The learning portfolio as a tool for stimulating reflection by student teachers

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2

Student teachers' perceptions of the functions of the learning portfolio in their learning process[1]

Abstract

We aimed to develop a framework that could be used to describe the value of the learning portfolio for the learning process of individual student teachers. Retrospective interviews with 21 student teachers were used, as were their portfolio-evaluation reports on their experiences of working on a portfolio. Seven functions of the learning portfolio in the student teachers' learning process emerged from the data. It was possible to distinguish between product and process functions: with product functions, the production of a portfolio was seen as working on a tangible end product; with process functions, it was the interplay between reflecting on the learning process and the learning process itself that was the key. Two subgroups of process functions of the learning portfolio were also distinguished, based on the type of learning they facilitated. Different views were expressed by the student teachers about the value of the portfolio, and it seems worthwhile to take these differences into account by making more diverse use of portfolios in teacher-education courses.

2.1 Introduction

The recent use of portfolios in teaching and teacher education is grounded in a new vision of teacher assessment and professional development (Wolf

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& Dietz, 1998). New assessment methods have been developed recently that do justice to the complexity of teaching and learning to teach, and that offer insights into both the behaviour and the knowledge acquisition of teachers, contribute to professional development, and fit into a constructivist view of learning (Mabry, 1999; Uhlenbeck, Verloop, & Beijaard, 2002). The portfolio is one of these relatively new assessment methods, and it is intended to give a picture of both teachers' practical knowledge and their behaviour and to encourage them to engage in professional self-development by reflecting on the way they function in their own teaching practice. The portfolio can be described as a dossier in which individual teachers reflect on themselves as teachers and on their own functioning and development. To do this they use a selection of material from their teaching practice that is gathered over a set period from different sources and contexts, and that shows how the individual teachers bestow significance on experiences in their teaching practice and how they act and have developed (Darling-Hammond & Snyder, 2000; Wade & Yarbrough, 1996). It has become difficult to speak of *the* portfolio, as there are great differences between portfolios depending on the specific purposes for which they are intended and the context in which they are used. Wolf and Dietz (1998) distinguished three types of portfolio that are used in practice: the learning portfolio, the employment portfolio, and the assessment portfolio. These portfolios differ in the extent to which their content is structured (varying from an open-ended to a standardised structure) and in the method of assessment (varying from ongoing self-assessment of one's own learning goals to formal evaluation based on criteria formulated by others).

The learning portfolio (also known as the professional development or process portfolio) is used a great deal in teacher education. The main focus of this type of portfolio is the student teacher's reflection on his or her own learning process with a view to advancing learning. Working on this portfolio should enable student teachers to visualise their learning process in concrete terms, to illustrate it using information about their teaching practice and their course, and to think about their learning in a focused and structured way (Wolf & Dietz, 1998). An important aspect of working on the portfolio is selecting experiences and materials that should help the student teacher to focus on key issues in his or her professional development (Kremer-Hayon, 1997). The intention is that, by thinking about key issues, student teachers will realise what experiences have been important learning experiences for them over a period of time and over different contexts and that they will connect them up into an organised whole (Loughran & Corrigan, 1995;

Richert, 1990; Wade & Yarbrough, 1996). Student teachers are free to choose their own objectives for their learning portfolio; they explore their own concerns from their own practice and have room to make personal choices. The intention is that this gives them ownership of and responsibility for their own learning (Barton & Collins, 1993; Green & Smyser, 1996; Johnson & Rose, 1997; Wolf & Dietz, 1998). Mentor, peers, and teacher educators play an important role in the production of the learning portfolio. Discussions with these people help student teachers to explain experiences that have been important to them and, through feedback and questions, help them to see alternative perspectives and to make connections between theory and practice (Freidus, 1998; Klenowski, 2002; Lyons, 1998[a]; Seldin, 1993). The fact that the portfolio contains materials from different sources, materials from both the student teachers themselves and from others (external, more 'objective' information, such as feedback from the mentor, video fragments of lessons, or pupils' work), should encourage student teachers to focus their attention on particular aspects of their teaching practice that they might otherwise overlook, and to see discrepancies between their own impression of how they are functioning and reality (Airasian, Gullickson, Hahn, & Farland, 1995; Smith & Tillema, 1998).

Studies of the use of the learning portfolio in teacher education have shown that student teachers vary in the way they use the portfolio as a tool for reflecting on their own learning process (Darling, 2001; Wade & Yarbrough, 1996). Research on the use of portfolios has mainly concentrated on looking for reasons why student teachers use or fail to use the portfolio in the way that the education course deems desirable (Borko, Michalec, Timmons, & Siddle, 1997; Meyer & Tusin, 1999). Little attention has been given to describing the nature of the reflection that portfolio use is intended to promote in relation to the learning process of student teachers (Zeichner & Wray, 2001). Nor has much consideration been given to what student teachers understand to be the purpose of the portfolio (Krause, 1996). Understanding how student teachers see the portfolio could assist supervisors who help the students with their portfolios and help them to adopt a more differentiated approach to thinking about what the individual student teacher gains in his or her learning process from producing a portfolio. This is why the key question in our research was what student teachers understand by working on a learning portfolio. This question was broken down into two parts: (a) What functions in their learning process do student teachers ascribe to the learning portfolio? and (b) How do the functions of the learning portfolio distinguished by the student teachers relate to each other?

2.2 Theoretical background

2.2.1 The process function of the learning portfolio

Two functions of the learning portfolio are generally distinguished in the professional literature: a product and a process function. Student teachers work on a learning portfolio not only to show what they have achieved and learned (the portfolio as product); the main purpose of the portfolio is that it helps them to work on their own learning process (the portfolio as process). The process function of the portfolio is the dynamic side of the portfolio, because this is where the interplay between reflection on the learning process and the learning process itself originates. This is the most important function of the learning portfolio (Darling, 2001; Loughran & Corrigan, 1995; Richert, 1990).

Research into the portfolio as a tool for reflection has shown that not all student teachers use the process function of the learning portfolio. Darling (2001), for instance, found in her study that students can work on their portfolios in two different ways. One group of students produced the portfolio for the course, that is, for the mark they would get for it. They were unwilling and unable to examine their own teaching critically as they produced their portfolios. Another group of students made the portfolio for themselves. They analysed their beliefs and their actions, using the portfolio to gain insight into themselves as teachers and learners. Reasons why some student teachers failed to use the process function of the learning portfolio were sought both in the context in which they were supervised and in the student teachers themselves. The professional literature on portfolios shows that *ownership* is an important condition for student teachers to use the process function. Only when student teachers see making a portfolio as a task that is worthwhile for them personally are they willing to ask themselves questions about occurrences in their teaching practice and to find out who they are and who they want to be as beginning teachers (Borko et al., 1997; Wade & Yarbrough, 1996). They then not only focus on carrying out the task, but use the task to reach a better understanding of the learning process they are going through (Marton & Booth, 1997; Newton, 2000). Darling (2001) expressed this as follows: *"The intention to construct the portfolio as the record of one's narrative as emerging teacher is the intention to go beyond recalling one's achievements and instead to gain insight into one's thinking. To do this well, one must be willing to submit to the rules of the practice: serious deliberation about what kind of teacher to be, careful examination of failure as*

well as success, and continual exploration of one's own motives and reasons for action and judgment. Students who create a portfolio with only external goods in mind may wind up foregoing a valuable part of their teacher education, that is, the ability and the inclination to critically examine their teaching" (p. 110).

