

Teachers' Professional Learning

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ferences between university courses, which are interpreted as dealing with 'theory', and personal teaching experiences, which are clearly designated as 'practice', is an important concern for those who are learning to teach. The data reported here suggest that very important developments occur as one moves from a pre-service program to the first year of teaching experience. To the extent that in-service education of teachers is designed for the experienced teacher, for whom the theory-practice tension may no longer be problematic, we may be overlooking very important opportunities to contribute to the development of the beginning teacher.

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2 *The Influence of Learning Orientations on the Development of Reflective Teaching*

Fred A.J. Korthagen

Introduction

During the past decade most reports on the effect of teacher education programmes on actual teaching practice have not been very optimistic. Many authors refer to the phenomenon known as the *transition shock* (for example, Corcoran, 1981; Veenman, 1984): beginning teachers work under considerable emotional pressure and in general they make a quick shift from progressive to utilitarian perspectives on teaching (Lacey, 1977; Goodman, 1985). Even practice teaching during pre-service teacher education was mentioned in this respect (for example, Zeichner, 1980; Tabachnick and Zeichner, 1984). Student teachers often see practice teaching as unrealistic; they feel like guests in the domain of their supervising teachers and have little opportunity to develop their own teaching style.

The search for a solution to these problems has resulted in new paradigms of teacher education, in which reflective teaching is the basic principle: preservice teacher education should promote the ability of prospective teachers to reflect on their teaching as a means of directing their own growth and development in the teaching profession. The question of *how* to respond to a given classroom situation must be related to questions about the *why* of the situation: why do pupils act as they do, why does this make me feel uncomfortable, why do I react in a particular way, etc. More important, teachers must examine the whole context in which learning and teaching take place: 'the moral, ethical and political issues, as well as the instrumental issues, that are embedded in their everyday thinking and practice' (Zeichner, 1983).

For many years the Mathematics Department of the Stichting Opleiding Leraren (SOL), a teachers' college in Utrecht, The Nether-

lands, has based its programme on the reflective teaching principle. It is a four-and-a-half-year pre-service programme comprising a combination of mathematics and one other subject (physics or geography, for example), plus one year of professional preparation which is spread over the entire programme.

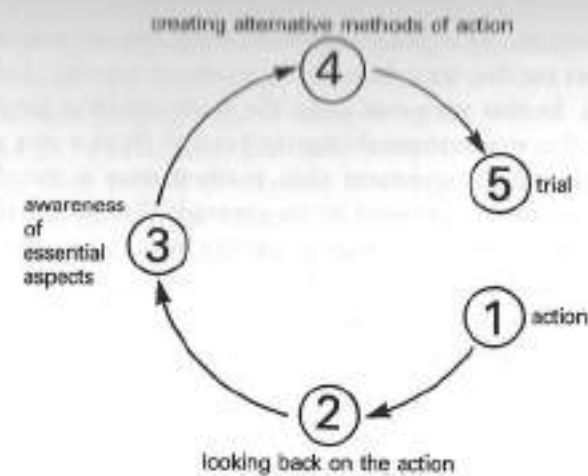
The present chapter opens with a description of the main characteristics of the programme, followed by the results of an evaluative study. These results compelled us to question whether a programme based on the promotion of reflection is equally suitable for all prospective teachers. This led to a longitudinal study on the development of prospective teachers during pre-service teacher education. We discuss the results of this study, which show that the concept of *learning orientation* is crucial to an understanding of the effects of the programme on different students. Finally, this concept helped us to formulate suggestions for the improvement of teacher education programmes.

The goal of this chapter is to fill in a number of gaps in the present research into reflective teaching; there is, for example, a lack of programme descriptions and almost no reports are available on the outcomes of these programmes. Moreover, little is known about the thinking and behaviour of teacher educators and about interaction processes in teacher education.

The Basic Principles of the Programme

The programme is based on the assumption that it is impossible to prepare prospective teachers for each and every professional situation with which they may be confronted during their careers. However, the programme can train them to reflect on their experiences and on the manner in which they function as teachers and to strive for a conscious awareness of their own professional development. Consequently the supervision proceeds from the subjective perception of reality on the part of the prospective teacher, with regard to, say, some particular lesson. Later the teacher will have only this subjective perception to fall back on, and it is this upon which the students are asked to reflect. It is for this reason that the programme attaches such importance to the reports or logbooks in which the students describe and reflect upon their experiences. Students are taught to trace the various phases which make up the cycle in figure 1. Phase 5 signals the start of a new cycle, so that in effect we are talking about a spiral model, which we call the ALACT model, after the first letter of the five phases.

