depth as well as breadth” (Elshout-Mohr et al., 2004).

If we want students to take more responsibility for their learning process (“self-steering” or self-directing), we have to design adequate training tasks and make use of standards for assessment. Only in this way will students be obliged to pass through every phase of the reflection process. When they do this regularly, their self-steering ability will improve.

The reflection process is made up of several steps that have to be carried out in succession. It begins with an estimate of one’s own competencies in relation to specific standards; this implies focusing on specific learning goals and end qualifications (step 1). Self-evaluation is based on a series of products and learning experiences in relation to the standards (step 2). The third step is to identify patterns in one’s own performance. The ability to identify patterns will improve considerably when a student is obliged to underpin his claims systematically by having to select the evidence from all the “rough” material (Van Tartwijk et al., 2003). The final step of the reflection cycle is to plan the next step in one’s education. In actual practice, students are not required to go beyond step 2, self-evaluation, in the reflection process (Elshout-Mohr et al., 2004). When a student has to meet clear requirements for each step, reflection will become more profitable and less “vague”.

Asking for and giving feedback enhances the quality of one’s own self-evaluation and contributes to a culture in which students are used to taking responsibility for their development. Moreover, students become more conscious of the standards set for their performance and products. Educational psychology also teaches us that learning is a social event and as such, peer feedback can be used to enhance the outcomes.

The requirements for the reflection process reflect the principles of coaching: in the coaching process, the focus is on recognising patterns in your own behaviour and taking responsibility for your contribution or role, within the context of specific goals and standards (Lingsma et al., 2003). Tutors must be well aware of these principles and be trained in coaching skills.

By making good use of the two main functions of portfolios, a student is better able to steer his own development. Academic objectives, however, determine the direction of this development. A clear view of what is meant by academic objectives is therefore indispensable. Without a frame of reference, communication about development is pointless.

b) What can be used as a generic description of academic objectives?

Since the implementation of the Bachelor-Master structure, a generic framework for academic objectives has been provided by the Dublin descriptors: these describe the end qualifications of a university graduate. The descriptors were adopted internationally in 2004; they were formulated by a group of experts and adopted by the Dutch-Flemish Accreditation Organisation (NVAO).

The qualifications are described as five distinct competency domains: knowledge, application of knowledge, (reflective and critical) judgment, communication skills and learning skills. They are, however, highly interdependent: reflective judgment, for instance, cannot be displayed without a solid knowledge base and communication skills. One of the demands for the accreditation of academic programmes is that faculties make transparent the ways in which their students obtain the end qualifications. This demand has encouraged thinking in terms of learning paths or learning lines.

The Dublin descriptors are applicable to all sorts of academic disciplines, whether more professional (with an extra emphasis on “learning to do”), more research-oriented (with an extra emphasis on “learning to become a researcher”) or in the humanities (with an extra emphasis on “learning to think”).

c) Which features of the portfolio learning environment are relevant for enhancing the intended outcomes?

Proper use of a portfolio makes demands on the learning environment. Several important elements can be distilled from the practical experience gained.
Several years ago, when the Bachelor-Master structure was introduced, the board of Utrecht University decided that all faculties should use portfolios to support the development of academic skills. A survey of portfolio use conducted at the university in 2005 showed that users thought the main problem was the lack of explicit learning lines and standards. They also reported as problems the fact that students were not coached in reflection skills and that the portfolio had an unclear status within the study programme. In general, the medical faculty respondents were more positive about portfolios than respondents from other faculties (Rubens and Oost, 2005). According to Oost, portfolios were introduced too early in many faculties: the general approach to education according to the new demands of the Bachelor-Master structure had not crystallised sufficiently as yet (conclusion in Oost’s keynote address at a conference at Vrije Universiteit Amsterdam, June 2006).

Because the Dublin descriptors are interdependent, the best way for a student to acquire the necessary qualifications is to be trained in authentic tasks. Ideally, a programme should consist of series of comparable but varied authentic tasks (Merriënboer, 2005). A student can only learn to look for patterns in his own performance if he acquires sufficient experience in authentic tasks. In the arts and sciences, where “learning to think” and “learning to become a researcher” are the main goals of academic development, authentic tasks are, for instance, organising a mini-conference, undertaking a research project, or performing a design task (Milius et al., 2001). In programmes where “learning to do” is more central, such tasks might involve dealing with patients at a GP’s practice, “where the student can smell, see and feel the practice” (Jansen-Noordman and Merriënboer, 2002). In this way students learn from the start to use their knowledge, skills and attitude in an integrated manner.

According to Merriënboer (2005), training in authentic tasks encourages knowledge and skills transfer to situations in actual practice. Portfolios enhance this transfer even more because self-evaluation, reflection and self-steering tasks are inherent to portfolios. Experience-based learning can be improved by having students perform systematic observation tasks.

In short, the minimum requirements for the learning environment appear to include: having a clear view of the end qualifications and learning lines, translated into a sufficient number of varied authentic tasks; having a clear and well-communicated view of the specific place of the portfolio tasks within the overall programme; and tutors trained in coaching techniques.

### 4.4 Questionnaire and method

In order to address the research questions, we developed a questionnaire that took as its framework the intended learning outcomes and end qualifications and the demands on the learning environment. The questionnaire was tested by four portfolio experts at Vrije Universiteit Amsterdam, two of whom work for the Centre for Educational Training, Assessment and Research (CETAR). The revised version was completed by a fifth expert from CETAR.

The final version was distributed electronically among the staff involved in portfolio use at department level at all 14 research universities in the Netherlands. Five examples of “good practice” were selected from the results, based on length of use and an excellent assessment of the benefits. The secondary criteria were: the phase of the programme (one Bachelor’s and one Master’s programme) and main objective (academic performance and professional behaviour). The staff and panels of students involved were interviewed in order to explore the critical success factors. We will quote from the interviews to illustrate various points.

### 4.5 Results

#### 4.5.1 General results

*Response*

We obtained information on 43 portfolio applications, and no information on a maximum of five. At ten (of the 14) universities, the response was 100%. In short, the data are representative for the way portfolios are currently used at research universities in the Netherlands. The range of applications is 0 to 14 per university (spring 2007).
The tables in the following section use numbers instead of percentages, as the number of applications is relatively small and the number of variables large.

**Explanation of the categories used in Tables 4 to 12**

**Main objectives for portfolio and types of programmes**

We classified the main objectives of portfolio use as follows:

- **Academic performance**: learning to do research/to design, and communicate about it in a critical way; developing an independent, critical attitude.
- **Professional behaviour**: learning to practise a profession, be independent, responsible and critical.
- **Academic career management**: reflecting on motivation and academic choices.

Accordingly, we made a distinction between the arts and sciences on the one hand and professional training programmes (e.g. medicine, teacher training) on the other. (Reason for this distinction: portfolios are more likely to be evaluated positively in professional training programmes than in arts & sciences programmes.)

- **Arts & sciences** (arts and literature, social sciences, sciences, technical sciences, etc.)
- **Medical programmes** (medicine and dentistry)
- **Teacher-training programmes** (for pre-university and higher education)
- **“Other professional programmes”** (Master’s in pedagogy, Bachelor of law and Bachelor of pharmacology).

**Table 4: Number of times portfolios are used per objective and type of programme**

<table>
<thead>
<tr>
<th>Type of programme</th>
<th>Portfolio objectives</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACADEMIC PERFORMANCE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PROFESSIONAL BEHAVIOUR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACADEMIC CAREER MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>Arts &amp; sciences</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Medical programmes</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Teacher-training programme</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Other programmes</td>
<td>professional</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>N</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>42</td>
</tr>
</tbody>
</table>

Portfolios are used nearly as many times for academic performance as for professional behaviour. In the Master’s programmes, they are mainly used for professional behaviour purposes (6 of a total of 7). Portfolios are used for academic career management exclusively in the Bachelor’s phase.

**4.5.2 Intended educational benefit and perceived relevance of main objectives**

*What was the intended result of portfolio use?*

Most respondents answered this question with phrases such as “to allow students to direct their own learning process” for all three types of objectives. Faculties try to influence student attitudes towards their studies, to make them more responsible for their own achievements. According to a science tutor: “We want students to study actively, we want them to learn to ask for the feedback they need, to understand the objectives of the programme and the level at which they master the subject matter in relation to the end qualifications.”

We were interested in what the students themselves thought about the outcomes. One chemistry student said: “Peer review was useful. I was not inclined at all to ask for feedback. It’s good that I had to do it. Now, in our third year, we still ask each other for feedback even though it isn’t compulsory anymore.”

A medical student told us: “You remember the points you are told you have to improve and you try to pay attention to them. Also, you notice changes in the way you see yourself as a practitioner in the future. You can track your progress, experience your own development by seeing that your
self-image is becoming richer. It now feels quite natural to reflect on myself and how I am performing in practice.”

Another student mentioned the tutor groups as a useful supplement to peer feedback and peer reviews: “We had a very open discourse about ourselves and the quality of our work.”

**Perceived relevance**

Do users perceive professional behaviour as a more relevant objective of portfolio use than academic performance or academic career management?

**Table 5: Relevance of objective as perceived by students and tutors**

<table>
<thead>
<tr>
<th>Objective perceived as relevant by</th>
<th>Portfolio objectives</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACADEMIC PERFORMANCE</td>
<td>PROFESSIONAL BEHAVIOUR</td>
</tr>
<tr>
<td>students</td>
<td>tutors</td>
<td>students</td>
</tr>
<tr>
<td>Minority</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Half</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Majority</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>N</td>
<td>18</td>
<td>18</td>
</tr>
</tbody>
</table>

According to the respondents, students as well as tutors are more likely to see the relevance of portfolios for professional behaviour than for the other two main objectives. One remarkable outcome is that tutors generally see portfolios as being more relevant than do students. This is the case for every category of objective. Students are the most “sceptical” when portfolios are used for academic performance and academic career management.

When asked to score the educational benefit for students on a scale from 1 (extremely negative) to 10 (extremely positive), about two thirds of respondents award a score higher than 6. The scores vary from 2 to 9. In general, they award lower scores to portfolios being used to achieve academic objectives than they do when they are used in pursuit of professional objectives. *Within* these categories, however, the scores vary greatly. In the following, we will attempt to explain differences by looking more closely at some specific features of the portfolio learning environment.

**4.5.3 Features of the learning environment and assessment of learning outcomes**

In this section we will zoom in on the features of the learning environment mentioned earlier. Do the various institutions differ with respect to these features, and is this reflected in how they assess the estimated learning outcome (i.e. the scores awarded by our respondents)?

- **Requirements concerning the steps of the reflection process**
We assumed that reflection will be more beneficial and less “vague” when a student has to satisfy clear requirements in each step of the reflection process. We therefore asked whether students have to meet specific requirements in each step.

Table 6 indicates how often the respondents gave a positive answer (to each question/step). For example, three of the respondents set requirements concerning the identification of patterns for students reflecting on specific aspects of academic performance.
Table 6: Frequency with which requirements are set for step 1 to 5 of the reflection process

<table>
<thead>
<tr>
<th>Steps</th>
<th>Portfolio objectives</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACADEMIC PERFORMANCE</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>PROFESSIONAL BEHAVIOUR</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>ACADEMIC CAREER MANAGEMENT</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>42</td>
</tr>
<tr>
<td>1. Requirements concerning references to standards (end qualifications/competencies) in self-evaluations</td>
<td>6 10 1 17</td>
<td></td>
</tr>
<tr>
<td>2. Requirements concerning the incorporation of products and learning experiences in self-evaluations</td>
<td>7 16 1 24</td>
<td></td>
</tr>
<tr>
<td>3. Requirements concerning the identification of patterns</td>
<td>3 11 1 15</td>
<td></td>
</tr>
<tr>
<td>4. Requirements concerning the systematic underpinning of claims</td>
<td>1 11 1 12</td>
<td></td>
</tr>
<tr>
<td>5. Requirements concerning the student's planning the next stage of development</td>
<td>6 11 2 19</td>
<td></td>
</tr>
</tbody>
</table>

To summarise, consistently more requirements have been imposed on the reflection process for professional behaviour than for academic performance.

Assessment of learning outcome
In only eight cases do students have to meet certain requirements in all (or almost all) the steps, i.e. 4 or 5. In all eight cases, the objective is professional behaviour, and in all eight the respondents assess the learning outcome as “excellent” (mean score of nearly 8).

- The purpose of the reflection task is indicated
Before setting requirements for reflection tasks, the purpose of the task should be explained (i.e. why should the students have to reflect at all).

Table 7: Explanation of reflection task and portfolio objectives

<table>
<thead>
<tr>
<th>Reflection explained</th>
<th>Portfolio objectives</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACADEMIC PERFORMANCE</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>PROFESSIONAL BEHAVIOUR</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>ACADEMIC CAREER MANAGEMENT</td>
<td>2</td>
</tr>
<tr>
<td>No</td>
<td>13 8 1 22</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>5 11 1 17</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>18 19 2 39</td>
<td></td>
</tr>
</tbody>
</table>

Where the objective is professional behaviour, more attention is paid to the purpose of reflection, unlike in the case of academic performance. No relationship has been found between the scores and the estimated learning outcomes.

- Standards for learning lines are used
Students need a frame of reference to reflect and practise self-direction, at various levels. Do such standards exist, and are they used?
Table 8: Learning lines and portfolio objectives

<table>
<thead>
<tr>
<th>Learning lines</th>
<th>Portfolio objectives</th>
<th>ACADEMIC PERFORMANCE</th>
<th>PROFESSIONAL BEHAVIOUR</th>
<th>ACADEMIC CAREER MANAGEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>exist?</td>
<td>used?</td>
<td>exist?</td>
<td>used?</td>
</tr>
<tr>
<td>In progress</td>
<td>8</td>
<td>8</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>2</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>N</td>
<td>11</td>
<td>10</td>
<td>12</td>
<td>9</td>
</tr>
</tbody>
</table>

Clear standards are actually used only twice in the case of academic performance and 7 times in the case of professional behaviour. Students’ learning outcome is assessed as “excellent” (mean of almost 8) in all programmes in which a clear frame of reference is used.

- **Embedding of portfolio within the programme and frequency of use**
  A change in attitude (“becoming the director of one’s own learning”) does not come about by performing a marginal task only incidentally. We assume that students can only acquire the right attitude by making regular and integrated use of portfolios within their learning path.

We divided portfolio use into two categories:
- limited: only for academic career management or in connection with one or two subjects;
- integrated: the portfolio is used as an educational and assessment tool within the learning path/paths.

Table 9: Embedding within programme and main objectives

<table>
<thead>
<tr>
<th>Embedding</th>
<th>Portfolio objectives</th>
<th>ACADEMIC PERFORMANCE</th>
<th>PROFESSIONAL BEHAVIOUR</th>
<th>ACADEMIC CAREER MANAGEMENT</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited</td>
<td>11</td>
<td>6</td>
<td>3</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Integrated</td>
<td>7</td>
<td>12</td>
<td>2</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>18</td>
<td>18</td>
<td>5</td>
<td>41</td>
<td></td>
</tr>
</tbody>
</table>

Limited and integrated use are found in equal measure. Integrated use is most common when the objective is professional behaviour; limited use is more common when the objective is academic performance.

