Combining Different Aims in a Portfolio System: a Web-based Portfolio and the Various Ways in which it can serve the Student

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Abstract: A portfolio in a competency-driven curriculum can serve many functions.
This article describes the essence of competency-based learning and focusses on the role the portfolio can play in the formative and summative function of assessment. Important issues are validity and reliability.
The implications of combining different functions for the design of an electronic portfolio will also be discussed.
In the presentation the focus is on the design (including examples of student-portfolios) and the implementation procedure.

0 Introduction

A portfolio is an organised, goal-driven documentation of a student's professional growth and achieved competence in the complex act of a profession. Although it is a collection of documents, a portfolio is tangible evidence of the wide range of knowledge, dispositions, and skills that a student possesses as a growing professional. Documents in the portfolio are self-selected, reflecting student's individuality and autonomy (Campbell 2001). Portfolios can be used in different ways in education. In the literature on portfolios three main aims for the compilation of a portfolio are usually distinguished, resulting in three different types of portfolio (Wolf 1997):

1. To address evaluation requirements: assessment portfolio;
2. To advance professional growth: professional growth portfolio
3. To aid in employment searches: showcase portfolio

An additional emerging aim, which has recently gained much attention, is that of 'sharing knowledge', being part of learning community. The fourth function of the portfolio is the communication function. The function which is eventually assigned to the portfolio is closely linked to the educational concept existing within the institution and the way this is implemented at curriculum level. The specific functions which the portfolio has to fulfil determine its design and eventual method of implementation. This article will describe the function of a portfolio in a competency-based curriculum.

1 Educational Concept: Competency-based Learning.

For several years now forms of competency-based learning have been introduced into large sections of higher education in the Netherlands. This has involved different definitions of the concept of competencies. Elshout-Mohr (2000) describes competencies as follows: 'In the Dutch context, competencies refer to attributes of individuals that enable them to handle complex professional tasks in an appropriate, process- and product-oriented manner.' Other definitions go deeper into the 'attributes', Klarus (1998) for example refers to 'an individual's capabilities (cognitive and behavioural skills)' while others describe 'attributes' as 'knowledge, skills and attitude'. What all these definitions have in common is that students become acquainted with professional practice during their studies and learn to deal with professional situations of greater or lesser complexity.

Characteristics of competency-based learning are:

1. Realistic tasks. During the course students work on realistic tasks: study tasks and assignments have an explicit and demonstrable link to professional practice and competencies. Ideally products and tasks are commissioned directly from bodies in the professional field with students being responsible for delivering or implementing them. The main focus lies on developing the student's competencies. This means that education is demand-driven, the educational programme 'facilitates'.
2. Students are responsible for their own learning process. During the programme the responsibility of individual students increases: they become the manager of their own learning. The principle behind this is that the responsibility which the student has for providing particular services (see 1 above) will have a positive influence on the responsibility which is assumed for the learning process.
3. Assessment of students is based on competency levels rather than the testing of professional knowledge and skills: students prove that they can function at a certain level.
4. Students are addressed as starting professionals during their studies. Professional practice thus has a systematic place in the programme and is involved in the assessment of study results and student's competency development.
5. Learning organisation. Programmes are continually developing in response to the ever-changing and ever-increasing complexity of professional situations: an innovative attitude is expected of professional practitioners. Tutors (currently practising professionals) and students (future professionals) learn from and with each other.

The choice for competency-based learning has far-reaching consequences; it is not only the programme which will be renewed, but the whole organisation which will change (see further on this: Te Lintelo 1999, Mirande 2000, Terwindt 2000).

2 Competency-based Learning and the Portfolio

2.1 The Personal Growth Portfolio
The biggest change for students in competency-based education is having to assume greater responsibility for their learning process and providing evidence for this. The student is given responsibility for all phases in the learning process: orientation, planning, implementation and evaluation. *Traditionally* the student's input was restricted to the implementation phase. In the orientation phase (what has to be learnt?), the planning phase (which activities will need to be carried out to achieve this?) and the evaluation phase (has what had to be learnt actually been learnt?) the responsibility lay with the tutor. In a competency-based curriculum, the student takes or is given responsibility in every phase. This means that the programme becomes demand-driven instead of input-driven and has the role of facilitating the student's learning process. In competency-based education meta-cognitive knowledge and skills (including reflection) are essential skills for the student: students need to be able to analyse the strengths and weaknesses in their learning process and in their knowledge and skills. On the basis of this they have to make choices, formulate learning aims and monitor their own learning process. The portfolio is eminently suitable for supporting these processes. A portfolio in a competency-based curriculum is thus by necessity directed towards the student's development (professional growth portfolio: Wolf,1997). The developmental aspect

points in two directions: students record and monitor their own development as well as developing their meta-cognitive skills while working on the portfolio.

