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

Mansvelder-Longayroux, D.D.

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Promotores:	Prof. Dr. N. Verloop Prof. Dr. D. Beijaard (Rijksuniversiteit Groningen)
Referent:	Prof. Dr. F.A.J. Korthagen (Universiteit Utrecht)
Overige leden:	Dr. P.C. Meijer Dr. J.W.F. van Tartwijk Prof. Dr. J.D.H.M. Vermunt (Universiteit Utrecht)

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Introduction

This dissertation reports on the nature of reflection in student teachers' learning portfolios. Reflection is seen as an important principle for the training of teachers. The learning portfolio recently made its entrance as an instrument to stimulate reflection by student teachers on their development as teachers. The study of the learning portfolio as a tool for stimulating reflection by student teachers is central to this dissertation. This first chapter deals with the background to the study, the research questions, and the context of the study. We also describe the relevance of the study and the nature of the research. We conclude the chapter with an overview of the chapters that follow.

1.1 Background to the study

Reflection in teacher education

It is almost impossible to imagine teacher education today without the concept of reflection as one of the guiding principles for professional development. For different but related reasons, reflection has become an important concept in the training of teachers. Firstly, teacher education institutes increasingly focus on the experiences of the student teachers themselves because of the gap student teachers perceive between the theory offered by the university and their teaching practice. In particular, attention is paid to the perception of these experiences by student teachers and the related conceptions about teaching and learning of student teachers. Reflection is seen as an important way to make explicit these often tacit conceptions, also called 'subjective theories', and to restructure them, if necessary, using 'objective theories' from scientific insights (Borko & Putnam, 1996; Korthagen, 2001). Secondly, the view on the teaching profession has changed. Teaching is no longer seen

as an application of separate teaching skills, but as a complex whole of thinking and acting together in which practical experiences and theoretical knowledge both play a role (see Verloop & Wubbels, 1994). Schön (1983) has often been cited within this framework. He was of the opinion that a professional makes decisions in each situation on the basis of various unique aspects of the situation. The changed view on teaching as being complex has enlarged the importance of reflection in teacher education. Thirdly, it is impossible to prepare student teachers for all situations that can possibly occur in teaching. Korthagen (2001) sees reflection as a condition for 'growth competence', the ability to steer one's own development as a teacher after initial teacher education. This ability to further develop oneself is important not only for teachers themselves, but also for the possibilities for change in school reforms. Griffiths (2000) writes that "*an emphasis on reflection as part of initial teacher education can be seen as only a limited aspect of its wider role. In particular, reflection in and on action can form an important part of all teachers' professional development, with possible benefits to the school, community and beyond*" (p.553). Finally, it is assumed that reflection plays an important role in the construction and integration of the personal practical knowledge of teachers (Meijer, 1999; Beijaard & De Vries, 1997).

The learning portfolio

Several techniques are used in teacher education to stimulate reflection by student teachers. Examples are exchange of experiences with others (intervision), journal writing, action research into one's own teaching practice, evaluation of one's own teaching using checklists or questionnaires, and the examination of cases (see Airasian, Gullickson, Hahn, & Farland, 1995; Zeichner & Liston, 1987). Teaching portfolios are used more and more for this purpose. The recent introduction of the use of portfolios in teaching and teacher education is grounded in a new vision of teacher assessment and professional development (Wolf & 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. In the learning portfolio (also known as the

professional development or process portfolio), reflection on one's own thinking and performance is a central component. 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 a learning portfolio should enable student teachers to concretize their learning process using information about their teaching practice and their course, and to think about their functioning in teaching practice in a structured way (Wolf & Dietz, 1998).

1.2 Purpose, research questions, and context of the study

The first articles that reported the use of the portfolio in teacher education were very positive about the possibilities that the portfolio offers to stimulate reflection (Barton & Collins, 1993). It was assumed that by working on their portfolios student teachers are incited automatically to reflect on their own learning process and to reach a better understanding of teaching. Results from recent research into the portfolio as a tool for reflection indicate that student teachers do not automatically reflect on their experiences as a result of working on a portfolio (Borko, Michalec, Timmons, & Siddle, 1997; Krause, 1996; Lyons, 1998[b]; Meyer & Tusin, 1999; Wade &Yarbrough, 1996). In the portfolio literature, it is mentioned more and more often that the quality and value of the portfolio should be brought up for debate (Breault, 2004; Delandshere & Arens, 2003). Research on portfolios as a tool for reflection has especially focused on the experiences of student teachers with the portfolio. The content of the portfolio itself is not often an object of research. Zeichner and Wray (2001) write that systematic research must be done on the portfolio as a tool for stimulating reflection: "*We need to learn more about the nature and quality of reflection under different conditions of portfolio use*" (p. 619).

This study was aimed at describing the nature of reflection in the learning portfolios of student teachers. We explored the use of the learning portfolio among 21 student teachers during their one-year postgraduate teacher-training course at Leiden University in the Netherlands. The concept of reflection was operationalised in terms of learning activities (Vermunt & Verloop, 1999) that student teachers undertake while producing their portfolios. The general problem of the study was whether student teachers reflect in their learning portfolios and in what way. This general problem was divided into three research questions:

1. What is student teachers' understanding of working on a learning portfolio?
    a. What functions in their learning process do student teachers ascribe to the learning portfolio?
    b. How do the functions of the learning portfolio distinguished by the student teachers relate to each other?
2. How do student teachers reflect in their portfolios?
    a. What learning activities do student teachers undertake as they compile their portfolios?
3. When and how do meaning-oriented learning activities manifest themselves in a portfolio theme?
    a. What themes do student teachers include in their portfolios?
    b. Which portfolio themes show meaning-oriented learning activities?
    c. How do meaning-oriented learning activities manifest themselves within a portfolio theme in relation to the other learning activities in the theme?

1.3 Relevance of the study

The study was undertaken in order to contribute to a better understanding of the operation of the learning portfolio. A description framework was developed to describe the nature of reflection in the learning portfolios of student teachers that can be used to explain the concept of reflection in relation to working on a portfolio. Such a framework for reflection had not been developed earlier, as a result of which it is difficult to compare results from portfolio research. To be able to judge the value of the portfolio as a tool for reflection, it is important that a comparison of results can be made. Insight into the nature of reflection in the portfolio can help the designers of teacher education courses to formulate the purpose of making a portfolio more specifically and to fine-tune the use of the portfolio and the portfolio supervision to that.

1.4 Nature of the research

The study is of a descriptive nature. At the moment that this study was

started, little research had been done into the portfolio itself. Portfolio research tended to concentrate on the experiences of student teachers with the portfolio (Borko et al., 1997; Wade & Yarbrough, 1996). For this reason we chose to conduct a qualitative, small-scale, in-depth study. This enabled us extensively and profoundly to describe the nature of reflection in the portfolios, so that justice could be done to the portfolio data as they occur in the practice of the teacher education course. We used retrospective in-depth interviews with student teachers, and their portfolio evaluation reports, to get a picture of how the portfolio had functioned in the course from the perspective of the students. The main method used in the study was content analysis of the portfolios of the student teachers.

The content analysis of the portfolios was an iterative process between theory and data. Theory from educational psychology, in particular the learning activities distinguished by Vermunt and Verloop (1999), was used in the process of developing the system of categories. The data were examined on the basis of Vermunt and Verloop's descriptions of learning activities. The categories of learning activities were adjusted and the descriptions were adapted to the data. This process led to the final system of categories for the analysis of the data. This system of categories was also used for the analysis of the interviews and portfolio-evaluation reports.

To monitor the validity and reliability of the study, following Denzin and Lincoln (1994) and Miles and Huberman (1994), in reporting the results of the study we paid explicit attention to the description of the use of the portfolio in the training course and the context in which the portfolio functioned. During the analysis and coding of the data, we also used peer debriefing with other researchers and coding checks. We described the procedure for analysis and coding extensively and we illustrated the results using concrete data.

1.5 Overview of the study

In Chapter 2, we answer the first research question: what is student teachers' understanding of working on a learning portfolio? We examined the perceptions of the student teachers of the functions of the learning portfolio in their learning process. Based on the results of content analyses of retrospective interviews with the student teachers and their portfolio- evaluation reports on their experiences of working on a portfolio, we distinguished different functions that the learning portfolio fulfilled in their learning process.

In Chapter 3, we answer the second research question: how do student teachers reflect in their learning portfolios? We describe how we searched for an adequate operationalisation of the concept of reflection. We examined studies on reflection, portfolios, and student learning. The development of the category system for describing reflection in the portfolios is described and illustrated. We report on the variation in reflection we found in the portfolios.

In Chapter 4, we focus on those learning activities that are geared to the understanding of experiences. We refer to these learning activities as meaning-oriented learning activities, as distinguished from action-oriented learning activities. In this chapter we answer the third research question: when and how do these meaning-oriented learning activities manifest themselves in a portfolio theme? The content analysis of the portfolios focused on the content of the portfolio themes to which these learning activities refer and the relation with other learning activities in a theme. We illustrate the structure of these portfolio themes.

Finally, in Chapter 5, we return to the research questions and draw some main conclusions. We look back on the study and raise some points for discussion. We conclude this chapter with suggestions for further research and practical implications of the study for teacher education.

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

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

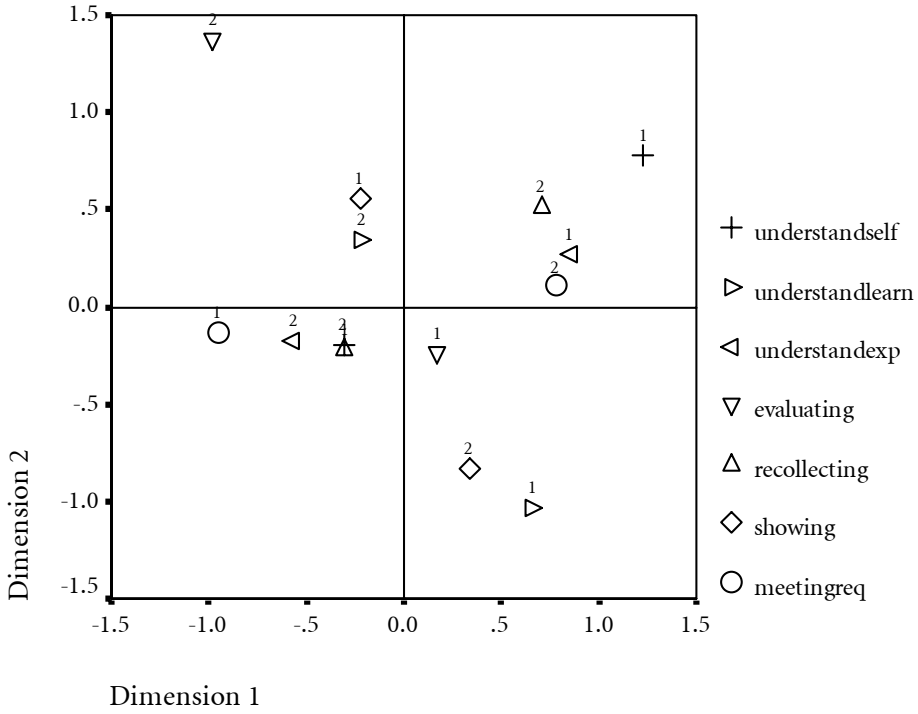
variable	**frequency**		**dimension 1**	**dimension 2**
portfolio function	mentioned	not mentioned		
meeting the requirements	10	11	**.743**	.014
showing yourself or others	12	9	.074	**.464**
recollecting and structuring experiences	14	7	.215	.114
evaluating development	17	4	.169	**.332**
understanding 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 'not understanding experiences' often occur together. At the other side of the first dimension is the opposite combination of 'not 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 'not understanding' category: 'showing others or yourself' and 'not understanding the learning process'; and recollecting and structuring experiences' and 'not 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 'not 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 mentioned by individual student teacher
2 = category not mentioned 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.

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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*)

3

The nature of reflection in the learning portfolio[1]

Abstract

This article reports on a research project that studied the nature of reflection in the portfolios of student teachers: 39 learning portfolios were analysed. Current theories on reflection offered little on which to base a system of categories for analysing the content of the portfolios. Theory on learning activities was used. We found that the student teachers tended to focus in their portfolios on their own practice and how to improve it. They examined what they had done and learned, in what aspects they had made progress, and they formulated plans for the future. When looking back on their development as teachers, the students discussed individual experiences which had been important to them, as well as making connections between different experiences over a period of time. The student teachers made less use of the portfolios to gain a better understanding of situations and developments that had occurred. Supervision and guidance on the production of portfolios seemed to be essential to encourage this activity.

3.1 Introduction

Learning to reflect on experiences gained during teaching practice is an important component of many teacher education courses. Reflection is

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This chapter is based on: Mansvelder-Longayroux, D., Beijaard, D., & Verloop. N. (2002). Het portfolio als reflectie-instrument voor docenten-in-opleiding [The portfolio as a tool for stimulating reflection by student teachers]. *Pedagogische Studiën, 79*(4), 269-286.

regarded as a condition for teachers having the capacity to continue to steer their own development as teachers (Korthagen, 2001). This capacity is not only important for the teachers themselves, but also for changing educational practice when educational reforms are introduced (Griffiths, 2000). Teacher-education courses employ a variety of techniques to encourage student teachers to reflect, including: peer discussion; writing up logbooks; carrying out action research into their own teaching practice; evaluating their own teaching with the aid of check lists or questionnaires; and case studies (see Airasian, Gullickson, Hahn & Farland, 1995; Zeichner & Liston, 1987). Teaching portfolios, especially the learning portfolio (also called 'professional development' or 'process' portfolio) are now being used more and more for that purpose. Student teachers use this type of portfolio to reflect on their development as teachers and to formulate learning objectives for the future, based on information showing what they have achieved and learned (Wolf & Dietz, 1998). The learning portfolio typically shows what the student teacher has learned over a specific period; allows scope for individual learning pathways; does justice to the complexity of learning to teach; and encourages the student teacher to reflect on his or her own professional development (Tanner, Longayroux, Beijaard, & Verloop, 2000).

Much has already been written about the added value offered by the portfolio as a tool for stimulating reflection in the context of the professional development of student teachers. However, most of this has been narratives describing experiences with using portfolios on teacher-education courses (see Wade & Yarbrough, 1996). Recently, more and more publications have appeared on systematic research into the portfolio, but major differences between the objectives and forms of the portfolios that have been studied make it difficult to draw conclusions on the value of the portfolio in general (Zeichner & Wray, 2001). This research has tended to concentrate on students' experiences with the portfolio (Borko, Michalec, Timmons, & Siddle, 1997; Darling, 2001; Loughran & Corrigan, 1995; Lyons, 1998[c]; Wade & Yarbrough, 1996). Students have been asked how they felt about producing a portfolio and whether the process prompted them to reflect. The content of the portfolio itself has less often been the subject of research. Zeichner and Wray (2001) wrote that there is a need for systematic research into the nature and quality of reflection in portfolios.

Studying the portfolio as an instrument to facilitate reflection requires the process of producing the portfolio, and not the end product, to be the focus of study (see also Darling, 2001). Research into reflection using the

portfolio is, after all, concerned not with the professional development of the student teachers described and illustrated in the portfolio (the process of learning to teach), but with the process of interpreting experiences during the production of the portfolio. A number of studies have found that it is during the very process of producing a portfolio (the construction process) that student teachers reflect on themselves as beginning teachers (Darling, 2001; Darling-Hammond & Snyder, 2000; Loughran & Corrigan, 1995; Lyons, 1998[c]; Richert, 1990).

This article reports on our research project that studied the nature of reflection in the portfolios of student teachers. We discuss the theory on reflection, characteristics of reflection that emerged from the portfolios themselves, and explain our interpretation of the concept of reflection for the purposes of this research project.

3.2 Theoretical background

3.2.1 Reflection as a principle for teacher education

Virtually all research on reflection and the quality of reflection makes reference to the different definitions there are of the concept of reflection. Several thorough overviews of the literature on reflection have been produced: Griffiths (2000), Hatton and Smith (1995), Jay and Johnson (2002) and Korthagen (2001). The latter argued that the different views on reflection can be converted into different views on 'good' teaching and 'good' teacher education (see also Calderhead, 1989; Hatton & Smith, 1995; Valli, 1992; Zeichner, 1983). He saw the formulation of an unequivocal definition of reflection as a socio-pedagogic problem that is difficult to solve. Views on good teaching and good teacher education, in his view, can always be contested and so, therefore, can the interpretation of the concept of reflection.

The consequence of making a link between the interpretation of the concept of reflection and the view of good training provided by teacher educators and researchers, is that before long reflection becomes a normative concept. How they interpret the concept of reflection mirrors the aspects that teacher educators and researchers consider to be important in the training of teachers. Consequently, the main focus of the professional literature has been on the content of reflection (what it focuses on, such as problems in teaching practice, social and political aspects of education); and the product

of reflection (the intended outcome of reflection, such as improving teaching practice or the teacher gaining insight into him/herself as a teacher). This can be seen again in the different approaches distinguished in the literature on reflection. The three approaches below were distinguished by Grimmett (1988), Sparks-Langer (1992) and Valli (1992) under slightly different names:

- in the 'deliberative approach' or 'cognitive approach', reflection is geared to weighing up different perspectives and theories in order to view practice from different angles;
- in the 'personalist approach' or 'narrative approach', reflection is geared to constructing personal practice-based knowledge and developing awareness of one's own identity, beliefs and development;
- in the 'critical approach', reflection is geared to critically examining the social and political implications of education, so that teachers question the purposes and assumptions of education in general.

3.2.2 Reflection as a process

The views of researchers on reflection as a process are far less divergent (Korthagen, 2001). In general reflection is seen as a way of systematically thinking about experiences, frequently coupled to action in educational practice, and arising from a problem experienced (Hatton & Smith, 1995). This systematic thought is understood to mean a mental process of structuring and restructuring experiences (Korthagen, 2001; Schön, 1983). In seeking to operationalise the concept of reflection, however, researchers cite a very diverse range of mental activities that they consider to be reflection, and these are also described in fairly broad terms, so that their specific characteristics are not clear. To give a few examples: reflection has been operationalised as searching for different explanations for events in the class (Ross, 1989); looking back on and looking ahead to experiences (Conway, 2001); investigating underlying assumptions that play a role in education (Zeichner & Liston, 1985); and finding general principles and formulating a personal theory (Bain, Ballantyne, Packer, & Mills, 1999).

The models for reflection[1] used on teacher-education courses to teach student teachers to reflect are, for a number of reasons, not so useful for describing the reflection that takes place in reality. First, the reflection process is treated as a procedure made up of consecutive steps. In the real world, student teachers often reflect in a less systematic way and they also differ in the way they reflect. Second, it is not entirely clear what mental

activities take place within particular steps. Kubler LaBoskey (1993) noted, in response to Dewey's model (1910), that student teachers can go through the stages of the model in different ways: reflecting or not reflecting. She thought that the attitude of student teachers (openness to other viewpoints and willingness to take a critical look at themselves) and their ability to reflect were more decisive for the reflection they engaged in than whether they followed the specific steps of the model. These steps taken together constitute a procedure for logical thought more than anything. Von Wright (1992) stated that student teachers can focus on their activities as a teacher, but they can also focus on their own beliefs as they follow the model, and that these are two completely different things. He wrote that teacher educators often assume that if student teachers reflect on their own actions they will develop insight into their own beliefs; in other words that they will become aware of their own frame of reference, through which they approach and interpret their experiences. He believes that only self-reflection leads to that, where the object of reflection is one's own beliefs and not one's own actions (see also Bengtsson, 1995). Reflecting on your own beliefs assumes that you can distance yourself from your experiences and see that your beliefs play a role in your thinking and action.