Other factors linked in the literature to use of the process function of the portfolio are experience in producing a portfolio, instruction and supervision, and the learning orientation of student teachers. Student teachers often have no *experience* of producing a portfolio before they start their teacher-education course. They find the 'open' character of the portfolio especially difficult at first (Johnson & Rose, 1997; Wade & Yarbrough, 1996). Loughran and Corrigan (1995) found that the portfolio was soon reduced to a static collection of material, because students did not understand what a portfolio is and so dynamic reflection on teaching and learning was completely absent. Only when students actually produced a portfolio did they start to realise that there is an important difference between a portfolio theme (entry) that shows what one has achieved and learned and a portfolio theme (entry) that is used to gain insight through reflection into one's philosophy of teaching and learning. Lyons (1998[b]) found that, through working on their portfolios, students gradually changed their concept of what reflection in the portfolio entailed, the purpose of reflection, and how they played a role in this themselves. The students increasingly realised that, by using the portfolio to critically examine their teaching practice, they were becoming aware of their philosophy of teaching and learning ('coming to know') and they could express their knowledge about learning and teaching in explicit terms ('knowing that we know').

There is also evidence to suggest that *instruction and supervision* affect the way student teachers use the portfolio. Krause (1996) found an association between students' understanding of the purpose of the portfolio and the explanation they had been given about producing a portfolio. Students who had been given an assignment to practice working with concepts that are relevant to the production of a portfolio had a better understanding of how they could use the portfolio to gain insight into their learning process. Wade and Yarbrough (1996) found differences between students with different supervisors. They argued that there is a need for research into the influence of individual supervisors' methods of presenting and supervising the portfolio on the value that students attach to the portfolio and the way they use it.

Finally, the question is increasingly being asked whether producing a portfolio is equally suited to the *learning orientation* of each student teacher. From research conducted by Smith and Tillema (1998) it emerged that people

with views on learning that fit into the concept of self-directed learning find using a portfolio for their own professional development easier than do people with different views on learning. Meyer and Tusin (1999) found an association between students' learning orientation and their experiences with the portfolio. Student teachers with a performance orientation towards learning geared to their own skills used the portfolio as a product with which they could show others their abilities (the portfolio as 'showcase'). Student teachers with a process orientation towards learning geared to their own development and to lending meaning to their experiences emphasised the process function of the portfolio (the portfolio as 'evolving works').

2.2.2 Reflection and the portfolio

In all research studies outlined above it was presupposed that the learning portfolio has a product and a process function, and that use of only the product function of the portfolio is undesirable and use of the process function is desirable. To gain more insight into factors that affect use of the process function of the portfolio by student teachers, we also need to gain more insight into the process function itself and what we aim to achieve with it. This requires an explanation of the concept of reflection in relation to the compiling of the portfolio (Beijaard, Driessen, Tartwijk, & Vleuten, 2002). Reflection is generally associated with the process function of the portfolio. However, reflection is not a goal in itself; it is a means by which to learn from practical experiences (in addition to other forms of learning), and to extend and deepen one's own practical knowledge in an active, conscious, and purposeful way (Kelchtermans, 2000; Korthagen, 2001). This implies that, within the context of the use of portfolios, the concept of reflection should be defined in terms of the function of reflection in student teachers' learning process.

Up to now portfolio research has not yet made sufficiently clear how the interplay between reflection on the learning process in the portfolio and the learning process itself works. This is connected with the fact that the concept of reflection is interpreted differently in the different studies (see Zeichner & Wray, 2001). Based on the portfolio literature outlined above, two functions of reflection in the learning process can be distinguished: self-direction of one's own learning process and the development of practical knowledge. These functions come together in the portfolio and are highly interconnected, but they are nevertheless different functions. The first function concerns the steering or regulatory side of the portfolio. Producing a portfolio requires

student teachers to distance themselves from their practical experiences and to think about what learning experiences have been important to them over a period of time and in different contexts. This distancing of themselves from the learning process with a view to steering the progress and outcome of their learning process is also known as self-regulation (Vermunt & Verloop, 1999). The second function of reflection concerns the content aspect of the portfolio. It is concerned with the systematic development of knowledge by student teachers based on reflection on their experiences. The content of the portfolio is not set; the student teachers have to contribute this themselves. The content consists of experiences from teaching practice and the course that are important to them. What finally ends up in the portfolio is highly individual and personal, because the items that student teachers put into their portfolios are also very personal (Antonek, McCormick, & Donato, 1997; Tanner, Longayroux, Beijaard, & Verloop, 2000). These two functions of reflection in the portfolio will now be discussed in more detail.

2.2.3 Self-regulation of learning

Because teaching is such a complex profession, it is impossible to prepare student teachers for all the situations they may come up against and to equip them with all the necessary knowledge and skills. That is why it is important that student teachers learn to learn from their own experiences, so that they can continue to learn when they are working as teachers after they have finished their training (Korthagen, 2001). This capacity to learn independently is also known in teacher education as 'continuing competence and growth'. In education it is becoming more and more important that teachers be willing and have the ability continually to develop new knowledge and skills themselves, so that they can take advantage of new developments in education, raise their own actions for discussion, and continually improve their own teaching (Griffiths, 2000). Reflection is seen as a powerful tool enabling teachers to make conscious choices about their own development, about what they want to improve in their teaching practice and how (Boud, Keogh, & Walker, 1985; Korthagen, 2001). In other words, reflection has a self-regulatory function in the learning process of student teachers.

Little attention has been given to this regulatory aspect of reflection in the various operationalisations of reflection in the professional literature. Educational psychology theory enables reflection to be described in the sense of self-direction of one's own learning process in terms of regulatory activities. Regulatory activities are thinking activities which can be used at

different times to exercise control over the learning process (Boekaerts & Simons, 1995; Bolhuis, 2000). When student teachers engage in regulatory activities, they are distancing themselves from their learning process and, as it were, asking themselves critical questions about aspects of their learning process. This may be their preparation for learning (What are my learning objectives? How do I hope to reach my learning objectives?); their monitoring of the learning process (Am I doing it right? Am I developing? What do I still not understand? Do I need to change something about my approach? Are there new questions?); or their evaluation of their learning (Am I making progress? Have I reached my learning objectives? Which ones have I reached/not reached and why? What areas do I still need to work on?). When student teachers reflect on their learning process at different points in time and use their portfolios for this, there is a constant interplay between working on the portfolio and the learning process itself. This requires that they be conscious of their learning and that they can see how they have learned and to what extent they have learned (Krause, 1996).

