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ABSTRACT

This paper seeks to contribute to construction of a theory which makes explicit the relationship between the concept of reflection and fundamental views on good teaching. The discussion draws on empirical data gathered in 10 years of research focusing on a teacher education program that seeks to promote reflective teaching. Results are reported from four studies involving teacher education students (student teachers) and graduates who participated in a program for the preparation of secondary mathematics teachers at a teacher education college, the SOL, in Utrecht (Netherlands). Data from the four studies suggest several characteristics that may be considered correlates of reflectivity. Reflective teachers have better interpersonal relationships with students than other teachers and develop a high degree of job satisfaction. Reflective student teachers: (1) consider it important for their students to learn by investigating and structuring things themselves; (2) have previously been encouraged to structure their own experiences and problems; (3) have strong feelings of personal security and self-efficacy; and (4) appear to talk or write relatively easily about their experiences. Female student teachers reflect more on their relationships with fellow students and less on subject matter (mathematics) than male student teachers. Thirty-five references are included. (IAH)

CHARACTERISTICS OF REFLECTIVE PRACTITIONERS: TOWARDS AN OPERATIONALIZATION OF THE CONCEPT OF REFLECTION

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CHARACTERISTICS OF REFLECTIVE PRACTITIONERS: TOWARDS AN OPERATIONALIZATION OF THE CONCEPT OF REFLECTION

1. Introduction

Within a relatively short time, reflection has become part of the language of teacher education (Gore, 1987). Such terms as 'reflection', 'reflective teaching', and 'the teacher as a reflective, inquiring professional' are now widely used in journal articles, and at teacher education conferences. This popularity reflects a shift in teacher education programs away from an emphasis on mastery of technique and the learning of theoretical principles, and towards the promotion of analytical, reflective habits and attitudes in teaching. However, reflective skills and technical competence are not mutually exclusive (Van Manen, 1977; Tom, 1985). Technical competence may even be seen as a pre-condition for reflection, in that a grounding in technical skills frees teachers for more analytical thinking, and prevents that they draw the conclusion that such reflection is impractical and unhelpful in teaching (Hoy and Woolfolk, 1989). Thus it is becoming increasingly clear to professionals in the field that the goal of teacher education programs should be to make students teachers both technically competent and reflective and self-critical (Hoy and Woolfolk, 1989).

Although there seems to be a growing consensus about this twofold aim of teacher education, no clear connection between reflective skills and technical skills has yet been demonstrated. In our view, one important fact is often forgotten: that it is worthwhile to pursue reflection in teaching only to the extent that it contributes to better teaching. Obviously, the question of whether or not reflection is useful is closely related to the question of what good teaching is. In this regard the literature on the subject is somewhat confusing. The various approaches to the development of reflective teachers differ substantially on a number of issues (Tom, 1985), one of which is the underlying view of what constitutes good education, and what the role of the teacher should be in that education. Authors who propose different objects of reflection often have differing views on what good teaching is. For this reason, we believe that there are two questions which must be answered before any agreement can be reached as to the meaning of the term 'reflective practitioner':

1. What is good teaching?
2. What is the role and nature of reflection in good teaching?

The answers to these questions are crucial to an investigation of the central question of this symposium:

3. What are the critical attributes which distinguish reflective teachers from their colleagues? In other words, how would you know one if you saw one?

Some authors clearly state their views on what constitutes good teaching, while others are less explicit. We will look at several examples.

In the approach which sees reflection as critical inquiry, advocated by such authors as Zeichner (1983), and Carr & Kemmis (1986), the objects of reflection are primarily the moral, ethical, political, and instrumental issues embedded in teachers' everyday thinking and practice. Established patterns used in teaching situations are not taken for granted, but are made explicit. It is fairly clear what these authors consider to be good teaching. We may surmise that their description of a good teacher as a critical, inquiring professional is linked to a specific view of the aims of education in schools, i.e. to make students critical, responsible citizens.

Ross (1987) relates reflection to rationality and responsibility; in her view reflection is a way of thinking about educational matters which involves the ability to make rational choices, and to assume responsibility for those choices. In this respect, she appears to see the teacher as a professional who is accountable for the way he or she teaches, rather than someone who is merely teaching a prescribed curriculum.

In the approach employed by Cruickshank et al. (1981), the object of reflection is the effectiveness of instructional strategies in attaining given ends. It relies on specific procedures and student outcome measures. This technical approach is most probably based on a view of the teacher as a competent, highly technical person (see Gore, 1987), although the authors also state that the aim is to develop in students good habits of thought about teaching, so that they become wise as teachers. It is not clear what their underlying view of education is. It could be a technical and instrumental philosophy of education, which regards mastery of skills by the students as the primary aim of education.

A more humanistic or personalistic orientation with respect to reflection (e.g. Dirkx, 1989) considers feelings, thoughts and actions in one's relationships with others as the most important object of reflection by teachers. Here the teacher is seen as someone who uses the self as an important means of facilitating learning.

For Schön (1983, 1987) reflection involves some form of experimentation, in which practitioners constantly interpret situations by means of problem-setting and problem-solving, a process which can lead to a reframing of the situation. Schön's descriptions do not make explicit his interpretation of good teaching. It is conceivable that he stresses the experimental nature of good teaching, and does not attach a particularly high value to teachers' use of the theoretical underpinnings of their teaching.

Regardless of whether an author explicitly states his or her views on what constitutes good teaching, it is clear from the above examples that statements about the nature of reflection are linked to fundamental views on good teaching. We would argue, therefore, that prescriptive statements about reflection are often questionable, simply because individual views on the aims of education are questionable. Prescriptive statements may be of importance to someone who shares those views, but even this is not always true, since such statements often lack a sound theoretical basis. The relationship between a teacher's reflective skills and the quality of his or her teaching has to be explored in more depth (Kennedy, 1990, p. 850; Wubbels and Korthagen, 1990, p. 29).