3.2.3 Reflection in the portfolio

Reflection in the portfolio concerns the *process* of interpreting experiences during the production of the portfolio. This means that reflection in the portfolio should be conceived as a mental process that takes place while a portfolio is being made. For the reasons outlined earlier, the literature on reflection offers little assistance for describing this thought process. These reasons can be summarised again as follows:

- conceptualisations of reflection are often coupled to a vision of good teaching; as a result of which research on reflection usually focuses on the content and product of reflection;
- when reflection is conceived as a process, this is often operationalised in very diverse mental activities that are described in very general terms;
- reflection models used to teach student teachers to reflect on their experiences are of a prescriptive nature and the different steps are not described in detail.

Another reason, that has not previously been mentioned, why the literature on reflection is not really very useful for describing reflection in the portfolios is associated with the variation in reflection that can occur

due to the special character of the portfolio itself. Existing definitions of reflection cannot really cover this variation adequately. The portfolios show student teachers' reflection on single experiences and on experiences that encompass different events and contexts. They also show reflection that occurred during the process of student teachers' learning and reflection taking place whilst producing the portfolio. This is because, in their portfolios, students have to connect experiences, situations, beliefs, approaches, etc. over a specific period. They have to reflect, for instance, on how they have approached problematic situations over a period of time and what the results of their interventions were; how they experienced and interpreted situations and whether and how their views have changed over time; and, based on their teaching methods in different classes, they have to reflect on what they consider to be important in their teaching and how they try to give substance to that. This is rather like what Clarke (1995) called 'thematic' reflection: reflection that, although it arises in response to 'separate' events, encompasses other events and contexts. Reflection in the portfolio is not only a response to a particular problem or a particular issue of teaching practice, it is also concerned with linking different experiences over time, so that, in the words of Darling (2001, p. 111), there is an *"'unfolding' of one's understandings of teaching and learning"*.

3.2.4 Reflection in this research project

The lack of clarity in literature on reflection about the thought processes that make up the reflection process led us to turn to literature that specifically addresses thought processes. Theory from educational psychology offers opportunities to distinguish and describe thought processes in terms of learning activities that student teachers undertake as they work on their portfolios. Educational psychology assumes the basic premise that learning is an active, constructive and purposeful process, in which the knowledge gained is linked to the situation in which it is used (Boekaerts & Simons, 1995; Verschaffel & De Corte, 1998). The thought processes that students engage in as they learn are called learning activities. These learning activities determine, to a significant extent, the quality of the learning outcomes that students achieve (see Vermunt & Verloop, 1999). This research used the three types of learning activities distinguished by Vermunt and Verloop (1999): cognitive, affective and metacognitive or regulative learning activities. The different types of learning activities refer to different aspects of the learning process. Cognitive learning activities refer to working on the study material

itself, such as: retrieving important information from a book (selecting); organising this information (structuring); and making comparisons between the study material and one's own experience (concretising). Affective learning activities refer to how the students deal with positive and negative feelings that can arise as they work on the study material. Students, for instance, may or may not be able to motivate themselves to study (motivating oneself), and they may or may not have confidence in their own ability to study (judging oneself). The regulative or metacognitive learning activities refer to the learning process as a whole. These are learning activities that students can undertake in order to manage and guide their own learning, such as: assessing whether you have attained your learning objectives (evaluating); or taking on extra activities if you notice that your learning is not going according to plan (adjusting).

3.2.5 Research question

This research project focused on the process of producing a portfolio. Using an analysis of the content of student teachers' portfolios, we investigated the nature of the reflection that emerged from the portfolios. Our use of the theory on learning activities meant that the concept of 'reflection' was operationalised in a specific way in this research project; that is as the learning activities that student teachers undertook as they produced their portfolios. The main research question was: What learning activities do student teachers undertake as they compile their portfolios?

3.3 Method

3.3.1 Context

The research was carried out on a one-year university teacher-education course at Leiden University in 1998/1999. Student teachers on the course attended weekly classes at the university, whilst also doing teaching practice in a school or having a paid job as a teacher. During the course of the year they produced two learning portfolios, one each semester, dealing with what they felt to be important learning experiences in their teaching practice and in their university studies.

3.3.2 The portfolio

The portfolio was used on the course as an instrument to encourage student teachers to reflect on themselves as beginning teachers, to make them aware of how they were progressing in their professional development, and to make them aware of their own part in that development. The portfolio consisted of: (a) a vision on learning and teaching; (b) five to eight themes that they chose themselves that were important in their development (cf. Seldin, 1997); (c) a conclusion about their learning process in the semester; (d) their experiences with 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 are (or are becoming); what they consider to be important in their teaching and why; and how they express this in their own teaching practice. The self-chosen themes formed the core of the portfolio. In these themes, the student teachers reflected on their learning experiences, beliefs, learning points and development. A theme is a subject that is or has been important in the development of the student teacher. It is a cover-all term that links the different learning experiences together. 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. 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 with the portfolio itself. They used the appendix to the portfolio for materials that could illustrate and clarify the described development 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 school mentor or pupils; and university assignments.

As most of the student teachers had never produced a portfolio before, they were given guidance and support by their university supervisors during the process of producing their first portfolio. All the student teachers were given a portfolio manual which contained information about the purpose of the portfolio, five exercises on working with portfolios and information on evaluating portfolios. Important concepts, such as 'theme', 'reflection', 'development' and 'illustrative material' were explained and illustrated with examples. Five meetings were held in which the students worked on the portfolio exercises in groups of about 8 student teachers with one university

supervisor. The purpose of these exercises was to give the student teachers concrete experience in what working on a portfolio entailed and to give them the opportunity to make a start on their own portfolios. The student teachers practised thinking up and selecting portfolio themes, formulating learning objectives, making their experiences explicit, reflecting on and illustrating developments, and planning their portfolios. Feedback on unfinished products occupied an important place in the meetings. The portfolio manual contained points to consider, such as: Is the theme based on a clear learning objective? Are different experiences related to each other within a theme? Are materials from different sources used in the work on a theme (student's own and other sources)?

The student teachers produced their second portfolio more independently. They had two supervision meetings with their supervisor to talk about their work on the portfolio in the second semester of the course. The student teachers were also encouraged to discuss their portfolios with fellow students and their school mentor. The second portfolio was a continuation of the first. It contained further development of themes from the first portfolio, as well as new themes that had become important to the student teacher in the second part of the course. The student teachers had to include varied themes in this second portfolio, so that they were encouraged to reflect on different aspects that could play a role in learning and teaching. At the end of each semester, the portfolio was evaluated at a meeting with their university supervisor and their school mentor. In this final meeting they discussed their individual development over the past semester and drew up learning objectives for the future. The most important aspect of the evaluation of the portfolio was whether the student teachers could demonstrate that, by reflecting on their own practice, they had been able to make further progress in their development as teachers.

3.3.3 Participants

All 25 full-time student teachers of languages and the exact sciences from the 1998/1999 course year were willing to take part in the research: 18 (72%) student language teachers (German, Dutch, English and the classical languages), and 7 (28%) student science teachers (biology, maths and chemistry). 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.

3.3.4 Data-gathering

The 25 student teachers who took part in the research were supervised by eight different supervisors from among the university staff as they produced their portfolios. Four of the 25 student teachers left without completing the course, so they were not included in the research findings. A total of 39 portfolios (21 first and 18 second portfolios) were gathered and analysed for the research. Although it was intended that each student teacher should produce two portfolios, 3 students only produced 1 portfolio during the course year on account of the fact that they transferred from the one-year full-time course to the two-year part-time course.

3.3.5 Data analysis

When the system of categories for analysing the portfolios was being developed, the literature on reflection, as explained earlier, offered little assistance for describing the nature of reflection in the portfolios. Theory from educational psychology was better suited to the nature of the portfolio data. The learning activities distinguished by Vermunt and Verloop (1999) were used. The process of developing the system of categories was an iterative and interactive process between theory and data, comprising the following steps:

1. studying the portfolio data on the basis of Vermunt and Verloop's definitions of learning activities;
2. searching for learning activities in the data and formulating provisional categories;
3. comparing these provisional categories with Vermunt and Verloop's definitions of learning activities; the categories were renamed and Vermunt and Verloop's descriptions of the learning activities were adapted to the portfolio data in order to arrive at a provisional system of categories;
4. studying the portfolio data on the basis of the provisional category system. The categories were adjusted and defined more accurately, to produce the final system of categories for the analysis of the data.

The final system of categories consisted of six learning activities: the cognitive learning activities, 'analysis', 'memorising'[2] and 'critical processing'; and the regulative learning activities, 'diagnosis', 'evaluation' and 'reflection' (see Table 3.1)[3]. These learning activities were broken down into a total of 34 subcategories.

Table 3.1. Definition of learning activities involved in producing portfolios and subcategories of each learning activity

Recollection
Recollection / recalling from memory situations, events and (learning) activities that happened in the past. This means that recollection includes all learning activities that involve describing one's own professional development, when these learning activities took place in the past. Recollection is not only retrospective, it also has a forward-looking side, in the sense of describing future activities and expectations. The subcategories of recollection were:

- evaluation in the past
- analysis in the past
- critical processing in the past
- diagnosis in the past
- reflection in the past
- notes for the reader
- adoption of the views of others or of theory
- description of the situation
- description of what you did or plan to do (and why)
- description of how you approached something or how to plan to approach something in the future (and why)
- expectations, expressing hopes for how it will go in the future

Evaluation
Evaluation of your experiences and your own development as a teacher. The subcategories of evaluation were:

- giving an opinion
- examining what you have learned
- drawing conclusions about your own development
- evaluating your knowledge or functioning
- investigating whether you have achieved your learning objective
- examining what you found difficult
- formulation a plan or learning objective
- investigating whether a particular approach worked

Analysis
Examining which different aspects of an experience, event or development can be distinguished, and what underlying processes played a role in an experience, event or development. The subcategories of analysis were:

- examining what factors played a role or are playing a role in a situation
- examining what factors played a role or are playing a role in your development or functioning, in the effect of a particular approach, in things you have learned, in a line of reasoning (always in combination with a form of evaluation, so that these fragments taken together become a form of critical processing, diagnosis, or reflection)
- examining similarities and differences between situations, experiences and beliefs

Table 3.1 (continued)

Critical processing
Comparing your own opinion with the opinions or beliefs of others (theory, mentor, fellow student, university supervisor, etc.); formulating your own opinions on the basis of different arguments (evaluation); and looking at which arguments are more credible than others and why (analysis). Critical processing always includes an evaluation and an analysis.

- critical processing

Diagnosis
Determining the weaknesses in your own thinking and actions (evaluation) and investigating possible causes of positive and negative experiences during one's development as a teacher (analysis). Diagnosis always includes an evaluation and an analysis. The subcategories of diagnosis were:

- examining what you found difficult and why
- examining what you found difficult and what factors played a role in this, why a problem occurred
- examining what you found difficult and what consequences this had
- examining why you did not achieve a particular learning objective
- examining how you functioned and what factors played a role in this
- examining how you functioned and what consequences this had

Reflection[1]
Thinking about everything that has taken place during a particular learning event or over a period of learning; evaluating your own development (evaluation); and examining what factors are connected with this (analysis). Reflection, just like diagnosis, consists of a combination of evaluation and analysis. However, diagnosis focuses on what the student teacher can do, reflection focuses on the learning event or period of learning. The subcategories of reflection were:

- examining whether a particular approach worked or not and why
- examining what you have learned and what factors played a role in the points you have learned
- examining the progress you have made in your development
- examining what areas you have made progress in and what factors played a role in your development, what you have learned and how
- examining what areas you have made progress in and what the consequences were

[1] Due to the specific operationalisation of reflection in terms of learning activities in this research, the 'broad' concept of reflection includes a number of learning activities, including reflection in the narrower sense as used in educational psychology.

The procedure for coding the portfolios was as follows. Three components of the portfolio were included in the analysis: the themes the student teachers had chosen and described themselves; their vision on learning and teaching; and their final conclusion. For the sake of readability, each of the three components will be referred to as a theme from now on in this paper. A theme was the large fragment for analysis that was then broken down into smaller fragments. The principle used for breaking down the themes into smaller fragments was that a new learning activity meant a new fragment. If a theme clearly consisted of different subjects, a new subject also started a new fragment. Each analysis fragment was given a code for:

- learning activity;
- detailed specification of the learning activity (subcategory).

Only after the analysis fragments within a particular theme had been fixed and coded, was it possible to determine whether codes for 'critical processing', 'diagnosis' and 'reflection' could be assigned. 'Critical processing', 'diagnosis' and 'reflection' all consisted of a combination of 'evaluation' and 'analysis': a value judgement on an argument, the student's own functioning or development ('evaluation') is explained on the basis of factors that have played a role in those matters ('analysis'). The codes for 'critical processing', 'diagnosis' and 'reflection' could only be assigned to the composite fragments (see also the definitions of learning activities in Table 3.1).

The reliability of the category system was 0.77 (Cohen's kappa) based on 14 portfolio themes. The reliability was determined at the level of the subcategories of the category system.

3.4 Results

Six learning activities emerged from the portfolio analysis: 'recollection', 'evaluation', 'analysis', 'critical processing', 'diagnosis' and 'reflection'. 'Recollection' was the learning activity that was found most frequently (see Table 3.2): it was found in each portfolio theme. This is not surprising, given the fact that descriptions of situations, activities and experiences were needed to explain to the reader of the portfolio all about what happened during the course, and that the statements in the portfolio were based on these descriptions. The student teachers also reported on learning activities they had undertaken during their course in almost all portfolio themes. For instance, they wrote up how they thought a particular lesson had gone. This was in fact a description of an evaluation which they had already done,

after the lesson in question. A combination of 'recollection' and 'evaluation' was found in many portfolio themes. The student teachers described their experiences and activities ('recollection') and expressed a value judgement on their chosen approach, their development, or functioning, or they gave an opinion about something ('evaluation'). The learning activities 'analysis', 'critical processing', 'diagnosis' and 'reflection', emerged far less often from the portfolios. Almost all of the student teachers did make a start on these to some extent, but much less than 'recollection' and 'evaluation', and then mainly with portfolio themes that were very personal and in which emotions were involved, such as discipline, interaction with pupils and their own development.

Table 3.2. Frequency of learning activities

learning activity	**frequency (percentage)**	
recollection[1]	967	(54.4)
evaluation[2]	693	(39.0)
analysis[3]	15	(0.8)
critical processing	6	(0.3)
diagnosis	58	(3.3)
reflection	39	(2.2)
total[4]	1778	(100.0)

[1] Situation, activity, approach, etc. : 569 (32.0). Learning activity in the past: 398 (22.4).
[2]Evaluation in combination with analysis comes under critical processing, diagnosis or reflection.
[3]Analysis in combination with evaluation comes under critical processing, diagnosis or reflection.
[4]A total of 310 portfolio themes were analysed. In determining the frequency of the different learning activities, in order not to be dependent on way the student teachers described their portfolio themes, we decided to combine learning activities that related to the same subject matter within a portfolio theme. We were investigating which learning activities were found to be associated with a particular topic and not how often a particular learning activity occurred in a topic. The total of 1,778 was therefore much lower than the total number of analysis fragments.

3.4.1 Differences between the learning activities

The learning activities 'recollection', 'evaluation', 'analysis', 'critical processing', 'diagnosis' and 'reflection', that we encountered in the portfolio themes, differed in the type of learning they were aiming at: action and improvement of action in teaching practice, or understanding the underlying processes

that can play a role in action in teaching practice. This distinction fits into a division 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.

'Recollection' (except for a few specifications of the learning activity 'recollection': 'analysis', 'critical processing', 'diagnosis' and 'reflection' that were undertaken in the past) and 'evaluation' addressed immediate performance, and the improvement of performance, in teaching practice (see Table 3.3). The learning activity 'recollection' was oriented towards describing situations in teaching practice, a chosen strategy for action, activities at school, or the student's own functioning as a teacher; the learning activity 'evaluation' was oriented towards expressing value judgements on these matters. The learning activities 'analysis', 'critical processing', 'diagnosis' and 'reflection' were oriented towards understanding the underlying processes that can play a role in action in teaching practice (see Table 3.3). The learning activity 'analysis' was oriented towards finding factors that played a role in a particular situation, the effect of an approach, the student's functioning or own development; or towards finding similarities and differences between situations, experiences or beliefs. When 'analysis' was combined with 'evaluation', and these learning activities both related to lines of reasoning that supported or undermined an opinion, this became 'critical processing' (giving an opinion by weighing up different arguments); when they related to the student teacher's own functioning, this became 'diagnosis' (examining what factors played a role in their functioning); when they related to a learning event or learning process, this became 'reflection' (examining what factors played a role in a learning event or learning process). These learning activities, which are intended to improve understanding, may be undertaken during the production of the portfolio; or they may have been undertaken at an earlier stage in the learning process, in which case it is a matter of

'recollection'. This is why the learning activity 'recollection' could be oriented towards improving performance and towards understanding underlying processes. This depended on the more detailed specification of the learning activity (subcategory). The student teachers tended to focus mainly on their own practice and how to improve it. The learning activities that were oriented towards understanding processes that play a role in performance in teaching practice were found to a much lesser extent in the portfolios.

Another difference between the learning activities that emerged from the portfolio-analysis concerned the period of time to which the learning activities referred. All six learning activities could refer either to separate situations, or to related situations over a period of time (see Table 3.3). For example: student teachers may have expressed an opinion about a situation that occurred (evaluation / situation), and examined what they found difficult in the early stages of their training (evaluation / related situations); they may have examined why a chosen approach did not work in a particular lesson (reflection / situation), what areas they made progress in, and how this affected their later functioning (reflection / related situations). The literature on the use of portfolios sees the fact that writers of portfolios have to make connections between different experiences as a characteristic feature of the portfolio and one of its strengths (see Borko et al., 1997; Wolf & Dietz, 1998).

Table 3.3. Differences between learning activities

learning activity	**(improvement of) action**		**understanding of underlying processes**	
	situation	***related situations***	***situation***	***related situations***
recollection	x	x	x	x
evaluation	x	x		
analysis			x	x
critical processing			x	x
diagnosis			x	x
reflection			x	x

3.4.2 Some illustrations of learning activities

Some examples of learning activities that emerged from the portfolios are given below. The portfolio fragments come from the portfolios of five student

teachers. The names of the student teachers are fictitious. The codes for the analysis fragments are indicated between brackets.

Learning activities oriented towards action in teaching practice and improving performance

In her portfolio theme on teaching methods, Bernadette described the approach she followed to teach discussion skills to her pupils (recollection / situation).

> In my Year 10 grammar school class, (US: ninth grade senior high class) we held a discussion to give the pupils the opportunity to practice producing the necessary content and to practice the necessary presentation skills to make a convincing argument. The pupils had already been given an introduction to holding a discussion; now they had to put what they had learned into practice. First, they divided themselves up into three groups and, in their groups, decided what would be a good argument to present in a single lesson. They had to do a lot of preparation for homework, as the discussions were to be held a week later. I did this in one double period. While one group was holding its discussion, the other pupils could carry on with their preparation.