Figure 1



The final goal is that the student teacher learns to proceed through the spiral model without the help of the supervising teacher educator and to make use of *internal feedback* based on his or her own experience and *external feedback* from pupils or other teachers, adjusting where necessary their own subjective view of reality.

The First Year: Reflection on Experiences Within the Teacher Education Institute

The ALACT-model starts with an action phase. These experiences need not be limited to classroom experiences, for as Zeichner (1981) notes: 'Reflection which is directed toward the improvement of practice does not necessarily need to take place within the boundaries of the classroom to have an impact.' Small task groups of student teachers working together (for example on mathematics) have many opportunities for reflection: on learning processes, on the processes of helping fellow students and of being helped, on the process of co-operation within the group, and on the ways in which problems can be solved.

Moreover, there is a special first year practicum in which the student learns to reflect on his or her own thoughts, feelings, attitudes and actions in everyday relationships with others at the SOL. Activities such as role-playing, games and discussions are used in this reflection practicum, which gives students an opportunity to develop their empathic understanding, to learn to express their feelings, and to become more proficient in dealing with problems of cooperation.

The process involved in learning mathematics is also used as an

object of reflection. At regular intervals, students are asked to hand in written reports on the way they set to work on a particular mathematical problem. In this way not only the mathematical *product* is stressed, but also the mathematical *inquiry process*: 'It is a not so new but still rarely fulfilled requirement that mathematics is taught not as a created subject but as a subject to be created' (Freudenthal, 1978). At secondary school, pupils are often given the impression that the important thing in solving math problems is coming up with the right answer. It is for this reason that the teacher educators prefer problems to which more than one solution is possible, or for which no cut and dried solution exists. This makes it more interesting to compare solutions and the ways in which the various students tried to tackle the problem.

As regards the students' reflection on their working and learning methods, the programme does away with the myth that mathematics is primarily a mental exercise. Feelings and attitudes quite naturally come to the fore in such aspects as the fun of problem-solving, an aversion to a particular problem, the experience of sinking one's teeth into a problem, the pleasure of working together and the excitement when something finally 'dawns'. It is extremely important for prospective teachers to recognize the significance of the more emotional aspects of the learning process.

Throughout the programme there are several points at which students are allowed a choice. On the pedagogical and didactical side, for instance, they have a say in the general curriculum, and in the mathematics courses they are often given a choice of material. There is a close link between learning to reflect and learning to choose: pondering the past or future choices compels the students to reflect on their own goals and attitudes. Individual interviews and the students' logbooks, to which the supervisors add their comments, encourage students to reflect on the various choices open to them, and help them to develop their own style of teaching.

In this description of the programme two aspects are particularly noteworthy. First of all, learning to reflect is not limited to the pedagogical component of the programme. It is also a recurring principle on the mathematical side. Students are encouraged to reflect not only on the subject content, but also to consider the way in which they help or cooperate with others, as well as their awareness of feelings, attitudes and personal goals. Thus *the mathematical side of the programme and the specific professional preparation are closely linked*.

A second major aspect of the programme is that *reflection is stressed even before students embark on their practical teaching*. The idea behind this

is that student teachers can be armed against socialization into established patterns of school practice. The student teacher must first gain some idea of who he or she is, of what he or she wants, and above all, of the ways in which one can take responsibility for one's own learning. The first period of student teaching can be one of extreme stress, in which the prime concern is simply to 'get through'. This is not an auspicious moment for learning the art of reflection. Prospective teachers must already have at their disposal sufficient powers of reflection to enable them to evaluate the influence of these personal concerns on the way in which they themselves function in the classroom.

The Phasing of Practice Teaching

It is not until the second year that students actually become involved in practical teaching. The first stage is helping individual secondary school pupils. This eliminates the problem of controlling a whole class and gives the student teacher a chance to devote his full attention to individual learning processes and didactic procedures. Here, too, the use of the logbook and college-based supervision are important in stimulating student reflection.