2.2.4 Construction of practical knowledge

Learning from experience plays an important role in learning to teach; however, having experiences is no guarantee that a person will learn from them. Student teachers have to understand their experiences if they are to be able to build up practical knowledge (Kelchtermans, 2000; Korthagen, 2001). Understanding places high demands on the cognitive and metacognitive capacities of student teachers: it takes time and energy, is not always easy, and certainly cannot be transferred from one person to another (Boekaerts & Simons, 1995; Newton, 2000). Reflection is the means by which student teachers can reach an understanding of their experiences. This involves a reconstruction of experiences (Bain, Ballantyne, Packer, & Mills, 1999; Korthagen, 2001) "that leads to new comprehensions of action situations, of self-as-teacher, or of taken-for-granted assumptions about teaching" (Grimmett, 1988, p. 12).

The personal frame of reference, sometimes referred to as personal teaching theories or subjective theories, also plays an important role in understanding experiences. This is a person's knowledge and beliefs about learning and teaching that determine how he or she approaches and interprets new situations (Kwakman, 1999; Putnam & Borko, 1997; Richardson, 1996). If student teachers are to develop practical knowledge, they not only need to be aware of their own thinking and actions in teaching

practice, they also need to realise that their perception of a situation is only one of several possible views (Barnes, 1992; Oosterheert, 2001). This requires the insight that understanding oneself is crucial to understanding reality (Hofer & Pintrich, 1997; Von Wright, 1992). If student teachers reflect on their personal teaching theories and not only on their activities as teachers, they will become conscious of the beliefs that determine their actions and so they will be able to test these beliefs and restructure them if necessary (Bengtsson, 1995; Von Wright, 1992; Kelchtermans, 2000). This is what is known as critical reflection (Louden, 1991; Mezirow, 1997). Reflection on experiences is geared to the understanding of underlying processes that can play a role in the actions of practising teachers. Another concept that is used in this context for students' learning is 'deep processing' (Oosterheert & Vermunt, 2001; Vermunt, 1998). Deep processing requires certain thinking activities, such as searching for connections between new information and one's own beliefs; searching for points of agreement and differences between experiences (relating); integrating newly acquired knowledge with existing knowledge; bringing different experiences together into an organised whole (structuring); forming judgements about whether the views of others are correct; interpreting a situation for oneself and comparing this with the interpretations of others (critical processing) (Vermunt & Verloop, 1999). External sources of information that offer alternative perspectives are very important in facilitating deep processing (Oosterheert, 2001).

2.3 Method

2.3.1 Context

The student teachers in this study attended a one-year postgraduate teacher-training course at Leiden University in the Netherlands in the 1998/1999 academic year. During their training year, the student teachers attended weekly classes at the university, whilst also doing teaching practice in a school or, in some cases, having a paid job as a teacher. They were being trained to teach at the senior general and pre-university levels of secondary education (pupils aged 12-18) in a specific language (Dutch, German, English, or the classics) or science subject (biology, maths, or chemistry). They produced two learning portfolios during the year, one each semester, on experiences that were important to them in the practical training at the school and during the theoretical module at the teacher-education institute.

2.3.2 The learning portfolio

The portfolio was used during the course as an instrument to encourage student teachers to reflect on themselves as beginning teachers, on how they were progressing in their professional development, and on their own part in that development. The student teachers had to include the following elements in their portfolio: (a) a vision on learning and teaching; (b) five to eight themes that they had chosen themselves that were important in their development (cf. Seldin, 1997); (c) a conclusion about their learning process in the semester; (d) their experiences in compiling the portfolio; and (e) appendices containing illustrative material to accompany the themes. In their vision on learning and teaching, the student teachers described the kind of teacher they were (or were becoming); what they considered to be important in their teaching and why; and how they expressed this in their own teaching practice. The themes that the students chose themselves made up the core of the portfolio. A theme was defined as a topic that is or has been important in the student teacher's development. It was a cover-all term that linked the different learning experiences. Examples of themes were interaction with pupils; use of a specific teaching method; myself as a teacher; conversation skills in the senior years at secondary school; and motivating pupils. The intention was that the student teachers would examine their learning experiences in more depth by working on the themes. They had to examine what experiences were important to them and why, and what the essential aspects of those experiences were. They also had to make connections between different experiences over a period of time and in different contexts, and to think about what they had learned, how they were developing, and what had contributed to that. Based on the various themes, the student teachers wrote a conclusion on their learning process over the past semester, discussed their strengths and weaknesses, and formulated new learning objectives for the future. They concluded the portfolio with a section on their experiences in producing the portfolio itself (portfolio-evaluation report). They used the appendix to the portfolio to present materials that could illustrate and clarify the development described in the portfolio themes, such as quotations from logbooks; lesson materials they had produced themselves; pupils' work; fragments of video recordings of lessons; feedback from their mentor or pupils; and university assignments.

As most of the student teachers had never produced a portfolio before, they were given help with their first portfolio in the form of a portfolio manual and five exercises in the production of a portfolio. The purpose of

the portfolio exercises was to give the student teachers practice working with concepts that played an important role in the portfolio, such as 'theme', 'reflection', 'development', and 'illustration material'. They produced their second portfolio more independently. The second portfolio was a continuation of the first. The student teachers had to include varied themes in this second portfolio, so they were encouraged to reflect on different aspects that could play a role in learning and teaching. Some of the themes for the second portfolio were allowed to follow on from themes in the first portfolio. Throughout their training year, meetings with their university supervisors and school mentors, intervision meetings with fellow students, keeping logbooks, and gathering material from their teaching practice were tools used to help the student teachers to clarify problems and practical issues in their portfolios; to take a structured approach to gaining new insights and making new plans for action; to understand experiences that were important to them; and to examine how they functioned as teachers and their own personal style of teaching. At the end of each semester, the portfolio was used as the basis for a meeting with their university supervisor and their school mentor, in which they discussed their individual development over the past semester and drew up learning objectives for the future.

2.3.3 Participants

All 25 full-time student teachers of languages and the exact sciences were willing to take part in the research: 18 (72%) student language teachers and 7 (28%) student science teachers. The sample contained 5 men (20%) and 20 women (80%). The average age of the participants was 27. Sixteen (64%) of the student teachers had a job and 9 (36%) were on teaching-practice placements.