In her portfolio theme on debating with Year 11 [US: tenth grade] classes, Joyce described a specific lesson and how it went. From the text accompanying the fragment, it was clear that she was describing what struck her at the time (evaluation in the past = recollection / situation).

> What struck me was that most of the pupils responded enthusiastically; some of them had some experience of debating, and many found it a welcome change from the normal lessons, which predominantly involved whole-class teaching.

In her portfolio theme on biology fieldwork, Rose examined whether the task she had designed for the pupils had worked well (evaluation / situation).

> The aim of my lesson was not that the pupils would perform the task perfectly. The aim was to surprise these pupils with all the life you can find in an ordinary ditch next to the school. I believe that I did achieve that aim. Every one of the pupils was absorbed in something

> and I heard a lot of pupils telling their friends that they had seen something interesting, and I saw a lot of smiling faces above the bowl of water watching creatures swimming around. When I asked the pupils what they thought about the lesson, not everyone wanted to say. I was curious to know whether the pupils liked it and I was surprised that they all seemed motivated.

Looking back over her experiences up to the time of writing, Bernadette expresses her opinion about the Studiehuis (new approach to learning at upper secondary level that emphasises independent study) in her portfolio theme on the Studiehuis as an educational innovation (evaluation / related situations).

> I also noticed that the 'studiehuis' suited me as a teacher. I think that pupils should bear the main responsibility for their learning themselves and that is the cornerstone of this approach. It is easier to use different teaching methods in the 'Studiehuis'; not just teaching, but letting the pupils consult each other and discuss their assignments after they have done them, and allowing the pupils to take responsibility for their learning, by letting them decide for themselves what is important to them and what is not. I did this, for instance, with parsing sentences. This was very useful for me, because I could see at once where the problems were. It also meant that I did not have to waste valuable time explaining the material.

In another portfolio theme on discipline, Bernadette looked back over the past period. She looked at whether she had made any progress and drew some conclusions (evaluation / related situations).

> This short period of swinging backwards and forwards between being nice and being strict gradually came to an end, because I have become more sure of my ground. I felt calm and much more relaxed in the classroom and I found a middle way between being nice and being strict. I gradually learned that you can still be nice when you are being strict. The one need not rule out the other.

Learning activities oriented toward understanding underlying processes
In one of her portfolio themes, Joyce described what struck her about the way she functioned, when she watched a video-recording of a lesson (evaluation

in the past = recollection), and what factors had played a role in this (analysis in the past = recollection). The next two fragments together describe what she thought about her functioning at that time and the factors that played a role in that (diagnosis in the past = recollection / situation).

> Looking at the lessons that I recorded on video at the beginning of the year, the main thing I noticed was that I tended to stand at the front of the class without moving around much and came across as not very energetic. (= evaluation in the past)
> I did not use many gestures to back up what I was saying and mainly used the board to get my message across. The effect of this was that I came across as if I too was not really enjoying teaching the class. (= analysis in the past)

In her portfolio theme 'Performing in class', Rose described what was going on in two lessons that went badly. She gave an analysis of the lessons she had already done (analysis in the past = recollection / related situations).

> After reflecting on both situations, I came to the conclusion that I did think I needed to do something about it, but that I didn't really dare to. I was afraid of playing the role of teacher in front of these pupils. Probably because they were such cheeky pupils. I was afraid of confrontational behaviour from the pupils.

In another theme, she gave her opinion on the place for personal experience of the environment in biology teaching. She noted that the national standards do not require this to be included in her teaching, but that should be a very important aspect if the aim of biology lessons is to get pupils more involved with nature in their daily lives (critical processing / situation).

> When I came back from Orvelte and was teaching my own class again, I really wanted to make room for what I had learned. I especially wanted to make room for the aspect of personal experience. (= evaluation)
> This is not a compulsory element for the exit qualifications, but I think it is important to pay some attention to this. The article 'Does biology teaching bring us closer to nature? asks the question whether a scientific approach does not distance us too much from our own perceptions. I think it is good when a teacher feels responsible for

> helping to develop pupils' appreciation of nature and that involves pupils realising that nature is something to enjoy. I don't think you can convey that personal appreciation itself, but a bit of enthusiasm can be infectious. (= analysis)

In a theme on his personal development, Steven looked back at his functioning in the past period and examined what consequences this had for his functioning in other areas (diagnosis / related situations).

> I am very unsure of my own abilities. (= evaluation)
> That comes out in two ways:
> - Avoidance. I've noticed that I avoid setting targets. That goes for learning objectives and also, for instance, for planning. The reason behind this is that I'm afraid that I will not manage to achieve the targets and that I will be criticised for that. The absence of learning objectives for this teaching practice placement is not completely accidental.
> - Perfectionism. I regularly take much longer with things, dotting the 'i's and crossing the 't's. (= analysis)

In his portfolio theme on independent working, Rob discussed the approach he had chosen to give pupils the opportunity to do more work on their own. He gave the pupils a section of text from the book to summarise on their own. He explained why this approach did not work so well and why some pupils lacked the motivation to perform the task (reflection / situation).

> This worked with some pupils, but by no means all of them. (= evaluation)
> This may be because I also use this method to get pupils to focus on the lesson. If they are doing something else, I call on them to summarise. (= analysis)

3.4.3 Pattern of learning activities

The learning activities that emerged from the portfolio themes frequently followed each other in a particular, inter-related, sequence (see Figure 3.1). The student teachers often opened their portfolio theme with a description of a situation, experience or activity (recollection), or they expressed their thoughts about something or about how something had gone (evaluation

in the past as the starting situation for a theme). This could be a specific experience (for instance a project they had done), a situation that had occurred in a particular lesson (situation), or it could be recurrent experiences at different times and/or in different classes (related situations). The learning activities undertaken with reference to the description of a situation could be undertaken during the production of the portfolio (present), or they may have already been undertaken by the student teacher during the learning process itself and now be being written up again (past). The student teacher may have alternated between the present and the past within a portfolio theme. Student teachers analysed the described situation sometimes, examining what exactly was going on and what processes had played a role in the situation. Sometimes they examined how different but related situations/experiences were similar and/or different. In most cases, a description of a situation was followed by an evaluation, in the form, for instance, of an opinion, conclusions on their own development or an assessment of an approach used in a lesson. These evaluations were sometimes combined with an analysis; in which case the student teachers did not only report that the chosen approach did or did not work, but also why; or they reported that they had not achieved their learning objective, and why. When the evaluation and analysis of the learning activities together referred to the weighing up of different arguments for or against a particular opinion or explanation, this was 'critical processing'. When they referred to the student's own functioning, this was 'diagnosis'; and when they referred to a learning event or learning process, this was 'reflection'. The learning activities 'reflection' and 'diagnosis' were often followed by a further 'evaluation' in the form of a plan, learning objective or opinion.

Figure 3.1 shows a pattern of learning activities that was commonly found in the portfolio themes. This pattern of learning activities could coincide with a theme, or several patterns could be found within one portfolio theme. This was usually the case when student teachers only undertook a small number of learning activities and did not proceed through the whole pattern. Some student teachers merely described their experiences and evaluated them, before starting a description of a new situation, etc. Few student teachers proceeded through the whole pattern. The sequence of learning activities, as shown in Figure 3.1, did not always correspond to the order in which the student teachers wrote up their learning activities in the portfolio themes.

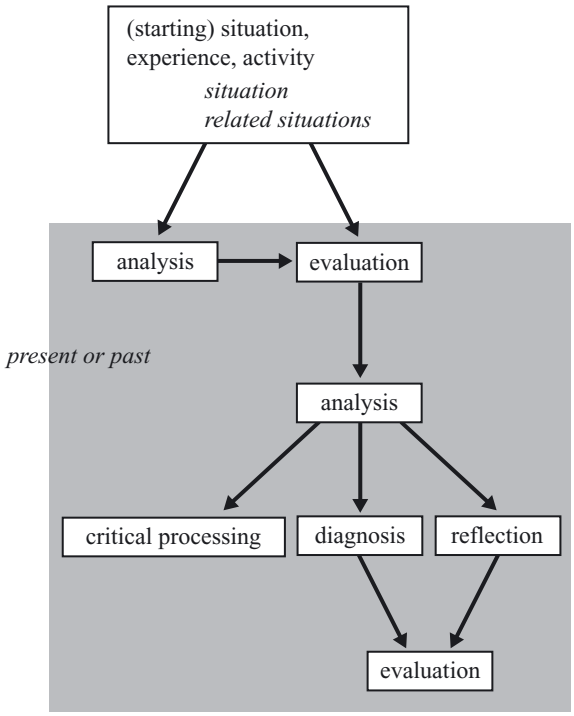

Figure 3.1. Pattern of learning activities within portfolio themes

3.4.4 Illustration of a pattern of learning activities

Lydia included a theme on discipline problems in a Year 10 [US: ninth grade] senior general secondary class. She opened the theme with a description of the situation (the class) and indicated where her problems with this class lay.

> Class H3c has 28 pupils, of whom only eight are really at senior general secondary level, according to the assessment tests. The rest were recommended for junior general secondary by their primary schools, but somehow ended up in Year 10 [US: ninth grade] senior general secondary . Because of this, the lessons are too difficult for some of them and others are very unsettled and cannot concentrate. My predecessor told me that this class made her life a misery. (= recollection: description of situation) // As I had had little experience with pupils like these in January, it was difficult for me to stand my ground at first. I heard myself being quick to retaliate. (= recollection:

> evaluation of functioning in the past) // The pupils were boisterous, talked a lot, did not work and were cheeky. I felt that I had no control over this class, but I did not know what to do to change that. (= recollection: examining what you found difficult in the past)

She wrote that she had asked her school supervisor if he would observe one of her lessons and discuss it with her afterwards (= recollection: description of what you did). She described the different approaches she chose, in response to his feedback, to improve the situation (= recollection: description of approach). Up to this point, this is the starting situation for a theme. Lydia included several experiences over a period of time.

Further on in the theme, she described how the different approaches worked out. She wrote about her findings in relation to the practicability of the approaches she had chosen. She had reached her conclusions on this earlier, immediately after trying the various approaches. (= recollection: evaluation in the past). Looking back over this period, Lydia concluded:

> These actions made the pupils realise that when I threatened to punish them I would carry it out. It became possible to do work in the lessons again, but it was not really enjoyable. (= evaluation: evaluation of approach)

She reported that at a certain point things started to improve with this class, and that this was not so much due to the approach she had chosen, but to a change in her own attitude.

> Once I had realised that I could send pupils out and give them extra work for a punishment, I began to feel more sure of myself in the class. As a result, my teaching became more relaxed and I think the class felt that too. Little by little the atmosphere improved and I noticed that the pupils had a sense of humour. It turned out to be much easier to resolve many situations with humour than with punishment: a joke seemed to work better than a threat. Once I had discovered that, the working ambience also got much better. (= evaluation: drawing conclusions about your own development + analysis: examining what factors played a role in that; the fragments together is reflection: examining what areas you have made progress in and what factors played a role in your development)

Lydia closed the theme with a conclusion explaining what she had found so difficult at the beginning, what areas she had made progress in and what factors had played a role in her development.

> It was very difficult to determine and maintain my position in H3c. Nor was it easy to motivate and discipline the pupils. At the beginning I kept asking myself what I had let myself in for. (= evaluation: examining what you found difficult) // There came a point when I would not accept this behaviour any longer and that was a turning point for me. From that point on, I was checking them all the time and that was very important for surviving in that class. Then I started to enjoy teaching more and I started to treat dealing with incidents more like a game that I had to win. This attitude ensured that, just as I had said in the very first week at ICLON, in my own opinion I was becoming ready and able as a teacher. (= analysis: analysis of factors) // My performance as a teacher is still far from perfect but I now know that I am able to manipulate and manage a class. So this class was ultimately responsible for ensuring that I learned to hit the roof. (= evaluation: drawing conclusions about your own development) (the fragments together is reflection: examining what areas you have made progress in and what factors played a role in your development)

3.5 Conclusions and discussion

This research project focused on the nature of reflection in the portfolios of student teachers. In order to study this, the concept of reflection was operationalised in terms of learning activities. Six learning activities emerged from the portfolio-analyses: 'recollection', 'evaluation', 'analysis', 'critical processing', 'diagnosis' and 'reflection'. With the current design of the portfolio, which places a great deal of emphasis on reflection on their own professional development, the student teachers mainly engaged in the learning activities 'recollection' and 'evaluation'. 'Recollection' (except for a few specifications of the learning activity 'recollection': 'analysis', 'critical processing', 'diagnosis' and 'reflection' that were undertaken in the past) and 'evaluation' addressed immediate performance, and the improvement of performance, in teaching practice. Above all, these learning activities encouraged the student teachers to become aware of their own actions,

functioning and development. The student teachers described in their portfolios what they had done, what areas they had made progress in, what situations they had come across, how they dealt with them and what they had learned from them. The learning activities 'analysis', 'critical processing', 'diagnosis' and 'reflection' only rarely emerged from the portfolios. These learning activities are important for the structuring and restructuring of the student teachers' own practical knowledge or their own frames of reference. What they have in common is that they are geared to the understanding of underlying processes than can play a role in the actions of practising teachers.

The analysis of the portfolios also found that a distinction can be made within the learning activities with regard to the period of time to which the learning activities relate. All learning activities could refer to separate experiences or related experiences over a period of time and different contexts. The student teachers discussed 'separate' situations, events or activities that took place at specific times, and they also made connections between experiences that were important to them and discussed the relationship between them in their portfolios.

A regularly recurring pattern of learning activities emerged from the portfolio themes analysed for this project. This pattern was confined, in most cases, to a description of separate or related situations, experiences or activities (description of one or more situations), followed by an evaluation (in the present or the past). In the case of a small number of portfolio themes, a more elaborate pattern was found. In these cases, the description of the situation(s) and/or the evaluation was followed by an analysis (in the present or the past). Where such an analysis related to the evaluation, this became 'critical processing', 'diagnosis' or 'reflection'.

As explained earlier, the analysis of the portfolios found that learning activities that addressed immediate performance and the improvement of performance in teaching practice were found much more often than learning activities that addressed the understanding of underlying processes that can play a role in the actions of practising teachers. A possible explanation for this is that student teachers often conceived of development as being able to do something better, and not as forming an opinion about something, becoming aware of their own beliefs, changing their beliefs, etc. Moreover, student teachers tended to be more inclined to look at what they had changed (what aspects of their practice had improved), than at how they had changed (how their learning process had gone). Teaching as 'do-context' (see Clandinin, 1986) and the attention demanded by problems of practice may

have played a role in this. Embarking on learning activities that are geared to improving understanding is time-consuming (see also Boekaerts & Simons, 1995). Courses should probably do more than they do at the moment to give student teachers the space to distance themselves from teaching practice.

The question is whether we would have found more learning activities geared to improving understanding if the portfolio had been used differently. Further research would be needed to investigate this (see also Zeichner & Wray, 2001). Clearly, if we want student teachers to engaged in more learning activities that are geared to improving understanding, this would place high demands on their (meta)cognitive capacities, and do student teachers have enough knowledge and experience for this? Do they not always need another person to make them aware of processes that could play a role in their experiences, so that they do not only rely on their often limited frames of reference? (see also Kagan, 1992). The portfolio would have to be used as the point of departure for discussions with others about their own experiences and themselves as beginning teachers. This is in keeping with the findings of the portfolio study of Orland-Barak and Kremer-Hayon (2001). Their research into two types of portfolios (product portfolios and process portfolios) led them to conclude that the portfolio itself probably does not control the quality of reflection, but that discussions and cooperation with others play a very important role. The production of a portfolio should not just be a matter for the individual, therefore (see also Freidus, 1998); as the guidance and supervision of the production of the portfolio is extremely important for learning activities that are geared to improving understanding. Student teachers do generally already ask the 'what works' and 'how can I' questions. Portfolio supervision should aim to encourage them to ask the 'why' questions. Student teachers mainly asked themselves 'why' questions in connection with portfolio themes with which they feel personally involved. This finding is in keeping with the findings of Desforges (1995, p. 393) that *"deep processing is more likely to occur if the matter to hand demands personal involvement."* This could mean that reflection as a learning activity that is geared to understanding, is dependent on the subject matter to which it relates; so reflection, in that case, is not a skill that can be applied indiscriminately to any subject (see Bereiter & Scardamalia, 1998; Eraut, 1994; Von Wright, 1992).

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Notes

[1] Von Wright (1992) called these kind of models: variations on a theme of Kurt Lewin. This theme consists of four steps: 1) action and experience; 2) reflection on your own experiences; 3) reappointing the experiences in a 'theory'; and 4) testing out your ideas in your practice. Korthagen's ALACT model (2001) is also an example of this.

[2] We used 'recollection' in this study, because 'memorising' in the sense of 'reproducing from memory' is not very appropriate in this context.

[3] This does not mean that the student teachers did not include the other learning activities distinguished by Vermunt and Verloop (1999) in their portfolios, but that they did not emerge clearly from the portfolios. Little evidence of affective learning activities emerged from the portfolios, for instance, because it was not usual for the students to write about any feelings they may have had when producing their portfolio in the portfolio itself. They did describe feelings in their portfolios, but these were the feelings they had had about teaching during their training process. Because of the time lapse between dealing with these feelings at the time, and describing their development when they were writing up their portfolios, the portfolios mainly revealed cognitive and metacognitive learning activities. The learning activities that refer to the production of the portfolio as a whole (in contrast with the description of their development) were not usually written up explicitly. Selection is an example of this. A student teacher 'just' chooses a theme. The descriptions of the themes did not often allow the researchers to deduce much if anything about how the choice was made. Some learning activities were entered as subcategories of another learning activity, due to the data giving a different interpretation to those learning activities. For example: 'relating' became a form of analysis and 'planning' became a form of evaluation.

4

Reflection in the learning portfolio geared to the understanding of experiences[1]

Abstract

Results from recent research into the portfolio as a tool for reflection indicate that student teachers do not automatically make sense of their experiences by reflecting on their learning process as a result of working on a portfolio. We explored in which portfolio themes the reflection of student teachers is geared to the understanding of experiences and how this reflection manifests itself. We operationalised reflection geared to the understanding of experiences in terms of the meaning-oriented learning activities 'analysis', 'critical processing', 'diagnosis', and 'reflection'. We distinguished these meaning-oriented learning activities from the action-oriented learning activities 'recollection' and 'evaluation', which are geared to (the improvement of) action in teaching. Based on the content analysis of 39 portfolios, we distinguished four theme clusters in which we found meaning-oriented learning activities, about problems experienced, the educational reform, teaching and testing, and development and functioning. The meaning-oriented learning activities generally played a small part next to the action-oriented learning activities 'recollection' and 'evaluation' in the portfolio themes. Personal involvement with the portfolio themes seemed to be an important condition for undertaking meaning-oriented learning activities in a portfolio theme.

[1] This chapter is submitted as: Mansvelder-Longayroux, D.D., Beijaard, D., & Verloop, N. Do producing a learning portfolio and reflecting go hand in hand? Manuscript submitted for publication.

4.1 Introduction

The learning portfolio is a current instrument in teacher education. Producing a learning portfolio requires student teachers to make a selection of experiences and materials from practice gathered over a set period from different sources and contexts, and to relate these experiences and materials to each other. The instrument, therefore, makes it possible for student teachers to visualise the complexity of their learning processes in concrete terms (product function), and to think about their learning in a focused and structured way (process function) (Barton & Collins, 1993; Wolf & Dietz, 1998). The process function of the learning portfolio is generally seen as the main purpose of the learning portfolio in which reflection plays a central role (Darling, 2001; Loughran & Corrigan, 1995, Richert, 1990).