When the portfolio is used in this way it is much more than just a collection of selected work. Dochy et al (2000) cite research which shows that the learning experiences and strategies which students develop to work with the portfolio (collecting and analysing data, organising, interpreting, reflecting) are important skills in the concept of life-long learning. Through reflecting on the learning process, working in the portfolio and receiving feedback, students develop meta-cognitive knowledge and skills. Research among teachers (Tanner, 2000 and van Tartwijk, 1998) indicates that compiling a portfolio stimulates systematic reflection on one's own educational practice because choices and considerations have to be made explicit. A condition for this is that a context is created in which the portfolio forms the impetus for discussion about one's method of work. For students this means that a portfolio must also fulfil a communicative function. At the Amsterdam Faculty of Education we are investigating in a longitudinal study the effects of the portfolio on the selfregulation by students.

An important condition for a personal growth portfolio is that students feel that they are the owners of their portfolios (Wade, 1996). A consequence of this is that the student must have a certain measure of freedom in the design and composition of their own portfolio and that the student can decide who has access to the various components in the portfolio.

In short a personal growth portfolio has the following functions:
1. Monitoring one's own learning processes and making visible growth and development in relation to the competencies;
2. Communication about choices, aims and learning processes;
3. Support for students in their reflection;
4. Registration of the student's individual curriculum. In a demand-driven programme students will inevitably be following a curriculum tailored to their own individual learning needs.

2.2 The Assessment Portfolio

The function of a portfolio in competency-based learning is not necessarily restricted to its role in students' development; it can also function in the assessment of students. Using the evidence collected in their portfolio students can show that they are competent at the level of a starting professional. This means that output feedback in the form of a one-dimensional score (for example pass/fail) is no longer sufficient, and that assessment and feedback must be directed at the way in which and the degree to which the student has developed. The assessment has a formative function here, this form of assessment steers the learning process and contributes to the student's development. Feedback (from peers, counsellors) must be directed at the strong and weak points in the student's functioning and support the reflection process. This assessment function can be completely fitted into the personal growth portfolio.

When it has to be assessed whether a student is competent at a certain level (for example, to decide whether a student is sufficiently competent to receive their diploma), the assessment has a summative function. What requirements need to be met for a portfolio to fulfil this summative function? In answering this question the issues of reliability and validity need to be considered[1].

In the discussion about assessment portfolios it is generally held that assessment portfolios, unlike personal growth portfolios, should fulfil certain external quality demands to make reliable assessment of students possible. (Wolf, 1997). Assessment portfolios must be comparable; demands are made on the number and sort of artefacts which have to be included: in other words they have to be more or less standardised. But is this a justified demand? Is it in fact necessary for assessment portfolios to be similar and comparable and if so, to what extent? Or is it rather that in this new educational concept different demands need to be made of assessment and that so far we have adhered too much to old criteria in regard to standardisation and reliability in portfolio assessment?

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[1] Reliability means that the outcomes of assessment should not depend on accidental variables such as characteristics of the assessors. Validity means that assessment procedures should measure knowledge, skills and competences, which are relevant for the context in which the assessment takes place.

Elshout-Mohr (2000) looks for new criteria and Table 1 gives a clear overview of three educational settings each with their own learning goals, learning arrangements and assessments. In the third column a description is given of the consequences of the different settings for assessment.

Table 1 Alignment of learning goals, learning arrangement and assessment

Setting	Learning goals	Learning arrangement	Assessment
Setting 1: teacher directed	Discrete knowledge and skills	Teacher-directed programme; guided practice.	Students do tests and examinations marked by the teacher.
Setting 2: student-directed	General skills	Strategy training; Individual practice in a variety of situations.	Students demonstrate general skills in performance. These are assessed with fixed evaluationscales.
Setting 3: competence-oriented	Professional competence	Active participation in professional work or simulations of such work; guided work-experience; construction of personal working and learning concept.	Students present views and implementations in - portfolios - practical assignments. Assessors may develop new assessment criteria if necessary.