Thus we may conclude that reflection is in danger of becoming a concept which is simply too big, too vague and too general for everyday application (the Goldilocks Principle, Katz & Raths, 1985). Analyses of the concept of reflection in relation to underlying views on good teaching might help to ward off this danger. What is needed are coherent theories in which this relationship is made explicit; in this way the theories can be tested, and prescriptive statements developed which do have an adequate empirical basis.

The aim of the present paper is to contribute a number of building blocks for the construction of such a theory, by answering (in Section 4) the question: What are the critical attributes which distinguish reflective teachers from their colleagues? We will draw on empirical material gathered in ten years of research focusing on a teacher education program that seeks to promote reflective teaching. The designs of these studies are summarized in Section 3. It will be clear from the preceding remarks that we must first address the other two questions (1 and 2) in relation to this teacher education program (Section 2). Thus in attempting to define guidelines which will enable us to recognize a reflective teacher when we see one, we will confine ourselves to the kind of reflective teacher which this particular teacher education program aims to produce. During our research we also found some indications that certain teacher characteristics are correlated to reflective capacities and attitudes, and a number of these will be described in Section 5. In Section 6 we present additional comments about the reported research. Finally, in the course of these analyses a number of research questions have arisen, and these will be dealt with in Section 7, when we attempt to answer the second main question to be addressed during this symposium:

What is an appropriate and productive research agenda, which will further our understanding of the notion of reflectivity?

2. A program for the preparation of reflective teachers

We can start to develop a theory on reflection, as referred to in Section 1, by making use of promising research spots, such as institutions for teacher education where the promotion of reflective teaching is considered an important aim. Between 1971 and 1988 there was one such spot in Utrecht, in the Netherlands. It was the mathematics department of a teacher education college called the SOL, where a program for the preparation of secondary school mathematic teachers had been developed, in which the promotion of reflective teaching was a basic goal. It was a 4 1/2-year program where student teachers selected a second subject, in addition to mathematics. A total of one year, distributed over the 4 1/2-year period, was devoted to the professional preparation.

We have reconstructed the views of the staff of the mathematics department (which during the period in question consisted of 10 to 13 teacher educators), focusing on secondary education (mathematics) and teacher education. For purposes of this reconstruction we made use of document analysis (there were a great many formal and informal papers available, written by staff members), and interviews with members of staff. A verification of this reconstruction was carried out by means of a study among graduates of the SOL program, who were asked to give the characteristics of their preparation program (Korthagen, 1982). Moreover, the reconstruction of the views of the staff was translated into a questionnaire consisting of 46 statements, which were scored by the teacher educators on a five-point scale. These checks resulted in a confirmation of the conclusions which had been drawn (Korthagen, 1988).

The result of the reconstruction is described in Korthagen (1982, 1985). The promotion of reflection appeared to be a basic principle underlying the SOL program. To clarify which conception of reflection is meant here, we have summarized the answers to the first two questions posed in Section 1, i.e., what was the view of the staff on 'good teaching', and what role does reflection play in that view?

A. What is good teaching?

The reply given by the individual members of the staff to this question was strongly influenced by the context of Dutch secondary school mathematics education, which in the seventies saw a surge in the direction of realistic mathematics education. This entails the use of concrete problems and real-world contexts. The student is taught to translate reality into a mathematical model, to apply mathematical techniques within that model, and then to translate the mathematical solution into the best possible solution in the real world. The student is required to analyze, to distinguish between matters of major and minor importance, to structure, to combine theory and practice, and to devise creative alternative solutions and methods of problem-solving. Collaborative learning and metacognitive strategies are of prime importance here, and are given explicit consideration. (For more details of this development towards realistic mathematics education, see Wubbels, Korthagen, & Broekman, 1991).

This process-oriented view of mathematics education was not without its influence on the thinking of the teacher educators in the mathematics department of the SOL. In retrospect, we can say that their outlook was characterized by the following views:

1. Good education is learning-oriented: it focuses on the learning process of the student; the teacher is the facilitator of that process.
2. One of the main tasks of the teacher is to present real and concrete problems which the student then approaches by means of analysis, structuring and the testing of alternative solutions.
3. Education should devote considerable attention to problem-solving, collaborative learning, metacognitive strategies and learning how to learn.
4. The ultimate goal of good teaching is the promotion of conscious and strategic learning and problem-solving.
5. The relationship between the teacher and the student is a helping and cooperative relationship in which the teacher offers a climate of security and challenge, and only as much structure as each individual student needs.
6. The process towards more independent learning by the student requires a strategy of gradualness in which the student is given more and more responsibility for the learning process.
7. Teachers should be capable of committing themselves purposefully, consciously, and methodically as an instrument in the teaching and learning situation.
8. Teachers should themselves be able to deal with mathematics in a conscious and systematic manner.
9. Teachers should be able to analyze and develop their interpersonal relationships with the students, with a view to attaining the ideal helping and cooperative relationship.
10. Teachers should be conscious of their own strong and weak points, and direct their own development in the direction of the nine principles formulated above.