Up to now it was assumed that in working on their portfolios student teachers are stimulated automatically to reflect on their own learning processes and to reach a better understanding of teaching. Results from recent research into the portfolio as a tool for reflection seem to indicate that producing a portfolio does not cause student teachers naturally to make sense of their experiences. Factors linked in the literature to reflection in the portfolio are ownership, experience in producing a portfolio, instruction and supervision, perception of purpose, and the learning orientation of student teachers (Borko, Michalec, Timmons, & Siddle, 1997; Krause, 1996; Lyons, 1998[b]; Meyer & Tusin, 1999; Wade &Yarbrough, 1996). In the portfolio literature it is mentioned more and more often that the quality and value of the portfolio should be brought up for debate (Breault, 2004; Delandshere & Arens, 2003; Zeichner & Wray, 2001).

To enter this debate, research should be done not only into factors that can influence reflection in the portfolio, but also on the nature of reflection in the portfolio (Delandshere & Arens, 2003; Zeichner & Wray, 2001). In a previous study (Mansvelder-Longayroux, Beijaard, & Verloop, in press), we investigated how student teachers reflect when producing their portfolios. Reflection was conceived of as mental learning activities that student teachers undertake when they work on their portfolios. From the content analysis of the portfolios it appeared that the student teachers demonstrated in their portfolio themes mostly action-oriented learning activities geared to (the improvement of) teaching in practice. Examples are a description of how you approached a situation, examining what you have learned, or drawing conclusions about your own development. Meaning-oriented learning activities, geared to the understanding of underlying processes

that can play a role in action in teaching practice, did not often appear in the portfolio themes. Examples of meaning-oriented learning activities are examining what factors played a role in a situation, examining why a particular approach did not work, or examining what you found difficult and the consequences of this.

These meaning-oriented learning activities are important for the building up, structuring, and restructuring of student teachers' own practical knowledge (Oosterheert & Vermunt, 2001; Vermunt & Verloop, 1999). They lead, like action-oriented learning activities, not only to *consciousness-raising* of what the student knows and is capable of, but also to *understanding* of experiences in teaching and learning. We elaborate on meaning-oriented learning activities below. The purpose of this study was to find out when and how student teachers undertake meaning-oriented learning activities when working on their portfolios. Using an analysis of the content of student teachers' portfolios, we investigated which portfolio themes showed meaning-oriented learning activities and in what way the meaning-oriented learning activities manifested themselves within these portfolio themes. An understanding of the nature of meaning-oriented learning activities in the production of portfolios could provide more insight into the concept of reflection in relation to working on a portfolio. This would be a valuable contribution to the discussion about the value of the portfolio for student teachers' learning processes, and could assist portfolio supervisors in finding ways to stimulate student teachers to undertake meaning-oriented learning activities in working on their portfolios, and to take a more differentiated approach to thinking about what they intend to achieve with the portfolio.

4.2 Theoretical background

Understanding teaching and learning

In learning from experiences, giving meaning to experiences is central. Student teachers must understand their experiences if they are to build up practical knowledge (Korthagen, 2001). Reflection is the means by which student teachers can reach an understanding of their experiences. Vermunt and Vermetten (2004) describe this as follows: *"Learning is not a passive, knowledge-consuming and externally directed process, but an active, constructive and self-directed process in which learners build up internal knowledge representations that are personal interpretations of their learning experiences. These representations change constantly on the basis of the*

meaning people attach to their experiences" (p. 258).

Reflection in the portfolio concerns the process of interpreting experiences during the production of the portfolio and is geared to the understanding of underlying processes that can play a role in the actions of the student teachers in practice. Reflection in the portfolio can be operationalised in terms of the mental learning activities that student teachers undertake when producing their portfolios (Mansvelder-Longayroux, Beijaard, & Verloop, in press). The learning activities student teachers engage in largely determine the quality of the learning outcomes they attain (see Vermunt & Verloop, 1999). In research on students' learning, learning with the aim of understanding is also indicated as deep-level learning or deep processing (Lonka, Olkinuora, & Mäkinen, 2004). Deep processing requires certain thinking activities, such as searching for connections between new information and one's own beliefs, seeking 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).

In our previous study (Mansvelder-Longayroux, Beijaard, & Verloop, in press), we found six learning activities in the portfolios: 'recollection', 'evaluation', 'analysis', 'critical processing', 'diagnosis', and 'reflection' (see Table 4.1). 'Recollection' and 'evaluation' are action-oriented learning activities geared to (the improvement of) action in teaching practice. Undertaking these learning activities leads to *consciousness-raising* of what one has done, of what one knows and is able to do. 'Analysis', 'critical processing', 'diagnosis', and 'reflection' are meaning-oriented learning activities geared to the *understanding* of underlying processes that can play a role in action in teaching practice. These learning activities can be considered forms of deep processing. They are geared to making sense of experiences and are important for the building up and structuring of practical knowledge.

4.2.1 Research question

The aim of the present study was to gain more insight into the meaning-oriented learning activities that student teachers undertook as they produced their portfolios. The following questions were addressed: (a) What themes do student teachers incorporate in their portfolios? (b) Which portfolio themes show meaning-oriented learning activities? and (c) How do the meaning-

oriented learning activities manifest themselves within a theme (e.g., in relation to the other learning activities that appear from the theme)?

Table 4.1. Definition of learning activities involved in producing portfolios and subcategories of each learning activity
(adapted from Mansvelder-Longayroux, Beijaard, & Verloop, in press)

Action-oriented learning activities

Recollection
Recollecting / recalling from memory situations, events, and activities that happened in the past. Recollection is not only retrospective, it also has a forward-looking side, in the sense of describing future activities and expectations. The subcategories of recollection were

- notes for the reader
- adoption of the views of others or of theory
- description of the situation
- description of what you did or plan to do (and why)
- description of how you approached a situation or plan to approach a situation in the future (and why)
- expectations, expressing hopes for how it will go in the future

Evaluation
Evaluation of your experiences and your own development as a teacher. The subcategories of evaluation were

- giving an opinion
- examining what you have learned
- drawing conclusions about your own development
- evaluating your knowledge or functioning
- investigating whether you have achieved your learning objective
- examining what you found difficult
- formulating a plan or learning objective
- investigating whether a particular approach worked

Meaning-oriented learning activities

Analysis
Examining what different aspects of an experience, event, or development can be distinguished, and what underlying processes played a role in an experience, event, or development. The subcategories of analysis were

- examining what factors played a role or are playing a role in a situation
- examining similarities and differences between situations, experiences, and beliefs

Table 4.1 (continued)

Critical processing
Comparing your own opinion with the opinions or beliefs of others (theory, mentor, fellow student, university supervisor, etc.); formulating your own opinions on the basis of different arguments (evaluation); and looking at which arguments are more credible than others and why (analysis). Critical processing always includes an evaluation and an analysis.

- critical processing

Diagnosis
Determining the weaknesses in your own thinking and actions (evaluation) and investigating possible causes of positive and negative experiences during one's development as a teacher (analysis). Diagnosis always includes an evaluation and an analysis. The subcategories of diagnosis were

- examining what you found difficult and why
- examining what you found difficult and what factors played a role in this; why a problem occurred
- examining what you found difficult and what consequences this had
- examining why you did not achieve a particular learning objective
- examining how you functioned and what factors played a role in this
- examining how you functioned and what consequences this had

Reflection[1]
Thinking about everything that took place during a particular learning event or over a period of learning; evaluating your own development (evaluation); and examining what factors are connected with this (analysis). Reflection, like diagnosis, consists of a combination of evaluation and analysis. However, diagnosis focuses on what the student teacher can do, reflection focuses on the learning event or period of learning. The subcategories of reflection were

- examining whether a particular approach worked or not, and why
- examining what you have learned and what factors played a role in the points you have learned
- examining the progress you have made in your development
- examining what areas you have made progress in and what factors played a role in your development: what you have learned and how
- examining what areas you made progress in and what the consequences were

[1] Owing to the specific operationalisation of reflection in terms of learning activities in this research, the 'broad' concept of reflection includes a number of learning activities, including reflection in the narrower sense as used in educational psychology. The latter is meant here.

4.3 Method

4.3.1 Context

The student teachers who participated 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. 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.

4.3.2 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; (c) a conclusion about their learning process during 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 to 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.

4.3.3 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 student teachers 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.

A total of 39 portfolios (21 first and 18 second portfolios) were gathered and analysed for the research. Although it was intended that each student teacher should produce two portfolios, 3 students produced only 1 portfolio during the course year. The 39 portfolios contained in total 310 themes, an average of 15 portfolio themes per student teacher for the first and second portfolios together.

4.3.4 Data analysis

The portfolio data were analysed in two stages. Firstly, categories describing the content of the portfolio themes were developed systematically in response to the data. The student teachers' themes in both the first and second portfolios were compared for similarities and differences across individuals. This comparison led to the formulation of six categories (theme clusters) containing aspects of their learning processes as beginnning teachers that they worked on in the themes of their portfolios. The categories were discussed with another researcher (*peer debriefing*; Denzin & Lincoln, 1994), resulting in a more accurate description of the categories. All data were coded using the category system. The procedure for coding the portfolios was as follows. Each portfolio theme formed a coding unit and became one code. The coded portfolio themes were discussed with another researcher. The assigned codes were examined. In some cases, the researchers differed in the categories they ascribed to a particular portfolio theme. After the differences were discussed, agreement was reached on all portfolio themes.

Secondly, the categories for the content of the portfolios (theme clusters) were related to the learning activities that occurred in the portfolio themes. Together with another researcher, we examined how the meaning-oriented

learning activities manifested themselves within the portfolio themes in relation to the other learning activities that occurred within these themes. This stage resulted in a description of the meaning-oriented learning activities and their the place within the portfolio themes.

4.4 Results

4.4.1 Portfolio theme clusters

On the basis of the analysis of the portfolios, we identified six theme clusters, about

1. problems experienced
2. the educational reform (*Studiehuis*, a new approach to learning at upper secondary level that emphasises independent study)
3. teaching and testing
4. activities other than teaching
5. oneself as a teacher
6. development and functioning

The first cluster contained themes about problems that the student teachers experienced during and in relation to teaching a class. The problems that student teachers work on in their portfolios are mostly in the areas of interaction with pupils and testing, but didactics and pupils' learning can also be brought up. Examples are problems with discipline, uncertainty about one's own position in the class, and having difficulties with setting limits and being consistent, with thinking up questions for a test and assessing presentations and reports, with motivating pupils for the subject matter, with explaining the subject matter, and with working with the method of the school.

The second theme cluster that student teachers work on in their portfolios contains themes related to the educational reform that will be introduced in upper secondary level and emphasises independent study (*Studiehuis*). Themes in this cluster are about experiments with this new approach to teaching and learning. Didactics, pupils' learning, and oneself as a teacher are the main aspects of the teaching profession that are given attention in these portfolio themes. Examples are pupils' learning in the *Studiehuis*, stimulating independent study, the consequences of the educational reform for didactics, working with study planners, using different teaching methods that stimulate independent study, the teacher as a coach of learning processes,

and the connection of the ideas of the *Studiehuis* with the student's own vision on learning and teaching.

The third theme cluster contains themes about the development of and approach to lessons and tests on which the student teachers worked intensively and which they find interesting or important. The themes in this cluster concern didactics and testing. Examples are the development of assignments for writing and for speaking, the development of amusing extra assignments, giving a series of lessons about debating and about poetry, constructing and correcting tests, evaluating presentations or papers, and giving feedback on pupils' work.

The fourth cluster of themes on which student teachers work are themes about activities that they have undertaken apart from class teaching. These activities are in the area of school organisation and school context and of interaction with colleagues and parents. Examples are participation in staff meetings to discuss reports, meetings of the subject department, parents'evenings, attending study days for teachers, participation in extracurricular activities like trips, and collecting information about the policy of the school concerning bullying or dyslectic pupils.

The fifth cluster of themes contains themes in which the student teachers discuss their personal interpretations of teaching. Examples are vision on learning and good teaching, the tasks and required competences of a teacher, motivation for the teaching profession, and the influence of the home situation on performance in teaching practice.

The sixth theme cluster contains themes in which the development and functioning of the student teachers as teachers is central. These are themes in which the student teachers look back on their development as a whole and discuss their capacities as teachers, their strong points, and the aspects that need to be developed further. These are mostly the final conclusions in the portfolios, which connect the different themes.

4.4.2 Themes and meaning-oriented learning activities

We found meaning-oriented learning activities in 122 of the 310 portfolio themes. There were great differences between the student teachers in the number of themes with meaning-oriented learning activities ($\bar{x}$ =6, *sd*=3). All but one of the student teachers had one or more themes in the portfolio in which meaning-oriented learning activities occurred.

We found themes with meaning-oriented learning activities in four of the six theme clusters distinguished; they were not found in themes about

activities other than class teaching and themes about oneself as a teacher. Most of the themes with meaning-oriented learning activities were found in the first theme cluster, which consisted of themes about problems that the student teachers experienced in their teaching (56) (see Table 4.2). In the theme clusters about teaching and testing and about development and functioning, 31 and 24 themes, respectively, with meaning-oriented learning activities were found. We found 11 portfolio themes with meaning-oriented learning activities about the educational reform.

Table 4.2. Frequency of theme clusters and themes with meaning-oriented learning activities

theme clusters	**total number of themes**	**themes with meaning-oriented learning activities**
problems experienced	78	56 (71,8%)
the educational reform	28	11 (39,3%)
teaching and testing	92	31 (33,7%)
activities other than teaching	28	-
oneself as a teacher	29	-
development and functioning	55	24 (43,6%)
	310	122 (39,4%)

4.4.3 Illustration of themes with meaning-oriented learning activities

Below we discuss how meaning-oriented learning activities manifest themselves within portfolio themes. We examined the place of meaning-oriented learning activities within a theme in relation to the other learning activities that come up in the theme. We give an example of a portfolio theme for each theme cluster. The learning activities arising from these example themes are indicated between brackets.

Problems experienced
A theme about problems experienced was usually composed as follows (basic form). The theme started with a description of the problem and the activities and measures that student teachers undertook to solve the problem (recollection), followed by an evaluation of the measures: what worked and what did not (evaluation). Alternatively, the theme may start with a description of what the student teachers found difficult (evaluation) and what

they did about it (recollection). Next, the student teachers examined how they functioned in comparison with their functioning in an earlier period, what they had learned, and what areas they still had to work on (evaluation). This basic form can be extended with meaning-oriented learning activities. A number of meaning-oriented learning activities were found in the portfolio analysis. We found meaning-oriented learning activities in

- the description of the problem, when the student teachers went deeper into the problem situation and examined what factors played a role in the situation (analysis of problem situation).
- the evaluation of the measures, when the student teachers examined what worked and what did not, and considered why (reflection on approach).
- the description of their problems, when the student teachers examined what they found difficult, and considered what factors played a role and what the consequences were (diagnosis of functioning).
- the evaluation of their development, when they examined in what areas they had developed, and considered what factors played a role in their development and in the points they had learned (reflection on development).

Issues with discipline in 3b

Karen started her theme with a description of the difficulties she had with this class:

> In the course of the past months I have had a lot of difficulties keeping order in this class. From the first lesson it was clear to me that it would not be easy to keep this class under control. When I called out the list of names, I noticed that a group of ten boys did not mention their own names but their neighbours'. That caused a lot of laughter in the class (recollection: description of situation). […] In the following lessons the class became more and more busy and annoying and I had more and more difficulties keeping order. When I wanted to explain something to the whole class, it sometimes took ten minutes before the whole class was quiet. Pupils sometimes took different seats, did not bring their books, and did not do their homework (recollection: description of situation). Because I am responsible for my lessons, I believe that I am responsible for solving these problems. However, I know that being strict and showing high-status behaviour are not my strong points (evaluation: examine how you functioned).

Karen indicates that she tried in several ways to change the behaviour of the pupils and to create a calmer atmosphere:

> In the first instance, I did that entirely by myself without informing others of the problems I had with this class. I gave lines several times and I also sent some pupils out of the classroom (recollection: description of approach). This did not produce the result I wished; these measures made little impression on the other pupils and in the next lesson those who had been punished did not change their behaviour (evaluation: examining if the approach works). I also marked the assignments the pupils had to work on in class several times (recollection: description of approach). The effect of this measure was that they started to work, but that almost all of them received a very good extra grade. This was also not regarded as a punishment (evaluation: examine if the approach works).

At a certain point she had had enough of it and she decided to inform the class mentor and the deputy headmaster:

> As a result of that conversation I decided to discuss their behaviour with the class the next day and to make some agreements together. The pupils were also allowed to criticise my lessons and to indicate what they found had to be changed (recollection: description of approach). The conversation with the class went reasonably well: the class listened carefully and agreed with me. But the pupils did not dare to be frank with me in saying what they wanted to be changed or why they behaved as they did. Anyhow, the following lessons went a lot better (evaluation: examine whether an approach works).

In the continuation of the theme, Karen describes the hurdles that she still faced, how she handled various problems, and how that went. She concludes the theme with a conclusion about her own functioning during that period:

> As can be seen from the above, class 3b is a class that causes much trouble to many teachers, also to more experienced teachers than me. Nevertheless, I think that I could have prevented some of the problems by handling things differently. The past few months it became clear to me that pupils need structure and clarity. That concerns the content of the lessons, but mostly the rules that must be observed. Looking

> back on the beginning of this year I realise that in the first lessons I was mostly concerned that pupils would accept me as a teacher and enjoy my lessons. Posing rules moved to the background and only in later lessons did it come up, when the situation demanded it. I also noticed that I find it difficult to pose limits and be consistent with certain things (diagnosis: examine how you functioned and what factors played a role in this). […] Something I am content with is that in most of the lessons the atmosphere was good. I must be more consistent and clear in posing rules, but besides that I think that the ambience is an important element in my lessons (evaluation: examine how you functioned).

The educational reform

The themes about the educational reform tend to relate to the new approach to the lessons. The structure of the themes was as follows. The themes started with a description of the lessons in the *Studiehuis*: how they looked, and what assignments and teaching methods were used (recollection). The student teachers then evaluated the *Studiehuis* approach: how the pupils worked, what worked and what did not (evaluation); or they evaluated their own functioning: what they found difficult in those lessons (evaluation). On the basis of their experiences, the student teachers gave their opinions about the *Studiehuis*: what the benefits and disadvantages for pupils' learning are, the consequences for the role of the teacher, and how the Studiehuis ideas went together with their own visions on learning and teaching (evaluation). We found meaning-oriented learning activities in

- the description of the approach, when the student teachers examined the differences between the Studiehuis approach and the old one (analysis of differences).
- the evaluation of the new approach, when the student teachers examined what worked and what did not, and why (reflection on approach).
- the discussion of their own functioning, when the student teachers examined what they found difficult, and why (diagnosis of functioning).
- their opinion about the Studiehuis, when the student teachers indicated their views on the value of the Studiehuis, and considered the arguments for their opinions and compared their opinions with the opinions of others (critical processing).