Table 10: Frequency of portfolio use and main objectives

<table>
<thead>
<tr>
<th>Frequency of use</th>
<th>Portfolio objectives</th>
<th>ACADEMIC PERFORMANCE</th>
<th>PROFESSIONAL BEHAVIOUR</th>
<th>ACADEMIC CAREER MANAGEMENT</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidentally/once or twice every year</td>
<td>10</td>
<td>4</td>
<td>2</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Regularly/minimally once every month</td>
<td>8</td>
<td>9</td>
<td>2</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Intensive/weekly</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>18</td>
<td>18</td>
<td>4</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

Portfolios are used more frequently when the objective is professional behaviour than when it is academic performance. They are used intensively only for professional behaviour purposes (they are also used more frequently as assessment tools or skills dossiers).
Assessment of learning outcome
Integrated use is generally assessed as positive, with negative marks being awarded only 4 times. The learning outcome mostly gets high marks when students use their portfolio every month or week; only 3 of the 24 marks were negative.

- Use of peer feedback and requirements for feedback

Table 11: Use of peer feedback/requirements for feedback and portfolio objectives

<table>
<thead>
<tr>
<th>Peer feedback</th>
<th>Portfolio objectives</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACADEMIC PERFORMANCE</td>
<td>PROFESSIONAL BEHAVIOUR</td>
</tr>
<tr>
<td>Peer feedback used</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Requirements set for feedback</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

The opportunities we mentioned in 4.3(a) to improve the quality of the reflection processes by means of peer feedback are seldom used in practice. We must even cast a critical eye on those situations where peer feedback is in fact used. According to students, the feedback is often superficial and restricted to technical aspects. It is also often provided too late and is therefore less useful than it would have been if provided immediately. As one student said: “At the end of the year we found that five feedback reports on my presentations were missing. John, can you remember my presentation in October? Can you give me some feedback on it?” They report on having to collect feedback just before the course finishes. Students were also not always happy about the form peer feedback takes, i.e. checklists. “Having a talk works, filling in a form does not. Talking about how you work together and your role in the group is uncommon, and that is really the big plus of being in a tutor group.” Another student adds: “Sometimes you are extremely surprised at how other people see you and that’s a very important educational aspect.”

- Preparation of students and tutors

Table 12: Preparation of students and tutors

<table>
<thead>
<tr>
<th>Preparation</th>
<th>Portfolio objectives</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACADEMIC PERFORMANCE</td>
<td>PROFESSIONAL BEHAVIOUR</td>
</tr>
<tr>
<td></td>
<td>Students tutors</td>
<td>Students tutors</td>
</tr>
<tr>
<td>Written &amp; oral information</td>
<td>16</td>
<td>11</td>
</tr>
<tr>
<td>Use of ePortfolio</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Training in coaching</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

Tutors are generally less well informed about and trained in the use of ePortfolios than students. Only 17% had received explicit training in coaching skills, and even that must be taken with a grain of salt. In interviews, we were told that training was not compulsory and that coaching skills were not the main focus of training.

In practice, tutors often adopt an informal approach. As one student told us: “In the USA, tutors are made responsible for their students’ outcomes. Here, a tutor said: ‘Tutoring is taking up too much of my time. Next year I will not do it anymore.’” The students interpreted this as a sign that the tutor saw the portfolio as an irrelevant part of the programme.

Coaching is still underdeveloped, even in teacher training programmes, where portfolios were first implemented. According to a tutor: “We should relate the feedback more to the main roles of teachers.” He hoped that by doing so tutors would concentrate less on giving feedback on details of performance and provide more support for deep learning (gaining an understanding of connections, causes, underlying views).
4.6 Conclusions and discussion

There are a relatively small number of portfolio applications and a large number of variables involved. Although it is impossible to perform more sophisticated analyses with our data, we can draw some interesting conclusions about how portfolio use can be improved in practice.

We found that in many cases, portfolios are being underutilised. The results systematically favoured using portfolios to achieve professional behaviour objectives; so did the assessment of both the portfolio outcomes and the suitability of the learning environment.

The main reason given for using portfolios is to encourage students to direct their own learning process. That is more commonly achieved when the objective is professional behaviour than when it is academic performance or academic career management. We assume that this is partly because of a difference in urgency. Where professional behaviour is concerned, students reflect mostly on their experiences in authentic situations, for instance how they handle anxious patients in a dentistry practice, subject patients to an anamnesis, teach a series of lessons, take on a teaching apprenticeship, or perform archaeological field research. These experiences in the “real world” can be quite confrontational and distressing. When students reflect on their academic performance, on the other hand, they are thinking mainly of products and experiences such as a research project, a design task, essay writing, or presentations. They generally do these things within the faculty, i.e. a relatively safe environment when compared to work in the field.

Besides the student’s sense of urgency to improve his or her performance, the requirements set for the quality of the reflection process are probably a crucial factor as well: they are systematically higher for professional behaviour.

Tutors tend to see the relevance of ePortfolios more than students do. This is true for all three categories of portfolio objectives. It may be that tutors today are confronted by a group of students who know better than their predecessors what they want and what sort of guidance they need. ePortfolios enable tutors (and students) to prepare themselves better for discussions. Many tutors also see a positive change compared with their own study programme: nowadays communication skills and professional or research skills are given much more attention and integrated into the whole programme. Students, on the other hand, are unable to draw any comparisons with a previous situation. They usually do not appreciate or put effort into "soft reflection" tasks when not obliged to, or when they are not assessed seriously or barely receive feedback. And this is exactly what happens all too often, even more when portfolios are used to achieve academic performance and academic career management objectives than when they are used to attain professional behaviour objectives.

In many cases, the institution implemented ePortfolios even though the learning environment was not yet ready for it. On the other hand, ePortfolios have often encouraged universities to screen programmes for coherence within learning lines and the role of skills and reflective thinking within the programme.

The relatively negative results when it comes to using ePortfolios for academic performance purposes do not imply that they should not be used to achieve these objectives. That would be a premature conclusion, because the necessary learning environments have in general not yet been fully developed. Finally, various applications show that ePortfolios can be used to the complete satisfaction of students and tutors.
The following checklist may be useful when developing an ePortfolio learning environment.

<table>
<thead>
<tr>
<th>Checklist ePortfolio learning environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The portfolio has a well-defined status/is linked to extensive learning lines.</td>
</tr>
<tr>
<td>2. Learning lines encompass the core competencies of university graduates and not just separate skills. The object is to provide a broad, in-depth academic and professional education.</td>
</tr>
<tr>
<td>3. The learning lines have distinct levels and standards that are properly communicated.</td>
</tr>
<tr>
<td>4. Students must have comparable experiences to be able to identify patterns. Within learning lines, students undergo sequences of varied learning experiences in authentic situations.</td>
</tr>
<tr>
<td>5. In order to enhance the self-steering process, students are assigned portfolio tasks/reflection tasks after sequences of practical experiences (academic and/or professional).</td>
</tr>
<tr>
<td>6. Students are trained to reflect upon their performance, and they must meet specific requirements with respect to pattern identification and formulation of the next step in their development (&quot;self-steering&quot;).</td>
</tr>
<tr>
<td>7. Students organise and receive feedback on their performance or products immediately after delivery.</td>
</tr>
<tr>
<td>8. Students systematically produce evidence for their progress through the learning lines.</td>
</tr>
<tr>
<td>9. The requirements set for the students’ reflection reports are mirrored in the requirements set for tutoring skills (i.e. a tutor has to be dedicated to the goal, be an expert as well as a coach).</td>
</tr>
<tr>
<td>10. The tutors’ performance is part of a plan to improve and control the quality of educational programmes: they are being trained and assessed.</td>
</tr>
</tbody>
</table>

References


5. Mentoring in portfolio-based learning: What is an effective mentor?

Anouk Prop and Erik Driessen, Maastricht University, Faculty of Health, Medicine and Life Sciences, Jaine Shacklady and Tim Dornan, Manchester Medical School

5.1 Introduction

Portfolio-based learning is increasingly being implemented in a range of educational and professional learning contexts worldwide in order to monitor students’ professional development. The portfolio is also increasingly being used in medical education to encourage student professional development. Although there are different types of portfolios for different purposes, a portfolio is usually described as a collection of a student’s work and achievements during his or her academic career. In a portfolio, evidence for the student’s performance is often underpinned with critical self-evaluations, which form the basis for the identification of learning needs. As a result, a learning plan can be constructed which gives the student direction and serves as a tool in his/her learning process and professional development (Challis, 1999).

In the context of portfolio-based learning, reflection is an essential precondition for the professional development of medical students. In order to monitor their own learning process and gain an understanding of their own strengths and weaknesses, future doctors must be able to reflect on and analyse their performance. However, previous research has revealed that working with portfolios does not always stimulate reflection in general practitioner training (Pearson & Heywood, 2004). A recent study conducted by Driessen et al. (2005) revealed that four conditions are needed for the successful reflective use of portfolios in medical education, coaching by a mentor being one of the most crucial. This has been confirmed by several studies showing that the role of the mentor is vital in portfolio-based learning (Mathers et al., 1993; Snadden, 1996; Pearson & Heywood, 2004; Dagley & Berrington, 2005; Elango et al., 2005; Kjaer et al., 2006; Ryland et al., 2006; Webb et al., 2006; Grant et al., 2007).

Although mentoring programmes are still fairly rare in medical education (Buddeberg-Fischer & Herta, 2006), it is commonly agreed that a mentoring relationship is of major importance (Jackson et al., 2003; Sambunjak et al., 2006). Nevertheless, there is no clarity about the characteristics an effective portfolio mentor should possess in order to guide medical students in their professional development. A competency profile of an effective portfolio mentor would therefore be valuable, as it could be used for selection, training and faculty development purposes. The term “competency” appears to be difficult to define. It is often merely referred to as the ability to act adequately in specific contexts, based on a combination of knowledge, skills, attitudes and other characteristics (Van Tartwijk et al., 2003). This definition of competency will be used in the present study, which aims to define a competency profile for effective mentors in portfolio-based learning. We analysed the literature and interviewed students and mentors in order to determine the competencies that an effective mentor should possess.

5.2 Research questions

This study addressed the following principal research questions:

- What do students and mentors believe are the essential competencies of an effective mentor in portfolio-based learning?
- What competencies of an effective mentor are considered essential for which phase (early/final phase) of the student’s professional development?
- What pitfalls are there in mentoring portfolio-based learning?
5.3 Context

This study was conducted in two settings that are similar but different enough to be informative and allow us to arrive at new knowledge about portfolio mentoring.

Maastricht Medical School

Maastricht Medical School was established three decades ago as the founding school of a new university that adopted problem-based learning (PBL) for all its undergraduate courses. It has recently led the way in portfolio learning by implementing this approach extensively within its medical programme while simultaneously revamping the curriculum in order to maintain its innovative design.

- Year 1 pre-clinical: theory, with only simulated clinical contact:
The main goal of the first-year portfolio is to coach and assess student reflection skills. With the aid of a portfolio, students learn to analyse their strategy and academic progress critically and to improve both. They are required to draw up a learning plan. This way, students who lag behind in reflective or professional skills, or students who have problems studying, are detected at an early stage of the programme.

- Years 5-6 clinical: second clerkship and foundation year:
In year 5, students prepare to work independently in their final (sixth) year. With the help of a mentor, they first acquaint themselves with the final year and produce a learning plan for year 6 at the end of year 5. The aim of the final-year portfolio is to coach, monitor and assess the student’s independent performance in health care and scientific research. The student also prepares for post-graduate medical training. To help students in this regard, the final-year portfolio has the same format as the post-graduate portfolios. The final-year portfolio contains competency-analyses, feedback from multi-source feedback procedures, performance assessment, scientific assignments and other materials.

- Assessment procedure:
The Portfolio Committee assesses (pass/fail) first-year students’ reflective skills and final-year students’ competency development each year. In the pre-clinical phase, the assessment focuses on reflective ability. In the clinical phase, the portfolios are used to assess the students’ clinical performance. All the mentors are members of the Portfolio Committee, but mentors do not assess the portfolios of students they are mentoring. The portfolio and the assessment procedure are described in more detail elsewhere (Driessen et al., 2003; Driessen et al., 2005).

Manchester Medical School

Manchester Medical School became the UK’s first problem-based medical school when it adopted Maastricht-style PBL in 1995. Manchester has also followed Maastricht in adopting mentored portfolio-based learning in its curriculum, though this has only been in place for two full years (unlike Maastricht, where it has been in place for five years). There is therefore a close pedagogic link between the Manchester and Maastricht Medical Schools, but also enough differences to provide “a lens” through which to analyse portfolio mentoring.

A formal reflective portfolio was introduced to the Manchester curriculum with the year 1 entry cohort of 2004 and was then implemented in years 2 and 3 with the same cohort of students. It is currently being introduced in year 3 and is very important to students because their reflective portfolio entries will be needed to support their applications for post-graduate education.

Portfolio based learning in Manchester can be summarised thus:
- Years 1-2 (largely theory, with limited clinical contact)

Currently, medical students keep paper portfolios through which they develop reflection skills, plan their learning, and reflect on what they have learned in the clinical contacts that take place in the early years of the curriculum. This process is mentored, often by bioscientists.
- Years 4-5 (second and last clerkship years)
Students in these years have either already had to, or will have to, apply for post-graduate training posts by drawing on reflections about their earlier learning without much, if any, formal mentoring support. clinicians teaching this phase of the curriculum will have had variable – often limited – experience of portfolio learning.

5.4 Instruments

A literature study was conducted to arrive at an initial answer to the research questions mentioned earlier. Given the scope of this study, general and medical publications on educational research were consulted. The literature was selected after reading the abstracts, resulting in seven publications that met the above criteria. The "snowball method" was also used and the references in the selected articles were also reviewed. Review articles and theoretical overviews were also gathered to check their references. The literature was analysed in order to determine the competencies that an effective mentor should possess.

A global interview scheme was used for the focus group interviews with students and mentors (see Table 13). This interview scheme was based on earlier mentor studies (Driessen, 2005) and the literature on mentoring and expert consultation.

Table 13: Interview scheme

Global interview scheme:

- What is the role of the mentor in the professional development of medical students?
- What general competencies should an effective mentor possess to encourage the professional development of medical students?
- What specific competencies should an effective mentor possess to encourage the professional development of medical students?
- What specific competencies should an effective mentor possess to encourage the professional development of medical students in the early phase of their programme and what specific competencies should he/she possess to encourage medical students in the final phase?
- What pitfalls have you encountered with respect to mentoring in portfolio-based learning? This question focuses on the following aspects:
  - the role of the mentor
  - the role of assessment
  - the background of the mentor
  - number of years of experience.

5.5 Subjects

The following groups of subjects participated in this study:

Mentors
- Mentors working with students in various years at the Faculty of Medicine, Maastricht University (N=12): six from year 1 and six from year 5-6 were sampled (maximum variation approach), to participate in two focus groups (each with half of its participants from each phase of the curriculum).
- Mentors working with students in various years at the School of Medicine, Manchester (N=16-20); 5-7 from years 1-2 and 5-7 from the clinical years who have had experience of mentoring foundation trainees but not undergraduates, to participate in two focus groups.