B. The role and nature of reflection

It will be clear from the ten principles above that the fostering of an inquiry-oriented attitude and the promotion of the ability to analyze, to structure and to devise creative solutions were among the basic educational goals, both for students in mathematics classrooms in secondary education, and for prospective teachers. As regards the student teachers, these goals were pursued not only in the mathematics component, but also in the professional preparation component of the program. The aim was to produce student

teachers who would ultimately be capable of independently tracing a process consisting of the following phases (Korthagen, 1985):

1. Action: confrontation with a concrete situation which requires action
2. Looking at or looking back on the situation (analysis)
3. Awareness of essential aspects
4. Creation of alternative solutions or methods of action
5. Trial

Phase 5 also forms the first phase of a new cycle. This is a spiral model, known as the ALACT model (after the initial letters of the five phases). The process described by means of this model may be seen as the SOL conception of the process of reflection. The crux of this process lies in phase 3, where a mental structure is formed, or an existing mental structure altered. In our reconstruction of the SOL concept, we have therefore opted for the following definition of reflection: reflection is the mental process of structuring or restructurering an experience, a problem or existing knowledge or insights (Wubbels & Korthagen, 1990).

Thus in the view of the SOL teacher educators, reflective teachers have the capacity to tracing the ALACT cycle for all aspects of the teaching and learning situation, but focusing on reflection on mathematical situations, interpersonal relationships in the classroom, and their own functioning as a teacher. During the preparation program student teachers should develop a reflective attitude, thus fostering a capacity to direct their own professional development.

The contents of the SOL program put special emphasis on learning to act in, and reflect on countless different situations, either independently or in collaboration with others. Thus students were confronted with a great many teaching situations, cooperative assignments, and interpersonal problems, as well as mathematically oriented problems. (For a more detailed description of the program, see Korthagen, 1982, 1985.)

3. Four studies focusing on a reflective teacher education program

We carried out four research studies within the framework of the SOL program described above. These will be discussed in brief in the present section.

Study 1

The first study (1982) was set up as an initial overall evaluation of the program. It consisted of a written survey of 116 graduates of the SOL and 13 student teachers on the point of graduating, supplemented by interviews with 10 of them. The most important questions in the questionnaire were:

(1) What have you learned during your teacher education?
(2) What do think was missing from your teacher education?

(For details of this study, see Korthagen, 1982, 1985.)

There emerged from this study a distinction between preferences for two different ways of learning. Internally oriented practitioners want to use their own knowledge and values to structure problems and experiences themselves. Externally oriented practitioners ask for guidelines and structuring from outside (from the teacher educators, for example). On the basis of the definition in Section 2, internally oriented practitioners might be termed reflective practitioners.

Study 2

The phenomenon of internally and externally oriented student teachers prompted our decision to carry out a second study, this time with a longitudinal design. This study was initiated in 1984, and has been continuated. We followed a group of 18 students during their teacher preparation, using questionnaires, interviews and video recordings of supervisory conferences. In addition, we regularly interviewed their teacher educators and asked them to fill out questionnaires about the student teachers. (For details of this study, see Korthagen & Verkuyl, 1987, and Korthagen, 1988.) This study again brought to light a difference between internally and externally oriented student teachers. To illustrate this difference we will give some examples of statements by respondents, taken from studies 1 and 2.

The respondents with an internal learning orientation made the following statements, when asked what they had learned during their training:

- *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? Why? I think that the ability to do this can be important in difficult classroom situations.*
- *I have learned to learn, as best I can, from my experiences.*
- *I have learned to look at my mistakes and to improve myself.*
- *I have discovered 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.*
- *I think the most important thing I've learned is to look at myself, to solve problems myself, or at least to work out the first steps toward solving a problem.*
- *I have learned to act self-reflectively, to regularly look back on the way in which I function as a teacher, and to attach to these actions both conclusions and guidelines for the future.*

Externally oriented respondents made the following statements on the SOL program:

- *There are too many things 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, and what you are thinking or feeling.*
- *Too much has to come from the group, and there is not enough explanation.*
- *There is no structure.*
- *I would rather have had a course with the ordinary things you come across every day, like refusing to work, cribbing, and cutting classes.*
- *How do you deal with situations that have to do with a lack of motivation on the part of the students?*

The longitudinal study showed that after one and a half year most of the externally oriented student teachers in the research group of 18 had left the SOL program. Although this was often due to poor results in mathematics, the fact that the structure they desired was lacking appeared to be a major motive for the decision to drop out. Of the 18 student teachers in the group, 8 gave up their studies before the end of the second year. We continued the longitudinal study with the remaining 10 student teachers.

Study 3: The IEO test

After distinguishing between internally and externally oriented student teachers, we then devised a questionnaire for measuring these learning orientations of teachers and prospective teachers. It was known as the IEO test for internal/external orientation (Korthagen, 1988). There are two versions of this test: one designed for student teachers in the initial stage of the preparation program, and the other intended for teachers or student teachers who have already done some classroom teaching. Version 1 consists of six subscales, concerned with internal and external learning orientations in the following domains: (1) the prospective teacher himself, (2) the fellow students, and (3) the subject matter in the program (mathematics). (See Korthagen & Verkuyl, 1987 for more information about the choice of these domains.) We recall the fact that reflection on these domains was emphasized in the initial stages of the SOL program. Version 2 of the IEO test (for teachers or student teachers with teaching experience) consists of eight subscales, namely two scales (for the degree of internal orientation and the degree of external orientation) for each of the following domains: (1) the prospective teacher himself, (2) the pupils in the school, (3) the subject matter at school (mathematics), and (4) the school context. In both versions of the IEO test items are scored on a five-point scale (ranging from 'strong disagreement' to 'strong agreement').

We used version 1 of the IEO test (for students in the initial stages of their preparation program) to determine how the degree to which prospective teachers are internally or externally oriented in the domains 'self', 'fellow students' and 'mathematics' is correlated to the variables age, previous schooling, and gender. For this purpose the test was administered to 138 students in three different colleges for teacher education (Korthagen, 1987).