The first classroom experience takes place at the end of the second year. A primary school class (11 to 12-year-olds) is divided into three (or two) groups. During a period of six weeks each student teacher works with his or her own group of about eight children for one to one-and-a-half hours a week. The cooperating teacher is not present. The group of two or three student teachers who teach children from the same class is supervised by the teacher education institute. This supervision is based on the students' logbooks and the supervisor does not visit the school, which means that the student teachers are given a large measure of freedom and responsibility. This helps the prospective teacher to find his or her own personal style of teaching and, more important, it stimulates reflection on personal style and growth. Again an essential aspect of the experience is that the problem of controlling the class is not dominant.

In the third and fourth years, the students work with whole classes at secondary school level and are supervised by cooperating teachers. To provide effective supervision these teachers must first acquire specific helping skills, the most important of which is the ability to set aside their own beliefs about teaching and to help the student teachers to develop theirs.

The Professionalization of Teacher Educators

This brings us to one of the most important elements of a preparation programme based on reflective teaching. This type of programme places no small demands on the skills of teacher educators and supervising teachers. For several years intensive courses were held to teach them how to stimulate reflection, and how to supervise student teachers without actually observing them in the classroom. An important aspect of this process of professionalization is the development of a reflective attitude of the teacher educators and co-operating teachers themselves.

However, according to present government regulations, cooperating teachers no longer receive a remuneration, and this has resulted in a considerable decline in the number of well-qualified cooperating teachers.

The First Evaluation of the Programme

An initial evaluation of the programme in 1982 was based primarily on a questionnaire, which was sent to 116 former students of the Mathematics Department of the SOL and to thirteen students who were approaching graduation. The most important (open) questions were:

1. What have you learned during your teacher preparation?
2. What do you think was missing in your teacher preparation?

A categorization of these *learner reports* by two independent researchers showed that more than 50 per cent of the respondents had experienced important learning effects in the field of reflective teaching and directing one's own growth, in spite of the fact that there was nothing in the questionnaire or in the accompanying letter to suggest that this was a main issue in the research. Examples of reflection-oriented responses were:

- *I have learned to reflect on my teaching. I think this is important because I think it can be helpful when I am teaching on my own. How can I correct myself? What did I do well? What did I do wrong? What was the cause? I think that this capacity can be important in problematic classroom situations.*
- *I have learned to have confidence in myself, to develop a notion of what I am good or reasonably good at and to accept what I am not very good at without simply resigning myself to it.*

- *I have learned to learn, as best I can, from my experiences.*
- *I have learned to take note of my mistakes and to improve myself.*
- *I have experienced that it helps, and that it is necessary, to keep asking myself why I do things in a certain way.*
- *I have learned to evaluate myself. A central issue during the preparation was to give your own opinion about how things went, for example, if you thought it went well, you had to say why; what went well? The same applied when you thought things had gone wrong, so that you became critical of your own teaching. Terribly important for school practice!*
- *I think the most important thing I've learned is to look at myself, to be able to solve problems myself, or at least to know the ways toward solutions.*

On the negative side many teachers reported that they had been insufficiently prepared to handle problems of discipline and motivation. In particular those teachers who were working in lower vocational schools noted a gap between teacher preparation and teaching practice. They expressed disappointment about the impact of practice teaching, due to the fact that they were not given complete responsibility for the classes they taught. However, other elements in the programme, especially the first-year reflection practicum were seen as very important by the respondents. To quote a former student:

The first-year reflection practicum was a revelation to me. I began to see that I was capable of standing back and looking at my own actions and their impact on others. The one year brought about an enormous change in my attitude and behaviour and in the way I thought about them. The same point was brought home later on, in an optional course on expressing one's feelings. In fact this was something that kept coming up in my logbooks and in supervision sessions.

Differences in Learning Orientations

It became clear from a further study of the individual reports that the respondents could be placed on a continuum with at one end those who stressed the acquired ability to reflect, and at the other end those who felt the need for more directions for teaching practice. In order to study this difference between the respondents more thoroughly, five former students representing both ends of the continuum were interviewed. Summaries of these interviews were published in Korthagen

(1982). We concluded that student teachers differ in the degree to which they prefer to learn via reflection. We call this learning by *internal direction* and we use the term *internal orientation*. Other students have an *external orientation*, that is, they prefer to learn through external direction, from a supervisor or a book, for instance. They want structure and guidelines from outside (cf. Hunt, 1979). These differences in learning orientations may be caused by the *belief systems* and *implicit theories* which students have about learning. The so-called Göteborg group showed that people can differ considerably with regard to their *conceptions of learning* (cf. Säljö, 1979).