Students
While mentors who worked with students in different years participated in the same focus group, previous experience had shown that senior students tend to dominate junior students in discussions, so the student participants were “segregated”. A multiple category design was used for the focus groups:
- Group of 2nd year students (N=8-10) Faculty of Medicine, Maastricht University (pre-clinical)
- Group of 6th year students (N=8-10) Faculty of Medicine, Maastricht University (clinical), multiple category design
- A group of five 1st and five 2nd year students, School of Medicine, Manchester
- A group of ten 4th and 5th year students and/or foundation year 1 trainees, School of Medicine, Manchester
5.6 Results

We begin by reporting our findings from the literature study. We then report the results from the focus groups, which eventually led us to formulate a competency profile for effective portfolio mentors.

Findings from the literature study

Portfolio mentors are commonly employed in higher education worldwide to guide students in their professional and personal development. However, the idea of mentoring is one of the oldest educational approaches. It has its origins in Homer's Odysseus. Odysseus appoints a steward, Mentor, to look after his son Telemachus before he sets out on his long journey. Mentor inspires Telemachus to seek his father and guides and advises him on his journey. The metaphor of the journey can be seen in this context as a learning process, in which the role of the mentor is developmental and caring, but not parental (Oliver & Aggleton, 2002). Mentoring was also a part of the master-apprentice relationship in the Middle Ages or other apprenticeship models at various times. Today, mentoring is considered an important part of medical education (Sambunjak et al., 2006).

In a recent study, Berk et al. (2005) built on previous definitions to describe the mentoring relationship as "one that may vary along a continuum from informal/short-term to formal/long-term in which a faculty member with useful experience, knowledge, skills, and/or wisdom offers advice, information, guidance, support, or opportunity to another faculty member or student for that individual's professional development. The mentoring relationship is based on personal and direct interaction and is reciprocal. The mentee and mentor both benefit in an emotional or tangible way" (Jacobi, 1991).

According to Jowett & Stead, mentoring responds to a number of needs (Jowett & Stead, 1994). First, it is considered to be a development process that is tailored to the individual rather than to an entire cohort of students or trainees. Secondly, it provides personal contact and commitment that participation in group training and development activities cannot provide. Thirdly, mentoring is also attractive for economic reasons: mentorship appears to be "free of charge". The results of the literature study are summarised in Table 14.

Table 14: Outcomes of literature study

<table>
<thead>
<tr>
<th>Berk et al. (2005) Nursing</th>
<th>Knowledge</th>
<th>Skills</th>
<th>Attitudes</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The mentor has</td>
<td>The mentor is able to</td>
<td>The mentor is</td>
<td>The mentor has the respect of peers in field</td>
</tr>
<tr>
<td>Expertise</td>
<td>Support and encourage the mentee and his work</td>
<td>Honest</td>
<td>Has the respect of peers in field</td>
<td></td>
</tr>
<tr>
<td>Knowledge of resources, experts</td>
<td>Motivate the mentee</td>
<td>Professional</td>
<td>Shares success and benefits of the products and activities with mentee</td>
<td></td>
</tr>
<tr>
<td>and source materials in the</td>
<td>Guide and direct regarding professional issues</td>
<td>Accessible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>field</td>
<td>Provide timely, clear, comprehensive and constructive feedback to mentee’s work and questions</td>
<td>Approachable</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provide resources, experts and source materials in the field</td>
<td>Committed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Challenge the mentee to expand his abilities</td>
<td>Respectful towards the mentee’s uniqueness and his contributions</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Knowledge</strong> The mentor has</td>
<td><strong>Skills</strong> The mentor is able to</td>
<td><strong>Attitudes</strong> The mentor is</td>
<td><strong>Other</strong> The mentor</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------------------</td>
<td>-----------------------------</td>
<td>------------------------</td>
<td></td>
</tr>
<tr>
<td>Morton-Cooper &amp; Palmer (2000) Medical education and nursing</td>
<td>• Appropriate knowledge and experience</td>
<td>• Command respect from others • Build on the mentee’s strengths and offer constructive feedback on his limitations • Sustain interpersonal relations • Communicate • Counsel • Instruct • Coach • Provide reliable information and resources • Promote good judgment • Seek new challenges and initiatives • Demonstrate initiative, take risks and use influence and charisma appropriately • Allow mentee to develop within his own terms • Lead and offer clear direction • Share credit for achievement • Deal with others • Share personal experience, knowledge and skills</td>
<td>• Imaginative and creative • Successful at what he does, providing status and prestige • Willing to motivate others • People-oriented and interested in seeing others develop and advance • Committed to investing time, energy and effort toward a different type of working relationship</td>
<td>• Shares a network of valuable personal contacts • Provides faculty and staff development</td>
</tr>
<tr>
<td>Jacobi (1991) Higher undergraduate education</td>
<td>• Greater experience, influence and achievement</td>
<td>• Provide assistance and support to the mentee • Help the mentee achieve longer term, broader goals • Provide emotional and psychological support • Offer direct assistance with career and professional development</td>
<td>• Involved in the learning process of the mentee • A role model</td>
<td>• Has to be established in the profession</td>
</tr>
<tr>
<td>Jowett &amp; Stead (1994) Higher education</td>
<td>• Technical competency and experience</td>
<td>• Help students to develop technical competency • Facilitate and enhance students’ learning • Encourage integration of theory into practice • Support and guide • Give positive direction • Provide good facilitation of learning opportunities • Offer guidance concerning the development of personal skills</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Findings from the focus group interviews

Where possible, the findings from the focus group interviews have been summarised per programme phase, with a distinction being made between the perceptions of students and those of portfolio mentors.

### The mentor as a "contact coach" in the early programme phase

In this phase, students reported that they have a need for a portfolio mentor who is a contact person between the student and the university. Students want to be coached by a mentor who has a complete view of the student as a professional and as a person. Portfolio mentors in the early programme phase described their approach as directive and they pay a lot of attention to encouraging self-reflection and self-awareness in students. For them, the portfolio serves as a tool that helps students reach a deeper understanding of their development processes and their progress in the programme. Both students and mentors believe that there should be regularly scheduled contact moments. Students prefer the mentor to focus on the student as a person and not necessarily on the portfolio. Mentors think it is also important to generate an awareness of the purpose and the possibilities of the portfolio, since students in the early programme phase are often motivated to work with a portfolio in the first place.

### The mentor as a "coach on demand" in the final programme phase

Final-phase mentors reported that they are available for students but the initiative for coaching comes from the students themselves. Students in this phase consult the portfolio mentor about specific questions concerning their professional career or their performance during their clerkship. Portfolio coaching focuses on learning and assessment in the workplace and preparing to work in the profession. Students can familiarise themselves with the job market by reflecting in their

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Skills</th>
<th>Attitudes</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>The mentor has</td>
<td>The mentor is able to</td>
<td>The mentor is</td>
<td>The mentor</td>
</tr>
<tr>
<td><strong>Experience in leadership</strong></td>
<td><strong>Encourage and empower</strong></td>
<td><strong>Enthusiastic</strong></td>
<td><strong>Professional</strong></td>
</tr>
<tr>
<td><strong>Teach</strong></td>
<td><strong>Advise</strong></td>
<td><strong>Confidential and trustful</strong></td>
<td><strong>Organised</strong></td>
</tr>
<tr>
<td><strong>Supervise</strong></td>
<td><strong>Guide</strong></td>
<td><strong>Friendly</strong></td>
<td><strong>Caring</strong></td>
</tr>
<tr>
<td><strong>Communicate well</strong></td>
<td><strong>Help mentee in learning process</strong></td>
<td><strong>Approachable</strong></td>
<td><strong>Self-confident</strong></td>
</tr>
<tr>
<td><strong>Facilitate the transition from observer to doer</strong></td>
<td><strong>Incorporate regular feedback on mentee’s performance</strong></td>
<td><strong>Patient and understanding</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Involve mentee in activities</strong></td>
<td><strong>Help mentee in learning process</strong></td>
<td><strong>Possessed of a sense of humour</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Spend time with mentee</strong></td>
<td></td>
<td><strong>A role model:</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Driessen et al. (2005)</th>
<th>Knowledgeable about the courses</th>
<th>Show mentees what questions to ask themselves when reflecting on their performance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>First year medical students</td>
<td></td>
<td>Help identify learning needs and design learning plans</td>
<td></td>
</tr>
</tbody>
</table>
portfolio, assisted by their portfolio mentor’s critical questions and confrontational arguments. Final-phase students agree that a mentor has to be an expert in the field, so that he or she can provide useful feedback on their performance and development and show them the way in their professional career. They think the contact moments with their portfolio mentor should focus on understanding the fundamental issues involved in their performance in clinical practice and on making decisions in their profession. The mentor holds a mirror up to the student. Portfolio mentors in this phase focus in particular on raising career awareness by continuing to ask questions and by detecting inconsistencies in the portfolio.

The mentor as a “buddy” in all programme phases
Portfolio mentors and students in all the different programme phases reported that a portfolio mentor should be a “buddy” to students. The mentor should be approachable and accessible for students and guide them in a non-parental way through their programme. According to students, the mentor should have gone through the same learning processes as they are now doing. Although the portfolio is the basis of the mentoring programme, personal contact with the mentor is regarded as more important than the portfolio itself. Students and mentors perceive establishing and continuing personal contact between student and mentor as the most important success factor for effective portfolio mentoring. Students and mentors prefer to have the same mentor from the beginning of their programme until the end of their academic career. This way, the mentor can have a significant influence on the student’s professional development. The portfolio can then provide added value in the mentoring programme, since constant feedback on the professional and personal development of the student is possible.

The key competencies and characteristics of an effective portfolio mentor are presented in Table 15 below.

### Table 15: Perceive essential competencies and characteristics of an effective portfolio mentor in early and final phase of the programme

<table>
<thead>
<tr>
<th>Programme phase</th>
<th>Essential competencies of an effective portfolio mentor according to students</th>
<th>Essential competencies of an effective portfolio mentor according to portfolio mentors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Early phase</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 1 &amp; 2</td>
<td>The mentor is a <strong>contact person</strong> for students with respect to their academic career and their professional and personal development</td>
<td>The mentor is <strong>directive</strong> and <strong>guiding</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The mentor <strong>encourages</strong> students to be <strong>self-aware</strong> and to engage in self-reflection</td>
</tr>
<tr>
<td><strong>Final phase</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 5 &amp; 6</td>
<td>The mentor is a <strong>coach on demand</strong> for students with respect to their academic career and their professional and personal development</td>
<td>The mentor is an <strong>expert</strong> who can be <strong>consulted when necessary</strong></td>
</tr>
<tr>
<td></td>
<td>The mentor is an <strong>expert in the student’s future profession</strong></td>
<td>The mentor is <strong>critical and confronting</strong></td>
</tr>
<tr>
<td></td>
<td>The mentor is a <strong>career counsellor</strong></td>
<td>The mentor <strong>incites</strong> students to <strong>career awareness</strong></td>
</tr>
</tbody>
</table>
Pitfalls with regard to mentoring in portfolio-based learning

Students and mentors in all programme phases were also asked what pitfalls they perceive with regard to mentoring in portfolio-based learning. The results are summarised in Table 16 below.

Table 16: Pitfalls with regard to mentoring in portfolio-based learning

<table>
<thead>
<tr>
<th>Pitfalls</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Role of the mentor</td>
</tr>
<tr>
<td>o It takes mentors a lot of time to establish and continue their personal contact with students.</td>
</tr>
<tr>
<td>o It is difficult for mentors to get students to reflect.</td>
</tr>
<tr>
<td>o It is difficult for mentors to guide students to elaborate on their learning goals.</td>
</tr>
<tr>
<td>2. Role of assessment</td>
</tr>
<tr>
<td>o Students and mentors both find the combination of coaching and assessment difficult.</td>
</tr>
<tr>
<td>o Students find it difficult to deal with the mentor’s feedback.</td>
</tr>
<tr>
<td>3. Background of the mentor</td>
</tr>
<tr>
<td>o Mentors have trouble defining their mentor role and its limitations and responsibilities.</td>
</tr>
<tr>
<td>o Mentors find it hard to deal with the personal and psychosocial problems of students and refer them to counsellors.</td>
</tr>
<tr>
<td>4. Years of experience</td>
</tr>
<tr>
<td>o Mentors with little experience find it difficult to identify the different learning styles of students and how they influence the learning process</td>
</tr>
</tbody>
</table>

5.7 Conclusion and implications for educational practice

The findings from the literature study and the focus group interviews have led us to construct a competency profile for effective portfolio mentors. The competency profile surveys the knowledge, skills and attitudes of an effective portfolio mentor. Establishing and continuing personal contact between student and mentor is of critical importance in effective mentoring. An effective mentor is someone who has gone through the same process of development; knowledge of the content is of minor importance, especially in the first phase of the study.

On the basis of the results of this study, an effective portfolio coach should match the following profile.
**Wanted: Effective portfolio mentor!!!**

We are looking for an effective portfolio mentor to guide an enthusiastic group of students throughout their **entire professional and personal development process**. The ideal candidate will act as a buddy for the students. He or she must be able to establish and continue personal contact with them. The portfolio mentor also functions as a contact person between the student and the educational institute.

An effective portfolio coach should match the following competency profile:

**Knowledge:**
- Knowledge of the curriculum and educational organisation, both content and process
- Knowledge of job practice and labour market, both content and process
- Good judge of human nature

**Skills:**
- Coaching skills: be able to guide and advise students on their professional and personal development in their programme and future job
- Able to coach on portfolio content/technical aspects of portfolio
- Social and communication skills: active listening, asking critical questions, providing constructive feedback
- Able to use own experience in the coaching process

**Attitudes:**
- Open, empathic, closely involved, dedicated, motivated, enthusiastic, approachable, accessible, available, reliable, respectful, critical, sympathetic, spontaneous, social, active, directive, communicative
- The candidate needs to have an affinity with young people and not act as a "pampering parental figure"

The candidate has preferably followed the same learning path as the student.

If you think you match this competency profile, we urge you to contact us.

The pitfalls reported in the literature and by students and mentors have implications for educational practice, more specifically for the selection, training and assessment of effective portfolio mentors.

1. **Mentor training should focus on providing constructive feedback**

Training programmes for effective portfolio mentors should pay attention to the way in which mentors provide constructive feedback to students, since students find it difficult to deal their mentor’s feedback. Providing constructive feedback is a delicate affair in which the following aspects should be taken into account:

<table>
<thead>
<tr>
<th>Providing constructive feedback</th>
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</thead>
</table>
| **What?** | o The feedback should concern the **competency development and growth** of the student  
| | o The **performance of the learner** has to be at the forefront  
| | o The feedback should consider the **student’s behaviour**, not the student’s personality  |
| **How?** | o The feedback should be formulated according to **SMART** principles, that is **Specific**, **Measurable**, **Attainable**, **Realistic** and **Timely**  
| | o The feedback should focus on **positive aspects** and aim to help the students along in their development  
| | o The feedback should be **sincere and a true reflection** of reality  |
| **When?** | o The feedback should be given **just in time**  |
| **Why?** | o Providing constructive feedback can **help to establish a “buddy” relationship** between mentor and student, which is an essential precondition in effective mentoring  |
2. The mentor relationship should focus on establishing and continuing personal contact

The findings of the literature study and the outcomes of the focus group interviews show that a mentor relationship is based on personal and direct contact (Berk et al., 2005) and that consistency in personal contact is very important. However, establishing and continuing personal contact takes up a lot of time, especially for the mentors, who often are preoccupied with other work pressures. In the focus group interviews, the portfolio mentors suggested ways of tackling this problem.