Study 4: A comparison of the effects of two teacher education programs

Finally, a fourth study was carried out in which graduates of the SOL program were compared with graduates of another program, which was more subject-matter oriented (Wubbels & Korthagen, 1990). The graduates of the SOL program (n = 37) and of the other program (n = 36) had been teaching between 1 and 10 years. They were compared on the basis of reflective attitude, using the IEO test (the internal scales of the version for teachers), their inclination towards innovation, their job satisfaction (both of these measured by means of a teacher questionnaire), the quality of the interpersonal relationships with the students in their classes as measured through student perceptions, and the adequacy of the teachers' perceptions of these relationships as measured by determining the difference between the students' and the teacher's perception of those relationships.

Although none of the four studies was explicitly designed to answer the question of how to recognize a reflective practitioner, each of them provides some information on the subject. First, they brought to light several critical attributes of reflective student teachers. These attributes are, in our opinion, generic characteristics of reflective student teachers. They are the operationalization of the process described in the definition of reflection given in Section 2. We assume that these attributes hold true not only for student teachers, but also for teachers actually involved in professional teaching, but this extrapolation will require further study. These 'critical attributes' are presented in Section 4. Second, it appears from our data that student teachers who possess these critical attributes to a high

degree differ in other ways from their less reflective colleagues. These features are not characteristic of the process of reflection, but may accompany the critical attributes. We refer to them as correlates. These correlates will be discussed in Section 5.
We emphasize that both the attributes and the correlates were the results of rather small-scale studies. Therefore they should be regarded as hypotheses for follow-up studies.

4. Critical attributes of reflective student teachers

We selected two student teachers from the longitudinal study (Study 2) who in comparison with the others made the greatest number of statements which, on the basis of our definition of reflection (Section 2), displayed the major attribute of a 'reflector':
Attribute 1: The reflective student teacher is capable of structuring situations and problems, and considers it important to do so.
We coded these reflectors as R1 and R2. They completed the course of training, finishing in less than five years. We will illustrate this attribute by means of several of their statements during the interviews.

Interviewer (in the second year): *Do you consider the process of reflecting on yourself just as important as the teacher educators here?*
R1: *Yes, I do think it's important. Later, when you're teaching, it doesn't make any difference how much math you know, if you can't keep order in the classroom. To do that it's important to learn how to stop and think: why did things go wrong, and what did I do that I could have done differently? That's why I think it's so important to stop and think about yourself.*
During an interview at the end of the course the same student teacher said:

During a lesson you just react to the situation, do whatever occurs to you. Later, thinking back, I want to work it out for myself. Not just ask someone else's opinion. I feel sort of like, well, I could have figured that out for myself, and then I don't like hearing it from someone else. Or else later you think, what I really meant was such and such, because he didn't understand why I reacted the way I did. Once I've got it all clear in my head, then I wouldn't mind hearing it from someone else, if they were there at the time. And if I have an idea about what went wrong, but I'm still not sure, then I'd like to hear what a more experienced person has to say. So first I need to be clear in my own mind what happened, and decide whether I'm satisfied with the way I reacted, and after that I'll listen to what someone else has to say about it.

Interviewer: *Suppose you've just finished a lesson that didn't go too well. What do you do afterwards?*
R2: *I try to figure out for myself why things went wrong. By thinking back, trying to remember what went wrong, what I did, what I was trying to do. What was all right, what wasn't. I try to find a solution - I'm so sure of myself that I think I can! If it were during my student teaching period, and I couldn't figure things out for myself, then in the end I'd ask for help. I know, because during the student teaching period I really had problems when I was teaching Dutch. First I spent a week mulling it all over in my mind, trying to decide what to do. Finally I went to see the cooperating teacher. I know I tend to be too selfconfident, always thinking I can figure things out for myself.*

From the group of 10 student teachers who continued their studies we selected one individual whom we considered less reflective. The view of this student (coded as L) was quite different:

Interviewer (a year and a half into the course): *As I understand it, the teacher educators want you to reflect on yourself.*

L: *In what way?*

Interviewer: *By thinking about on your own functioning, how you work on math, the relationship with your fellow students, with your pupils. Does that sound familiar to you?*

L: *Oh, you mean what was on the questionnaire? No, I never really noticed.*

Interviewer (at the end of four and a half years): *Suppose that during a field experience you had a class that didn't go well. What would you do afterwards?*

L: *I'd talk about it with other student teachers. Ask about other ways of dealing with the problem.*

It will be clear from the above statements by the student teachers R1, R2 and L how, in selecting the reflectors, we operationalized the characteristic 'structuring the situation yourself'. We verified our choice of these three student teachers by having an independent researcher evaluate all 10 student teachers on the basis of the interviews. She was asked to rate the degree of internal orientation in the domains 'oneself', 'fellow students' and 'mathematics' for every student teacher on a five-point scale. The two reflectors whom we selected had the highest total scores (R1: 13, and R2: 14). The lowest score (10) was registered by three individuals, among them the student teacher L, whom we had selected.
A second check was performed by calculating the mean of all the scores on the internal scales from the IEO test that had been administered every year during the longitudinal study. Table 1 gives the scores for the 10 student teachers. The respondents selected on the basis of high reflectivity rank 1 and 3 respectively, while the less reflective student teacher whom we interviewed recorded the lowest score. These results reinforced our confidence in the previous labeling of R1 and R2 as highly reflective and L as a less reflective student.