The evaluation gave rise to some doubt as to whether a preparation programme in which reflective teaching is a basic principle, is equally suitable for all students.

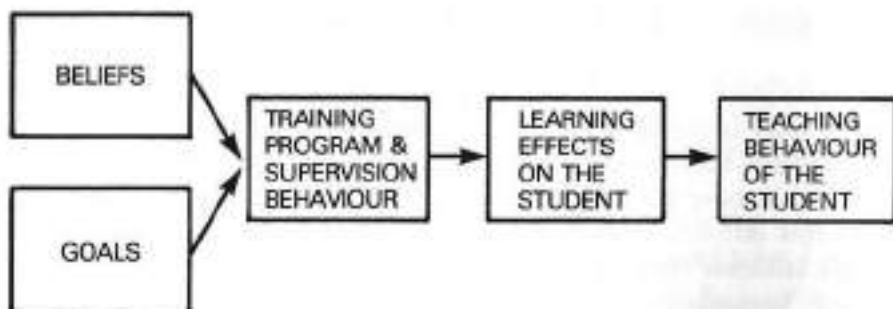
A Longitudinal Study: The Research Questions and Method

This prompted our decision to start a longitudinal follow-up study, based on the following research questions:

- (a) How do students with different learning orientations develop during this teacher education programme based on reflective teaching?
- (b) What is the impact of the programme on that development of students with different learning orientations?

In this longitudinal study, which is still in progress, we examine eighteen prospective mathematics teachers during their preparation programme at the SOL. We use the following research model (figure 2):

Figure 2



The process variables are the beliefs (and explicit goals) of the thirteen *teacher educators* and their supervision behaviour, while the product variable consists of the learning effects on *students*. The following instruments and research methods were used:

- 1 *Standardized interviews with the teacher educators*, focussing on their goals, on the way they try to implement these goals in the programme and on the results they observe. On the basis of the largely qualitative analysis of these interviews, we drew up
- 2 *A questionnaire* in which a number of statements about the fundamentals of teacher education could be scored on a scale from one to five.
- 3 *Kelly's repertory grid* (Kelly, 1955) enabled us to make explicit the categories used by the teacher educators in assessing their students. Kelly speaks of *constructs*. Examples of such constructs are dependent/independent, certain/uncertain, etc. In this RepGrid-method the teacher educator is given three cards with the names of three students. He is asked to mention one quality (construct) in which one of the students differs from the other two. Then, by assigning a score from one to five, he rates each student for all the constructs mentioned.
- 4 *Interviews with the students*. Twice a year the students in our study were interviewed about their opinion of the programme, learning results, points of criticism, the characteristics of the programme as seen by the students, and their learning conceptions, in particular their attitude towards reflective teaching.
- 5 *The I.E.O.-test*. In attempting to develop a test for evaluating learning orientations of prospective teachers, we discovered that it is impossible to classify students according to the degree of preference for reflection without taking into account the various areas on which learning has a bearing. Sometimes students appear to have an internal orientation in one area and an external orientation in another. From our interviews with students we derived the following areas or *domains* upon which learning can have a bearing (table 1):

Table 1

Domains of learning of students in the initial stage of the teacher education programme	1 the prospective teacher him(her)self 2 the fellow students 3 the subject matter (mathematics) in the programme.
Domains of learning of students after practice teaching	1 the prospective teacher him(her)self 2 the pupils in the schools 3 the subject-matter (mathematics) at school 4 the school

On the basis of this classification of domains we devised two versions of a questionnaire, called the I.E.O.-test for internal/external orientation. One version is designed for students in the initial stage of their training, while the second is for students who have experienced classroom teaching. In the case of the SOL Mathematics Department this means third and fourth-year students. For purposes of this chapter we will confine ourselves to the version designed for the students in the initial stage of the programme, as the data obtained by the other version of the I.E.O.-test are not yet available. This I.E.O.-test consists of three groups of items, corresponding to the following domains: the prospective teacher him(her)self, fellow students and subject matter (mathematics) in the programme. For each domain there is a scale designed to measure to what extent students have an internal learning orientation in this area and another scale which measures to what extent they are externally oriented. Thus there are six scales in all, each consisting of two types of items. One type asks the students to rate themselves on a five-point scale according to the extent to which a certain statement is applicable to their way of learning. On the other type they are to indicate how frequently they do something. An example of the latter type of item is: I reflect on the question 'who am I'.