<table>
<thead>
<tr>
<th>Establish personal contact</th>
<th>Continue personal contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>o Organise introductory talk</td>
<td></td>
</tr>
<tr>
<td>o Fulfil different teaching roles in order to get a complete view of the student's performance</td>
<td></td>
</tr>
<tr>
<td>o Make use of the prescribed contact moments</td>
<td></td>
</tr>
<tr>
<td>o Take an active role in initiating contact</td>
<td></td>
</tr>
<tr>
<td>o Organise contact moments in informal social settings</td>
<td></td>
</tr>
<tr>
<td>o Focus on showing dedication and involvedness</td>
<td></td>
</tr>
<tr>
<td>o Let the well-being of the student prevail in contact</td>
<td></td>
</tr>
<tr>
<td>o Make use of the prescribed contact moments</td>
<td></td>
</tr>
<tr>
<td>o Try to see the students in other educational settings</td>
<td></td>
</tr>
<tr>
<td>o Organise contact moments in informal settings</td>
<td></td>
</tr>
<tr>
<td>o Continue contact via e-mail</td>
<td></td>
</tr>
<tr>
<td>o Make firm agreements about continuing the contact moments</td>
<td></td>
</tr>
<tr>
<td>o Take advantage of chance meetings</td>
<td></td>
</tr>
<tr>
<td>o Let the well-being of the student prevail in contact</td>
<td></td>
</tr>
</tbody>
</table>

3. In mentoring, attention should be paid to planning and preventing peak load

It was clear from the focus groups interviews that a lack of time is often one of the major pitfalls in mentoring. The portfolio mentors agreed that there must be greater concern at an organisational level for planning and preventing peak load in the mentoring programme. Mentors also feel the need to allocate time for mentoring themselves, so that they can plan their mentoring activities as best suits their schedule. The portfolio can also play a role in this respect. If the portfolio is constructed so that it can be monitored and assessed efficiently, that will also have a positive effect on the "time problem". The structure and content of the portfolio should also not be modified too often.

4. A clear definition and competency profile of an effective mentor should be available

Portfolios are more effective when clear guidelines are available, and that is also the case with mentoring. Portfolio mentor training should make the aim of working with a portfolio explicit and specify the contribution to be made by the portfolio mentor. Training should focus on the role of the mentor as a facilitator of the professional development of students (Harden & Crosby, 2000). Since mentors and students indicated that coaching and assessment is a difficult combination, a clear distinction should be made between these two roles. The responsibilities of a portfolio mentor should also be made transparent.

References


6. The ePortfolio as an instrument for summative competency assessment

Ida Oosterheert, Sabine van Eldik and Marijke Kral, HAN University, Faculty of Education, Primary Teacher Training Nijmegen

6.1 Introduction
Institutions for higher education in the Netherlands are currently making the transition towards competency-based training and assessment. The ePortfolio is an important tool for summative competency assessment. There are, however, still a number of questions that need to be answered regarding the use of this tool, particularly concerning ways of safeguarding the validity and reliability of competency assessments.

6.2 Research question
The aim of this study is twofold:

1. To examine the literature and training practice in order to gain some understanding of how reliability and validity can best be safeguarded in summative competency assessment involving the use of ePortfolios.
2. To formulate a number of recommendations that may help improve the reliability and validity of assessments, particularly within the context of teacher training programmes.

Tests should be reliable and valid. Tests are reliable when the outcomes correspond with reality and do not depend on chance. Tests are valid when they measure what they are supposed to measure. A high level of reliability is no guarantee for validity: a test may quite reliably measure something that it was not intended to measure.

There is general agreement that validity and reliability within a competency-based curriculum cannot be measured merely by quantitative tests. Competency assessment also requires qualitative assessment criteria that do justice to the students’ professional context and their development at a specific point in time.

It is not yet clear what qualitative criteria should be used. One fundamental topic of discussion in this respect is the balance between reliability and validity. How do these factors relate to each other in competency-based assessment? And are they equally important? The main question of our study is therefore: How can reliability and validity best be safeguarded in summative competency assessment involving the use of ePortfolios?

6.3 Study
The main study consisted of three case studies conducted at a number of primary teacher training colleges in the Netherlands (PABOs). The aim was to answer the research question on the basis of practical experience. However, before commencing with our case studies, we conducted a preliminary study in order to refine the research question. This preliminary study consisted of a literature search and interviews with two recognised experts on competency assessment and ePortfolios: Dr Ruud Klarus, senior lecturer at HAN University (Hogeschool Arnhem-Nijmegen) and Dr Jan van Tartwijk, senior lecturer at Leiden University.
6.4 Preliminary study: literature search and expert interviews

6.4.1 Introduction

We first extracted a number of central themes from the literature that proved relevant to the research question. The most significant findings were subsequently classified on the basis of these six themes, thus providing a framework for the expert interviews. The tentative conclusions drawn from this study were used to refine the original research question. This procedure resulted in three new research questions, which served as guidelines for the case studies.

The six central themes that emerged from the literature were:

a) Standardisation of the portfolio
b) Holistic versus analytical assessment procedures
c) Transparency
d) Quality of evidence
e) Guidance and assessment
f) The ePortfolio as part of the test structure.

Below are the summarised results of the literature search and the expert interviews, classified on the basis of these themes.

6.4.2 Results

a) Standardisation

Standardisation of competency assessments increases the reliability of the outcomes. On the other hand, it diminishes their validity. Standardisation does less justice to the students’ authenticity and their specific learning context. This brings up the question of what precisely should be standardised in the ePortfolio and the assessments. The literature is divided on this point and emphasises various different aspects.

According to Driessen et al. (2005) and Baume and York (2005), assessment criteria should be standardised, as this will increase the assessors’ intersubjectivity and thus the reliability of their assessments (provided that they are well-trained, of course). Van der Vleuten and Schuwirth (2005) emphasise that the assessment procedure should be standardised and that the ultimate goal should be that the assessors reach a “saturation point” at which they fully approve of their assessments. Van der Vleuten and Schuwirth think that more subjective, unstructured and non-standardised assessments will then also become reliable. Finally, Klarus and Van Tarwijk are of the opinion that standardisation of the content of the portfolio itself is required, certainly initially. Students should be provided with frameworks comprising, for example, instructions as to what evidence should, as a minimum, be included in the portfolio, but which also leave them sufficient freedom of choice. Klarus suggests a growth model in which students gradually become used to working with the ePortfolio.

b) Holistic versus analytical assessment procedure

A holistic assessment is made on the basis of an impression of the whole, an analytical assessment on the basis of a systematic check of components. The question here is to what extent the manner of assessment, i.e. holistic or analytical, affects the validity and reliability of the competency assessment.

The literature favours holistic assessment (Baume & York, 2005; Van der Vleuten & Schuwirth, 2005; Dierick et al., 2001), particularly because the authors believe that competencies cannot be divided into separate parts and assessed as such. Klarus and Van Tarwijk also agree with this view. In addition, Klarus regards holistic assessment as the final stage in a growth model that starts with analytical assessment.

Holistic assessment does need to meet certain requirements. For example, assessors need to be thoroughly trained so as to become skilled and competent in holistic assessment (Gonczi, 1994, as cited in McMullan et al., 2003, experts Klarus and Van Tarwijk). Furthermore, assessment criteria are required to structure holistic assessments and make them reliable. It is important for assessors...
to exchange ideas on this subject and thereby develop the same understanding of the criteria (Van Tartwijk).

c) Transparency

By transparency of competency assessment we mean that assessors, educators, educational career
advisors and students need to know the aims and functions of the portfolio, as well as what aspects
will be assessed and how this will be done. Transparency is essential for reliable assessment as it
helps all parties concerned to acquire and propagate a joint frame of reference (Baume & York,
2005; Cluitmans & Klarus, 2005).

The experts mentioned various things to help improve this transparency that were also cited in the
literature. Cluitmans and Klarus (2005) state that competency requirements and all the steps in
the assessment procedure need to be known and understandable to all the parties involved.
Roberts (2002) stresses the importance of communicating the assessment criteria clearly and in a
timely manner to all the actors in a study programme. According to Driessen et al. (2005) and
Adams (1995), the ePortfolio should be introduced gradually. Students, educators and assessors
will need to learn how to use it. Another criterion is that assessors need to be trained to increase
intersubjectivity (Baume & York, 2005). Furthermore, Webb et al. (2003) would like to see
assessors discussing the assessment criteria in depth in relation to portfolio fragments in order to
develop the same understanding of these criteria.

d) Quality of evidence

The literature yielded two sets of criteria for assessing the quality of the evidence presented in a
portfolio:

Set 1

Triangulation: using different types of evidence from various situations to prove
competencies (Van Vleuten & Schuwirth, 2005). Triangulation increases
reliability and validity.

Internal consistency: different types of evidence and contexts produce a consistent and balanced
picture of students. Internal consistency promotes the reliability (Gonczi,
1994, as cited in McMullan et al., 2003) and validity (Wilkinson et al., 2002)
of assessments.

Congruence: there should be a clear connection between what the student wants to
prove and the evidence.

Set 2

Authenticity: the evidence comes from and says something about the student.

Currency: the evidence is not outdated.

Relevance: the evidence fits the competency.

Quantity: should be sufficient in relation to what the student wants to prove.

Variation: various contexts.

These criteria are limited in that they primarily test the portfolio’s assessability and not the quality
of the content. In other words, they do not provide a conclusive answer about the cut-off score:
What is sufficient? Good? Insufficient? The literature mentions only a few criteria that can be used
to assess the portfolio content. Dierick et al. (2001) refer to cognitive complexity: the extent to
which the student shows depth of observation and thinking. Overeem et al. (2005) attach great
importance to the quality of reflection. Credibility is mentioned by Driessen, Van der Vleuten,
Schuwirth, Van Tartwijk and Vermunt (2005). Credibility is also regarded as a very valuable
criterion by the experts and in the literature.

e) Guidance and assessment

The effect of combined guidance and summative assessment on the validity and reliability of the
judgement is a subject of debate. Whereas one school of thought holds that guidance and
summative assessment should be strictly separated, another believes that these two do not
necessarily need to be separated.

One good reason for strict separation of guidance and assessment is the relational solidarity
between student and counsellor (Elschout-Mohr, Oostdam and Overmaat, 2001), as combining the
two might make the counsellor less objective in his/her judgement. Moreover, students might feel
inhibited about showing themselves as learners in the guidance process (Mitchell, 1994, as cited in
McMullan et al., 2003). Klarus therefore thinks a second assessor is required if the assessment is to be as fair as possible.

The main argument in favour of not separating guidance and assessment, as put forward by Van Tarwijk, is that the guidance portfolio and assessment portfolio are interconnected. Van Tarwijk suggests adopting a model equivalent to that of the thesis supervisor-doctoral candidate model. The thesis supervisor provides guidance to the doctoral candidate, judges the quality of the student’s doctoral thesis in the first instance, and subsequently submits the thesis to more expert colleagues for assessment.

f) The ePortfolio as part of the test structure

The crucial question here is to what extent the ePortfolio can measure a student’s knowledge. Are any additional knowledge tests required? If so, how can they best be integrated into a competency-based curriculum?

What should be given particular consideration in this respect is that the manner of assessment has a considerable impact on the manner of learning (Van der Vleuten et al., 2005). This aspect should be taken into account when adjusting the assessment system (Challis, 2001).

Van der Vleuten and Schuwirth (2005), as well as the experts Van Tarwijk and Klarus, advocate a shift from assessment methods in which separate components are assessed towards a more integrated assessment. Klarus thinks formative tests can be integrated into the portfolio quite adequately. Students can use formative tests to practise and to acquire professional knowledge. The results can be used in their portfolios, in which they should make particularly clear how they have used the acquired knowledge in practice.

When using knowledge tests in addition to portfolio assessment, educational institutions should also take into account the quantity and manner of testing (Klarus). Both Klarus and Van Tartwijk are in favour of offering multiple test formats so that the students themselves can choose the format that fits them best.

6.4.3 Conclusion

The preliminary study reveals that there is still much debate about safeguarding validity and reliability in competency assessment involving the use of ePortfolios. This debate outlined a number of aspects, which helped us formulate the following tentative conclusions.

1. The validity of the ePortfolio as a test tool can only be safeguarded if the student has a certain freedom in how he/she fills the portfolio. To do so, a student also requires structure, particularly at the beginning. This structure may be provided by means of a growth model.
2. Transparency of the assessment criteria and the aims of the portfolio are important for all the parties concerned.
3. Holistic assessment of competencies is preferred, provided the assessors are trained in using this method.
4. Major criteria for determining the quality of evidence are triangulation, internal consistency, congruence and credibility. It is not yet clear, however, how these criteria should be used and how the cut-off score should be determined. Two factors that assessors consider important are the students’ reflective power and cognitive complexity.
5. A totally integrated assessment system does not yet exist. There are some doubts as to whether such a system should be devised anyway. What is clear is that the number of “isolated” tests should remain limited so as to not diminish the portfolio’s validity.
6. Separation of assessment and guidance has its pros and cons. There is, however, considerable consensus on the necessity of having at least one independent assessor participating in assessments.
6.5 Case studies

6.5.1 Introduction

On the basis of the tentative conclusions from the preliminary study, the research question was divided into three sub-questions, which served as guidelines in the case studies:

1. When is a piece of evidence or the total evidence convincing?
2. Should guidance and summative assessment be separated?
3. How does the ePortfolio relate to other types of tests?

6.5.2 Method

The study involved visiting three primary school teacher training colleges (PABOs) that use ePortfolios to produce summative competency assessments. These were: PABO Amsterdam, part of the Amsterdam Institute of Education (Educatieve Hogeschool van Amsterdam); PABO Arnhem, part of HAN University (Hogeschool van Arnhem en Nijmegen) and PABO Groenewoud, also part of HAN University.

At each PABO, we spent one day talking to a training coordinator/portfolio expert, assessors, educational career advisors and students.

There are roughly three models for education (Elshout-Mohr & Oostdam, 2001):

- **Model 1:** “Only one road leads to Rome.” This means there is a tight, prescribed curriculum and a strong relationship between this curriculum and testing. Everyone follows the same route to the same destination.
- **Model 2:** “Many roads lead to Rome.” Routes may differ, but everyone is heading for the same destination and will therefore be judged in the same manner.
- **Model 3:** “There is Rome and there is Rome.” Both the routes and the destinations may differ.

Model 1 may form part of model 2 and model 3, and model 2 may form part of model 3. For the purpose of this study, we tried to have as much variation in the case studies as possible.