TABLE 1: Mean of all the scores recorded on the internal scales of the IEO test by 10 student teachers during the longitudinal study

Students	1 R1	2	3 R2	4	5	6	7	8	9	10 L	mean
Mean reflection score	4.1	3.7	3.6	3.6	3.5	3.5	3.5	3.4	3.4	3.2	3.5

The excerpts from the interviews with R1 and R2 reveal another characteristic of the reflectors which is familiar to us from our own experience as teacher educators:

Attribute 2: The reflective student teacher uses certain standard questions when structuring experiences.
Structuring always takes place from a certain perspective. This perspective is translated into one or more questions: what happened, why did it happen, what did I do wrong, what could I have done differently, etc. We believe that it is important that during their training student teachers are taught to deal with such questions. The specific questions selected for such training will reflect the educational views in which the course is rooted (cf. Section 1). Thus in the SOL program a great deal of attention was given to the way the teacher's actions during the lesson influence the interpersonal relationship with the students.

Attribute 3: The reflective student teacher has no trouble answering the question of what he or she wants to learn.
The structuring of experiences and situations can also be directed towards one's own learning process. We found that this manifests itself most clearly in the fact that reflectors are less dependent on the teacher educators when it comes to choosing learning goals.
A few examples from the interviews follow here:

R1: *...like during the first short field experiences. You become aware of certain problems, you start to think of certain things as important, and that's when you're able to say: that's what I want to learn. I like the structure they use in the mathematics department, where you start off with little things, and later on you're able to formulate real learning goals, and to start working on them.*
Interviewer: *Can you decide for yourself how you want to learn something? Or do you need a teacher educator to provide suggestions?*
R1: *I'd prefer to figure out for myself what I want to learn, and decide how I want to learn it, because you know better than anyone else what the best way of learning is for you. I would read something on the subject, try out a few things myself, not too much at first. No, I don't think I really need a teacher educator to help me. If a teacher were to offer unsolicited advice, I'm not sure whether I would appreciate it. No, I don't think I would.*
Interviewer: *If you look at your own development as a teacher, and then consider the future, what would you like to learn, or learn to do better?*
R2: *Classroom work could be more structured, more under control. Sometimes I get the impression that I don't have everything in my grasp. I know what's going on in class, at least for 20 of the 30 pupils, but the other 10... Sometimes they escape me, and I want to get hold of them too (...) And devote more attention to a quiet atmosphere in the classroom. I try to do that by speaking directly to individuals wherever I can. Asking a group at the back of the class that's getting a bit noisy to come to the front, and talking to them there, instead of reprimanding them by raising my voice. Or separating groups, usually boys and girls who are just beginning to get interested in each other. At that age, that always leads to whispering, clowning, and a lot of noise.*

By way of contrast, here is an excerpt from an interview with the less reflective student teacher (during the last stages of the preparation program):
Interviewer: *Would you know an answer if I asked you: what do you want to learn?*
L: *I guess I'd like to learn more in practical situations.*
Interviewer: *Is it a difficult question for you?*

L: *Yes, it is a difficult question. Maybe later, after I've done some teaching, there will be situations that I find difficult. But I'll manage. I have no idea what else I should learn. I just have to get on with the work.*

Attribute 4: The reflective student teacher can adequately describe and analyze his or her own functioning in the interpersonal relationships with others.

Of the various possible objects of reflection, the SOL program focused on the student teacher's own performance in the interpersonal relationships with others (in particular pupils and fellow teachers). According to the SOL view, good teachers are able to analyze their performance in the interpersonal relationship with others (see Section 2, principle 9). Thus they reflect in particular on interpersonal relationships. Such concerns are not usually apparent until a later stage in the professional development (Fuller & Bown, 1975). This was confirmed by the results of our longitudinal study (Study 2), which showed that attention shifted from 'concerns about survival', to 'teaching situation concerns', and 'concerns about the pupils'. Attribute 4 was apparent from Study 1, where reflective graduates voiced such views as:

- *During my training I have examined, often in depth, my own performance. I have decided for myself exactly how I help others. I have taught myself to develop, and learned to think about myself with respect to certain theoretical frameworks, in relation to myself as well as to others. This ability is quite well developed, and it is of great help to me as a starting teacher.*
- *At the SOL I learned to look at myself, to see what effect my behavior has on the children, and to be consciously involved in the situation of the moment. This attitude has gradually become second nature to me.*
- *(On the influence of the program) You gain insight into your own performance, what you do and don't do in a group, and how others see your actions. This way I've gained a much clearer picture of myself, and this helps me to determine my attitude in the class. It also makes itself felt in contacts with colleagues and the school management.*

In study 4 we also collected quantitative data which show that SOL graduates with more than two years' experience have a more adequate perception of their own performance in their interpersonal relationships with the pupils than experienced graduates of another, more subject-oriented preparation program (Wubbels & Korthagen, 1990). In two classes taught by each teacher, the students' perception of the functioning of the teacher in his relationship with the students was measured by means of the Questionnaire on Teacher Interaction (the QTI, Wubbels et al., 1991). The teacher also filled out the QTI for the two classes, indicating how he perceived his own performance in the class. For each class of a particular teacher we calculated the sum of the absolute differences on the eight scales of the QTI between the average student score in that class and the teacher score. The averages of these difference scores in the group made up of SOL graduates, and the group made up of graduates from the other program, were then compared by means of a t-test. These averages did not differ significantly in the case of teachers with one or two years' experience. Among those who graduated more then two years before, however, there was a significant difference: the discrepancy between teacher and student perceptions of the teacher-student relationship was significantly smaller in the SOL group than in the control group. The scores were 3.1 and 3.8 respectively on a five-point scale ($t = 2.2$, $p = 0.02$, effect size about 0.5 standard deviation). We concluded that the teachers who graduated

more than two years before from the SOL had a more adequate perception of their interpersonal relationships with students in the classroom than the teachers in the control group who also had more than two years' experience.