To assess its reliability the test, consisting of sixty-one items, was administered to 138 first and second year students from three teachers' colleges. Cronbach's alpha ranged from .77 to .87, a good score for scales consisting of about ten items.

Results of the Longitudinal Study

Although the longitudinal study has not yet been completed, we are already in a position to report some important findings.

The interviews with the teacher educators and the questionnaire completed by these teachers showed a homogeneous 'team view'. Reflective teaching does indeed appear to be a fundamental goal. The teacher educators also mentioned concrete areas of knowledge which in their opinion students should master. These were concerned with such matters as the process of mathematics learning, didactic principles and the field of interpersonal contact (listening, cooperation, etc.). When the students entered the second year of the programme, the teacher educators placed more emphasis on acquiring skills in these fields.

The *RepGrid* showed that in considering individual students the constructs which the teacher educators had in mind differed considerably from the reflective/non-reflective construct, which was mentioned by only one teacher educator in the *RepGrid*. Many constructs had a bearing on qualities that could also have been mentioned as characteristic for one's personal functioning outside the college, such as shy, spontaneous, cheerful. The most frequently mentioned were: reserved (6x), inventive (5x) and industrious (4x).

Looking into the relationship between these qualities of students and the strategies followed by the teacher educators to reach the programme goals, we found that these goals were often abandoned or that the educators were sometimes at a loss to know how to attain the goals with certain students. In many cases the teacher educators decided to moderate their educational demands for fear that increased resistance would prevent the student concerned from learning anything at all. This spontaneous differentiation in strategies was based on all sorts of beliefs and implicit theories. There were no explicit theories about differences in learning orientations, and certainly not on the part of the entire team of teacher educators. On the basis of the interviews we arrived at the hypothesis that teacher educators only understand the way reflective students learn, possibly because they themselves have a reflective style. This was further investigated in two consecutive years by asking two of the educators who had been teaching an intensive educational course in a second-year group, to complete two questionnaires containing statements about ways of learning. One questionnaire was to be completed as the teacher educator thought that the student designated by him as 'most reflective' would have done, and the other questionnaire as if he were the student he considered 'least reflective'. Next the p.m. correlation was calculated between the predicted scores and the real scores (on a five-point-scale) for thirty-four different statements. The results are shown in table 2. These data support the hypothesis that the teacher

Table 2

p.m. corr. between predicted and real scores	teach.ed.A (1984)	teach.ed.B (1984)	teach.ed.C (1985)	teach.ed.A (1985)
most reflective student	0.73	0.53	0.78	0.66
least reflective student	-0.16	-0.13	-0.24	0.04

educators only understand the learning orientation of reflective students.

It is impossible to include here all the qualitative results from the *student interviews*. However one interesting point was the comparison we made between the eight students from the experimental group who left the programme after the first year and the ten who remained. The most important points of criticism put forward by the drop-outs may in fact be interpreted as indications of a clash of belief systems or, more specifically, of underlying learning conceptions:

- there is too much you have to find out for yourself.
- it should be clearer what you are supposed to learn, when something is good enough, what is right and what is wrong.
- those teachers are always asking questions.
- you have to keep telling them what your opinion is, what you are thinking or feeling.
- there is little opportunity to do things your own way
- it is an unnatural situation and there is too much coercion.
- you *have* to take part in everything, and you *have* to have fun.
- too much has to come from the group, and there is not enough explanation.
- there is no structure.

Because the teacher educators are more or less of one mind, the students feel that there is a strong pressure to conform to certain ways of learning. Most of the drop-outs considered these pointless, or at most foreign to their own ways of learning.

Among the students who stayed on after the first year there were those who were enthusiastic about practically everything the programme had to offer, others who were moderately enthusiastic, and still others who were critical of the programme, but who had nonetheless stayed on. Critical remarks about the teacher educators were sometimes repressed in an effort to 'play the game'.

