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Leiden
The Netherlands

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

Mansvelder-Longayroux, D.D.

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The nature of reflection in the learning portfolio¹

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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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 Grimmer (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 reflection¹ 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

Reflection¹

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	
	<i>situation</i>	<i>related situations</i>	<i>situation</i>	<i>related situations</i>
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.

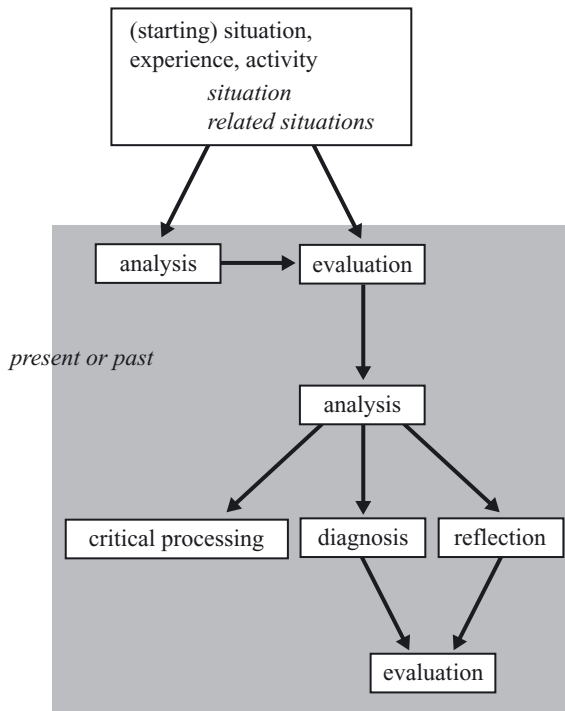


Figure 3.1. Pattern of learning activities within portfolio themes

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.