Independent work in H3

Sam started her theme about the educational reform with a description of what she had done and why (recollection):

> Next year the Tweede Fase (= other indication for Studiehuis) will be introduced. That means that pupils from Havo 3 (Year 10, US: ninth grade senior general secondary class) will start working independently with study planners next year. To prepare the pupils for that and to see myself how that works, I gave class H3b simple study planners and looked at how they worked with that. […] The pupils had to make a plan themselves for doing assignments. It was the intention that at the end of the series of lessons, consisting of about eight lessons, the pupils would have finished all the assignments. During the lessons they could correct their assignments. The pupils knew how many lessons they had to work on the assignments. When there was not enough time left in the lessons, they had to work on their assignments at home (recollection: description of situation).

Next, Sam discussed working with the study planners:

> During the lessons that the pupils were allowed to work on the assignments, I noticed that different pupils worked at a different pace. When I told a pupil that I found that he or she was not keeping up, he or she answered that he or she was right on schedule. It was, therefore, difficult to call the pupils to account. Other pupils worked very hard and were faster than the others. They became bored (evaluation: examine what you found difficult). I found it hard to give order to the lessons as a teacher. Because the pupils had planned on the basis of the lessons available, I could not vary the schedule. I could not put a video on. Because I did not explain the subject matter in front of the whole class, I had the feeling that I did not have much of a grip on the learning processes of the pupils and I also did not have much of an idea of whether they understood the subject matter and could develop a view. The pupils had few questions when they worked on their assignments. When I asked the pupils what they were working on and if they could explain to me what the answer was, they mostly gave the right answer. But I did not see how to fit the subject matter in with pupils' everyday lives by stories. It was just the book. That gave me a sense of dissatisfaction (diagnosis: examine

what you found difficult and what factors played a role in this).

She concluded her theme with learning points for the future:

> I learned from this that it is useful for the class and for me as a teacher to structure the programme and not to let the pupils work fully by themselves (evaluation: examine what you have learned). Looking back I would say that during the series of lessons I could have explained the subject matter in front of the whole class, but I did not realise that at that time (evaluation: examine how you functioned). I have also learned that when working with a study planner like this, it is important that you take your time to explain the study planner well. Otherwise you do not achieve your aims and it can cause a lot of confusion among the pupils (evaluation: examine what you have learned). I think it is very important to prepare the pupils slowly for working independently and planning their own work. At this moment there are just a few subjects for which the pupils must learn to work independently or work with a study planner. Next year they must work like that for every subject (evaluation: give an opinion).

Teaching and testing

The third cluster of themes in which there were meaning-oriented learning activities was the cluster of themes about teaching and testing. These themes were generally ordered as follows. The student teachers described their lessons or tests: what they looked like, and what approach they followed and why (recollection). Next, they evaluated their lessons or tests: how the pupils worked, what went well, and what went wrong (evaluation). They evaluated their functioning: what they found difficult (evaluation); and gave their opinions (evaluation). They often described the approach they planned to use in the future (recollection). We found meaning-oriented learning activities in

- the description of the approach of the lessons, when the student teachers described the lessons and examined what others thought about that and how their own opinions related to that (critical processing).
- the evaluation of the approach, when the student teachers investigated what went well and what did not, and examined why (reflection on approach).
- the evaluation of what they found difficult, when the student teachers also indicated why that was (diagnosis of functioning).

Debating in class 4

Mary started her theme with a description of the background of this project:

> The Dutch section of our school has introduced a 'debating' item into our curriculum for Year 11 to practice skills such as speaking, listening, looking, reading, and writing at the same time (recollection: description of situation).

Next, she described how she discussed the project with the class:

> First the pupils were given a hand-out in which it was explained how a debate works and what rules are applied. I spent an hour on this. First, I discussed the hand-out with the whole class, next the pupils could ask questions, and for the rest of the lesson they formed groups to work with and thought about a debating subject. […] I explained in this lesson how the debates would be evaluated. I think it is important that the class be involved in the assessment proceduree. I appointed a jury for each debate, which would evaluate both pairs. They were given an evaluation form and after a debate took place they had to consult about their judgment. Next, they suggested a grade; the final grade was my decision. The members of the jury then had to work out their judgment at home. They were also given a grade for this (recollection: description of approach).

Next, Mary described how the debates went:

> The different groups had very different debating subjects: 'The stream of asylum-seekers must be put to a stop', 'Schiphol must expand in the North Sea', 'Unqualified teachers should not be allowed to teach', and 'Teachers in difficult schools should be given higher salaries than teachers in easy schools' are some examples (recollection: description of situation). Most of the groups had prepared well for their subjects by reading the literature, researching the backgrounds, and taking cuttings from papers. It was hard for the pupils to use the full five minutes; most had written down some arguments on paper, read them, and gave a little information about that. I noticed that they were enthusiastic about this form of education; those who were debating enjoyed doing it, and the other classmates enjoyed listening to them.

> The pupils appeared to find it difficult to react to arguments suggested by the other pairs. They stuck mainly to the story they had prepared at home and were hardly capable of improvising. For this reason, most of the debates were static and there were no fierce debates. Of course we must not forget that it was the first time that they had to do something like this (reflection: examine whether an approach works or not and why). What I found a pity was that the discussions with the whole class rarely got into stride. The other pupils had mostly just a few questions and so the discussion was mainly between the pupils who participated in the debate (evaluation: examine whether an approach works). I am pleased with the method of evaluating the debates. The members of the jury generally took their task seriously and they often gave useful criticism during the subsequent discussion. I noticed how well the pupils could analyse and assess the debates: the positive and negative points often corresponded fully with my own points. They also worked out their evaluations very well (evaluation: examine whether an approach works). It was a valuable experience for me to assess the debates (evaluation: give an opinion). I also had no previous experience with this form of education and after the first debates I found it difficult to explain what I found good and what not (evaluation: examine what you found difficult). But with the help of the extensive evaluation form it went better and I could clearly indicate what my points of criticism were (evaluation: draw conclusions about your development).

Mary concluded her theme with her judgment of the project:

> I had a very positive experience of this form of education. I enjoyed seeing the pupils working so actively and I enjoyed listening to the different arguments and opinions. I noticed how convincingly some pupils can express their opinions about certain subjects and how well they thought about certain issues. This form of education was also received positively by the pupils. Also, I find it a useful way of training pupils in the skills mentioned above (evaluation: give an opinion).

Development and functioning

The last cluster of themes in which we found meaning-oriented learning activities was the theme cluster about development and functioning. The basic form of these themes was generally as follows. The student teachers examined

their development: they examined how things went at the beginning of the course and how they were going at present, what they had learned, and what they still had to work on (evaluation). They examined how they functioned as teachers and investigated whether they had achieved their learning goals (evaluation). We found meaning-oriented learning activities in

- the description of their development, when the student teachers examined on what points they had developed and considered how that had happened (reflection on development).
- the evaluation of their functioning as teachers, when the student teachers examined what factors played a role in their functioning and what consequences this had, or when they examined why they did not achieve their learning goals (diagnosis of functioning).

My changing view of teaching

Pauline used different metaphors in her portfolio theme "My changing view of teaching" to describe her development in interacting with pupils and the part her ideas about her role as a teacher and her confidence in her own capacities played in that. She started by giving the reason for her choice of the theme (recollection: note for the reader):

> At the beginning of the course we were given the task of drawing a metaphor of our idea of teaching. I have included this theme because I feel that my view of teaching has changed during the year as I have gained more practical experience, and I feel that the different metaphors that I have thought of reflect the process of my development.

Next, she explained the different metaphors that she used during the year:

> My first metaphor, which I drew fairly near the beginning of the course, compares teaching to tending a fire. I first thought of this metaphor because fire often begins by itself, it is not always necessary for someone to start it, and under the right conditions it can also burn by itself. The presence of the teacher can be compared with someone tending a fire; he or she has to provide the right kind of fuel in the right quantities, and at the right time, and also be ready to control the fire if it seems likely to get out of control, but without putting it out (evaluation: give an opinion). […] A later metaphor was that of an octopus trying to escape, which represented the class

> for me, while the teacher tried to keep it in the basket. This for me represented the feeling that it is necessary for a teacher to pay attention to many things at the same time. The class was something I had to control, and I didn't always succeed in doing so (evaluation: evaluation of functioning). Another metaphor was that of the teacher pouring water out of a container over other containers, some of which are filled while others remain empty. This represented the feeling that I sometimes had that what I was teaching the class didn't reach all of them (evaluation: evaluation of functioning). […] My final metaphor compares the class to a garden, and the teacher to a gardener. This shows that I have come to understand that a class is made up of individual pupils, and they often have to be treated in different ways. This shows progression from the previous metaphor because I feel more capable of reaching more of the pupils in the class (reflection: examine how you have developed). […] One aspect of my changing view of teaching that is reflected in the metaphors is my idea of the class. The first shows the class as one entity, the fire and the octopus; and also as something that can be threatening. The third shows an awareness of the difficulties of the work, but the members of the class are seen as separate entities. Finally the last metaphor shows again that the class is made up of individuals but I feel more confident of my ability to deal with this (reflection: examine how you have developed).

4.5 Conclusions and discussion

The nature of the portfolio themes with meaning-oriented learning activities was central to this study. From the analysis of the portfolios six clusters of themes emerged that student teachers included in their portfolios. These are clusters of themes about problems experienced, the educational reform, teaching and testing, activities other than teaching, oneself as a teacher, and development and functioning. We found themes with meaning-oriented learning activities in four of the six theme clusters: themes about problems experienced, the educational reform, teaching and testing, and development and functioning. The meaning-oriented learning activities were generally a small part of these themes next to the action-oriented learning activities, 'recollection' and 'evaluation'.

Themes that matter

The clusters of themes in which the student teachers showed meaning-oriented learning activities seemed to relate to each other in the *personal involvement* of the student teachers with the themes in these clusters. These results correspond to the finding from research into student learning that personal interest in subjects stimulates deep processing (Desforges, 1995; Vermunt & Vermetten, 2004). The personal involvement in the theme clusters that showed meaning-oriented learning activities arose from problems that were perceived as urgent or from personal interest in certain teaching activities that the student teachers enjoyed very much or found important, or both.

In the first theme cluster, about problems experienced, the student teachers felt a need to work on the theme, because their problems hindered them from good functioning as teachers in direct contact with the class and they experienced the problems each time in teaching. Problems such as having no discipline in the classroom and having difficulties with being strict or with explaining certain subject matter are often not solved using a single measure. To be able to solve these problems well, the student teachers must examine why a problem is a problem, what factors play a role in that, why an approach does not work, etc. In other words, the solving of the problem requires first that the student teacher can see the problem clearly and can define the problem. Undertaking meaning-oriented learning activities is a necessary condition for that.

For the themes about the educational reform, the student teachers were probably motivated to work on the theme because it was something new and different. They were educated in the 'old' system and are among the first teachers to give form to this new method. Furthermore, the student teachers were stimulated by the attention given by the school, the teacher education institute, and media to the *Studiehuis* to profoundly examine the new approach to lessons and to critically form opinions about the value of the *Studiehuis*.

The themes about teaching and testing concerned lesson activities that the student teachers enjoyed, interesting, or important. These themes were often about activities (a series of lessons, assignments, new forms of testing and assessment) that the student teachers undertook on their own initiative or to the development of which they made a large contribution and on which they worked intensively for a relatively long period of time. This personal interest probably brings with it a certain curiosity, as a result of which the student teachers are more inclined to ask themselves questions about the

approach followed and its value.

Finally, the theme cluster about development and functioning contained themes in which the student teachers looked back on their whole development as teachers. Meaning-oriented learning activities in these themes were mostly concerned with those aspects of the teaching profession that posed problems for the student teachers, and to which they had to pay much attention with a view to their functioning as teachers. Like the themes in the cluster about problems experienced, these themes require that the student teachers pay attention to the problem, because it is too complex to be solved quickly.

The theme cluster about activities other than teaching did not contain any meaning-oriented learning activities. A possible explanation for this is that the student teachers did not feel involved with the themes in this cluster and, therefore, chose for the easy way, to describe only what they had done. It is possible that they used these themes as 'filling' for the portfolio in order to meet the requirements of the course to do justice to the breadth of the teaching profession. Another explanation may be that the student teachers had not gained enough experience with these activities to distinguish for themselves the important experiences and learning moments and where there were still questions and a lack of clarity (see Kagan, 1992).

Surprisingly, the theme cluster about oneself as a teacher did not show any meaning-oriented learning activities either. This theme cluster is the only cluster that was not only about acting in teaching practice, but that especially concerned the beliefs of student teachers about learning and teaching and their role as teachers. A possible explanation for the lack of meaning-oriented learning activities is that it was (too) difficult for the student teachers to analyse their own beliefs (frame of reference) and to examine how these beliefs influenced their actions as teachers. Do student teachers not always need others to be able to ask questions about things that go without saying and to see that a situation can also be interpreted in other ways (Freidus, 1998; Oosterheert, 2001; Orland-Barak & Kremer-Hayon, 2001)? Furthermore, it is unclear whether meaning-oriented learning activities with regard to action and meaning-oriented learning activities with regard to beliefs are two different things. Several researchers (e.g., Bengtsson, 1995; Von Wright, 1992) indicate that reflection on one's own actions does not automatically lead to reflection on one's own beliefs about learning and teaching.

Implications and questions

As mentioned above, we found meaning-oriented learning activities in

themes about problems that student teachers experienced and activities that they enjoyed doing and found interesting. When it is the aim of a course that student teachers undertake meaning-oriented learning activities by working on their portfolio themes and in this way developing practical knowledge, the *selection* of themes is possibly a first step. Student teachers seem more willing to undertake meaning-oriented learning activities when the themes are relevant to them and personally important and when they are intrinsically motivated to work on the themes. This means that when promoting meaning-oriented learning activities, a *free choice* of themes for the portfolios can be important. Because undertaking meaning-oriented learning activities takes much time and energy (Newton, 2000), the *number* of themes that student teachers have to include in their portfolios must not be too high. Five to eight themes per portfolio is a lot and it is possible that some themes are included in the portfolio only because of the requirement to include a certain number of themes, as a result of which the student teachers undertake only action-oriented learning activities.

For undertaking meaning-oriented learning activities, a selection of personally important themes is not enough. We found meaning-oriented learning activities especially in themes about classroom management, teaching, and testing; but even in these themes they were scanty. The question is whether student teachers can be stimulated to undertake more meaning-oriented learning activities than they do already by working on their portfolios, and also in other aspects of their teaching. It is clear that the supervision of the portfolio is crucial for this. Supervison must be directed towards asking questions about things that are taken for granted by the student teachers, shaped in 'why' questions and giving feedback (Freidus, 1998; Orland-Barak & Kremer-Hayon, 2001). Sample themes with meaning-oriented learning activities could perhaps serve as illustrations to show student teachers in what ways they can think about their experiences and what the aims of the course are with reflection in the portfolio (see also Krause, 1996; Ward & McCotter, 2004). It is known from research into the learning of student teachers that they differ in the ways they learn from their experiences. Some student teachers are more willing than others to relate problems or situations that arise to their actions in teaching practice, and to examine what underlying factors can play a role in that (Kubler LaBoskey, 1993; Oosterheert & Vermunt, 2001). This was also clear in our study. The student teachers varied in the extent to which they showed meaning-oriented learning activities in their themes. The findings of Vermetten, Vermunt, and Lodewijks (2002) show that students use instructional measures in different

ways. The way students 'use' their learning environment corresponds to their own views on learning. This may imply that student teachers' conceptions of learning and their learning styles also must be given attention in supervision of the portfolio, and not only the portfolio themes.

5

General conclusions and discussion

In this chapter, the major results and conclusions of the present thesis are summarised in the light of the research questions of the study (section 5.1). In section 5.2 we discuss some points related to the purpose of the learning portfolio in the training of student teachers. Attention is also paid to the limitations of the study (section 5.3) and suggestions for further research are made (section 5.4). We conclude this chapter with practical implications of the study for teacher education (section 5.5).

5.1 Conclusions

Student teachers' perception of the learning portfolio

In Chapter 2 we reported on the functions of the learning portfolio in student teachers' learning processes as perceived by the student teachers themselves. The research question in this study concerned student teachers' understanding of 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? On the basis of the analysis of the interviews with the student teachers and their portfolio-evaluation reports, we distinguished seven functions of the learning portfolio. There were two product functions ('meeting the requirements' and 'showing others or yourself') and five process functions ('recollecting and structuring experiences', 'evaluating development', 'understanding experiences', 'understanding the learning process', and 'understanding yourself as a teacher'). This distinction between a product and a process function of the learning portfolio is also made in the portfolio literature (e.g., Darling, 2001; Loughran & Corrigan, 1995).

By relating the process function to the learning process of student teachers, we obtained a subtler picture of the process function of the learning portfolio. Two subgroups of process functions of the portfolio were distinguished based on the type of learning they facilitate: a group of process functions geared to action and improvement of action in teaching practice and a group of process functions geared to understanding 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', were geared to action and improvement of action in teaching practice. In these functions the learning portfolio has a bearing on the learning process, but does not play a role in it, in the sense that working on the portfolio starts a new learning process. 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. In these latter functions the learning portfolio plays a role in the learning process of the student teachers. These portfolio functions were mentioned less often than the other functions mentioned by the student teachers. The homogeneity analysis of correlations between the portfolio functions revealed that internal motivation to work on the portfolio seems to play a role in mentioning these portfolio functions.

Based on these results we conclude that teacher educators must inform the student teachers well about the intended function(s) of the learning portfolio. When they aim for working on a portfolio to start a learning process, they must make clear to the student teachers the difference between a portfolio that has a bearing on their learning process and a portfolio that also plays a role in their learning process, and how student teachers can realise the latter. Where possible, teacher educators should ensure that student teachers are as much as possible internally motivated to work on the portfolio and that they do not see working on a portfolio purely as a compulsory element of the course.

Reflection in the portfolio

The second research question of our study was, How do student teachers reflect in their portfolios? To be able to answer this question, we first had to determine how reflection in the portfolio could be operationalised. In Chapter 3 we described how we searched for an operationalisation of the concept of reflection in the literature. Because of the operationalisation of reflection in terms of learning activities, the research question on how

student teachers reflect in their portfolios was further specified in the question, What learning activities do student teachers undertake as they compile their portfolios? From the portfolio analysis, in which we used the learning activities distinguished by Vermunt and Verloop (1999), six learning activities emerged: 'recollection', 'evaluation', 'analysis', 'critical processing', 'diagnosis', and 'reflection'. These learning activities differed in the types of learning they aimed at: action and improvement of action in teaching practice, or understanding the underlying processes that can play a role in action in teaching practice. This distinction fits into a division used in research on how student teachers learn, between performance-oriented student teachers and meaning-oriented student teachers (e.g., Kubler LaBoskey, 1993; Oosterheert & Vermunt, 2001). 'Recollection' and 'evaluation' addressed immediate performance, and the improvement of performance, in teaching practice. The learning activities 'analysis', 'critical processing', 'diagnosis', and 'reflection' were oriented towards understanding the underlying processes that can play a role in action in teaching practice. These learning activities were found to a much lesser extent in the portfolios than 'recollection' and 'evaluation'.