It is noteworthy that those who stayed on voiced hardly any

criticism of the programme in the interviews which took place during the second year. On the one hand this has to do with the fact that the students with learning orientations that did not fit in, had already dropped out, while on the other hand we assume it was also the result of a learning effect at the meta-cognitive level. To quote a second-year student: 'What I found difficult to get used to, coming from secondary school, was that you have to learn in an entirely different way. In the beginning, because it was all so new, I wished I could do things the same way as in secondary school. It seemed much safer. Whereas now I see that we work in an entirely different way. Much more practical. You start to see that it is really a better way of doing things.'

How do you learn now?

'Now you reflect on the way in which you learn and the way in which you have learned something.'

What extras are in it for you?

'I think that it is very important, because you can fall back on old things you already know and use that as a basis for your present work.'

With regard to the value of reflective teaching as a fundamental training goal, the essence of the programme seems to lie in this *development and shifting of learning orientations*.

These qualitative findings were supported by quantitative results from the *I.E.O.-test*. Of the eight students who gave up, three of them left at such an early stage, that the *I.E.O.-test* could not be administered. The remaining students (five drop-outs and the ten who stayed on) completed the test in their first year. There were no significant differences noted for each separate scale, but the sum total of the scores on the three internal scales was clearly lower for those who gave up their studies ($p=.07$, in a one-tailed t-test).

Conclusions and Suggestions for the Improvement of Teacher Education Programmes Based on Reflective Teaching

We may conclude from the above that the teacher educators of the Mathematics Department of the SOL take a rather explicit view of the goals of teacher education in which reflective teaching occupies a central position. In practice, however, the actions of the educators are governed to a high degree by their perceptions of individual students and the strategies which the educators have at their disposal. In general they do well with students who prefer to learn in an active and

reflective way, while the existence of other learning orientations is barely acknowledged.

Fundamental changes take place with regard to the learning orientations of students, a phenomenon which has its positive as well as its negative side. On the one hand our results indicate that the teacher educators in our study clearly promote the development of internal learning orientations, no doubt as a result of their own pronounced views. We must add, however, that part of the effects we found may be explained by assuming that externally oriented students disappear from the teachers' college through a process of self-selection. This is the negative side of the picture: this preparation programme based on reflective teaching shows a clash between the learning conceptions of the teacher educators and those of a number of the students. This may lead students to drop out or to simulate learning behaviour (*quasi-adaptation* to the conceptions of learning of the educators). This may well be a danger inherent in all teacher education programmes based on reflective teaching. As teacher educators, we must consider the plight of the less-reflective students. Do we want them to stay in the programme and be given a chance to gradually alter their learning orientation? If so, then there must be no obstacles which can only be surmounted by those students who already have an internal orientation. If programmes based on reflective teaching are to be effective, it is of fundamental importance that supervision strategies take differences in learning orientation into account.

We would like to put forward two suggestions. First, externally oriented students should be allowed to learn the art of reflection gradually. This is called a *strategy of gradualness* (Korthagen, 1985). Otherwise the fear of these students that the programme will be of little use to them may become a self-fulfilling prophecy. The teacher educator can help externally oriented students by not expecting them to be able to figure everything out for themselves right from the start. He can give them concrete instructions, offer them choices and provide sufficient feedback. It might be wise to provide the student logbooks with a written commentary, thus adapting the supervisory procedure to the needs of the individual student.

'Make haste slowly' is the watchword here. Within the SOL programme, for example, first-year students start out by holding practice lessons for their fellow students. Short lessons of about ten minutes appeared to be more effective than half-hour sessions. As they reflect on the method for solving a particular mathematical problem, first-year students are being prepared for the time when they will

be asked to reflect on their learning processes during practice teaching and throughout the courses.

Secondly, we believe that students should be made explicitly aware of the problem of different learning orientations. Many authors believe that stimulating people to reflect on their own learning processes is an excellent means of developing adequate learning orientations (for example, Brown *et al.*, 1981). Gibbs (1981 and 1983) propagates a structural method in which students reflect on their conceptions of learning processes and study tasks, and then discuss their views with the rest of the group. We believe that this approach could have great advantages for teacher education programmes. The effect is twofold: it operates on the level of the processes of learning and teaching during the programme itself, as well as on the level of the school where the students will ultimately be teaching. It is essential for prospective teachers to realize that their pupils, too, will have different learning orientations, which will be influenced to no small degree by the education which they receive.

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