The 25 student teachers who took part in the research were supervised by eight supervisors from among the university staff as they produced their portfolios. They were all given the portfolio manual and the five portfolio exercises to work through with their supervisors, but after that it was more or less left up to the individuals concerned how to supervise the portfolio work and how often to meet to discuss it. Four of the 25 student teachers had not completed the course when the research project came to an end, and so they were not included in the research findings.

2.3.4 Data-gathering

The research question addressed in the present study was embedded in an overall study exploring student teachers' experiences of working on their portfolios. Structured retrospective interviews with open-ended questions about several aspects of the use of portfolios during the course were used to examine these experiences. The part of the interview relevant to the present research question concerned the views of student teachers about the value of making a portfolio for their learning process. The student teachers were asked whether producing a portfolio was a useful activity for them. Furthermore, to gain more insight into the process function of the portfolio, the student teachers were asked whether working on their portfolios stimulated them to reflect on their development as teachers. In order to elicit their thinking activities in constructing their portfolios, the student teachers were asked to concretize what they meant by reflection on their development as teachers and in what way working on their portfolios contributed to that. If necessary, they were prompted with further questioning. They were asked 'Why?', 'Why not?', 'In what way?' In order to prevent them, as much as possible, from simply giving answers they thought to be socially desirable, the student teachers were asked to illustrate their answers with examples. The interviews were held at the end of the training year and they dealt with both portfolios. All interviews were audio-taped. Each interview lasted an average of 75 minutes.

In addition to the interviews, we also used portfolio-evaluation reports, which the student teachers had to include as a compulsory element of their first and second portfolios. In these reports, the students gave a brief account of their experiences of working on the portfolios, and they were asked to explicitly examine the value of the portfolio for their learning process.

A total of 21 interviews and 39 portfolio-evaluation reports were gathered and analysed for the research. Although it was intended that each student teacher should produce two portfolio-evaluation reports (one for each portfolio), 3 students produced only one portfolio-evaluation report.

2.3.5 Data analysis

The data were analysed in two stages. Firstly, categories describing functions of the portfolio were derived from the interviews and portfolio-evaluation reports. Secondly, possible relations between the categories were empirically explored using homogeneity analysis.

Data analysis phase 1: Developing the categories

When the system of categories for the functions of the learning portfolio was being developed, a distinction was made between the process function of the portfolio and the product function. To describe the product function of the portfolio we used the product-oriented activity 'showing' as starting point. This activity is related to the portfolio as product (Barton & Collins, 1993; Wolf & Dietz, 1998). To describe the process function of the portfolio we used educational psychology theory, in particular the thinking activities distinguished by Vermunt and Verloop (1999). Educational psychology theory offers possibilities for describing reflection in terms of thinking activities that student teachers engage in when they are working on their portfolios (cf. Mansvelder-Longayroux, Beijaard, & Verloop, in press). We mentioned some thinking activities in the theoretical background section of this article. Other examples of thinking activities are determining the weaknesses in your own knowledge and skills (diagnosis), distinguishing main issues from side-issues (selection), investigating whether learning objectives have been achieved (evaluation), and thinking about everything that has taken place during learning (reflection) (Vermunt & Verloop, 1999). These thinking activities determine, to a significant extent, the quality of the learning outcomes that students achieve (Vermunt & Verloop, 1999).

The development of the category system was an iterative process comprising two steps:

1. Identification of activities and thinking activities in the data.

The data (transcribed interviews and portfolio-evaluation reports) were examined for thinking activities as described by Vermunt and Verloop (1999). In addition to the product-oriented activity 'showing', we found five process-oriented thinking activities: namely, recollection, structuring, evaluation, analysis, and reflection. The process-oriented thinking activities from the data were then compared with the descriptions of the thinking activities distinguished by Vermunt and Verloop (1999). These descriptions were adjusted on the basis of the data. The descriptions of the thinking activities were discussed with another researcher (*peer debriefing*; Denzin & Lincoln, 1994), resulting in a more accurate description of the thinking activities (see Table 2.1).

2. Formulation of portfolio functions on the basis of the activities and thinking activities in the data.

Provisional categories of portfolio functions were drawn on the basis of the (thinking) activities found. In order to formulate portfolio functions, the content to which the (thinking)activities referred was used to make a

further distinction within these (thinking)activities. Within the activity 'showing', a distinction was drawn between showing to the teacher-education institute because that is a course requirement and showing because the student teachers want to do that themselves. No distinctions emerged from the data within the thinking activities 'recollecting' and 'structuring'. Both thinking activities referred to recalling and composing experiences from the past, and these thinking activities were always found in combination. Within 'analysing', a distinction was drawn between understanding experiences from the past and understanding oneself as a teacher. Within 'evaluating' no further distinctions occurred; all evaluation activities in the data referred to evaluating one's own professional development. Within the thinking activity 'reflecting' also, no further distinctions could be made. This thinking activity referred to understanding one's own learning process.

Table 2.1. Description of thinking activities involved in producing portfolios

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Recollection
Recollection/recalling from memory situations, events and activities that happened in the past.

Structuring
Sorting different experiences into umbrella portfolio themes, structuring single experiences.

Evaluation
Evaluation of your development as a teacher, examining what you have learned in the past period.

Analysis
Examining what underlying processes played a role in an experience, examining similarities and differences between experiences, examining what vision on learning and teaching underlies your actions in teaching practice.

Reflection[1]
Examining the process of your development, evaluating your development (evaluation), and examining what factors are connected with this (analysis).

Note. [1]Due to the specific operationalisation of reflection in terms of thinking activities in this research, the 'broad' concept of reflection includes a number of thinking activities, including reflection in the narrower sense used in educational psychology. Reflection always consists of a combination of evaluation and analysis (see Mansvelder-Longayroux, Beijaard, & Verloop , in press).

The tentative categories (portfolio functions) were discussed with another researcher (*peer debriefing*; Denzin & Lincoln, 1994) and were adjusted and defined more accurately. Next, the thinking activities found in the data were examined on the basis of the category system. No new categories and no new information about the categories emerged. The result of this step was the final category system for the analysis of the data. The final category system contained seven portfolio functions: meeting the requirements, showing others or yourself, recollecting and structuring experiences, evaluating development, understanding experiences, understanding the learning process, and understanding yourself as a teacher (see Table 2.2).

All data were coded using the category system. The procedure for coding the interviews was as follows. Each answer given by a student teacher to an interview question formed a coding unit. When a student teacher mentioned more than one portfolio function in an answer, a coding unit was defined when the next portfolio function was mentioned. The portfolio-evaluation reports were divided into coding units in the same way. All coded interview data and portfolio-evaluation reports were discussed with another researcher. The assigned codes were examined. In some cases, the researchers differed in the portfolio function they ascribed to a particular fragment. After the differences were discussed, agreement was reached on all but two coding units. In these cases, the question was whether the thinking activity mentioned by the student teacher came under the code 'understanding the learning process' or 'evaluating development'. We decided to ascribe the code 'evaluating development' to both coding units. In the appendix we include fragments from two interviews and one portfolio-evaluation report to illustrate the way in which the data were coded.