From the portfolio analysis it appeared, furthermore, that the learning activities could be undertaken both in the present (during the production of the portfolio) and in the past (at an earlier stage in the learning process). In addition, a distinction could be made with regard to the period of time to which the learning activities related. All learning activities could refer to separate experiences or related experiences over a period of time and different contexts. The learning activities that emerged from the portfolio themes frequently followed each other in a particular, inter-related, sequence. This pattern of learning activities could coincide with a theme, or several patterns could be found within one portfolio theme. The pattern of learning activities was confined, in most cases, to a description of separate or related situations, experiences, or activities, followed by an evaluation. In a small number of portfolio themes, a more elaborate pattern was found. In these cases, the description of the situation(s), experiences, or activities was followed by the learning activities 'analysis', 'critical processing', 'diagnosis', or 'reflection'.

Based on these results, we conclude that mainly forms of 'recollection' and 'evaluation' were found in the portfolios of the student teachers. Using these learning activities, student teachers selected the experiences that were important to them and examined what they knew and were able to do. These learning activities form a condition for starting a learning process. Processing of these experiences using the meaning-oriented learning

activities 'analysis', 'critical processing', 'diagnosis', or 'reflection', however, rarely takes place. To realize that working on the portfolio starts a learning process, student teachers must go through an elaborate pattern of learning activities and the learning activities 'recollection' and 'evaluation' must be followed by meaning-oriented learning activities.

Meaning-oriented learning activities and working on the portfolio

In Chapter 4 we reported on the manifestation of meaning-oriented learning activities in the portfolio themes. This part of the study followed the part of the study described in Chapter 3 into the learning activities that student teachers undertake as they work on their portfolios. In that part of the study we distinguished between action-oriented learning activities geared to (the improvement of) action in teaching practice and meaning-oriented learning activities geared to the understanding of underlying processes that can play a role in action in teaching practice. In this part of the study we focused on when and how the meaning-oriented learning activities (analysis, critical processing, diagnosis, and reflection) manifest themselves in a portfolio theme. Sub-questions were (a) What themes do the student teachers include in their portfolios? (b) Which portfolio themes show meaning-oriented learning activities? and (c) How do the meaning-oriented learning activities manifest themselves within a portfolio theme in relation to the other learning activities in the theme? Based on the portfolio analysis we distinguished six theme clusters, about problems experienced, the educational reform (*Studiehuis*), teaching and testing, activities other than teaching, oneself as a teacher, and development and functioning. We found themes with meaning-oriented learning activities in four of the six theme clusters distinguished: in problems experienced, the educational reform, teaching and testing, and development and functioning. These four theme clusters seemed to relate to each other in the personal involvement of the student teachers with themes in these clusters. This is in line with the findings of other researchers (e.g., Desforges, 1995; Vermunt & Vermetten, 2004). The basic form of these portfolio themes was always composed of the action-oriented learning activities 'recollection' and 'evaluation'. The meaning-oriented learning activities generally played a small part next to these action-oriented learning activities in the portfolio themes. It is characteristic of meaning-oriented learning activities that they go into the 'why' of experiences. They form as it were a continuation, a depth, of the description of a situation, an approach, an opinion, or an evaluation of functioning or development.

Based on these results we conclude that meaning-oriented learning

activities did not occur much and only in those portfolio themes in which the student teachers felt personally involved. Personal involvement should be stimulated as much as possible through the selection of the portfolio themes.

5.2 Discussion

The concept of reflection

We have described what student teachers see to be the value of the learning portfolio for their learning process and how they reflect in their portfolios. In developing a description framework, great difficulty was posed by the concept of reflection. The operationalisation in terms of learning activities offered us opportunities not only to describe the portfolio and interview data, but also to do justice to the variation we found in these data. Because of this operationalisation, we gained a greater understanding of the concept of reflection, of which it is often said in the reflection literature that it has been conceptualized in many different ways and that it is a too general and wide concept (Hatton & Smith, 1995; Korthagen, 2001). In the literature, the content of reflection, the product of reflection, and the process of reflection are often used interchangeably. The result of this is that the concept of reflection is extremely vague and must be seen as a principle for teacher education rather than an indication for a mental thinking process. The operationalisation in terms of learning activities offered us possibilities to relate reflection and the learning of student teachers, and with that to gain more insight into the operation of the learning portfolio and the type of learning that the portfolio can stimulate. It was confusing in this study that because of the operationalisation of reflection in terms of learning activities the 'broad'concept of reflection enclosed reflection 'in the narrow sense'. The question arises whether teacher education institutes must still speak of reflection 'in the broad sense'. Would it not be better if they indicated what learning activities they mean by that, of which reflection 'in narrow sense' is possibly one?

Results of the content analyses of the portfolios indicated that a distinction could be made between action-oriented and meaning-oriented learning activities. Undertaking action-oriented learning activities leads to *consciousness-raising* of what one knows and is able to do; undertaking meaning-oriented learning activities leads to *understanding* of experiences in teaching and learning. Meaning-oriented learning activities can be

considered forms of deep-processing. They are directed towards making sense of experiences and are important for the building up and structuring of practical knowledge (Entwistle & McCune, 2004). It is important for the learning process of student teachers that they undertake both action-oriented learning activities and meaning-oriented learning activities. The action-oriented learning activities (recollection and evaluation) that we found in our study may be considered forms of selection of experiences. This selection of experiences is necessary for subsequent processing of these experiences (Vermunt & Verloop, 1999). We found little evidence of processing of these experiences using meaning-oriented learning activities in the portfolios. Without the processing of experiences there is no development of theories (of practical knowledge) and it remains separate observations of experiences (Kolb, 1984).

Biggs and Collis (1982) examined the learning outcomes of students in different academic contexts. They found that the outcomes of students' learning displayed similar stages, from 'knowing more' (quantitive) to 'to deepen understanding' (qualitative). They indicate that training institutes must pay attention to learning goals that aim at the qualitative aspects of learning, and that this should be supported by both teaching and assessment methods. "*Quantitative conceptions of teaching and learning address the first aim* [increase of knowledge] *only, so that the deepening of understanding is left to students' predilections for spontaneous deep learning activities*" (Biggs, 2003, p.41). Teacher education institutes should think about the purposes for which they wish to use the learning portfolio. When they aim at understanding, they must match the goal, use, and supervision of the portfolio to that.

The learning of student teachers

We found some meaning-oriented learning activities in the learning portfolios of the student teachers. They occurred especially in themes about class management, teaching, and testing which were personally important for the student teachers. Even in these themes, however, their occurrence was rare. The question is whether it is possible to stimulate student teachers to undertake more meaning-oriented learning activities by working on their portfolios, and also with regard to other aspects of the teaching profession, than they do already. It is known from research that student teachers differ in the way they learn from their experiences. The distinction between action-oriented and meaning-oriented learning activities that came up in this study fits into a division used in research into how student teachers learn. Some

student teachers are more willing than others not only to relate problems or situations that arise to their actions in teaching practice, but also examine what underlying factors can play a role in these problems and situations (Kubler LaBoskey, 1993; Oosterheert & Vermunt, 2001). The way the portfolio was used in this study is best suited to student teachers who have a meaning-oriented learning style. These student teachers are already directed towards gaining insight into situations and experiences. The student teachers' beliefs about learning seem to play a role in their use of the portfolio. The results of the study by Vermetten, Vermunt, and Lodewijks (2002) show that students use instructional measures in different ways. The way students 'use' their learning environment corresponds to their own views on learning. For the training of teachers, this means that it is important to pay explicit attention to the learning of student teachers, to student teachers' conceptions of learning, and to their learning styles. Working on a portfolio should be related to that.

5.3 Limitations of the study

The study has a number of limitations. Firstly, we interpreted reflection as a mental process that takes place while working on the portfolio. We deduced reflection as a process from the product of the portfolio using content analyses. This implies the restriction that it was possible to describe only that reflection in the portfolio that we found in the portfolio themes. The question arises whether what has been written has also been undertaken, and vice versa. So we could only deduce cognitive learning activities, and no affective learning activities, because it was not usual for the students to write about any feelings they may have had when producing their portfolio in the portfolio itself. However, feelings do play a role in the reflection process (see Korthagen, 2001).

Secondly, for the reason mentioned above, the learning activities inherent in working on a portfolio, such as selection and structuring, were also not given attention in the study. These learning activities refer to the portfolio as a whole and were not usually reported explicitly by the student teachers in their portfolios. Researchers have found that there is a relation between the selection of experiences and the way these experiences are processed by students (Vermunt & Vermetten, 2004).

Thirdly, in the description of the reflection in the portfolios, we related working on a portfolio to how student teachers learn. In the description of

reflection, however, we restricted ourselves to the description of the process (the mental activities) and the content to which the mental activities refer. We left the product of reflection (practical knowledge) out of consideration. For this reason, we were unable to examine whether different learning activities led to different types of practical knowledge.

Fourthly, to enable us to describe reflection in the portfolios, we developed a description framework by mapping the variation in reflection that we found in the data ('outcome space', Marton & Booth, 1997). This description framework was developed on the basis of the portfolios of a small number of student teachers, from one course year, and from one teacher education course. For this reason, our research findings cannot necessarily be generalised to other teacher education contexts. More variation in reflection in portfolios is possible.

Fifthly, the study is of a descriptive and qualitative nature. Only content analyses were used: content analyses of retrospective interviews, portfolio-evaluation reports, and portfolios. We did not examine factors that may have influenced the reflection we found in the portfolios and the influence of these factors on the portfolio functions that were mentioned by the student teachers. In the portfolio literature, ownership, experience in producing a portfolio, instruction and supervision, and learning orientation are mentioned as factors that can play a role in the use of the portfolio by student teachers (e.g., Darling, 2001; Loughran & Corrigan, 1995; Meyer & Tusin, 1999; Wade & Yarbrough, 1996).

5.4 Suggestions for further research

Research into the learning portfolio

We have taken the initiative in filling a gap in portfolio research. Up to now, much attention has been paid to factors that influence the use of the learning portfolio by student teachers, in particular to reasons why student teachers use or fail to use the portfolio in the way that the teacher education institute deems desirable. Little empirical research has been done so far into reflection in the (learning) portfolio. As long as it remains unclear what is meant by reflection and it is not indicated clearly what the aim of using the learning portfolio is, it will be difficult to examine whether the portfolio is a suitable instrument to stimulate reflection (Zeichner & Wray, 2001). An essential step is omitted in this way, which is not only important for the research into portfolios but can also contribute to the development of theory about

the learning of student teachers. Neither making a portfolio nor reflection is an aim in itself. The portfolio is an instrument that must contribute to the learning process of student teachers. Further portfolio research should, therefore, be related to research on how student teachers learn.

Research into student teachers' learning
More empirical research on how student teachers learn is desirable. Oosterheert and Vermunt (2001) mention that little is known about the learning process of student teachers. Much is unclear. How do student teachers learn? What is the nature of the practical knowledge they develop? What role does reflection play in that? Research in higher education into how students learn can facilitate research into, for example, learning activities that student teachers undertake and their learning styles. These concepts have been examined in an academic context and they must be given their own meaning in the context of the education of teachers. This latter context is different and complex, and one in which learning from experiences takes an important place. Examination of the characteristics of the learning environment of student teachers makes clearer what is desirable and achievable for the learning of student teachers. Instruments such as the portfolio can then be used to achieve more specific aims and their value can be examined in a more targeted manner (Breault, 2004; Delandshere & Arens, 2003).

5.5 Recommendations for teacher education

Purpose and use of the learning portfolio
The purpose that students reflect on their development as teachers by working on their portfolios is not specific enough. Reflection conceived of as a thinking process includes different thinking or learning activities. We made a distinction within the process function of the learning portfolio between learning activities geared to action and the improvement of action (recollection and evaluation) and learning activities geared to understanding underlying processes that can play a role in teaching practice (analysis, critical processing, diagnosis, and reflection). Most of the student teachers in this study saw the portfolio's function mainly in terms of looking back on their performance in teaching practice, and making explicit what they knew and what they could do compared with earlier in the course. The portfolios mainly showed the learning activities 'recollection' and 'evaluation'. These

learning activities encouraged the student teachers to become aware of their own actions, functioning, and development. For this reason, the portfolio had a bearing on the student teachers' learning process, but did not always initiate a learning process.

Teacher education institutes should work out whether this is what they aim at with the portfolio, in particular with reflection. If they aim for student teachers to undertake learning activities that lead to deep-processing, in other words, to the development of practical knowledge, they should examine whether the learning environment in which the portfolio functions supports this type of learning. Learning during the teacher education course differs from academic learning. Student teachers find themselves in a completely different and complex learning environment, in which learning from experience has an important place and in which problems in practice attract much attention. Embarking on learning activities that are geared to improving understanding is time-consuming (see also Boekaerts & Simons, 1995). Teacher education institutes should give student teachers the time to distance themselves from teaching practice.

The use of the learning portfolio in the teacher education course examined in this study does not seem well suited to stimulate learning activities such as analysis, critical processing, diagnosis, and reflection. It is possible 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 (Krause, 1996; Oosterheert, 2001). 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. Teacher education institutes should pay attention to the extent to which they appeal to student teachers' capacity for self-regulating their learning process by using the portfolio and, if necessary, they must help and supervise the student teachers more in the process of learning from experiences.

Instruction and portfolio supervision

As mentioned above, the student teachers mainly described in their portfolios what they had done, what areas they had made progress in, what situations they had come across, how they dealt with them, and what they had learned from them. A possible explanation for this other than the reasons mentioned above is that the concepts of 'professional development' and 'reflection' were not explained well by the lecturers and supervisors on the course. Student teachers often conceived of development as being able to do something better, and not as forming an opinion about something, becoming aware of their own beliefs, changing their beliefs, etc. Moreover, student teachers tended to be more inclined to look at *what* they had changed (what aspects of their practice had improved) than at *how* they had changed (how their learning process had gone).

It may be worthwhile to give student teachers the opportunity to 'experience' the various process functions of the portfolio by means of exercises, 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.

Student teachers do generally already ask the 'what works' and 'how can I' questions. Portfolio supervision should aim to encourage the student teachers to ask the 'why' questions. Student teachers have probably not gained enough experiences to make out for themselves the important experiences and learning moments and where there are still questions and lack of clarity (Kagan, 1992). They need others to be able to ask questions about things that go without saying and to see that a situation can also be interpreted in other ways (Freidus, 1998; Oosterheert, 2001; Orland-Barak & Kremer-Hayon, 2001).

Personal involvement

It appears from the results that to stimulate the undertaking of meaning-oriented learning activities it is important that student teachers do not see working on a portfolio as a compulsory part of the course, but that that they see that they work on a portfolio for themselves, for their own development. In particular personal involvement with the themes on which the student teachers work seems essential. Meaning-oriented learning activities arise

from a problem which is perceived as urgent or from personal interest in certain teaching activities that the student teachers enjoyed very much or find important, or both.

When a course aim is that student teachers undertake meaning-oriented learning activities by working on their portfolio themes and come to learning, to developing practical knowledge, the selection of themes could be a good starting point. Student teachers seem more willing to undertake meaning-oriented learning activities when the themes are relevant to them and are personally important, so that they are intrinsically motivated to work on the themes. This means that to promote meaning-oriented learning activities, it can be important to give student teachers a free choice of themes in their portfolios. Because undertaking meaning-oriented learning activities requires much time and energy (Newton, 2000), the number of themes that the student teachers have to include in their portfolios must not be too high. Five to eight themes per portfolio is quite a lot and may mean that some themes are included in the portfolio out of necessity to make up the required number, with the result that the student teachers only undertake action-oriented learning activities.

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Summary

Chapter 1 forms the general introduction to the dissertation. In this chapter we describe the background to the study, the purpose, relevance, and context of the study, and the research questions. In teacher education great importance is attached to the stimulation of reflection on experiences by student teachers, so that student teachers are able to continue to learn after they have finished their training. It is impossible to prepare student teachers for all situations they may come up against and to equip them with all the necessary knowledge and skills. Furthermore, it is becoming more and more important that teachers be willing and have the ability 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. Reflection is seen as a powerful tool enabling teachers to continue to develop in a structured way.

Different techniques are used in teacher education to stimulate reflection by student teachers. Recently, the portfolio also started to be used as an instrument for reflection. In response to changed views on teacher assessment and the professional development of teachers, new assessment methods have been developed that do justice to the complexity of teaching and learning to teach. These new assessment methods can offer insights into both the behaviour and the knowledge and conceptions of teachers, can contribute to the professional development of teachers, and fit into a constructivist view of learning. The portfolio is one of these relatively new assessment methods. Reflection on one's own thinking and performance is a central component in the learning portfolio. The main focus of this type of portfolio is student teachers' reflection on their learning process with a view to advancing professional development. Working on a learning portfolio should enable student teachers to concretize their learning process using information about their teaching practice and their course, and to think about their functioning in teaching practice in a structured way.

This study was needed because results from recent research into the portfolio as a tool for reflection indicate that student teachers are not automatically stimulated to reflect on their experiences as a result of working on a portfolio. In the portfolio literature it is mentioned more and more often that the quality and value of the portfolio as a tool for reflection should be brought up for debate. To allow debate on this it is necessary that the concept of reflection in relation to working on a portfolio be explained. Furthermore,

without clarification of this concept it is not possible to compare results from portfolio research. The aim of the study described in this dissertation was to describe the nature of reflection in the learning portfolios of student teachers. It was aimed at developing a description framework that can be used to explain the concept of reflection in relation to working on a portfolio and to contribute to a better insight into the operation of the learning portfolio.

We explored the use of the learning portfolio among 21 student teachers during their one-year postgraduate teacher-training course at Leiden University in the Netherlands. During the course of the year, the student teachers produced two learning portfolios dealing with what they felt to be important learning experiences in their teaching practice and in their university studies. The learning portfolio was used during the course as an instrument to encourage student teachers to reflect on themselves as beginning teachers, and to make them aware of how they were progressing in their professional development and of their own part in that. The self-chosen portfolio themes formed the core of the portfolio. In these themes, the student teachers reflected on their learning experiences, beliefs, learning points, and development. A theme is a subject that is or has been important in the development of a student teacher. It is a cover-all term that links different learning experiences. Examples of themes are interaction with pupils, oneself as a teacher, conversation skills in the senior years at secondary school, and motivating pupils.

The study can be characterized as a small-scale, qualitative, in-depth study. The general problem of the study was whether student teachers reflect in their learning portfolios and in what way. This general problem was divided into three research questions: (1) What is student teachers' understanding of working on a learning portfolio? (2) How do student teachers reflect in their portfolios? and (3) When and how do meaning-oriented learning activities manifest themselves in a portfolio theme?

In **Chapter 2** we report on the first research question, about student teachers' understanding of working on a learning portfolio. We concentrate on the functions of the learning portfolio in student teachers' learning process as perceived by the student teachers' themselves. To get a picture of how the portfolio functioned, we interviewed the student teachers about the value of making a portfolio for their learning process. The interviews were held at the end of the year of training and they dealt with the two portfolios that the student teachers had produced. We also analysed the portfolio-evaluation reports that the student teachers had written as a compulsory element of

their portfolios. In these reports they gave an account of their experiences of working on their portfolios and explicitly examined the value of the portfolio for their learning process. We examined different portfolio studies to find starting points for the content analysis of the interviews and the reports. In the portfolio literature two functions of the learning portfolio are generally distinguished: 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 to help them to work on their 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.

To describe the process function of the portfolio we used the learning activities distinguished by Vermunt and Verloop (1999) for the content analysis. The development of the category system for the analysis of the interviews and reports was an iterative process going from theory to data and vice versa. We found five learning activities (recollecting, structuring, evaluating, analysing, and reflecting) which formed the base for the formulation of the portfolio functions. The content to which the (learning) activities referred was used to make a further distinction within the (learning) activities and to formulate portfolio functions.