The three PABOs represent different training models. PABO Amsterdam’s route is somewhere between routes 2 and 3, PABO Arnhem is mainly on route 1 and PABO Groenewoud on route 2.

6.5.3 General conclusions

Students and assessors at training colleges that operate according to models 2 and 3 are the most satisfied with the assessments. The students state that they generally know where they stand and what they are doing. They can show what they have learned and are assessed in a reliable manner. All this is despite the larger measure of freedom they have, and despite the assessors’ intersubjectivity. Contrary to expectations, students in model 1 did not necessarily perceive the assessments as more reliable, even though this model has the most fixed route.

This result can probably be ascribed to two factors. Firstly, the assessment criteria at the PABO in question are not yet explicit. Secondly, model 1 by definition entails limited authenticity and therefore limited validity: the interviews with the students revealed that this is very important to them. Model 1 provides a reliable measure of something that may not be valid, or is less valid.

Particularly in models 2 and 3, then, the ePortfolio clearly offers added value as a tool for summative assessment.

The difference between models 2 and 3 is less clear than one would expect at first sight. There is no uncertainty about “the road to Rome”; different routes may be involved in both these training models. Whether or not the destination is the same for everyone depends on how detailed the description of that destination has been. PABO Amsterdam and PABO Groenewoud have different
6.5.4 Conclusions relating to the research questions

1. When is a piece of evidence or the total evidence convincing?

High authenticity promotes validity, but may diminish the reliability of assessments. Training colleges that attach great importance to authenticity (models 2 and 3) resolve this dilemma by making explicit how a portfolio is regarded. The fact that assessors still have different views in this respect is something that most students take for granted.

Students who are able to show their authenticity in the portfolio attach great importance to showing who they are, including in terms of their own learning process and learning outcomes. They are more likely to feel their assessment is reliable than students who are less able to show their individuality in the training programme, even though the students at each PABO are aware that assessors do not always look at things in the same way. Apparently, the students attach more importance to validity than to reliability.

The PABOs in our study emphasise the importance of authenticity, relevance (congruence) and variation (triangulation) as criteria. Quantity and currency are not given as much emphasis. Another criterion that the three PABOs find important is the "theory-practice link": students must show they can apply theoretical insights adequately in professional practice and reflect on the same. PABO Amsterdam and PABO Groenewoud leave it up to the students to show how they do this. PABO Arnhem has integrated the theory-practice link into the assignments. Moreover, the students can also show that they are able to put theory into practice in a linking narrative.

The theory-practice link criterion is also related to two other criteria mentioned above, namely cognitive complexity and reflective power. PABO Groenewoud integrated this aspect in a professional standard and a holistic interpretation at three levels.

The literature and the two experts we interviewed attach great importance to credibility as a criterion for quality. The three PABOs do not refer to this criterion, and the question is whether it in fact should be regarded as so important. After all, one can only say for sure that the criterion of credibility has been satisfied after the assessment has been made. Moreover, credibility has no content. It cannot give students a guideline for their learning process. In our humble opinion, it is therefore important to also employ the other criteria mentioned above.

With regard to portfolios in assessments, the literature and the three PABOs adhere to the old adage that "the whole is greater than the sum of its parts". Assessors therefore need to be given training in procedures and, more particularly, content, in order to consider the content of a portfolio from a holistic point of view.

2. To what extent do guidance and summative assessment need to be separated?

All the parties concerned agree that the participation of at least one independent assessor is required for summative assessment. There is also a broad consensus on the desirability of a second assessor. Whether or not this second assessor should be the educational career advisor/coach is subject to debate.

The pros are: some loss of information and personal circumstances and commitment can be taken into account. The cons are: the students are afraid to show themselves as learners in the guidance process and assessors unintentionally begin to take into account personal circumstances and commitment. As far as the latter argument is concerned, this proves that what may be considered a pro at one institution may be a con at another.

It is striking that the students in general have fewer problems with the possible involvement of educational career advisors in summative assessment than the educators, assessors and experts. The students seem to have a preference for the "thesis supervisor-doctoral candidate model", provided they get on well with the supervisor.
3. How does the ePortfolio relate to other types of tests?
At the three PABOs we studied, the ePortfolio is an important part of the total test structure. They all, however, use different test formats for professional knowledge and particular practical components in addition to or in combination with the portfolio.

Knowledge tests are given a positive assessment by all parties at the three colleges. The PABOs have integrated these knowledge tests into the curriculum in various ways. At PABO Arnhem, the tests are part of the portfolio. The students say there are rather a lot of tests.

PABO Groenewoud uses tests that students are required to take to receive credits for professional tasks. The students may link the test component dealing with the application of pedagogical content knowledge to the assessment of professional tasks in the portfolio. However, the students say they now have to wait a considerable time before they acquire credits. PABO Amsterdam is going to use progress tests in which the application of knowledge can be measured. Students will have to take these tests before they can take the skills test.

A practical (performance) assessment in addition to the portfolio appears to be needed. Amsterdam and PABO Groenewoud had positive experiences working with such an assessment. Apparently, interpersonal competencies will in any case need to be judged through direct observation in professionally relevant situations.

At present, none of the PABOs assume there will ever come a time when all learning outcomes will be assessed exclusively with the help of an ePortfolio and within professional competencies.

6.6 Recommendations
We would like to conclude this report with the following recommendations.

<table>
<thead>
<tr>
<th>Summative competency assessment: recommendations</th>
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<tbody>
<tr>
<td>1. Increase the <em>validity</em> of the ePortfolio as a summative assessment tool by giving students the freedom to fill in the portfolio in their own way. Use a growth model for this.</td>
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<td>2. Increase the <em>reliability</em> by developing transparent assessment criteria.</td>
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<tr>
<td>3. Make sure the assessment criteria say something about a portfolio’s assessability. An essential criterion in this context is that students explain their evidence and account for it in the light of the competencies they expect to prove with it. Other criteria are authenticity, variation and congruence.</td>
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<tr>
<td>4. Make sure that the criteria also say something about the <em>quality</em> of the portfolio. The criteria must leave room for students to gain experience in various learning contexts. Points of departure for qualitative criteria can be found in the Dublin descriptors, which can be given a specific content in professional standards per training phase. At any rate, make explicit what is meant by the “theory-practice link”.</td>
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<td>5. Make sure the assessment criteria serve as guidelines for, and are explicitly linked to, other activities in the training programme.</td>
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<td>6. Make sure there are two assessors per assessment. The second assessor may also be the educational career advisor, provided this advisor gets on well with the student in question. Provide assessor training in which the assessment criteria are discussed.</td>
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<td>7. Initially accept that assessors adopt an analytical working method in their assessments. Work towards a more holistic assessment/working method in assessor training and educational career guidance.</td>
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<td>8. Use a <em>limited</em> number of knowledge tests. Use various different test formats.</td>
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<td>9. Develop a practical assessment for competencies in the interpersonal/communication domain.</td>
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References


7 Portfolio assessment in undergraduate medical education

Hanno van Keulen, IVLOS Institute of Education, Utrecht University, Edith ter Braak, Department of Internal Medicine, Utrecht University Medical Centre

7.1 Introduction

Is portfolio assessment reliable? Do students learn from feedback provided by their supervisors? What kind of electronic and other instruments and procedures support this learning? Is making and assessing portfolios worth the effort? Does the electronic medium help to make this effort more acceptable?

These questions are too broad and too general for simple “yes” or “no” answers. In addition, it is not likely that one procedure will fit in every educational context. We chose to focus on the first clerkship of the undergraduate medical programme at Utrecht University Medical Centre. This clerkship can serve as an example for many other authentic, competency-oriented environments for professional learning in which portfolios are used for summative assessment purposes.

In the following section, we describe this educational context in more detail. Subsequently, we work out theoretical frameworks underlying our key questions concerning the validity and reliability of portfolio assessment, the function of feedback, and the advantages and disadvantages of the electronic medium. We describe our methods and instruments, present the results, and speculate as to whether our findings are of interest in other educational contexts.

7.2 The Internal Medicine clerkship in the third year of the undergraduate programme

The clerkship we are investigating focuses on general medical competencies and takes place in the department of Internal Medicine during the student’s third year. By participating in an authentic clinical context, students are supposed learn about the medical process as a whole in their encounters with real patients.

The clerkship runs for six weeks and is full time. Students enter the department in groups of seven and are allocated to the various wards (cardiology, haematology, nephrology, etc.). They are supposed to investigate at least ten newly admitted patients and write summarised patient records. Important learning goals in this clerkship are (1) learning to interview (“history taking”) and examine newly admitted patients, (2) deriving hypotheses (the differential diagnosis) on the clinical cause of the complaints and symptoms, and (3) learning to write down the record (the formal dossier on the patient). Students compile a portfolio in which these records form the body of evidence for their clinical competency. Their competency is assessed in four broad categories and according to nine specific performance indicators: gathering information (history and physical examination), clinical reasoning (which consists of differential diagnosis, suggestions for appropriate diagnostic tests, prognosis, therapeutic measures), record writing itself (content; summary) and medical knowledge. The portfolio is assessed summatively halfway through the clerkship and at the end. It is important to note that the portfolio is assessed by a clinician (usually an experienced resident in internal medicine) who does not actually see the students working with the patients on the ward.
<table>
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<tr>
<th>Feedback (observations and suggestions)</th>
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<tr>
<td><strong>A - Gathering information</strong></td>
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<td>History</td>
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<td>Physical examination</td>
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<td><strong>Judgment A</strong></td>
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<td>Below expected level</td>
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<td>4 5</td>
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<tr>
<td><strong>B - Clinical reasoning</strong></td>
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<tr>
<td>Differential diagnostic thinking</td>
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<td>Additional diagnostic tests and interpretation of outcomes</td>
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<td>Prognosis and possible complications</td>
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<td>Therapeutic measures including pharmacotherapy</td>
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<td><strong>Judgment B</strong></td>
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<td>Below expected level</td>
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<tr>
<td><strong>C – Recording</strong></td>
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<th>Judgment C</th>
<th>Below expected level</th>
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<th><strong>D – Content specific knowledge</strong></th>
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<th>Judgment D</th>
<th>Below expected level</th>
<th>Expected level</th>
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<th><strong>Reflection and development</strong></th>
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<td>Development of clinical reasoning</td>
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<td>Development of recording</td>
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| **Final mark:** | 4 5 6 7 8 9 10 |

Signature assessor:  
Signature student:

Remarks
Psychometric and edumetric aspects of portfolio assessment

Assessment of clinical competency is a good example of assessment of complex performance. Complex performance is increasingly assessed using innovative methods such as case-based testing, assessment centres, multi-source feedback, portfolios, or combinations of these. To justify the use of portfolio assessment for summative purposes, it should meet rigorous criteria, especially with regard to validity and reliability (the classic psychometric qualities of tests), but also with regard to the impact on student learning behaviour, transparency, acceptability, and costs. These are commonly referred to as edumetric qualities of assessment (e.g., Dierick, Dochy et al., 2001; Segers, 2004; Van der Vleuten, 1996; Inspectie van het Onderwijs, 2003). Portfolios are increasingly used in medical education, mainly for personal and professional development, planning, reflection and non-clinical purposes (Driessen, Van der Vleuten et al., 2005a; Cotterill, Bradley et al., 2006). Summative portfolio assessment of clinical competency is still quite uncommon, mainly because there are doubts concerning its validity and reliability and, perhaps, because clinicians are unfamiliar with portfolios. In the following sections we reflect on the psychometric and edumetric qualities and doubts concerning portfolio assessment and how our research may contribute to understanding in this field.

7.3 Validity

Innovative assessment methods such as the portfolio are often introduced because of their high level of validity. On the face of it, portfolio assessment has high validity since it is meant to assess tasks that are critical to a professional’s day-to-day performance in authentic settings (Mehrens, 1992; Miller, 1990). The portfolios we investigated describe in detail the results of students’ performance, results they can only achieve if they possess the required knowledge and skills to act appropriately with respect to clinical tasks. The resulting material is genuine and the tasks performed may be considered authentic. Perhaps, then, we do not need to worry too much about validity.

Portfolio assessment is, however, indirect. Assessment of competency is based on materials that are composed, written and reflected upon. Portfolios focus on results more than on processes. The material clearly lacks vital elements of clinical competency, such as history taking, physical examination skills and interpersonal conduct and attitudes. Students who are excellent writers are probably able to compensate for any lack of skill or for a poor attitude. Unmediated, direct observation of the student while he/she is examining a patient, followed by an interview with the student, either by supervising clinicians during rotations or as an organised event, is not vulnerable to this distortion. Indeed, this "long case method" is a common testing format in medical education in the United States, but it has two major problems. The first is that it only too rare in reality (Epstein, 2007). The expert clinicians who have the competency and credibility to assess students and residents have busy schedules. Only on occasion can they find the time to observe, discuss and assess without being interrupted. There is no reliable data on the number of occasions students or residents are observed and critiqued in this way during their course, but it probably happens only a few times in their first clerkships and hardly ever afterwards.

Another problem with long case assessment is that candidates perform variably and there is little transfer from one case (patient, disease, symptoms) to another. The evidence is that students vary in their performance even when the tasks they perform appear to be similar (Shavelson, Baxter et al., 1992) and to unreliable predictions of competency.

Others methods have been developed that do have a clear focus on clinical, technical and practical skills, such as the Objective Structured Clinical Examination (OSCE) (Roberts, Newble et al., 2006). The OSCE is a set of timed stations, each focusing on a different task, usually with the aid of simulated patients. This test undercuts some problems by standardising the clinical encounters and making them shorter and more diverse, but at the expense of authenticity. In terms of Miller's pyramid: the OSCE focuses on "shows how" and not on "does". The "mini-clinical-evaluation exercise" (mini-CEX) is another promising development (Norcini, 2003). It is a more structured and focused history taking and physical examination exercise on actual patients over a short period of time (10 to 20 minutes). But it is not very suitable for junior students.

Wass, Wakeford et al. (2003) showed that the sampling problem can be overcome by adjusting the testing time: given sufficient testing time, long history cases can achieve high-stakes reliability. But in a way this begs the question, as it would be quite unrealistic and unacceptable for supervisors in terms of the amount of time involved. Clearly, a variety of methods is needed to comprehensively...
assess clinical competency (Wass, 2006). The strength of portfolio assessment may be that it solves the sampling problem while still focusing on authentic performance with real patients, but without constraining assessors into an inflexible and time-consuming framework. Important foci for investigation will therefore be whether portfolio assessment really is less time-consuming, more flexible, and more representative in terms of patients, complaints, diseases, and other relevant clinical parameters.