5. Correlates of reflectivity

In this section we will present a number of characteristics which, on the basis of the four studies, may be considered correlates of reflectivity. These characteristics are in some cases the consequences of the critical attributes, and in other cases the antecedents. They may even be related to the critical attributes in a circular manner, in that they reinforce the critical attribute and are, in turn, reinforced by it. The correlates are, however, not a generic aspect of reflection.

Correlate 1. Reflective teachers have better interpersonal relationships with students than other teachers.
According to this correlate, reflective teachers are capable not only of adequately analyzing their interpersonal relationships with students (attribute 4), but also succeed in making those relationships better.
In Study 4 the interpersonal relationships of SOL graduates were compared with graduates of another preparation program (Wubbels & Korthagen, 1990, p. 36-37). Judging by the students' perceptions, measured by means of the QTI, the SOL graduates scored higher on all the scales which are positively linked to cognitive and affective learning outcomes. This was reported in one measure on which the SOL graduates scored significantly higher than the other graduates ($t = 1,9$, $p < 0,05$, effect size 0.6 standard deviations). This difference was above all a long-term effect, i.e., the difference was not significant for teachers who had graduated less than three years before.

Correlate 2. Reflective teachers develop a high degree of job satisfaction.
The comparative study (Study 4) also showed that teachers who graduated from the SOL three or more years before had a significantly higher level of job satisfaction than teachers in the control group who had likewise graduated three or more years before (3.9 and 3.3 respectively, on a five-point scale, $t = 2.4$, $p < 0.01$, effect size 0.6 standard deviations). The difference was not significant for teachers who graduated less than three years before.

We propose the following theoretical explanation for the correlation between reflectivity and job satisfaction. As Schön says (1983, p. 61), the more routine the activities of practitioners become, the more acute is the danger that they no longer think very much about what they are doing. We believe that teachers who get into this kind of rut will ultimately lapse into patterns of behavior that can no longer be corrected. This can lead to boredom and burn-out, which can result in a low level of job satisfaction.

Correlate 3. Reflective student teachers also consider it important for their students to learn by investigating and structuring things themselves.
It would appear that student teachers who consider reflection important for themselves also stimulate their pupils to reflect. The following statements made by student teachers involved in the longitudinal study will illustrate this point.

R1: *There's one thing that I think is especially good. In class when someone has a question, you don't just give the answer, or part of the answer. You help them to think again, or ask another question which will get them on the right track. That's what I liked about my student teaching. Whenever a question was asked, I'd think 'Now don't just tell them the answer. Stop and think how to get them to figure it out for themselves.'*

R2: *During my field experiences I noticed that if you make your pupils think, they make much faster progress. Just writing down more examples on the blackboard isn't going to help them much. If you let them work it out for themselves, it may take twice as long but the second, third and fourth time it'll go ten times as fast. And in the end you get much better results. I'm convinced that it not only works in theory, but in practice too. I do it without even thinking.*

By way of contrast, we will give the views of the less reflective student teacher recorded during the longitudinal study. In his opinion, the SOL did not put nearly enough emphasis on group teaching, explaining a point to the class as a whole.

L: *It's only when there are problems that he* [the teacher educator] *gives you a clue, and even then you have to figure out the rest yourself.*

Interviewer: *Would you like to teach that way?*

L: *No, I don't think so.*

Correlate 4. Reflective student teachers have previously been encouraged to structure their experiences, problems, etc.

This may indicate that the person in question has been through a difficult period in his or her life, or has for example been confronted with powerful cultural differences. This correlate was suggested by the words of a very reflective graduate of the SOL program whom we interviewed in Study 1. Talking about the extreme stress he had experienced as a starting teacher, he said:

And yet it's difficult to prepare yourself for such stress during your training. If you've never experienced a situation of great stress in your private life, where it's you against the rest, then you don't have any idea what it's like.

Similar views were voiced by reflective student teachers in our longitudinal study (Study 2):

Interviewer: *Are you the sort of person who reflects on himself?*

R2: *Well, I was more or less forced to. I was out of work for two years, and then when I got back in the running ... that sort of makes you stop and think about yourself.*

Interviewer: *And how about the subjects?*

R2: *Yes, especially pedagogy. Like for kids from lower social classes.*

Interviewer: *Why does that interest you?*

R2: *Well, I come from a working-class background. My parents are just ordinary working-class people. I went to a pretty fancy school, and that meant that I was part of a group that wasn't entirely accepted.*

This same sort of personal confrontation with a different cultural background was recounted by another reflective student teacher:

R1: *Most of the teachers here have a fairly open attitude, but even so they sometimes make certain comments. I'm a Christian, and people can make very insulting and hurtful remarks about the Christian faith that are absolutely untrue. They paint a*

kind of caricature of a group of people, to make them look ridiculous. Then I just withdraw into a sort of shell. If I had a problem, I would never go to a teacher like that, because he's destroyed my confidence in him. And that's a shame, because most of the time I know that the teacher is really OK, he just doesn't know what he's doing to other people.

For purposes of comparison, we also present the view of the less reflective teacher from the longitudinal study:
Interviewer: *Strange, isn't it, that you weren't that interested in the reflection practicum in your first year?*
L: *That's probably because of the way things were at home. We never talked much, and you certainly didn't put forward any opinions. And when you get here, and all of a sudden people start expecting you to have opinions of your own, then it's really hard. The first year it just didn't work; I dreaded all those discussions. Very gradually things have improved, and I've managed to change the way I feel.*

Thus it is important for teacher educators who aim to promote reflection to realize that in many cases reflective practitioners in our studies seemed to be already reflective before they started their training. As we concluded earlier (Korthagen, 1985), a preparation program aiming at the promotion of reflection would seem to be most beneficial to those student teachers who are already somewhat reflective.....