Seven functions of the learning portfolio emerged from the analysis of the interviews with the student teachers and the portfolio-evaluation reports. Most of the student teachers considered the portfolio to serve several functions at the same time. We distinguished 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'). A further distinction was made 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 geared to understanding underlying processes that can play a role in action in teaching practice and learning to teach were mentioned less often. It is precisely with respect to these process functions that the portfolio has a bearing on the learning process that the student teachers have gone through, and starts a new learning process.

A homogeneity analysis was used to determine whether there were empirically based associations between the functions of the portfolio mentioned by the student teachers. 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.

The results of this part of the study reveal that the student teachers mentioned the process function of the learning portfolio as a value of working on a portfolio, but they meant different things with the process function of the portfolio. The student teachers mentioned process functions in which the portfolio only has a bearing on their learning process and process functions in which the portfolio also influences their learning process and starts a new one. The latter process functions were mentioned less often by the student teachers, so they especially saw working on a portfolio as looking back on their development in the past period and attaching a value judgement to that. When teacher educators intend that working on a portfolio should start a learning process, they have to communicate clearly the process functions of the portfolio that are geared to that to the student teachers. Furthermore, it is important that student teachers are as much as possible intrinsically motivated to work on the portfolio and that they do not see working on a portfolio purely as a compulsory part of the course.

In **Chapter 3** we answer the second research question, on the nature of reflection in the portfolios. We describe how we searched for an

operationalisation of the concept of reflection in the literature. Reflection in the portfolio concerns the *process* of interpreting experiences during the production of the portfolio. This means that reflection in the portfolio should be conceived of as a mental process that takes place while a portfolio is being made. The literature on reflection offered us little assistance in describing this thought process. The lack of clarity in the literature on reflection about the thought processes that make up the reflection process led us to turn to the literature that specifically addresses thought processes and that was better suited to the nature of the portfolio data. Theory from educational psychology offered opportunities to distinguish and describe thought processes in terms of learning activities that student teachers undertake as they work on their portfolios. To develop the category system for the analysis of the 39 portfolios that were gathered in this study, we used the learning activities distinguished by Vermunt and Verloop (1999). The process of developing the system of categories was an iterative process between theory and data and vice versa. The final system of categories consisted of six learning activities: the cognitive learning activities, 'analysis', 'recollection', and 'critical processing'; and the regulative learning activities, 'diagnosis', 'evaluation', and 'reflection'. These learning activities were broken down into 34 subcategories (see Table 3.1).

'Recollection' was the learning activity that was found most frequently: it was found in each portfolio theme. A combination of 'recollection' and 'evaluation' was found in many portfolio themes. The student teachers described their experiences and activities ('recollection'), and expressed a value judgement on their chosen approach, their development, or functioning, or gave an opinion about something ('evaluation'). The learning activities 'analysis', 'critical processing', diagnosis', and 'reflection' emerged far less often from the portfolios. Almost all of the student teachers made a start on these, but to a much lesser extent than 'recollection' and 'evaluation'.

The learning activities that we found in the portfolio themes differ in the types of learning they aim at: action and improvement of action in teaching practice, or understanding the underlying processes that can play a role in action in teaching practice. This distinction fits into a division used in research on how student teachers learn, between performance-oriented student teachers and meaning-oriented student teachers. 'Recollection' and 'evaluation' address immediate performance, and the improvement of performance, in teaching practice. We indicate these learning activities as action-oriented learning activities. The learning activities 'analysis', 'critical processing', 'diagnosis', and 'reflection' are oriented towards understanding

the underlying processes that can play a role in action in teaching practice. We indicate these learning activities as meaning-oriented learning activities.

From the portfolio analysis it appeared, furthermore, that the learning activities could be undertaken both in the present (during the production of the portfolio) and in the past (at an earlier stage in the learning process). In addition, a distinction could be made with regard to the period of time to which the learning activities related. All six learning activities could refer to separate experiences or related experiences over a period of time and different contexts. The student teachers discussed separate situations, events, or activities that took place at specific times, and they also made connections between experiences that were important to them and discussed these relationships in their portfolios.

The learning activities that emerged from the portfolio themes frequently followed each other in a particular, inter-related, sequence (see Figure 3.1). This pattern of learning activities could coincide with a theme, or several patterns could be found within one portfolio theme. The pattern of learning activities was confined, in most cases, to a description of separate or related situations, experiences, or activities, followed by an evaluation. In a small number of portfolio themes, a more elaborate pattern was found. In these cases, the description of the situation(s), experiences, or activities was followed by the learning activities 'analysis', 'critical processing', 'diagnosis', or 'reflection'.

The results of this part of the study show that mainly forms of the learning activities 'recollection' and 'evaluation' appeared in the portfolios of the student teachers. The student teachers seemed to have a tendency to focus mainly on their own practice and how to improve it. The learning activities that are oriented towards understanding processes that can play a role in action in teaching practice were found to a much lesser extent in the portfolios. Using the action-oriented learning activities 'recollection' and 'evaluation', student teachers selected the experiences that were important to them and they examined what they knew and were able to. These learning activities form a condition for starting a learning process. Processing of these experiences using the meaning-oriented learning activities 'analysis', 'critical processing', 'diagnosis', or 'reflection', however, rarely takes place. To realize that working on the portfolio starts a learning process, student teachers must go through an elaborate pattern of learning activities and the learning activities 'recollection' and 'evaluation' must be followed by meaning-oriented learning activities.

In **Chapter 4** we report on the third research question, on the manifestation of meaning-oriented learning activities in the portfolio themes. This part of the study followed the part of the study described in Chapter 3, into the learning activities that student teachers undertake as they work on their portfolios. In that part of the study we distinguished between action-oriented learning activities geared to the improvement of action in teaching practice and meaning-oriented learning activities geared to the understanding of underlying processes that can play a role in action in teaching practice. In this part of the study we focused on when and how the meaning-oriented learning activities manifest themselves in a portfolio theme. Meaning-oriented learning activities can be considered forms of deep-processing. They are directed towards making sense of experiences and are important for the construction and structuring of practical knowledge.

To be able to answer the third research question, we first analysed the content of all portfolio themes. We compared all portfolio themes and we classified the themes in clusters based on similarities and differences. Based on the portfolio analysis we distinguished six theme clusters, about problems experienced, the educational reform (*Studiehuis*), teaching and testing, activities other than teaching, oneself as a teacher, and development and functioning. Next, we determined in which portfolio themes there were meaning-oriented learning activities. We found meaning-oriented learning activities in 122 of the 310 portfolio themes. There were great differences between the student teachers in the number of themes with meaning-oriented learning activities. All but one of the student teachers, however, had one or more themes in the portfolio in which meaning-oriented learning activities occurred.

We found themes with meaning-oriented learning activities in four of the six theme clusters distinguished; in problems experienced, the educational reform, teaching and testing, and development and functioning. These four theme clusters seemed to relate to each other in the personal involvement of the student teachers with themes in these clusters.

The basic form of these portfolio themes was always composed of the action-oriented learning activities 'recollection' and 'evaluation'. The meaning-oriented learning activities generally played a small part next to these action-oriented learning activities in the portfolio themes. It is characteristic of meaning-oriented learning activities that they go into the 'why' of experiences. They form as it were a continuation, a depth, of the description of a situation, an approach, an opinion, or an evaluation of functioning or development.

The results of this part of the study show that meaning-oriented learning activities did not occur much and only in those portfolio themes in which the student teachers felt personally involved. Personal involvement should be stimulated as much as possible through the selection of portfolio themes.

In **Chapter 5** we report the main conclusions of the study. We discuss the concept of reflection and the operationalisation of reflection that we used in this study. By linking the reflection literature to the literature on how student teachers learn, we obtained a subtler picture of the process of reflection that working on a portfolio can start. The operationalisation in terms of learning activities offered us possibilities to describe the data and to do justice to the variation we found in that. Results from the content analyses of the portfolios showed that a distinction could be made between action-oriented and meaning-oriented learning activities. Undertaking action-oriented learning activities leads to *consciousness-raising* of what one knows and is able to do; undertaking meaning-oriented learning activities leads to *understanding* of experiences in teaching and learning. For the learning process of student teachers it is important that they undertake both action-oriented and meaning-oriented learning activities. The action-oriented learning activities (recollection and evaluation) that we found could be considered forms of selection of experiences. This selection of experiences is necessary for subsequent processing of these experiences. There was little evidence of processing of these experiences using meaning-oriented learning activities in the portfolios; without the processing of experiences there is no development of theories (of practical knowledge).

The limitations of the study are formed by the limitations of the method (content analysis) that was used and the small number of students that were involved in this study. It was only possible to describe the reflection in the portfolios that we saw in the portfolio themes. The description framework for reflection in the portfolio that was generated was based on the portfolios of a small number of student teachers, from one course year, and from one teacher education course. For this reason, our research findings cannot necessarily be generalised to other teacher education contexts. We did not examine factors that may have influenced the reflection we found in the portfolios.

Two topics were recommended for future research. Portfolio research should be related to research on how student teachers learn. Neither making a portfolio nor reflection is an aim in itself. The portfolio is an instrument that must contribute to the learning process of student teachers. Furthermore,

more empirical research into how student teachers learn and their learning environments is desirable. Much is still unclear and unknown. When more is known about how student teachers learn and what is desirable and achievable in the context of training teachers, instruments such as the portfolio can be used to achieve more specific aims and their value can be investigated in a more targeted manner.

Teacher education institutes should work out the purpose for which they aim to use the learning portfolio. The goal that students reflect on their development as teachers is not specific enough. Reflection encloses different learning activities. Most of the student teachers in this study saw the portfolio's process function as having a bearing on their learning process. The portfolios mainly showed the learning activities 'recollection' and 'evaluation'. Teacher education institutes should examine whether this is their purpose for the portfolio, in particular for reflection. When they aim for student teachers to undertake learning activities that lead to deep-processing, the development of practical knowledge, they must match the goal, use, and supervision of the portfolio to that.

Nederlandse samenvatting

Hoofdstuk 1 vormt de algemene inleiding van het proefschrift. In dit hoofdstuk beschrijven wij de achtergronden, het doel, de relevantie en de context van het onderzoek, en de onderzoeksvragen die in het onderzoek centraal staan. Lerarenopleidingen hechten veel belang aan het stimuleren van reflectie op ervaringen bij docenten-in-opleiding, zodat docenten-in-opleiding in staat zijn ook na hun opleiding te blijven leren van hun ervaringen. Het is onmogelijk om docenten-in-opleiding voor te bereiden op alle situaties die zij in het leraarsberoep kunnen tegenkomen en hun de kennis en vaardigheden die zij daarvoor nodig hebben aan te leren. Bovendien wordt het steeds belangrijker gevonden dat docenten bereid en in staat zijn om zichzelf verder te ontwikkelen in het beroep, om zelf de eigen kennis en vaardigheden verder uit te kunnen breiden, zodat zij in kunnen spelen op nieuwe ontwikkelingen die zich in het onderwijs voordoen, hun eigen handelen ter discussie kunnen stellen en hun onderwijs steeds verder kunnen verbeteren. Reflectie wordt gezien als een belangrijk middel om jezelf op een gestructureerde manier te blijven ontwikkelen.

In de lerarenopleiding worden verschillende technieken gebruikt om reflectie bij docenten-in-opleiding te stimuleren. Recent wordt ook het portfolio als reflectie-instrument gebruikt. Naar aanleiding van veranderde opvattingen over docentbeoordeling en professionele ontwikkeling van docenten, zijn nieuwe beoordelingsmethodes ontwikkeld die recht doen aan de complexiteit van het leraarsberoep en het leren onderwijzen. Deze nieuwe beoordelingsmethodes kunnen een beeld geven van zowel het gedrag van docenten als hun kennis en opvattingen, kunnen bijdragen aan de professionele ontwikkeling van docenten en passen bij een constructivistische visie op leren. Het portfolio is één van deze relatief nieuwe beoordelingsmethodes. In het bijzonder bij het ontwikkelingsportfolio ('learning portfolio') staat reflectie op het eigen denken en handelen centraal. Dit type portfolio is gericht op het stimuleren van reflectie op het leerproces bij docenten-in-opleiding met als doel verdere professionele ontwikkeling. Het werken aan een ontwikkelingsportfolio moet docenten-in-opleiding in staat stellen om hun leerproces te concretiseren met behulp van informatie uit hun onderwijspraktijk en opleiding en om op een gestructureerde manier na te denken over hun functioneren in de eigen onderwijspraktijk.

Aanleiding voor dit onderzoek is dat resultaten uit recent onderzoek naar het portfolio als reflectie-instrument erop wijzen dat docenten-in-opleiding

door het maken van een portfolio niet vanzelfsprekend aangezet worden om te reflecteren op hun ervaringen. In de portfolioliteratuur wordt steeds vaker aangegeven dat de kwaliteit en waarde van het portfolio als reflectie-instrument ter discussie moeten komen te staan. Om deze discussie te kunnen voeren, is het nodig dat het begrip reflectie in relatie tot het werken aan een portfolio verhelderd wordt. Zonder verheldering van dit begrip is het bovendien niet goed mogelijk om uitkomsten uit portfolio-onderzoek met elkaar te vergelijken. Het onderzoek dat beschreven is in dit proefschrift beschrijft de aard van reflectie in het ontwikkelingsportfolio van docenten-in-opleiding. Het heeft tot doel om een beschrijvingskader te ontwikkelen dat gebruikt kan worden om het begrip reflectie in relatie tot het werken aan een portfolio te verhelderen en bij te dragen aan een beter inzicht in de werking van het ontwikkelingsportfolio.

In dit onderzoek hebben wij het gebruik van het ontwikkelingsportfolio onderzocht bij 21 docenten-in-opleiding tijdens hun éénjarige postdoctorale lerarenopleiding aan de Universiteit Leiden. Gedurende het opleidingsjaar maakten de docenten-in-opleiding twee ontwikkelingsportfolio's die betrekking hadden op voor hen belangrijke leerervaringen in de onderwijspraktijk en tijdens het onderwijs op de universiteit. Het ontwikkelingsportfolio werd in de opleiding gebruikt als een instrument om docenten-in-opleiding te stimuleren na te denken over zichzelf als beginnend docent en om hen bewust te maken van (het verloop van) hun professionele ontwikkeling en hun eigen rol daarin. De zelfgekozen portfoliothema's vormden de kern van het portfolio. In die thema's reflecteren de docenten-in-opleiding op hun leerervaringen, hun opvattingen, hun leerpunten en hun ontwikkeling. Een thema is een onderwerp dat belangrijk is of is geweest in de ontwikkeling van een docent-in-opleiding. Het is een overkoepelende beschrijving die verschillende leerervaringen met elkaar verbindt. Voorbeelden van thema's zijn: interactie met leerlingen, ik als docent, gespreksvaardigheid in de bovenbouw en motiveren van leerlingen.

Het onderzoek kan gekarakteriseerd worden als een kleinschalige, kwalitatieve dieptestudie. De probleemstelling van het onderzoek was of docenten-in-opleiding reflecteren in hun ontwikkelingsportfolio en op welke manier zij dit doen. De probleemstelling viel uiteen in drie onderzoeksvragen: (1) Wat verstaan docenten-in-opleiding onder het werken aan een ontwikkelingsportfolio? (2) Hoe reflecteren de docenten-in-opleiding in hun portfolio? en (3) Wanneer en hoe manifesteren begripsgerichte leeractiviteiten zich in een portfoliothema?

In **hoofdstuk 2** beantwoorden wij de eerste onderzoeksvraag naar wat de docenten-in-opleiding verstaan onder het werken aan een ontwikkelingsportfolio. We richten ons daarbij op de functies van het ontwikkelingsportfolio in het leerproces van de docenten-in-opleiding zoals gezien door de docenten-in-opleiding zelf. Om een beeld te krijgen hoe het portfolio in de opleiding gefunctioneerd heeft, hebben we de docenten-in-opleiding geïnterviewd over de waarde van het werken aan een portfolio voor hun leerproces. De interviews zijn aan het einde van het opleidingsjaar afgenomen en gingen over de beide portfolio's die de docenten-in-opleiding in dat jaar gemaakt hadden. Daarnaast hebben we de portfolio-evaluatieverslagen geanalyseerd die de docenten-in-opleiding gemaakt hadden als verplicht onderdeel van hun portfolio. In deze verslagen beschrijven zij hun ervaringen met het werken aan hun portfolio's en gaan expliciet in op de waarde van het portfolio voor hun leerproces. We hebben verschillende portfolio-onderzoeken bestudeerd om handvatten te vinden voor de inhoudsanalyse van de interviews en de verslagen. In de portfolioliteratuur worden over het algemeen twee functies van het ontwikkelingsportfolio onderscheiden: een productfunctie en een procesfunctie. Docenten-in-opleiding werken niet alleen aan een ontwikkelingsportfolio om te laten zien wat zij bereikt en geleerd hebben (het portfolio als product). Het belangrijkste doel van het ontwikkelingsportfolio is dat het de docenten-in-opleiding helpt om aan hun eigen leerproces te werken (het portfolio als proces). De procesfunctie van het portfolio is de dynamische kant van het portfolio, omdat daar de interactie plaatsvindt tussen reflectie op het leerproces en het leerproces zelf.

Om de procesfunctie van het portfolio te kunnen beschrijven, hebben we voor de inhoudsanalyse gebruik gemaakt van de leeractiviteiten die Vermunt en Verloop (1999) onderscheiden. De ontwikkeling van het categorieënsysteem voor de analyse van de interviews en de portfolio-evaluatieverslagen was een iteratief proces tussen theorie en data. We troffen vijf leeractiviteiten aan (herinneren, structureren, evalueren, analyseren en reflecteren) die de basis vormden voor het formuleren van de portfoliofuncties. De inhoud waarop de (leer)activiteiten betrekking hadden, werd gebruikt om verder onderscheid te maken binnen de (leer)activiteiten en de portfoliofuncties te benoemen.

Zeven portfoliofuncties van het ontwikkelingsportfolio kwamen uit de analyse van de interviews met de docenten-in-opleiding en de verslagen naar voren. De meeste docenten-in-opleiding noemden meerdere functies van het portfolio voor hun leerproces. We konden twee productfuncties van het

portfolio onderscheiden, waarbij het maken van een portfolio beschouwd wordt als het werken aan een tastbaar eindproduct ('voldoen aan de eisen' en 'laten zien aan anderen of aan jezelf') en vijf procesfuncties, waarbij de interactie tussen reflectie op het leerproces en het leerproces zelf centraal staat ('herinneren en structureren van ervaringen', 'evalueren van ontwikkeling', 'begrijpen van ervaringen', 'begrijpen van het leerproces' en 'begrijpen van jezelf als docent'). Binnen de procesfuncties van het ontwikkelingsportfolio kon nader onderscheid gemaakt worden tussen twee subgroepen van procesfuncties afhankelijk van het type leren waarop deze gericht zijn. De twee functies 'herinneren en structureren van ervaringen' en 'evalueren van ontwikkeling' zijn gericht op het (verbeteren van het) handelen in de onderwijspraktijk. De drie functies 'begrijpen van ervaringen', 'begrijpen van het leerproces' en 'begrijpen van jezelf als docent' zijn gericht op het begrijpen van onderliggende processen die een rol kunnen spelen bij het handelen in de onderwijspraktijk en het leren onderwijzen.