Table 2.2. Description of functions of the learning portfolio and underlying (thinking) activities

portfolio function	description	(thinking)activity
meeting the requirements	The portfolio is an assignment that you have to hand in to meet the course requirement to produce a portfolio in which you reflect on your learning experiences and development.	showing
showing others or yourself	The portfolio is a document in which you can record what you have done and learned, so you can look at it again later and show it to others.	showing
recollecting and structuring experiences	The portfolio helps you to consider what you have done and learned and go through it systematically.	recollecting structuring
evaluating development	Producing a portfolio makes you evaluate what areas you have developed in and what areas you still have to work on.	evaluating
understanding experiences	The reason for making a portfolio is to work out why certain situations occurred in your teaching practice and to be able to see connections between experiences.	analysing
understanding yourself as a teacher	The portfolio encourages you to think about yourself as a teacher, about what is important to you and what kind of teacher you want to be.	analysing
understanding the learning process	You produce a portfolio in order to gain insight into the progress you have made and the experiences that have been significant in that.	reflecting

Data analysis phase 2: Linking the categories

To answer the second research question, a homogeneity analysis using Alternating Least Squares (HOMALS) was carried out to determine how the portfolio functions related to each other. This analysis technique was used to find out whether there were empirically based associations between the functions of the portfolio mentioned by the student teachers. We used the SPSS 8.0 package for the homogeneity analysis.

HOMALS can be seen as a classic Principal Component Analysis (PCA) for variables measured on a nominal level. HOMALS consists of a two-step procedure (Gifi, 1983, 1990; Heus, Leeden, & Gazendam, 1995):

1. The categories of the nominal variables (in this study the portfolio functions) are quantified in a number on interval level (category quantification). In the present study, this was done by coding all the student teachers for whether they did (code =1) or did not (code = 2) mention a particular function of the portfolio (variable). Whether a function is mentioned or not has equal value in the HOMALS analysis. Next, the category values 1 and 2 are quantified on the basis of the mutual correlation between the variables. The results of this are the category quantifications.

2. The category quantifications can be analysed using a classic PCA. HOMALS represents the results of the PCA in the value of the portfolio functions on dimensions (= discrimination measure). The number of dimensions used in research depends on the amount of variance between the variables that each additional dimension can describe extra (= fit of the solution expressed in Eigenvalue) and on the degree to which the dimensions remain meaningful and can be interpreted. HOMALS represents similarities and differences between persons and categories as distances between points in a one- or more-than-one-dimensional space (plot). The categories of a single variable are placed as far from each other as possible, while all objects with the same score on that variable are placed as close to each other as possible. As this is done for all categories and persons at the same time, a solution is produced that can be represented as a distribution of points in a field (plot). When category points are close together in the plot, this means that these categories occurred together relatively often in the pattern of answers of the student teachers. Categories that are seldom or never combined with each other appear further away from each other in the plot (Berg, 1987; Heus et al., 1995).

2.4 Results

2.4.1 Differences between the portfolio functions

The analysis of the interviews and the portfolio-evaluation reports resulted in seven portfolio functions which the student teachers ascribed to the learning portfolio (see Table 2.2). Most of the student teachers considered the portfolio to serve several functions at the same time ($\bar{x}$ =3.33, *sd*=1.06). One student mentioned only one portfolio function, namely, 'meeting the requirements'.

These portfolio functions can be distinguished according to whether they threw light on the product aspect or the process aspect of producing a portfolio. 'Meeting the requirements' and 'showing others or yourself' were functions that befitted the portfolio as product. In both cases, producing a portfolio was seen as working on a tangible end product. Out of a total of 21 student teachers, 10 (48%) mentioned 'meeting the requirements' and 12 (57%) mentioned 'showing others or yourself' (see Table 2.3). The other five functions, 'recollecting and structuring experiences', 'evaluating development', 'understanding experiences', 'understanding the learning process', and 'understanding yourself as a teacher' consisted of thinking activities geared to reflecting on one's own learning process. These functions befitted the process function of the portfolio. It was possible to distinguish two subgroups of process functions of the portfolio, based on the type of learning they facilitated: action and improvement of action in teaching practice, and understanding the underlying processes that can play a role in action in teaching practice and learning to teach. Two functions, 'recollecting and structuring experiences' and 'evaluating development', belonged to the group of process functions that was geared to action and improving action. Fourteen student teachers (67%) mentioned 'recollecting and structuring experiences' and 17 student teachers (81%) mentioned 'evaluating development' (see Table 2.3). Three functions, 'understanding experiences', 'understanding the learning process', and 'understanding yourself as a teacher', belonged to the group of process functions that was geared to understanding underlying processes that can play a role in action in teaching practice and learning to teach. Eight student teachers (38%) mentioned 'understanding experiences', five student teachers (24%) mentioned 'understanding the learning process', and four student teachers (19%) mentioned 'understanding yourself as a teacher' (see Table 2.3).

Table 2.3. Functions of the portfolio and frequency by function in learning process

function in learning process		portfolio function	
Product		meeting the requirements	(10)
		showing yourself or others	(12)
Process	**action and improving action**	recollecting and structuring experiences	(14)
		evaluating development	(17)
	understanding underlying processes	understanding experiences	(8)
		understanding the learning process	(5)
		understanding yourself as a teacher	(4)

The distinction between the product and process functions of the portfolio and, within the process function, the distinction between portfolio functions geared to action and those geared to processes underlying action or learning to teach will now be explained in more detail and illustrated with the aid of extracts from the transcribed interviews.

As stated earlier, in the case of two functions, 'meeting the requirements' and 'showing others or yourself', producing a portfolio was seen as completing a course assignment. The focus was on the end product, the final document produced by working on the portfolio. Below are some examples of how student teachers viewed the portfolio as product:

> I notice now that I write things up because I know that those are the kinds of things the teachers want to see but they are not necessarily the things that have occupied me the most, things that I feel have been an important element for me over the past six months [meeting the requirements]. (Student teacher 8)

> It is not doing the portfolio that has made me conscious of my learning process. I am, you might say, conscious of my learning process every minute of the day because there is still so much to learn. Producing a portfolio is more likely to get in the way of that, because come what may you have to do something again with what you have already learned [meeting the requirements]. (Student teacher 6)

> It's just about showing what you have been doing [showing others]. (Student teacher 15)

> It is giving a kind of feedback to myself. I did this and I thought that was important, and this is what I have learned from it. If I leaf back through it again later, I'll see it again. It is there in black and white; it is not something that is just in my head that will change as the years go by. It is simply there now and it is a product that I can fall back on later, shall we say [showing yourself]. (Student teacher 14)

There is a distinct difference between the following quotes and those above. Rather than focusing only on the task they had to complete, the students teachers quoted below focused on the content of the portfolio, practical experiences they had during their learning process. They used the portfolio to become aware of the process and the results of their learning, central to which were their activities, development, and functioning (actions). 'Recollecting and structuring of experiences', and 'evaluating development' fit into this group of process functions of the portfolio. The portfolio was seen as an instrument for reviewing the semester that had just passed and making explicit what they had done, what they knew, and what they could do in comparison with at the start of the semester.