7.4 Reliability

An assessment procedure that is unreliable cannot be very valid either. This is a classic psychometric dogma. Because it proceeds from assessing just one or a few cases that are observed directly to ten cases that are “observed” indirectly through the window of the portfolio, portfolio assessment may help to make the assessment of clinical competency more reliable. But this is only in relation to the direct observation method and says nothing about absolute measures of reliability. Traditional testing probably emphasises reliability at the cost of validity; innovative formats like portfolio assessment run the risk of stressing validity at the expense of reliability (Gipps, 1994). Doubts still linger as to the reliability of portfolio assessment for high-stakes purposes. In the psychometric literature, reliability is often expressed in terms of an inter-rater agreement exceeding 0.8 (Heuvelmans & Sanders, 1993), although this criterion is only infrequently met in educational practice. Pitts, Coles et al. (2002), for example, found only moderate inter-rater reliability, despite explicit instructions, considerable investment in assessor training and agreement on criteria. They advise against the use of portfolios for high-stakes assessment. Roberts, Newble et al. (2002) think portfolios are a useful formative assessment tool but regard the evidence backing their use for summative purposes as thin. They encourage institutions to take a research-based approach and publish their data on validity, reliability, feasibility and effects on student learning. We take on this challenge in our research.

It is true that portfolio assessments are subjective and suffer from the same problems as the assessment of papers, oral presentations, and other products and processes that rely on expert judgment. Consciously or unconsciously, raters focus on different aspects of the student’s work, apply different criteria, or use these criteria in different ways. On the other hand, Funder (1995) has shown that humans form judgments all the time and that they are not that bad at judging if four conditions are met. These conditions, as described in his Realistic Accuracy Model, are: 1) the target of judgment must be relevant for the trait in question (in our case: clinical competency); 2) the information must be available to the judge; 3) the judge must accurately detect relevant and available information; and 4) the information must be utilised correctly.

The obvious way to increase accuracy is therefore to standardise the procedure so that students include the appropriate information, and to use a checklist or analytic framework to handle the information correctly. This approach has been criticised as the “corruption of portfolios for testing purposes”: portfolios are seen as highly individual and personal pieces of work that report unique experiences in authentic contexts. Standardisation threatens this uniqueness; analytic checklists may lead to atomism and trivialities (Beijaard, Driessen et al., 2002; Driessen, Van Tartwijk et al., 2005b). We must therefore be careful not to impose procedures that are too strict. However, we must also bear in mind that most of the research on portfolios stems from their use in teacher training, a domain that leaves much more room for diverse opinions and theories on competency than medicine. In many cases there is a standard for correct physical examination, prognosis, therapy, etc. that expert clinicians know and apply in their judgments. We therefore think that, for psychometric reasons, standardisation of assessment portfolios is wise, certainly in this domain.

What we cannot standardise, though, is student experience. This will not be the same, or even similar, from one student to the next because each student investigates unique patients, making comparison difficult. The problem is not that expert clinicians cannot detect the mistakes or omissions in the work of the students, but rather how to classify those mistakes or omissions. Assessment implies measurement, value judgments, distributing students on a scale. But how? A student in the cardiology ward examines a middle-aged man complaining of chest pain. He is quite obese and he smokes. His father died of a heart attack at age 56. The student omits certain relevant questions during history taking and forgets some relevant features of the physical examination, but overall she is doing quite well. Another student is seeing a 91-year-old woman with Alzheimer’s disease who is in pain and unable to cooperate at all. The student has a hard time arriving at a differential diagnosis. Then the two students are rated. What does this mean? Can we
really represent a complex and unique performance that is far from perfect – since it occurs during a learning process – by a single numerical value?

If clinical competency were a trait or attribute like intelligence, and portfolio assessment comparable with an intelligence test, we would be able to use the full spectrum of psychometric techniques to arrive at a numerical value and to grade students on the curve, preferably following the Gaussian distribution. Good for statistics, but how reasonable is it to think of complex clinical performance indicators as ordinal quantities of a property belonging to an individual student? The central assumption that competency can be subdivided into separate, measurable, stable, and generic traits is being called into question more and more (Schuwirth & Van der Vleuten, 2006).

Utrecht University Medical Centre uses the 4-10 numerical scale for assessing students in clerkships (Ten Cate, Ter Braak et al, 2006). In the Internal Medicine clerkship in year 3, students receive marks on ten performance indicators. The final mark is an unweighted average of these marks. This suggests that clinical competency can indeed be expressed as a numerical value. We feel this is an illusion. The indicators are most helpful in focusing on the relevant information (cf. Funder, 1995), and, in theory, it would be great to train raters in how to handle different clinical educational cases and to arrive at consensus. It has been shown that, after careful training and the use of scoring rubrics, inter-judge agreement can be high on performance assessment tasks (Dunbar, Koretz et al., 1991). In practice, however, this training would go on endlessly, since there is little transfer from learning to judge "pain in the chest – third year" to "Alzheimer, not cooperating – third year" and all the other conceivable tasks and developmental stages. There is no realistic way to develop a gold standard that single raters can use to accurately infer a numerical rating.

This leaves us with a final option to increase reliability in analytic judgments, often suggested in the literature: increase the number of raters. But this is exactly what we are not looking for as a solution. Expert clinicians already have too little time as it is. Moreover, increasing the number of raters tends to increase reliability less than increasing the number of tasks (Linn, Baker et al., 1991).

An important question, then, is what exactly should be reliable in portfolio assessment. We think the pass-fail decision should, at all cost, be sufficiently reliable, because otherwise students will justifiably complain about an injustice being done, and the public will wonder which doctors are actually competent and which are not. It would be wonderful for there to be greater agreement between raters, but perhaps it is better to see detailed ratings as mere placeholders for a series of qualitative judgments that vary across tasks and individuals (Delandshere & Petrosky, 1998), qualitative statements that are far more interesting than numerical values.

We could begin by letting go of criterion-referenced marking, and use a norm-referenced framework instead. To give an example, the meaning of the mark "7" is not "you made the kind of mistakes that cost you 3 points", but rather, "your performance is satisfactory and equivalent to that of your peers". This relative procedure has been elaborated at Utrecht University Medical Centre into a 4-10 Expected Level Scale (Ten Cate, Ter Braak et al., 2006) with three ranges of scoring: below expectations (4 and 5), meets expectations (6, 7 and 8), and exceeds expectations (9 and 10). This allows us to rephrase the reliability question: are we able to differentiate students correctly and reliably into these three categories? Hence, the pass-fail decision is incorporated into the difference between "below" and "meeting" expectations. And, we can also investigate whether portfolio assessment differentiates reliably between average students (who by definition meet expectations) and those who are really outstanding.

But who knows the "expectations"? In general, it is insiders who know. In this context, clinicians familiar with the curriculum, the students, and the educational and hospital contexts and cultures in which students perform do have expectations on the basis of previous tacit or explicit experience. It is to be expected that internal assessors will judge more validly and more consistently than external assessors (Van der Schaaf, Stokking et al., 2005). This of course is the normal situation in an educational setting, but internal raters do run the risk of idiosyncrasy. Moreover, these relative judgments make validation across institutions and contexts more difficult. We depend on experts who are not completely open to external control! So there are caveats, and we do need integrity.

One of the good things about using a short, relative scale is that there is no pressure to use the whole scale and attempt to reach a Gaussian distribution in order to differentiate more reliably between students. In reality, students who enter clerkships have already been through a highly
selective education. They can only enter after passing all previous skills and knowledge tests. Students of Medicine in the Netherlands are generally high achievers in all respects. We can therefore assume that we are dealing with a homogeneous and qualified group of students. Probably only a few will turn out to be incompetent. In order to differentiate reliably within this homogeneous group we need an instrument that is extremely sensitive. Since we do not have even a crude instrument, we should probably give up on this futile attempt and be satisfied with a reliable distribution over three categories. This is one of the key questions we try to answer: *which level of specificity and which scale is suitable for reliable judgments?* Is it the overall mark? Is it the set of intermediate categories we use (information gathering; clinical reasoning, record writing, and knowledge)? Or is it possible to attain reliability with respect to all ten basic performance indicators themselves (history taking, physical investigation, etc.)? And which scale (the relative expected level scale or the interval scale) suits our purposes best? As Delandshere and Petrosky (1998) state: assessment of complex performances should be faithful and useful, not necessarily numerical. This brings us to the next element of portfolio assessment that we need to elaborate on: feedback and its impact on student learning.

### 7.5 Impact on student learning

The goal of education is to foster learning, not to prove it. Assessment is for learning, not just of learning (Segers, 2004). Assessment methods that have a positive impact on student learning should therefore be favoured above methods that do not. "Learning for the test" is arguably one of the biggest threats to learning. But this certainly is not true of portfolio assessment. Preparing the portfolio means gathering evidence of competency, and the best way to do this is to report on competent performance, which implies that performing is an excellent way to prepare for the test.

The second way in which portfolios can easily impact on student learning is through timely feedback on the material in the portfolio. Delandshere and Petrosky (1998) report that assessors who had to write an interpretive summary of performance scrutinised the performance more carefully in order to explain and interpret it than when they focused on numerical ratings. In the latter case, they tried to "force fit" performance into generic value statements defined to create scores and score variance, but that were not very helpful in describing or explaining particulars of any one performance. Reducing performances to a set of scores and generic feedback makes it possible to take a certification decision but falls short of providing useful feedback to improve clinical performance. Clearly, students will learn more from feedback that is rich in content than they will from numerical value statements. It is therefore important to organise content-rich feedback on the expanding portfolio during the course (Beijaard, Driessen et al., 2002). But providing feedback is time-consuming, and it must therefore be justified by better learning results or by students arriving at these results in a shorter time span. We will need to investigate this in more depth.

Raters who look at the same material in the same portfolio and use the same criteria may still arrive at divergent opinions and provide quite different feedback (Schutz & Moss, 2004). Van der Schaaf, Stokking et al. (2005) argue that certain differences are not due to individual idiosyncrasies that can be removed through training and consensus building; they may come from different but valid cognitive representations of the material. Van der Schaaf, Stokking et al. give an example of the assessment of student teacher portfolios in which one group of raters form a concrete representation of the material and another group a more abstract representation. The material in the portfolio and the student’s writing style favour one of these representations, leading to differences in how the two groups of assessors grade the portfolio. "Too much detail", one group may say, whereas the others may say of the same material “not enough detail”. The researchers were able to prove that the inter-rater reliability increased when raters occupied similar positions on the concrete-abstract continuum.

This is an inspiring result. The lesson is that certain disagreements between raters are in fact relevant rather than errors and a threat to reliability, because both points of view can make valuable contributions to the students’ learning process. Students can learn from detailed feedback, but they can also learn from feedback that looks at the broader picture. This implies that students will receive different marks from different raters, which appears to be an injustice. If students can learn valuable but different things from different raters, we should be helping them to accept this apparent injustice rather than striving for consensus. There must be certain limits, of course: differences concerning pass-fail decisions are basically not acceptable.
7.6 Transparency and acceptability

For any assessment method to be used in practice, all the participants and stakeholders will have to accept its procedures and results. The strong face validity of portfolios helps to make them acceptable (Shavelson, Baxter et al. 1992). It remains to be seen whether clinical experts will accept the idea of judging competency primarily on the basis of indirect evidence. We think portfolio assessment is acceptable only in combination with other methods that assess skills and attitudes more directly (Epstein, 2007).

From the examiners’ point of view, portfolio assessment can be highly efficient. The time needed for critical reading is limited compared to the time involved in the direct observation of a sample as varied as the entries in our portfolios. We will have to find out whether students share this idea, since the burden of preparing the portfolio rests with them, and it is an extra activity on top of “doing” the patients. Another interesting question is whether the learning potential of timely, content-rich feedback can be realised in practice. Clearly, articulating and documenting the evidence that underlies decisions is time-consuming. It is certainly less expensive to use a numerical scoring system without having to explicitly articulate the evidential basis for individual ratings (Delandshere & Petrosky, 1998). When students feel their learning is positively influenced by feedback, this will make the effort of compiling the portfolio more acceptable.

Although portfolio assessment, like any form of expert judgment, carries with it connotations of subjectivity, it is also quite transparent since everything can be traced back to the original work. As elaborated above, we might expect differences between raters that are not the effect of lack of training or improper use of criteria, but stem from different values and notions of clinical competency. We will have to discover whether such differences occur, how to classify these into categories or dimensions, what the actual variance is, and whether or not differences between judgements and numerical ratings are acceptable in the eyes of students.

7.7 The effect of the medium

Although electronic patient information systems are accessible throughout the hospital, and tentative experiments have begun involving the use of PDAs at the bedside, the patient record at Utrecht University Medical Centre is still hand-witten. Clinicians scribble their notes on pieces of paper at the patient’s bedside. This is where the patient record starts, and clearly some mistakes have their origins in illegibility. Electronic records and electronic portfolios may have two other important advantages above hand-written or printed versions. Firstly, they allow for the inclusion of audiovisual materials such as pictures and audio recordings of physical symptoms. This makes the material less contingent on individual interpretation. For learning purposes, the validity of the material could be improved by including video vignettes of vital elements of the encounter with the patient in order to invoke formative feedback or provide evidence of competency with regard to skills and attitude. This would make the assessment process more time-consuming, however. In our project, we were unable to investigate this line of thought empirically. We concentrated on a second important advantage, which is the ease with which timely feedback can be provided. If the teacher could access the student material easily “any time, anywhere”, comment on it, and send feedback to the student just as easily, the learning process would be enhanced. In this clerkship, feedback is normally provided during two student-teacher assessment interviews during which the teacher has to concentrate on both the patient’s medical details and the more abstract level of the student’s performance (examination, clinical thinking, and record writing in general). One potential strength of providing early feedback on the basic patient material is that it reduces this cognitive load, enabling the teacher to concentrate more on the meta-level during the interviews.

Utrecht University Medical Centre has a problematic history when it comes to electronic portfolios. When Utrecht University implemented the Bachelor-Master structure in 2002, a university-wide electronic portfolio portal was introduced that all schools could use as they saw fit. It took a few years to resolve the technical problems, however, and at the Medical School, the additional firewalls needed to guarantee security and privacy in patient-related issues caused extra problems. Innovations such as streaming video were basically impossible; the portfolio could be accessed only from computers within the hospital and only by students and staff registered with Utrecht University. This made the system useless, since many students do their clerkships at other hospitals and are supervised by clinicians who are not employed by Utrecht University. Portfolios continued to be mainly handwritten.
In the course of this research project we introduced a simple electronic portfolio format by combining Microsoft Word® templates with e-mail. The patient record has a conventional structure that is used throughout the hospital. It has entries for history taking, physical examination, differential diagnosis, and so on. We converted this to a template that all students received by e-mail when enrolling in the course. It was also installed on all the computers in the hospital used by students during the course. Whenever students have “done” a patient, they can e-mail the resulting patient report and the accompanying reflections and questions to their teacher. Time permitting, the teacher provides immediate feedback, again by e-mail.

We wanted to know whether students would experience any difficulties in preparing the material in an electronic format, whether that format allows teachers to provide more immediate feedback without an excessive time investment, and whether the feedback would indeed positively impact student learning.

7.8 Methods

In a preliminary study, we observed the way students prepare their patient reports and portfolios. We observed several portfolio assessment interviews and discussed these with the teachers until we had exhausted all possible viewpoints (Cobb, Confrey et al., 2003). We interviewed staff members and students. We analysed patient reports, portfolios and teacher feedback. We analysed the assessments, the ratings, and the templates used for assessment.

On the basis of our observations, we converted the hand-written format into an electronic format that was equivalent in all respects, especially regarding the space provided for entering the patient data. We added two extra columns, one for the student to include reflections and questions, and one for the teacher’s feedback.