Op één na zagen alle docenten-in-opleiding de procesfunctie van het portfolio voornamelijk als het terugkijken op hun handelen in de onderwijspraktijk in het afgelopen semester en het expliciteren van wat zij gedaan hadden, wat zij weten en kunnen in vergelijking met het begin van het semester. De procesfuncties die gericht zijn op het begrijpen van onderliggende processen die een rol kunnen spelen bij het handelen in de onderwijspraktijk en het leren onderwijzen, werden minder vaak genoemd. Het is juist bij deze procesfuncties dat het portfolio niet alleen betrekking heeft op het leerproces dat de docenten-in-opleiding hebben doorgemaakt, maar ook een nieuw leerproces in gang zet.

Om te bepalen of er een empirische samenhang was tussen de portfoliofuncties die de docenten-in-opleiding naar voren brachten, is een homogeniteitsanalyse uitgevoerd. Uit de analyse kwam naar voren dat docenten-in-opleiding tegelijkertijd zowel product- als procesfuncties van het ontwikkelingsportfolio noemden. Opvallend was dat het noemen van de productfunctie 'voldoen aan de eisen van de opleiding' samen kon gaan met het noemen van de procesfuncties die gericht zijn op het (verbeteren van het) handelen in de onderwijspraktijk, maar bijna nooit samenging met het noemen van de procesfuncties die gericht zijn op het begrijpen van onderliggende processen die een rol kunnen spelen bij het handelen in de onderwijspraktijk en het leren onderwijzen.

De resultaten van dit deel van het onderzoek laten zien dat de docenten-in-opleiding de procesfunctie van het ontwikkelingsportfolio benoemen als waarde van het werken aan een portfolio. Maar onder de procesfunctie

van het portfolio worden verschillende dingen verstaan. De docenten-in-opleiding noemen procesfuncties waarbij het portfolio alleen betrekking heeft op hun leerproces en procesfuncties waarbij het portfolio daarnaast ook hun leerproces beïnvloedt en een nieuw leerproces op gang brengt. Deze laatste procesfuncties worden minder vaak genoemd door de docenten-in-opleiding. Zij zien dus met name het werken aan een portfolio als het terugkijken op hun ontwikkeling in de afgelopen periode en het daaraan verbinden van een waardeoordeel. Als opleiders beogen dat het werken aan een portfolio een leerproces op gang brengt, moeten de procesfuncties die dat bewerkstelligen duidelijk naar de docenten-in-opleiding toe gecommuniceerd worden. Daarnaast is het belangrijk dat docenten-in-opleiding zoveel mogelijk vanuit eigen motivatie aan het portfolio werken en het werken aan een portfolio niet zien als zuiver een verplicht onderdeel van de opleiding.

In **hoofdstuk 3** beantwoorden wij de tweede onderzoeksvraag naar de aard van reflectie in de portfolio's. We beschrijven hoe we in de literatuur gezocht hebben naar een operationalisatie van het begrip reflectie. Bij reflectie in het portfolio gaat het om het *proces* van betekenis geven aan ervaringen dat tijdens het maken van het portfolio plaatsvindt. Dit betekent dat reflectie in het portfolio opgevat zou moeten worden als een mentaal proces dat tijdens het maken van een portfolio plaatsvindt. De reflectieliteratuur bood ons weinig handvatten om dit denkproces te kunnen beschrijven. Vanwege de onduidelijkheid in de reflectieliteratuur over de denkactiviteiten die deel uitmaken van het reflectieproces, hebben we gezocht naar literatuur die specifiek ingaat op denkactiviteiten en beter aansloot bij de aard van de portfoliodata. Theorie uit de leerpsychologie bood mogelijkheden om denkactiviteiten te onderscheiden en te beschrijven in termen van leeractiviteiten die docenten-in-opleiding ondernemen op het moment dat zij aan hun portfolio werken. Voor de ontwikkeling van het categorieënsysteem voor de analyse van de 39 portfolio's die in het onderzoek verzameld zijn, hebben we gebruik gemaakt van de leeractiviteiten die Vermunt en Verloop (1999) onderscheiden. De ontwikkeling van het categorieënsysteem was een iteratief proces tussen theorie en data. Het definitieve categorieënsysteem bestond uit zes leeractiviteiten: de cognitieve leeractiviteiten 'analyseren', 'herinneren' en 'kritisch verwerken', en de regulatieve leeractiviteiten 'diagnosticeren', 'evalueren' en 'reflecteren'. Binnen deze leeractiviteiten werden in totaal 34 subcategorieën onderscheiden (zie Tabel 3.1).

De leeractiviteit 'herinneren' troffen we het vaakst aan. In elk

portfoliothema kwam deze leeractiviteit terug. In veel portfoliothema's kwam een combinatie van 'herinneren' en 'evalueren' voor. De docenten-in-opleiding beschreven hun ervaringen en activiteiten (herinneren) en spraken een waardeoordeel uit over een gekozen aanpak, hun ontwikkeling of functioneren, of gaven hun mening over iets (evalueren). De leeractiviteiten 'analyseren', 'kritisch verwerken', 'diagnosticeren' en 'reflecteren' kwamen veel minder vaak uit de portfolio's naar voren. Zij werden wel door bijna alle docenten-in-opleiding in meer of mindere mate ondernomen, maar in verhouding tot 'herinneren' en 'evalueren' heel weinig.

De leeractiviteiten die we in de portfoliothema's terugvonden, verschillen onderling in het type leren waarop ze gericht zijn: (het verbeteren van) het handelen in de onderwijspraktijk of het begrijpen van onderliggende processen die bij het handelen in de onderwijspraktijk een rol kunnen spelen. Dit onderscheid sluit aan bij een indeling die gebruikt wordt in onderzoek naar het leren van docenten-in-opleiding, tussen handelingsgerichte docenten-in-opleiding en betekenisgerichte docenten-in-opleiding. 'Herinneren' en 'evalueren' zijn gericht op (het verbeteren van) het directe handelen in de onderwijspraktijk. We duiden deze leeractiviteiten aan als handelingsgerichte leeractiviteiten. De leeractiviteiten 'analyseren', 'kritisch verwerken', 'diagnosticeren' en 'reflecteren' zijn gericht op het begrijpen van onderliggende processen die een rol kunnen spelen bij het handelen in de onderwijspraktijk. We duiden deze leeractiviteiten aan als begripsgerichte leeractiviteiten.

Uit de portfolioanalyse kwam verder naar voren dat de leeractiviteiten zowel in het heden (tijdens het werken aan het portfolio) als in het verleden (tijdens het leerproces dat docenten-in-opleiding in hun portfolio beschrijven) ondernomen konden zijn. Een ander verschil tussen de leeractiviteiten dat uit de portfolioanalyse naar voren kwam, betreft de tijdsperiode waarop de leeractiviteiten betrekking hebben. Alle zes leeractiviteiten konden zowel betrekking hebben op afzonderlijke situaties, als op aan elkaar gerelateerde situaties over een tijdsperiode en contexten heen. De docenten-in-opleiding bespraken in hun portfolio afzonderlijke situaties, gebeurtenissen of activiteiten die plaatsvonden op een bepaald moment, maar zij brachten ook ervaringen die belangrijk voor hen waren met elkaar in verband en bespraken deze in hun onderlinge samenhang.

De leeractiviteiten die uit de portfoliothema's naar voren kwamen, volgden elkaar vaak in een bepaalde volgorde op waarbij de ene leeractiviteit betrekking had op de andere (zie Figuur 3.1). Dit patroon van leeractiviteiten kon samenvallen met een portfoliothema, maar er konden ook meerdere

patronen binnen een portfoliothema voorkomen. Het patroon van leeractiviteiten bleef meestal beperkt tot een beschrijving van afzonderlijke of aan elkaar gerelateerde situaties, ervaringen of activiteiten, gevolgd door een evaluatie. Bij een beperkt aantal portfoliothema's vonden wij een verder uitgewerkt patroon. De beschrijving en evaluatie van situaties, ervaringen of activiteiten werd dan gevolgd door de leeractiviteiten 'analyseren', 'kritisch verwerken', diagnosticeren' of 'reflecteren'.

De resultaten van dit deel van het onderzoek laten zien dat in de portfolio's van de docenten-in-opleiding voornamelijk vormen van de leeractiviteiten 'herinneren' en 'evalueren' voorkomen. De docenten-in-opleiding lijken geneigd om zich vooral te richten op het verbeteren van hun handelen in de onderwijspraktijk. De leeractiviteiten die gericht zijn op het begrijpen van onderliggende processen die een rol kunnen spelen bij het handelen in de onderwijspraktijk troffen we veel veel minder vaak aan in de portfolio's. Aan de hand van de handelingsgerichte leeractiviteiten 'herinneren' en 'evalueren' selecteren docenten-in-opleiding de voor hen belangrijke ervaringen en gaan na wat ze weten en kunnen. Deze leeractiviteiten vormen daarmee een voorwaarde om een leerproces op gang te brengen. Verwerking van ervaringen door middel van de begripsgerichte leeractiviteiten 'analyseren', 'kritisch verwerken', 'diagnostiseren' of 'reflecteren' vindt echter weinig plaats. Om te bewerkstelligen dat het werken aan het portfolio een leerproces op gang brengt, is het nodig dat de docenten-in-opleiding een uitgebreid patroon van leeractiviteiten doorlopen waarbij zij volgend op de leeractiviteiten 'herinneren' en 'evalueren' ook begripsgerichte leeractiviteiten ondernemen.

In **hoofdstuk 4** beantwoorden we de derde onderzoeksvraag naar de manifestatie van begripsgerichte leeractiviteiten in de portfoliothema's. In dit deel van het onderzoek sloten we aan bij het in hoofdstuk 3 beschreven deelonderzoek naar de leeractiviteiten die docenten-in-opleiding ondernemen bij het werken aan hun portfolio. In dat onderzoek maakten we onderscheid tussen handelingsgerichte leeractiviteiten gericht op het (verbeteren van het) handelen in de onderwijspraktijk en begripsgerichte leeractiviteiten gericht op het begrijpen van onderliggende processen die bij het handelen in de onderwijspraktijk een rol kunnen spelen. In dit deelonderzoek richtten wij ons op wanneer en hoe begripsgerichte leeractiviteiten zich in een portfoliothema manifesteren. Deze begripsgerichte leeractiviteiten kunnen beschouwd worden als vormen van diepteverwerking. Zij zijn gericht op betekenis verlenen aan ervaringen en zijn belangrijk voor het opbouwen en

structureren van praktijkkennis.

Om de derde onderzoeksvraag te kunnen beantwoorden, hebben we eerst alle portfolio's geanalyseerd op de inhoud van de portfoliothema's. We hebben de portfoliothema's met elkaar vergeleken en op basis van overeenkomsten en verschillen gegroepeerd in themaclusters. Uit de portfolioanalyse kwamen zes themaclusters naar voren, over: ervaren problemen, de onderwijsvernieuwing (Studiehuis), lesgeven en toetsen, activiteiten buiten het lesgeven, jezelf als docent, en ontwikkeling en functioneren. Vervolgens hebben we gekeken bij welke portfoliothema's begripsgerichte leeractiviteiten voorkwamen. Bij 122 van de in totaal 310 portfoliothema's troffen we begripsgerichte leeractiviteiten aan. Er waren grote verschillen tussen de docenten-in-opleiding in het aantal thema's met begripsgerichte leeractiviteiten. Echter, op één na hadden alle docenten-in-opleiding wel een thema in hun portfolio waaruit begripsgerichte leeractiviteiten naar voren kwamen.

We troffen thema's met begripsgerichte leeractiviteiten aan in vier van de zes themaclusters; bij thema's over ervaren problemen, de onderwijsvernieuwing, lesgeven en toetsen, en eigen ontwikkeling en functioneren. Wat deze vier themaclusters met elkaar lijkt te verbinden, is de persoonlijke betrokkenheid van de docenten-in-opleiding met thema's binnen deze clusters.

De basisvorm van deze thema's werd steeds gevormd door de handelingsgerichte leeractiviteiten 'herinneren' en 'evalueren'. De begripsgerichte leeractiviteiten namen over het algemeen maar een kleine plaats in naast deze leeractiviteiten. Kenmerkend voor de begripsgerichte leeractiviteiten is dat ze ingaan op het 'waarom' van ervaringen. Ze vormen als het ware een vervolg, een verdieping, op de beschrijving van een situatie, een aanpak, een mening of een evaluatie van het eigen functioneren of de eigen ontwikkeling.

De resultaten van dit deel van het onderzoek laten zien dat begripsgerichte leeractiviteiten weinig voorkomen en alleen bij die portfoliothema's waarbij de docenten-in-opleiding zich persoonlijk betrokken voelen. Persoonlijke betrokkenheid zou via de selectie van de portfoliothema's zoveel mogelijk gestimuleerd moeten worden.

In **hoofdstuk 5** beschrijven we de belangrijkste conclusies van het onderzoek. We bespreken het begrip reflectie en de operationalisatie van reflectie die wij in het onderzoek gebruikt hebben. Doordat wij de reflectieliteratuur en de literatuur over het leren van docenten-in-opleiding

aan elkaar gerelateerd hebben, hebben we een preciezer beeld gekregen van het reflectieproces dat het werken aan een portfolio op gang kan brengen. De operationalisatie van reflectie in termen van leeractiviteiten bood ons handvatten om de data te beschrijven en recht te doen aan de variatie die we daarin aantroffen. Uitkomsten uit de inhoudsanalyses van de portfolio's lieten zien dat wij een verdeling konden maken tussen handelingsgerichte en begripsgerichte leeractiviteiten. Handelingsgerichte leeractiviteiten leiden tot *bewustwording* van wat je weet en kunt; begripsgerichte leeractiviteiten leiden tot *inzicht* in ervaringen in het onderwijzen en leren. Voor het leerproces van docenten-in-opleiding is het belangrijk dat zij zowel handelingsgerichte leeractiviteiten ondernemen als begripsgerichte leeractiviteiten. De handelingsgerichte leeractiviteiten (herinneren en evalueren) die wij in ons onderzoek aantroffen, zouden beschouwd kunnen worden als een vorm van selecteren van ervaringen. Deze selectie van ervaringen is nodig om vervolgens tot verwerking van ervaringen te komen. Verwerking van deze ervaringen door middel van begripsgerichte leeractiviteiten hebben we maar weinig in de portfolio's aangetroffen. En zonder verwerking van ervaringen vindt geen theorievorming (ontwikkeling van praktijkkennis) plaats.

De beperkingen van het onderzoek worden gevormd door de beperkingen van de methode (inhoudsanalyse) die gebruikt is in het onderzoek en het kleine aantal docenten-in-opleiding dat bij het onderzoek betrokken was. Wij hebben alleen die reflectie in de portfolio's kunnen beschrijven, die we terugzagen in de portfoliothema's. Het beschrijvingskader voor reflectie in het portfolio dat is ontwikkeld, is gebaseerd op de portfolio's van een klein aantal docenten-in-opleiding, uit één opleidingsjaar, van één lerarenopleiding. Onze onderzoeksbevindingen kunnen daarom niet zomaar gegeneraliseerd worden naar andere lerarenopleidingen. Factoren die mogelijk van invloed zijn geweest op de reflectie die wij in de portfolio's aantroffen, hebben wij niet onderzocht.

We hebben twee aanbevelingen gedaan voor vervolgonderzoek. Portfolio-onderzoek zou gekoppeld moeten worden aan onderzoek naar het leren van docenten-in-opleiding. Noch het maken van een portfolio noch reflectie is een doel op zich. Het portfolio is een instrument dat een bijdrage moet leveren aan het leerproces van docenten-in-opleiding. Daarnaast is meer empirisch onderzoek naar het leren van docenten-in-opleiding en hun leeromgeving wenselijk. Er is nog veel onduidelijk en onbekend. Als duidelijker is hoe het leren van docenten-in-opleiding verloopt en wat wenselijk en haalbaar is in de context van het opleiden van docenten, kunnen instrumenten als het portfolio gerichter worden ingezet en worden

onderzocht op hun waarde.

Lerarenopleidingen zouden moeten nagaan waarvoor zij het ontwikkelingsportfolio willen inzetten. Het doel dat studenten reflecteren op hun ontwikkeling als docent door het werken aan hun portfolio, is niet specifiek genoeg geformuleerd. Reflectie omvat verschillende leeractiviteiten. De meeste docenten-in-opleiding in dit onderzoek vatten de procesfunctie van het portfolio op als betrekking hebbend op hun leerproces. De portfolio's lieten voornamelijk de leeractiviteiten 'herinneren' en 'evalueren' zien. Lerarenopleidingen zouden moeten nagaan of dit is wat zij met het portfolio, in het bijzonder reflectie, beogen. Als zij ernaar streven dat docenten-in-opleiding leeractiviteiten ondernemen die leiden tot diepteverwerking, met andere woorden tot de ontwikkeling van praktijkkennis, dan moeten het doel en de invulling van het portfolio en de portfoliobegeleiding daarop gericht zijn.

Curriculum vitae

Désirée Mansvelder-Longayroux was born in Rotterdam, The Netherlands on October 7th, 1970. She attended secondary education at CSG Melanchthon in Rotterdam, where she graduated in 1989. From 1989 to 1995 she studied French Language and Literature at Utrecht University, having specialized in Educational Sciences for foreign language acquisition. In 1996 she took her degree in teaching French in senior secondary education at Utrecht University. In the same year she started working at her thesis as a PhD student in Educational Sciences at ICLON Graduate School of Teaching of Leiden University. She was closely involved in the development and implementation of the portfolio in the teacher training course. She has worked as an educational consultant for medical education at Leiden University Medical Centre since 2003. Her main area of interest is teachers' professional development.

Désirée Mansvelder-Longayroux, geboren op 7 oktober 1970 te Rotterdam, behaalde in 1989 het VWO diploma aan de CSG Melanchthon in Rotterdam. In hetzelfde jaar startte zij een studie Franse taal- en Letterkunde aan de Universiteit Utrecht. In 1995 behaalde zij het doctoraal examen. Binnen de studie specialiseerde zij zich in Taalonderwijskunde. Vervolgens behaalde zij in 1996 haar eerste-graadsbevoegdheid voor het vak Frans aan de Universiteit Utrecht. In datzelfde jaar begon zij als promovendus in de Onderwijskunde haar promotieonderzoek bij het Interfacultair Centrum voor Lerarenopleiding, Onderwijsontwikkeling en Nascholing (ICLON) van de Universiteit Leiden. Zij was nauw betrokken bij de ontwikkeling en implementatie van het portfolio in de lerarenopleiding. Sinds 2003 is zij werkzaam als onderwijskundig adviseur voor het medisch onderwijs in het Leids Universitair Medisch Centrum (LUMC). Haar belangrijkste aandachtsterrein is de professionele ontwikkeling van docenten.

Nawoord

Dit onderzoek is uitgevoerd in de praktijk van de lerarenopleiding. Onderzoek doen in een opleidingscontext houdt in dat je als onderzoeker aan moet sluiten bij theorie en tevens recht moet doen aan de praktijk. Het is een lange zoektocht geweest om de variatie in de data te kunnen zien en te kunnen benoemen met behulp van theoretische concepten. Het overbruggen van de afstand die ik ondervond tussen theorie en praktijk, maar ook tussen theorie en theorie was niet mogelijk geweest zonder de inbreng van onderzoekers, opleiders en docenten-in-opleiding.

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Désirée Mansvelder-Longayroux

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