> It makes you think about what you have done. It is very easy to think, now that is behind me, that's happened; you go on to the next thing and you forget it. Now you spend more time thinking over things that you feel are important [recollecting and structuring experiences]. (Student teacher 21)

> Because you are so busy the whole year just doing everything and preparing your lessons and marking, you don't take the time to think about what you are actually doing and what you are learning from it. Making the portfolio helped me to go through all that again and look at how it went at the beginning and how I see that now and how I do that now [recollecting and structuring experiences]. (Student teacher 4)

> Of course, I think about what went wrong after almost every lesson and I try to approach the things that went wrong differently the next time. These thoughts are mostly limited to that one lesson. Making the portfolio forced me to structure these thoughts and organise some of them into a theme. This has given me a clearer picture of the progress I have made over the past few months; writing up my

experiences made me aware of problems that I have solved, things I could have done better, and aspects of my teaching practice that I have not given much thought to up to now [evaluating development]. (Student teacher 4)

You are forced to think about everything: what went better or worse during my second placement compared with my first one, have I developed as a teacher, and am I really suited to being a teacher? [evaluating development]. (Student teacher 20)

In the second group of process functions of the portfolio, the student teachers saw that they could use the portfolio for their own learning process. 'Understanding experiences', 'understanding the learning process', and 'understanding yourself as a teacher' belonged to this group of process functions. The student teachers indicated that the portfolio not only had a bearing on their learning process but also played a role in it. They saw working on the portfolio in terms of gaining insight into themselves as beginning and learning teachers. They used the portfolio to relate experiences that had been important to them to other experiences and theory, or both, and to work out for themselves what was important to them in their teaching. The portfolio helped them to gain insight retrospectively into underlying processes that had played a role in their experiences. They saw working on the portfolio as working on understanding, or gaining a better understanding of, the things they were doing and the surroundings in which they were working. Consequently, the portfolio was not limited to being an instrument for looking back on action: it also became an instrument for working on developing practical knowledge or a personal teaching theory.

What I do notice is that because of the portfolio I analyse things more thoroughly; you take more and more steps in your thinking and you make connections; you say 'Oh yes, that is to do with that' and 'Oh, that is connected with that again' and 'I know that from previous things' [understanding experiences]. (Student teacher 9)

And then you start to think in a bit more depth about what exactly you did, and why it went like that. Doing that makes it all clearer to you and you learn more from it. I mean, if a situation or something goes well, then you think 'That was good'. But if you think about it, you think 'Hey, that should go in my portfolio', and then you think

about why it was good. And then it becomes especially clear why it went so well. And then it is not just 'OK, it went well, good'. But you think 'It went well and this is why' and then you can try it again another time [understanding experiences]. (Student teacher 13)

You need to go into your development more deeply now. Not just, it went well or it didn't go well. But, why did it not go well, what have I learned from this, how am I better now than I was three months ago, why is that, what have I done about that? [understanding the learning process]. (Student teacher 21)

Looking for material got me to think about what I really felt was important to my learning process. In the first phase I thought of ten themes, and gradually these were cut down to the eight important ones [understanding the learning process]. (Student teacher 3)

The portfolio got me to think more about being a teacher. I have a better idea now about what I want and what I don't want, the kind of teacher I want to be. I have a clearer idea about what kind of school suits me. A school with ideas about education that do not correspond to my views on education would obviously not be a school where I would feel comfortable and so I should not go and work there [understanding yourself as a teacher]. (Student teacher 1)

It is actually a kind of fingerprint. You describe the things that are really important to you [understanding yourself as a teacher]. (Student teacher 17)

2.4.2 Relationship between the portfolio functions

Two significant dimensions emerged from the HOMALS analysis that provided evidence of correlations between the portfolio functions brought up by the student teachers. Because there was one student teacher who mentioned only one portfolio function, namely, 'meeting the requirements', we examined the influence of her pattern of answers on the dimensions that emerged from the analysis. It turned out not to affect the two dimensions, but it did affect the number of variables which could best be used to distinguish between the student teachers on the second dimension. For this reason, this student teacher was not included in the final HOMALS analysis.

The first dimension to emerge from the analysis accounted for 32% of the variation between the categories (Eigenvalue .316); the second dimension accounted for 21% of the variation (Eigenvalue .211). In total, 53% of the variation in the seven variables was accounted for by the two dimensions. On the first dimension, the distinction between the student teachers was best described by three variables: 'meeting the requirements', 'understanding experiences', and 'understanding yourself as a teacher'. The second dimension was dominated by the variables 'showing others or yourself', 'evaluating development', and 'understanding the learning process'. One variable, 'recollecting and structuring experiences', showed little variation on either dimension. The measure of discrimination was below .300 (see Table 2.4).

Table 2.4. Marginal frequencies and measures of discrimination[1] of the variables on the two dimensions of a HOMALS solution

variable	frequency		dimension 1	dimension 2
portfolio function	mentioned	not mentioned		
meeting the requirements	10	11	**.743**	.014
showing yourself or others	12	9	.074	**.464**
recollecting and structuring experiences	14	7	.215	.114
evaluating development	17	4	.169	**.332**
understanding experiences	8	13	**.486**	.048
understanding the learning process	5	16	.145	**.353**
understanding yourself as a teacher	4	17	**.378**	.151

[1] The measure of discrimination of a variable shows the extent to which the solution is able to distinguish between respondents on that dimension. The value always lies between 0 and 1.

The categories were plotted on a two-dimensional field (see Figure 2.1). The first dimension is characterised almost entirely by the combination of categories of two variables. At one side can be seen that 'meeting the requirements' and '<u>not</u> understanding experiences' often occur together. At the other side of the first dimension is the opposite combination of '<u>not</u> meeting the requirements' and 'understanding experiences'. It therefore seems to be possible to interpret the first dimension of the plot

as an external-internal motivation dimension. The order of the other categories on this dimension also corresponds to this. At the extreme left of this dimension is the 'meeting the requirements' category: students who produced the portfolio for the course simply because they had to do it to get their teaching qualification. Next comes 'showing others or yourself' and 'recollecting and structuring experiences'. These categories often occur with a '<u>not</u> understanding' category: 'showing others or yourself' and '<u>not</u> understanding the learning process'; and recollecting and structuring experiences' and '<u>not</u> understanding yourself as a teacher'. The next category on the first dimension is 'evaluating development'. This category seems to form the transition to categories that relate more to the student teacher's internal motivation to produce a portfolio. This can also be seen from the position of '<u>not</u> evaluating development' at the extreme left of the dimension at the level of the 'meeting the requirements' category. The three categories to the extreme right of this dimension, namely, 'understanding the learning process', 'understanding experiences', and 'understanding yourself as a teacher', represent students who produced the portfolio for themselves in order to learn from the experience; producing the portfolio meant something to them and their own learning process.