In the first half of 2007, three cohorts of seven students each entered the experimental condition. They used the electronic format and sent their materials by e-mail to the teacher. The teacher provided feedback on each patient report as quickly as possible. Electronic copies of all reports and teacher feedback were gathered and analysed. Anonymous copies of the portfolios were sent to a second clinician – comparable to the first assessor in terms of his/her clinical and educational experience – for a second judgment. All assessors were asked to provide numerical ratings on a 4-10 scale for all performance indicators, for the four intermediate categories, and for the whole aggregated performance, i.e. one overall final mark. These marks were positioned on the expected level scale by means of the default procedure outlined above.

The assessments were then analysed psychometrically on inter-rater agreement for high-stakes decisions, i.e. the overall judgment in terms of “below expectations”, “meets expectations” or “exceeds expectations”. We also carried out inter-rater reliability calculations or estimations (contingent on the statistical power related to the number of data, Cicchetti, 1976)) on all other judgments in order to determine the suitable analytic level of assessment, and the suitability of the numerical scale versus the expected level scale.

We compared the situation in which feedback was provided only during the first assessment interview halfway through the course with our experimental condition, in which feedback was provided by e-mail on each patient report added to the portfolio. We interviewed students and analysed the contents of the patient reports and the teacher feedback. We observed a representative sample of the 30 minute assessment interviews in both conditions.

We investigated the feedback that was provided, to determine a potential conflict between providing qualitative feedback and providing numerical ratings and their justifications. We also analysed the feedback in terms of content, to determine possible differences in cognitive representations.

The teachers and several students were interviewed about their experience with the experimental condition. A twelve-item questionnaire with a five-point Likert scale was developed and used to gather data on student opinions and satisfaction from all students in the sample.
7.9 Results and discussion

a) Reliability

We used the results of three raters who rated a total of 17 portfolios. At first sight, agreement between raters on high-stakes decisions is high. We found agreement with regard to the overall judgment on the “expected level” scale in 94% of cases, with only one disputed case. In other words, raters who only have access to indirect evidence of performance in the form of the portfolio do agree on the decision that really counts. This is the good news.

Calculating inter-rater reliabilities nevertheless proved to be a tricky, if not pointless, business. The best measure for determining agreement on nominal judgments, for example whether a student performs below expectations or meets or exceeds expectations, is Cohen’s kappa, since it also accounts for chance agreement. However, we were unable to calculate kappa, since not all raters used all categories. This prevalence dependency made it necessary to look for other measures, such as proportions of agreement (Pols & Bosveld, 2003), or correlations. In fact on every occasion (i.e. the final mark, the four intermediate categories, and the nine performance indicators), all the raters allocated almost all the students to the same category: “meets expectations”. We were unable to calculate the reliability with which students were allocated to the category “exceeds expectations” because this category was not used at all in the overall judgments in our sample.

We decided to determine the reliability of the judgments on the numerical 4-10 scale, treating this as an interval or ordinal scale and calculating Pearson and Spearman correlations. The results are included in Table 17.

<table>
<thead>
<tr>
<th>Table 17: Inter-rater reliabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Final mark</td>
</tr>
<tr>
<td>Gathering information</td>
</tr>
<tr>
<td>History</td>
</tr>
<tr>
<td>Physical examination</td>
</tr>
<tr>
<td>Clinical reasoning</td>
</tr>
<tr>
<td>Differential diagnosis</td>
</tr>
<tr>
<td>Additional diagnostic tests</td>
</tr>
<tr>
<td>Prognosis</td>
</tr>
<tr>
<td>Therapeutic measures</td>
</tr>
<tr>
<td>Record writing</td>
</tr>
<tr>
<td>Contents of reports</td>
</tr>
<tr>
<td>Summaries</td>
</tr>
<tr>
<td>Medical knowledge</td>
</tr>
</tbody>
</table>

It is clear that – perhaps with the exception of the final mark and the prognosis – these correlations are totally inadequate. On all other intermediate categories and performance indicators there is wide disagreement. History taking, a very important learning goal of this course, has a particularly low correlation. With respect to the final mark on the 4-10 scale, exact agreement was reached on 45% of cases. Given the fact that the marks “7” and “8” were allocated in 85% of decisions, this is not really satisfactory.

We correlated the final mark of the portfolio with the independent ratings each student received on an "exam patient": a long case. Both assess clinical competency but they focus on different aspects: the exam patient includes practical skills and attitudes towards the patient, whereas the portfolio includes record writing. Correlations of the numerical ratings were rather low: 0.4 (Pearson and Spearman). On average, marks on the exam patient were higher. This is in line with findings that vis-à-vis grading of this kind can be somewhat inflated (Ten Cate, Ter Braak et al., 2006). We must question whether these differences are significant. Methodologically, the comparison is unsound, since many different assessors were involved in assessing the long case.
Furthermore, we found no differences with respect to comparisons on the expected level scale: all students "meet expectations". As a basic check for consistency, then, the latter comparison may be appropriate.

b) From reliability to impact on learning

We conclude that, in this context, portfolio assessment leads to high, almost complete, agreement with regard to the straightforward question of whether or not the student should pass the course. This is in line with previous observations concerning clerkships in medical education: almost all the students who enter, succeed. And why not? Medical students are gifted, hard-working, motivated, and have already taken endless tests selecting them on their knowledge and skills. We think the portfolio is not so much a measurement or testing instrument as an instrument that has a serious impact on students’ activities and learning behaviour. The instructions for preparing the portfolio are quite clear. The students are required to investigate patients and write up a record, otherwise they will not be able to hand in a portfolio that meets the requirements. Moreover, the portfolio more or less forces the hospital, i.e. the workplace, to enable students to "do" patients, whereas normally very junior students of this kind run the serious risk of being mere spectators. As a measurement or testing device, the portfolio simply functions as a filter for those few students who fail to perform adequately. The numerical ratings, however, are skating on thin ice at best. Rating is part of our culture and as such apparently beyond debate, but it suggests a precision and routine in applying shared criteria for performance indicators that are simply non-existent.

There is no debate on the performance indicators themselves. To the assessing clinicians, it is sufficiently clear what truly competent (read perfect) results on these indicators would be. But we must conclude that it is not at all obvious to them how they should scale the imperfections that can be expected from these developing professionals, given the fact that each combination of patient, complaints, symptoms and underlying clinical or non-clinical causes is as new to them as it is to the students. This apparently causes them to restrict themselves to a very narrow part of the scale: 89% of all marks are either a "7" or an "8". But even within this narrow range, agreement is low.

On the basis of the interviews, the survey, and analysis of the feedback and the way students responded to the feedback in subsequent patient reports, we conclude that providing timely feedback does influence student learning behaviour. Both students and teachers report that the quality of the patient reports improved on the basis of the feedback, especially with regard to history taking, consistency of clinical reasoning, and record writing. See Table 18 for data on student opinions.

### Table 18: Survey of student opinions (N=16; response = 76%)

<table>
<thead>
<tr>
<th>Question</th>
<th>(Strongly) Disagree</th>
<th>Neutral</th>
<th>(Strongly) Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 The 10 patient reports provide a representative picture of my competency</td>
<td>37%</td>
<td>19%</td>
<td>44%</td>
</tr>
<tr>
<td>2 Working on the patient reports stimulated thought</td>
<td>0</td>
<td>31%</td>
<td>69%</td>
</tr>
<tr>
<td>3 I received timely feedback on my patient reports</td>
<td>30%</td>
<td>44%</td>
<td>26%</td>
</tr>
<tr>
<td>4 The feedback was helpful for future history taking and physical examination</td>
<td>19%</td>
<td>50%</td>
<td>31%</td>
</tr>
<tr>
<td>5 The feedback was helpful for my differential diagnosis and my clinical reasoning</td>
<td>38%</td>
<td>31%</td>
<td>31%</td>
</tr>
<tr>
<td>6 The feedback was helpful for writing the patient reports</td>
<td>0</td>
<td>25%</td>
<td>75%</td>
</tr>
<tr>
<td>7 It is acceptable to me that the Teaching Clinician assesses me, although he or she hasn’t observed me</td>
<td>56%</td>
<td>19%</td>
<td>25%</td>
</tr>
<tr>
<td>8 The grade I received from the Teaching Clinician is correct</td>
<td>7%</td>
<td>47%</td>
<td>44%</td>
</tr>
<tr>
<td>9 I’d rather write the portfolio by hand than on the computer</td>
<td>88%</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>10 I had no problems working with the electronic portfolio</td>
<td>13%</td>
<td>6%</td>
<td>81%</td>
</tr>
<tr>
<td>11 The number of patient reports I had to make was too high</td>
<td>0</td>
<td>44%</td>
<td>56%</td>
</tr>
<tr>
<td>12 I’d rather stay on the ward longer instead of having to compose the portfolio</td>
<td>0</td>
<td>25%</td>
<td>75%</td>
</tr>
</tbody>
</table>
Moreover, when feedback on medical and case-specific issues had already been provided by e-mail, we noted a shift in emphasis in the assessment interviews from discussing these details in each patient report to a more generalised discussion of the student’s progress with regard to the performance indicators. For example, in the experimental condition, we observed several cases in which the teacher focused on a lack of consistency between the differential diagnosis, history taking and the physical examination, a theme that was not apparent in the non-feedback condition.

Another advantage was that students knew the feedback before entering the assessment interview. They were better prepared, had questions ready, and some were even able to dispute the feedback with reasons and rationales.

Portfolio assessment in this particular context may fail to distribute students reliably on a numerical scale, but this does not necessarily mean that providing numerical ratings competes negatively with providing feedback. We noticed, however, that formulating the judgment in numerical terms (“your mark is a 7”) often provoked discussions on the value of the judgment (“why not 8?”) and not on the reasons for awarding this mark. And since assessors agree on the final mark in less than fifty percent of cases, student do in fact have a point in arguing. We also noticed that judgments formulated in feedback terms (“your history taking was not consistent with your differential diagnosis”) was more likely to provoke content-rich discussions (“Can you give an example?” “What should I have asked?”). Given the fact that the scores on these performance indicators lack inter-rater consistency, it would be wise to limit grading on the analytic level as much as possible.

An analysis of the feedback provided by two different assessors gave some indication that assessors do hold different views. One assessor seemed to look for a complete and correct representation of the medical aspects of each case, whereas the second looked for consistency between differential diagnosis and the process of history taking and physical examination. This difference could account for the low inter-rater agreement on the indicator most affected by these different views: history taking. The number of assessors in our sample, however, is too small to favour this hypothesis above other explanations, e.g. idiosyncrasies or lack of training.

Students reported that they valued timely feedback. However, we also noted a serious problem. Many students failed to send in the portfolio entries on time. They postponed record writing until they had dealt with several patients. In these cases, feedback came too late to rectify early mistakes. We investigated the reasons for this seemingly self-handicapping behaviour and found that a majority of students (see Table 2) preferred being on the ward, in close contact with patients and primary clinical processes, to record writing. In their opinion, it is on the ward that they learn from experience. They seem to underestimate the role that reflection and writing have to play in transforming experience into competency.

c) Acceptability and the effect of the medium

In the eyes of the students, the portfolio does not entirely cover their clinical competency. They are right of course. Their skills and attitudes and their commitment to clinical work are not shown in the portfolio. That is why they prefer to be assessed by someone who has actually seen them working (see Table 2), or to have feedback from those working on the ward included in the portfolio and rewarded. Students agree that working on the portfolio stimulated critical thinking, and that feedback, when provided, was helpful. From our data we inferred that those students who were late in sending in portfolio entries, and who therefore did not receive timely feedback, had a less positive view of the helpfulness of feedback.

Students in general have no problems with accepting the outcomes of the portfolio assessment.

Students greatly prefer the electronic medium over any handwritten format. Minor problems cited were how to type symbolic representations of medical phenomena. One student reported more serious problems: the ward to which she was allocated had no computers available to her during rotations, so she had to either to postpone working on the portfolio until she was at home or start by using pencil and paper.

For the assessing clinician, the problem is providing feedback. It is not easy for them to organise their work in such a way that they can provide rich and thoughtful feedback “on demand”. It is easier and less time-consuming to give students a numerical mark or value statements such as “excellent” or “keep up the good work” than to suggest improvements. In the experimental condition, providing feedback on all patient reports and writing interpretive assessment summaries
instead of just marking meant an increase from approximately 30-45 minutes per student (no feedback, just marking) to 60-80 minutes. The time spent on each individual patient report increased from 2-5 minutes to 5-7 minutes. This clearly adds to the clinician’s workload and should be compensated for. Teachers agree that providing timely and content-rich feedback in this way is valuable for students and helps them to improve. We can infer from our data that those students who sent in portfolio entries in time but did not receive immediate feedback were the ones who disagreed with the survey question “I received timely feedback”.

According to the assessors, the electronic portfolio did indeed make it easier for them to provide feedback, to provide it immediately, and to provide it on all performance indicators, but this also put pressure on them to actually do so on all occasions.

It is important for the organisation to control teacher workload. One solution is to reduce the number of portfolio entries, since feedback has a positive impact and makes learning more efficient. It is difficult to determine the optimum number of portfolio entries, however, since grading in this system is always relative to the expectations, and the progress students make cannot be compared to a gold standard.

Another helpful idea is to develop feedback menus, consisting of pre-formulated feedback phrases, from which the assessor can choose the most appropriate. This would save time and also help to make assessment more objective. After analysing the feedback, we were able to pick out several phrases that recurred frequently, so this approach seems to be promising.

It is important for the public to be able to trust the outcomes of portfolio assessment. On a superficial level, all students pass the course, and this may cause raised eyebrows. Our conclusion is that portfolio assessment is not a safeguard simply because it accurately measures competency. The real safeguard is the assessment and selection system of the whole curriculum, which ensures that, as a rule, only those students enter the course who have the knowledge, the skills, the intelligence, the stamina and the motivation to succeed. When such students put enough effort into the course, they meet the requirements, almost without exception.

7.10 Conclusions

We conclude that the portfolio is a valuable addition to the assessment repertoire. Its main strength is in its impact on the learning activities of the students. There are two sides to this. Firstly, having to prepare the portfolio makes students do the right things, and it also influences the organisation of the workplace to enable students to do these things. Secondly, the portfolio enables instructors to provide feedback on performance, results, and reflections. Timely and interpretive feedback is helpful for learning.

The second advantage of the portfolio is its applicability in work-based learning contexts in which the experts necessary for assessment have very limited time and flexibility, such as at a hospital. With regard to validity, one positive feature is that the portfolio provides a more representative picture of competency and performance, the results of performance, and the rationales behind the performance than direct observation can achieve in the same amount of staff time. Portfolio assessment, especially when it is supported electronically, is flexible and highly time-efficient for the teaching staff. This comes at a certain cost, however: elements of competency that require time-consuming direct observation cannot be easily included.