In the competence-oriented approach, the learning arrangements are based on the ideas that learning is situated in a professional context and that learners profit from learning episodes in which they participate, as novices, in professional work. Participation provides them with opportunities to construct their own views on the work and the profession, and to regulate their own learning. The right-hand column in Table 1 summarises how assessment procedures might stem from the same approaches to learning as the learning goals and learning arrangements. In setting 1 and 2 identical assessment criteria are used for all students. Elshout-Mohr argues that in setting 3 "congruence between the instructional setting and the assessment procedure can best be reached by employment of assessment criteria that are attuned to student's work and self-regulated learning. It is not fair to assess students by using standard tests and fixed criteria".

In fact what she says here is that in a competency-based curriculum, with a demand-driven programme where the student carries a great deal of responsibility, assessment needs to be 'demand-driven' as well. Not only the curriculum has to be tailored to the individual student, but also the assessment. The evidence presented by the student must of course fit within the general framework of the professional competencies; but every student gives these their own unique interpretation which can only be done full justice in a non-standardised assessment. Assessment criteria have to fit not only within the framework of the professional competencies but also be relevant to the learning process of each individual, self-directed student. Such an assessment wins in validity at the level of the learning process of the individual student. It is precisely in a demand-driven competency-based curriculum that validity has a higher priority than reliability (Klarus, 2000). How you collect the evidence, and the nature of the evidence, is not important as long as the portfolio is valid, up-to-date, authentic, dynamic, longitudinal, multidimensional, interactive and rich in evidence of competence (Dochy, 2000).

Programmes which are concerned with developing demand-driven, competency-based curricula struggle with the form of assessments and the role which portfolio can play in these. Van Tartwijk (2000) signals a tendency away from freedom in students' individual selection of material, structure and form towards a more structured portfolio in which attainment targets are used to direct a self-evaluation which is supported by material included in an appendix. The underlying motive here is the pressure from educational departments to increase the reliability of portfolio assessment and in this way also indirectly to increase their influence on the content of the curriculum. This emphasis on reliability above all else fits, we believe, within more traditional educational models. If the assessment demands a great many requirements which portfolios must fulfil, this means that students will eventually make portfolios which bear a strong resemblance to each other. There would be an unintended conformity in the program. These portfolios are

reliable but not valid as far as the student's individual learning process is concerned. However, if, in a competency-based curriculum, the responsibility lies with the student there will be a wide variety of portfolios in which the assessors have to interpret whether a student has sufficient proof of competence or not. Elshout-Mohr (2000) suggests that the problem concerning reliability and assessment can probably not be solved at the level of content, but at the procedural level: a carefully planned and controlled assessment procedure, which of course would be identical for all. The portfolio can play a central role in such a procedure. The criteria and standards to which the content must conform are not part of the portfolio and can be reached in discussion between tutor and student and possibly also the assessor.

3 Design of the Portfolio : a Combination Portfolio

In the literature on portfolios an area of tension is signalled, also for students, between the formative and summative functions of a portfolio (Wolf, 1997 en van Tartwijk, 2000). Personal growth portfolios (formative) give a valid impression of the learning process at an individual student's level. This 'evidence' can also fulfil a function within a summative evaluation (see above). The area of tension for the student lies in the fact that that a personal growth portfolio demands an open attitude to learning and being vulnerable. Such an attitude is difficult to combine with the fact that the same portfolio will play a role at certain moments in the assessment of the student. The question is then how both functions of assessment (formative and summative) can be combined in one portfolio. In the Netherlands we have developed a portfolio design in teacher education institutions which is constructed so that it can fulfil both functions at the same time without difficulty[2]. This format meets the following requirements:
- The ownership rests with the student; the student decides who has access to the various components of the portfolio;
- It offers space, freedom and creativity to the students; they decide how they will prove their competence and what is included in the portfolio;
- The portfolio fulfils a function in the communication among students themselves and between students and tutors.

A web-based portfolio is able to fulfil these requirements and unite various functions. Students collect evidence on their own web-page in the form of products, and feedback and reflection on these. This material is ordered around the professional competencies. From this developmental portfolio the student then makes a selection: what do I want to show my assessors which will prove as convincingly as possible that I meet the demands of the competencies? What we have here is in fact an assessment portfolio within a developmental portfolio, a portfolio with different layers. The student only has to show the selected assessment portfolio to the assessors. This means that we leave the ownership of the portfolio with the student. Only a digital portfolio allows this possibility. In our presentation we will show the design of the portfolio with examples and give a brief description of the implementation procedure.

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[2] An English version of this portfolio system can be found on http://portfolioinfo.efa.nl

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