The second dimension is more difficult to interpret. One possible interpretation is that it is a process-time dimension. The key to the 'understanding the learning process' category at the bottom of this dimension is the process of learning, the progress made by the students in their own development from the beginning to the end of the course. The 'understanding yourself as a teacher' category towards the top of this dimension concerns a snap-shot in time, a student gaining insight into the teacher he or she is at this point in time. The other categories are positioned between these two extremes on this dimension. The 'recollecting and structuring of experiences' and 'evaluating development' categories were geared more to the process of learning, specifically to progress made in development. The 'understanding experiences' and 'showing others or yourself' categories focused more on the learning moments, the learning experiences that were important to the student teacher.
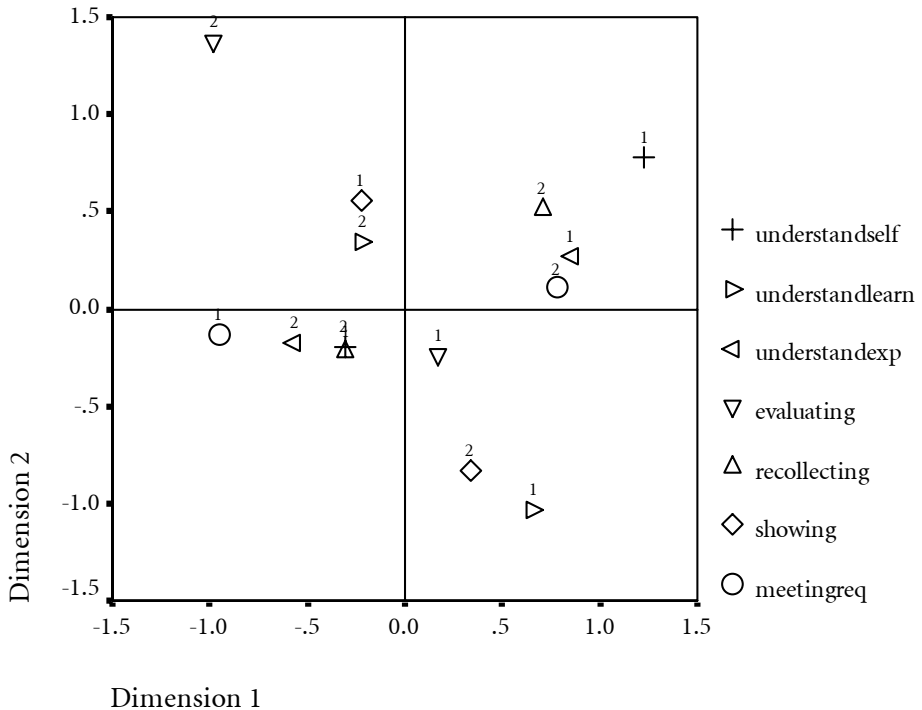
1 = category <u>mentioned</u> by individual student teacher
2 = category <u>not mentioned</u> by individual student teacher

Figure 2.1. Category quantifications of a two-dimensional HOMALS solution

2.5 Conclusions and discussion

This research project focused on the function of the learning portfolio in student teachers' learning process. Seven functions of the learning portfolio in their learning process emerged from the analysis of the interviews with the student teachers and their portfolio-evaluation reports. There were two product functions, where producing the portfolio was seen as working towards a tangible end product ('meeting the requirements' and 'showing others or yourself'); and five process functions, where the interplay between reflecting on the learning process and the learning process itself was the key ('recollecting and structuring experiences', 'evaluating development', 'understanding experiences', 'understanding the learning process', and 'understanding yourself as a teacher'). All these process functions involved reflecting on the learning process retrospectively, that is, at the end of the

learning process. In addition to the distinction between product and process functions of the portfolio, it was also possible to make a further distinction within the process functions of the learning portfolio. Two subgroups of process functions of the portfolio were distinguished, based on the type of learning they facilitated. Two functions, 'recollecting and structuring experiences', and 'evaluating development' were geared to action and improvement of action in teaching practice. Three functions, 'understanding experiences', 'understanding the learning process', and 'understanding yourself as a teacher', were geared to understanding underlying processes that can play a role in action in teaching practice and learning to teach.

All the student teachers who took part in the study, with one exception, saw the portfolio's process function mainly in terms of looking back on their performance in teaching practice over the past semester, and making explicit what they had done, what they knew, and what they could do compared with at the start of the semester. The process functions that are geared to understanding underlying processes that can play a role in action in teaching practice and learning to teach were mentioned less often. It was precisely with respect to these process functions that the portfolio not only had a bearing on the student teachers' learning process but also played a role in it. The learning portfolio became in this sense an instrument for developing a personal teaching theory. The homogeneity analysis of correlations between the portfolio functions revealed that student teachers mentioned product and process functions of the learning portfolio at the same time. We noted that naming the product function 'meeting the requirements of the course' was associated with naming the process functions that are geared to action and improvement of action in teaching practice, but it was seldom if ever associated with naming the process functions that were geared to understanding the underlying processes that can play a role in action in teaching practice and learning to teach.

We investigated the learning portfolio as an instrument for encouraging student teachers to reflect on themselves as beginning teachers, on how they were progressing in their professional development, and on their own part in that development. As stated earlier, it emerged from the functions of the learning portfolio mentioned by the student teachers that the portfolio did have a bearing on their learning process, but that it did not always initiate a learning process. A possible reason for this is that the concepts of 'professional development' and 'reflection' were not explained well by the lecturers and supervisors on the course. Student teachers often interpreted development as 'being able to do something better'. It was probably not explained to them

properly that this view of progress has its limitations and that it also, or indeed specifically, concerns the development of a personal teaching theory through reflecting on experience. This means that reflecting is not the same thing as 'thinking about' experiences.