Correlate 5. Reflective student teachers have strong feelings of personal security and self-efficacy.
The relationship between reflection and self-efficacy has a theoretical basis. For, reflection is a form of meta-cognition, which has been shown to be related to self-efficacy (Bandura, 1982; McCombs, 1988). It is well-known from the work of developmental psychologists that reflection may form a threat to the self-image. Laying your own performance open to inspection makes you vulnerable, threatens your survival within your own inner reality. Thus for reflection high degree of self-efficacy is necessary. This is illustrated by the following statements from the interviews in the longitudinal study:
R1: *In the course of my training I've gradually become more sure of myself. I don't know whether it has to do with the course or not. I find it much easier to speak up. In secondary school, if there was something I didn't understand, I'd go home and try to work it out. I did that the first couple of years here too, but now I put on the brakes, and just say that I don't understand. Three out of four times you discover that you weren't really concentrating, or that it was some minor point that you missed. But sometimes it's a good thing you put on the brakes, because there are a lot of others who don't understand either, or because I missed a couple of essential steps. I'm not hesitant about doing that any more. I think that the same thing is true in classroom situations. Your first student teaching period, you're explaining something and you think, let it go for now, and check again in a couple of minutes. But now if you're explaining something, you say 'Jane, would you mind putting that diary away for now?' and just go on talking. You look to see if they do it, and if necessary you tell them a second time. Whereas in the beginning you'd just let it go.*
R2: *I think being articulate and sure of yourself are closely related. These are things that I still think about, that are a kind of leitmotiv running through my training. I try to go through things systematically, and I feel sure of myself when I'm able to put*

something into words. I know that I'll learn how to do it in the end, but now I'm starting to grasp certain things, so that the pieces are starting to fall into place.

For purposes of comparison, here is the story of our less reflective student teacher:

L: *I often feel as if I don't really have anything to contribute. When I start to say something I think, no, that's not really important. And then later when someone else says the same thing, it gets used after all. A lot of the time there's a thought circling around in my head, but I just can't get it out. (...)*
In the group I found it very difficult to talk, especially about myself. I'd start to perspire, and I hated it. It's still not easy for me, but it's a lot better now. It's as if they expect it of you; they don't say so, but you can feel it. Everyone talks about their own feelings, so why shouldn't I?

Correlate 6. Student teachers with teaching experience who have a high degree of self-efficacy focus in their reflections about their teaching on the students. When they have a low sense of self-efficacy they focus on the self.

An analysis of the quantitative data suggests that when the prospective teachers have teaching experience, the relationship between reflection and self-efficacy is somewhat more complicated. For more experienced student teachers there seems to be a link between self-efficacy and the object of reflection. Student teachers who emphasize their own functioning when they reflect about their teaching, have a relatively low sense of self-efficacy. If they emphasize the students in their reflections, they have a relatively high sense of self-efficacy. This hypothesis about the relationship between reflectivity and self-efficacy is based on the results of both the longitudinal study and the comparison study, which are presented in Table 2. There appear to be consistently positive correlations between the degree of self-efficacy and the internal scale 'pupils' of the IEO test. For the internal scale 'self' of the IEO, these correlations are usually negative. These findings are in line with results found by Ashton et al. (1989). For the other domains (mathematics, school, etc.) the correlations are near zero. These results would seem to make sense, as high concerns for the self can indicate a lower quality of interpersonal relationships in the classroom, and thus a lower sense of efficacy. If these interpersonal relationships are positive, then teachers can allow themselves to reflect more on their students.

TABLE 2: Correlations between the self-efficacy scale+ and the internal scales of the IEO test for the domains 'self' and 'students'.

	'comparison study'		longitudinal study			
			3rd year		5th year	
	self	students	self	students	self	students
self-efficacy	-.04	.31**	-.75*	.14	-.37	.57
	n = 72		n = 10		n = 10	

** p <0.01
* p <0.05

+ self-efficacy was measured with an adaptation by Brekelmans (1989) of a questionnaire of Cloetta & Hedinger (1981).

Correlate 7. Reflective student teachers appear to talk or write relatively easily about their experiences.
The reflective teachers and student teachers in our studies appeared to talk and write easily. In the longitudinal study (Study 2), the answers of the two reflectors (R1 and R2) to the open questions in the interviews were approximately twice as long as those of the less reflective student teacher, who said that he had never been much of a talker (see his statements under correlate 5). In the comparative study (Study 4) we asked graduates of the SOL program and of another program to mention a number of characteristics of their preparation program. Graduates of the SOL program gave twice as many characteristics (on average 4.6) as did the graduates from the control group (on average 2.3).

Correlate 8. Female student teachers reflect more on their relationships with fellow students and less on subject matter (mathematics) than men.
In Study 3 we found that among student teachers in the first and second year of their preparation program, there was a significant correlation between the variable gender and an internal learning orientation in the domains 'fellow students' and 'mathematics'. Women scored higher than men on the scale related to internal learning orientation in the domain 'fellow students' (scores of 3.6 and 3.3 respectively, $F = 5.86$, $p < 0.02$), and lower on the internal scale 'mathematics' (scores of 3.2 and 3.4, $F = 3.82$, $p < 0.05$). Thus women seem to reflect more than men on the relationships with their fellow students, and less than men on mathematics.

6. A few comments

In the present section, we first mention some relationships between reflectivity and other variables which we expected, but for which we have not obtained confirmation. We also discuss the validity of the IEO test. Finally we will examine differences between practitioners who are at different stages of their career.

Age
In Study 3 we found no strong correlations between age and reflectivity for the domains 'self' and 'mathematics', as we had expected on the basis of indications in Study 1. There was a negative correlation, however, between age and the internal orientation regarding fellow students ($r = -0.29$, $p < 0.01$). Thus older student teachers are somewhat less inclined to reflect on their fellow students and their relationships with them.