It is possible, of course, to increase validity by adding video fragments of crucial and representative aspects of performance to the portfolio. Although we did not investigate this, the electronic format we used is very well suited to this option. But “perfection may not be worth the extra cost” (Simon, 1956). In our context, assessors will not find the time to analyse these materials, just as they do not find the time to observe students directly on a regular basis. A better suggestion would therefore be to include video-based peer feedback in the portfolio procedure. The burden of the portfolio lies with the students anyway, and although they may complain that it is time-consuming, they have an obligation to analyse and reflect on their own performance in order to achieve lasting and more generic and transferable learning results. Peers can help them do this. Again, we did not investigate how peer feedback on video fragments affects the quality of learning, but we suggest making this a topic of future research and development.
We also conclude that portfolio assessment is not really a measurement instrument. Its strength is not that it reliably positions students on a numerical scale that represents competency. We found that the assessors in our study could reliably distinguish students who should fail from those who meet the expectations, but we also found that attempts to express performance or competency in numerical ratings were unreliable.

We conclude that portfolio assessment is suitable in educational contexts that meet two conditions. The first is that the student cohort should be homogeneous with respect to important prerequisites, such as knowledge, skills, and motivation. The second is that assessment should be carried out by internal assessors who know these prerequisites and as such know what “meets expectations” means.

Portfolios by their very nature are transparent to outside evaluation. In cases of doubt or debate, it is fairly easy to arrange a second opinion. We suggest that such safeguard procedures should be part of any portfolio assessment procedure. Such procedures should focus on high-stakes judgments such as the pass-fail decision, and not on minor disputes concerning the exact numerical position in the “meets expectations” domain.

If portfolio assessment is to become a more independent and objective measurement of competency, two lines of development should be pursued. The first is the development of objective standards for performance indicators. The second is assessor training to ensure that standards are used consistently and reliably. We have doubts about the feasibility and the wisdom of such an approach, certainly in the context of clinical education. Compared to feedback, the value of numerical grades for student learning is very limited. Standardising student performance on the wide and unpredictable variety of authentic cases is probably not even possible and certainly time-consuming, just like training for consensus on numerical judgments. We think it is wiser to dedicate precious staff time to providing feedback in a way that affects student learning. Portfolio assessment may not be perfect in this respect, but it is certainly useful.

References


8 ePortfolio: Images and evidence of teacher competency

Ellen van den Berg, Edith Stein Teacher Education College/University of Twente

8.1 Introduction

The theory–practice divide necessitates urgent and radical changes in teacher education that are more in line with recent insights into how professionals learn (e.g. Putnam & Borko, 2000). Portfolios are perceived as a good way to represent contextualised learning in complex authentic settings (e.g. Shulman, 1998). Student teachers assemble portfolios to demonstrate their competencies in teaching; they also use them as a tool for reflection, with the portfolio allowing them to critique their own work and that of others.

A knowledge base for assessing teacher competency is gradually emerging. In brief, we can distinguish the following principles (e.g. Dwyer, 1998; Frederiksen, Sipusic, Sherin, & Wolfe, 1998; Uhlenbeck, 2002):

- Teacher competency should as far as possible be assessed in a context-sensitive manner, specifically in authentic professional situations.
- Professional action is multifaceted (there is no one best practice).
- There is a need for a mix of various different sources of data and information.
- Competency is comprehensive and assessing it requires an interpretative process model. There is a relationship between teacher decision-making (based on a personalised professional knowledge base), teacher actions and the effect of these actions on student learning (Roelofs & Van den Berg, 2004).

In this paper we describe two projects that explore ways of applying ePortfolios in our pre-service teacher education programme. In the first project we focused on the design and implementation of an ePortfolio that serves formative assessment purposes. Students were asked to show how their competency improves over time. This type of portfolio is known as a developmental or process portfolio. In the second project we also used the ePortfolio for summative assessment purposes. Here, peer learning and assessment were the focus of attention. We conclude this paper with a summary of the “lessons learned” in these projects.

8.2 Development over time

At Edith Stein Teacher Education College, students are required to write a Personal Development Plan (PDP) to guide their learning over time. The text-based nature of this plan has some disadvantages. Firstly, it is hard to dig into the act of teaching by using only texts about teaching; the plan therefore lacks authenticity. Secondly, students perceive the plan not as a tool to guide their learning but as an obligation to be fulfilled. In other words, students do not experience a sense of ownership of the PDP. The pilot project described in this section was initiated to increase authenticity and student ownership of the PDP, in which video recordings of lesson activities play a pivotal role.

Before the start of the project, the designers expected to gain an understanding of the following topics:
- the value of various different media channels (video, audio, text) in an ePortfolio;
- video recordings as a means to help students monitor their growing competency as a teacher;
- advantages of an ePortfolio over a text-based portfolio;
- the conditions required for a successful full-scale implementation of an ePortfolio that aims to show competency growth over time.
8.2.1 Intentions

Figure 2 shows the sequence of activities needed to prepare an ePortfolio.

<table>
<thead>
<tr>
<th>Before internship</th>
<th>During</th>
<th>After internship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson preparation 1</td>
<td>↓</td>
<td>Looking back based on indicator competencies</td>
</tr>
<tr>
<td>Video recording 1</td>
<td>↓</td>
<td>Intention Personal Development Plan (PDP)</td>
</tr>
<tr>
<td>Realisation (PDP)</td>
<td>↓</td>
<td>Lesson preparation 2</td>
</tr>
<tr>
<td>Video recording 2</td>
<td>↓</td>
<td>Looking back based on indicator competencies</td>
</tr>
<tr>
<td>Construction of ePortfolio</td>
<td>↓</td>
<td>Teacher educator uses ePortfolio</td>
</tr>
<tr>
<td>Intentions in PDP for next period</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 2: Process of ePortfolio construction

The core of the ePortfolio is a set of video recordings of lessons the students teach over time and their reflection on these lessons, followed by their action plans. The students are given indicators of their competencies and questions to guide their reflection and help them to look back and plan subsequent actions. The project team expected that students would find making audio recordings an easier method of documenting their reflective thoughts than writing them down.

8.2.2 Realisation

Two students and a teacher educator volunteered to take part in the pilot in order to experiment with the ePortfolio concept as described above. The experiment taught us that the students could easily record and cut video footage with the SURF virtual cutting machine. They found putting together an ePortfolio time-consuming but also worth their effort, as the video recordings proved to be a far better basis than texts for reflecting on their classroom teaching. The teacher educator valued the video component of the ePortfolio for the same reason. The use of audio recording was not successful. The students preferred writing down their thoughts to recording and assembling audio files in the ePortfolio. They found the latter laborious.
It was difficult for the students to use indicators of competencies to monitor their teaching and plan for subsequent actions. This pilot shows that students need more help than just a written format with competency indicators. The teacher educator shared the students’ opinion. Additionally, he felt that he needed more experience in order to guide students in developing their competency based on video recordings of their classroom practice.

The students did not follow the planned procedure, i.e. alternating action and reflection. Instead, they videotaped lessons at the beginning and at the end of their internship and commenced the reflection processes while assembling their ePortfolio after their internship. Although they did not follow the procedure as recommended, the students valued the process of constructing an ePortfolio, judging it as more authentic and expressing ownership of the result. In this sense, the ePortfolio “outperformed” the text-based Personal Development Plan. Despite the difficulties in guiding the ePortfolio process, the teacher educator also favoured the ePortfolio above the text-only variant. Having time to guide the processes remains an issue here, however. (For more information about this project see: Edith Stein, 2007.)

8.2.3 Conclusions and recommendations

Technology
In terms of technology, the ePortfolio project was largely successful. The use of the SURF virtual cutting machine made it particularly easy for students to add relevant recordings of their practical experience to their ePortfolio. It was not as easy to include audio recordings, but this was not a problem for the students because they preferred written above spoken reflections. Based on the results, the project team decided to skip the audio recording part of the ePortfolio construction procedure. In the case of full-scale implementation (about 1000 students), the team advises organising workshops to train students to work with that SURF virtual cutting machine and providing a user manual.

Educational design and role of teacher educator
The educational design of the ePortfolio requires improvement. It must be more firmly embedded in the curriculum and incorporate competency growth throughout based on students reflecting on video clips of themselves in the classroom. An ePortfolio that supports the documentation of such growth will be capable of attaining its full educational potential. The role of the teacher educator in guiding the processes of ePortfolio construction and subsequent personal development should be more clearly articulated. And as there are no ready-made solutions here, teacher educators should cooperate in order to define their role and learn the procedures for guiding ePortfolios.

Full-scale implementation?
This pilot demonstrates that ePortfolios show great promise in documenting professional development over time and grounding teacher education in practice by means of video clips. However, it seems too early to fully implement this portfolio concept at Edith Stein Teacher Education College. In view of the conclusions and recommendations formulated in this section, it would be sensible to organise a try-out with about 25 students before exposing more than 1000 students to this type of portfolio use. The try-out could be used to test the recommendations and improve the concept further, both technologically and educationally.

8.3 ePortfolio: Peer learning and assessment

The second project we describe is called “Idols in Portfolioland”. The title refers to a popular television contest in which the best singer is chosen in several rounds. In the final round, it is not a professional panel but the public who votes for the best. The basis for commencing this project was the strongly held belief of a teacher educator in the arts that teacher education focuses too much on what goes wrong. He compares portfolio use in education to the original use of a portfolio, in which an artist shows his best work to the galleries (a showcase portfolio). This idea inspired him to introduce a portfolio concept that concentrates on the best practices created by the students themselves. This concept was piloted with a few students in an earlier project. Because a proof of concept had already been established, we decided to launch a try-out with about 40 students.
8.3.1 Intentions

Two classes of second-year teacher education students were asked to participate in this project (40 students). They attended lectures in which the procedure was outlined and theoretical background information on teaching art and geography (the relevant subjects) was presented. The classes were then divided into groups of four students. The members of these small groups taught the same art and geography lessons. All lessons were videotaped. The students viewed each others’ lessons during group meetings and decided which lesson they found the best. The videotape of this lesson then became the core component of a group ePortfolio. Figure 2 shows the basis for the ePortfolio construction process.

Figure 3: Interpretive model of competent performance (after Roelofs & Sanders, 2003)

The starting point in this framework is that teacher competency is reflected in the consequences of teachers’ actions, the most important being students’ learning activities. Other examples of consequences are: a smooth or disruptive classroom climate or a feeling of well-being among students. Starting from the consequences, the remaining elements of the model can be mapped retroactively, beginning with the component “action”. This refers to professional activities, e.g. delivering instructions, providing feedback to students, and creating a cooperative classroom atmosphere. Secondly, any teacher activity takes place within a specific context in which a teacher has to make many decisions, both on a long-term basis (planning ahead) or immediately within a classroom situation. For instance, teachers will have to plan their instruction and adapt it depending on differing circumstances (such as different student learning styles, different organisational conditions). Thirdly, when taking decisions and performing activities, teachers will have to draw from a basis of professional knowledge and skills and personal attitudes and beliefs. The likelihood of valid inferences is better when combining different aspects of teaching into one comprehensive model of competent performance than when using reductionist models that concentrate on separate parts of the teaching process (Roelofs & Sanders, 2004).

The future teachers used edited parts of the videotape of the “best” lesson as the core of their portfolio, supplementing their theoretical analyses and reflective thoughts. The ePortfolio took the form of a PowerPoint presentation. Students presented their PowerPoints to one another during whole-class sessions, discussed the results and finally voted for the “best of the best” lesson.
8.3.2 Realisation and evaluation

The intended curriculum was implemented in accordance with the intentions. Figure 4 depicts examples of the framework’s components.

<table>
<thead>
<tr>
<th>Consequences:</th>
<th>Children’s learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action:</td>
<td>Teaching</td>
</tr>
<tr>
<td>Decision making:</td>
<td>Lesson preparation</td>
</tr>
<tr>
<td>Basis:</td>
<td>Lecture</td>
</tr>
</tbody>
</table>

Figure 4: Examples of framework
Figure 5 offers an impression of the process of ePortfolio construction.

At the start: Lectures and video workshop

Lesson preparation

Students videotaping one another

Decisions in small groups

Video editing and portfolio construction

Final presentations

Figure 5: Sequence of activities
An evaluation questionnaire distributed among the students shows that:
• they value viewing and critiquing one another’s (video) lessons;
• they did not run into many technological problems, in part because a help desk was made available;
• some of the students did not appreciate working with a framework other than their usual formats;
• some students thought too much time was devoted to the technical aspects at the expense of subject matter and pedagogical content knowledge.

The teacher educators said in interviews that:
• in broad outline the project met their expectations;
• they were pleased with the overall quality of the presentations;
• they noticed that the students judged their videos on different criteria and procedures in small groups (more holistic/intuitive and more analytic/systematic);
• next time they would want to focus in greater depth on the subject matter and pedagogical content knowledge as cognitive tools for analysis and reflection.
• (For a full report of the results see: Von Piekartz, Van den Berg & Nawijn, 2006).

8.3.3 Conclusions and recommendations

Technology
Students did not experience many problems with the technology. A short workshop was basically sufficient to teach them the basics of video recording and editing and putting together an ePortfolio in PowerPoint. The help desk and more conversant peers solved any remaining technical problems.

Educational design and role of teacher educator
The educational design of this project was rather complicated but did not cause major problems. What requires more attention is to integrate the in-depth use of theoretical concepts into analysis and reflection on teaching situations. Another issue is to find a more reliable and valid method of judging the ePortfolios. In particular, the use of ePortfolios in high-stake assessments requires thorough consideration in the years ahead.

The educational design requires students who can take responsibility for their learning and cooperation processes. The teacher educator is more a facilitator during these processes. Both teacher educators and students think that the teacher educator should play a more pivotal role as far as subject matter and pedagogical content knowledge are concerned. Students expect more instruction and guidance from the teacher educator in these areas.

Full-scale implementation
The experience gained during the try-out with 40 students gives us the confidence to implement this ePortfolio concept (“looking for the best”) with all the students. We believe students are capable of organising this process and evaluating one another’s work. During full-scale implementation, the role of the teacher educator will be emphasised more.

8.4 Looking back and looking ahead: lessons learned

In this final section, we summarise the “lessons learned” in the two portfolio projects.

• Video recordings are an indispensable way of anchoring teacher education in the complexity of classroom teaching and should therefore always be an important component of an ePortfolio. In order to make sense of the video recordings, relevant information should be supplemented. Visuals and text are preferable to audio.

• Self-reflection and peer analysis are triggered by the ePortfolio; however, teacher educators have a pivotal role to play in guaranteeing the theoretical underpinnings.

• Pilot projects and try-outs of ePortfolio projects are also professional development activities for teacher educators. They learn to use ePortfolios within competency-based curricula in which students take responsibility for their learning processes. For now, “just-do-it” appears to be the best way to gain expertise in this area.
• There is a need for procedures to evaluate ePortfolios, particularly for high-stake assessment purposes. This procedure should be strict enough to guarantee reliable and valid judgments, but should not put at risk ePortfolio construction as an authentic and motivating activity in which students experience ownership of their portfolio.

• Students do not face many technological problems when constructing a rather sophisticated ePortfolio in PowerPoint. A workshop with some basic training in video recording and editing, a help desk, and easy-to-use manuals smooth the construction process.

• Starting an ePortfolio project with a small pilot is a good means of testing a concept and provides a huge amount of information for improvement at low cost.

References