Another possible explanation is that insufficient structure was given to the portfolio at the start. The portfolio used in the course had an open character regarding both the content of learning (the learning experiences described by the student teachers in the portfolio) and the regulation of learning (how the student teachers learned from their experiences). Although the literature on the use of portfolios indicates that the value of the portfolio for ownership and understanding of the learning process is dependent on this open character, among other factors (Johnson & Rose, 1997), it is too easy to assume that regulation of the learning process and the development of practical knowledge will follow from the production of a portfolio. A course lecturer or supervisor may opt for the content of the portfolio to be left open in order to allow student teachers to explore their own concerns, but this does not necessarily mean that the regulatory side of the portfolio must also be open. At the end of their academic courses, student teachers find themselves in a completely different and complex learning environment, in which learning from experience has an important place. Vermunt and Verloop (1999) described how destructive friction can arise for students who find it difficult to regulate their learning process when the lecturer or learning environment leaves the regulation of learning entirely to the students. Krause (1996) found that course lecturers or supervisors often overestimate the self-regulation skills of their students. Furthermore, a capability for self-regulation does not necessarily mean that student teachers are ready and able to understand the processes underlying their actions and learning (Oosterheert, 2001).

Giving students a more structured portfolio to work with, more specific instructions, and closer supervision could ensure that student teachers have a better understanding of what producing a portfolio involves. It may be worthwhile to give student teachers the opportunity to 'experience' the various process functions of the portfolio, in particular, the interplay between producing a portfolio and their learning process. This would be a way to show them that there are different ways to reflect on themselves as beginning teachers and that the portfolio, in addition to having a bearing on their learning process, can also be used for their learning process, in other words, to work on developing practical knowledge. This requires the student teachers to work on their portfolios on a regular basis.

It emerged from the homogeneity analysis that an intrinsic motivation for producing a portfolio seems to be associated with mentioning the process functions of the learning portfolio that are geared to understanding underlying processes. Using the learning portfolio to understand experiences, or to come to a better understanding of experiences, is a learning process in itself that takes time and energy. Whether all student teachers are willing to do this is open to question. Another question is whether all student teachers are able to do this; in other words, is the learning portfolio a suitable tool for every student teacher? The student teachers' beliefs about learning seem to play a role in their use of the portfolio. The distinction between the two subgroups of process functions of the portfolio corresponds with a classification that is used in research into how student teachers learn. Oosterheert and Vermunt (2001), for instance, distinguished between 'reproduction-oriented' or 'immediate performance-oriented' student teachers and 'meaning-oriented' student teachers. Immediate performance-oriented student teachers concentrate on improving their immediate performance in teaching practice: they see problems that occur as problems to do with their actions or functioning ('problems of performance'). Meaning-oriented student teachers are also keen to improve their performance in teaching practice, but they are also aware that they cannot immediately understand all situations and experiences. They see problems in teaching practice also as 'problems of understanding'. Kubler LaBoskey (1993) made a similar distinction between 'common-sense thinkers', who ask 'what works' and 'how to' questions, and 'alert novices', who ask 'why' questions. Vermetten, Vermunt, and Lodewijks (2002) found in their research that students use instructional measures in different ways; they interpret instructional measures differently depending on their conception of learning. The way students 'use' their learning environment corresponds to their own views on learning. Research should be conducted to find out whether it would be worthwhile to take account of these individual differences by making more diverse use of portfolios in courses. The way the portfolio was used in this study is best suited to student teachers who have a meaning-oriented learning style.

We sought in this study to find a framework that could be used to describe the value of the learning portfolio for the learning process of individual student teachers, by describing the function that the learning portfolio fulfilled in student teachers' learning process . By linking the portfolio literature to the literature on how student teachers learn, we obtained a subtler picture of the process function of the learning portfolio. This allowed us to gain greater insight into the operation of the instrument and the type of

learning that the learning portfolio can stimulate. We realise that only a small number of student teachers were involved in this study and that our research findings cannot necessarily be generalised to other training contexts. Only retrospective instruments were used, interviews and portfolio-evaluation reports, so we were only able to obtain insights into the student teachers' views on the function of the learning portfolio. The functions of the learning portfolio raised by the student teachers were described in terms of thinking activities that they engaged in as they compiled their portfolios. In a later study we hope to analyse the content of the portfolios in order to investigate what thinking activities student teachers really engage in when they are working on their portfolios.

Acknowledgements

Appendix Illustration of coding units

Fragment of interview with student teacher 10

Interviewer: In the teacher education course the portfolio is used to stimulate reflection on one's own development as a teacher. Can you describe what you understand by reflecting on development?

Student teacher: That you examine yourself in retrospect; how certain things happened, why they happened, and if you really have developed, whether some things have changed. But mainly that you examine in retrospect how it went precisely.

Interviewer: And that 'something', what is that?

Student teacher: For instance, that you did something in a certain way at the beginning and that at a certain moment you see that you are in fact doing it in a different way than you did before. Thus, a kind of change in the way you act. [Up to here preparation for the following question about the portfolio]

Interviewer: Did working on your portfolio stimulate you to reflect on your development as a teacher?

Student teacher: Yes, I was stimulated more or less to think about it, because in my opinion a portfolio is based on your developments. Thus you are stimulated in that way to examine what has been changed and how you have developed.

Interviewer: What do you mean by 'how you have developed'?

Student teacher: Yes, how I taught at the beginning of the course and how I teach now. (*evaluating development*)

Fragment of interview with student teacher 11

Interviewer: Producing a portfolio, was that meaningful for you?

Student teacher: Yes, because working on your portfolio makes you realize the things you have experienced. (*portfolio function not yet clear*) And I also find it useful to have this whole portfolio as a kind of reference book of myself. To be able to see how I thought about things, what I have written down, a kind of summary of important things that I learned during the course. (*showing yourself*)

Interviewer: You said that working on your portfolio made you conscious about certain things you had gone through. Can you describe the kinds of things you mean by that?

Student teacher: It is a kind of raising of consciousness of your own learning processes. While writing a portfolio theme, I start seeing certain connections. A concrete example is this first theme. It is about teaching with a certain method and, yes, I have progressed in that, but I am not quite conscious of it. But when I am working on my portfolio and I have to write it down, than I think that is good theme, I have changed in that aspect. Than I start thinking about it and when I get to the essential aspects I start to see, oh yes, this is what caused it. It makes it more tangible and concrete for me. (*understanding the learning process*)

Fragment of portfolio-evaluation report from student teacher 20

I found making my portfolio difficult but useful. When I was told at the beginning of the course that I had to hand in a portfolio, I was not very keen on it. This was mainly because I had no idea how to produce a portfolio. I also found it difficult to make myself work on it during my teaching period. Like all other student teachers, I was very busy with teaching and preparing lessons, so I found it unreasonable that we also had to work on our portfolios, which I did not see the use of at that time. […] (*meeting the requirements*) Yet I do see the value of making a portfolio, now I have finished it. While working on your portfolio, you are reminded of the lessons which went well, but most of all of the lessons which were a complete disaster. It made me think about the reasons why a lesson did not go as I had prepared it, and what I did in the next lesson to prevent another failure. (*recollecting and structuring experiences*) All this information comes in quite handy for rereading during your second teaching practice period, in which you have to work more independently and in which there is no mentor teacher in every lesson. (*showing yourself*)