Previous schooling
On the basis of the results of Study 1, we had hypothesized to find that student teachers who had a higher level of schooling were more reflective. In Study 3, however, this relationship could only be demonstrated for reflection on mathematics. An ANCOVA with previous schooling as factor and age as a covariate showed a significant main effect of the factor previous schooling on the scale 'external orientation regarding mathematics' ($df = 4$, $F = 2.93$, $p < 0.02$). When the student teachers' level of previous schooling is high, then they are slightly less externally oriented in the domain mathematics.

Inclination towards innovation
In our comparative study we found no indication of a link between reflectivity and

inclination towards innovation, as we had expected. Such a link has been suggested by Zeichner (1983, p. 6), and Zeichner & Liston (1987). It is possible that the difference between the operationalization of the concept of reflection in the SOL program, and that in the Wisconsin program have resulted in fundamental differences. In any case, we know of no empirical results that show that the Wisconsin operationalization of reflection is correlated with an inclination towards innovation.

The IEO test

It must be observed that in our comparative study (Study 4), we were not able to demonstrate that SOL graduates score significantly higher on the internal scales of the IEO test than the graduates in the control group. On the other hand, we have many other indications that SOL graduates are indeed more reflective (Wubbels & Korthagen, 1990, p. 41). We believe that the present form of the IEO test is not as adequate as we would like it to be. To begin with, the IEO test suffers from the familiar drawback of many attitude tests, namely, that respondents are asked to indicate how often or in what way they usually do something. Obviously, this does not have to agree with what they actually do. Moreover, it is conceivable that distortion occurs when respondents are influenced by a comparison of their own reflective orientation with a norm which says how reflective they ought to be. That norm is no doubt influenced by the teacher education program, and such influence may affect one student teacher more than another. Moreover, we feel that, since the construction of the IEO test, we have gained more insight into the concept of reflection. Our present conceptualization of reflection has not yet been completely operationalized in the versions of the test which we used so far.

For these reasons we believe that the results recorded for Study 3 should be interpreted with some caution. The same holds true for the attributes and correlates: further research is needed before we can speak of firm conclusions.

Reflectivity and the reality shock

Finally, we believe that the view of reflection as a purely rational process is too limited. Emotions and attitudes play a crucial role (cf. correlate 5 and 6). We are convinced that the stimulus to engage in reflection is almost always rooted in a need to get a better grasp of the situation. However, when fear of the situation becomes too great, as often happens during the 'transition shock' (Müller-Fohrbrodt et al., 1978; Corcoran, 1981), reflection may disappear altogether. One of the graduates whom we interviewed in the course of Study 1 put it like this:

It is as if the capacity for reflection is pushed away when you're confronted with an accumulation of conflicts. You feel empty. I no longer had any point of reference.

Our longitudinal study of the development of student teachers in the SOL program also provided indications of a relapse, a lessening of the ability to reflect, when an individual actually enters the teaching profession. And yet in Studies 1 and 2 we found indications that the capacity for reflection returns after about a year. This would seem to point to the existence of a kind of latency period. The comparative study (Study 4) confirmed this. It appears that at the beginning of their professional career there were almost no differences between the graduates of the SOL program and those of the program which was more oriented toward subject matter. After a few years, however, the SOL graduates have a more adequate self-perception (attribute 4), better interpersonal relationships with their students (correlate 1), and a higher degree of job satisfaction (correlate 2). All in all, there is sufficient reason for researchers in the field of reflective teaching to distinguish between

student teachers, teachers in the initial stages of their teaching career, and experienced teachers. We will return to this subject in the next section.

7. A research agenda

This section contains recommendations for further research, which can elucidate the concepts of reflection, reflective teaching and the reflectivity of practitioners.

A general framework for the study of reflection and reflective teaching

As we indicated in Section 1, it is of importance that authors who discuss reflection should make it clear what exactly they mean by this term. Since a perception of the importance of reflection cannot be divorced from a perception of the role of reflection in 'good teaching', we believe that more attention should be given to the embedding of conceptualizations of reflection in an underlying philosophy of education. A comparison of publications by such authors as Zeichner (1983), Schön (1987), Cruickshank (1981), Ross (1987), and Korthagen (1985) suggests that in this respect there are fundamental differences between their approaches. This is not necessarily a problem, as long as it is clear that the various views differ from one another, and how they differ.

If researchers in this area take pains to indicate how their conceptualization of reflection is related to the characteristics which they consider fundamental to good teaching, it will also be possible to carry out empirical research into these alleged relationships. Up to now there has been little evidence of this empirical basis within the theory related to reflection (cf. Zeichner, 1987).

Such empirical research requires precise operationalizations of the definitions of reflection. This is no simple task, considering the fact that much of what we are investigating takes place in the teacher's head. Sophisticated research methods are needed. Techniques such as stimulated recall by means of video recordings of teaching activities, and the analysis of supervisory discourse would appear to be helpful in revealing what is actually going on inside the teacher's head.

As we indicated in Section 6, when studying reflective teaching, there are sufficient grounds to distinguish between student teachers, teachers in the early stages of a teaching career, and experienced teachers. We would like to argue in favor of more longitudinal research into the developmental processes of teachers, not least into the differences between various learning orientations. Research into contextual influences on teacher development should be incorporated into this kind of study (Wildman & Niles, 1987; Korthagen, 1991). As Zeichner (1987) says: "Research in this area needs to be able to document the particular contribution of pre-service programs apart from other influences."

Specific research questions arising out of the research presented in this paper

With respect to the attributes and correlates of reflectivity formulated in the present paper, the following questions may be posed:

1. To what extent can the attributes and correlates be confirmed by other studies? As we observed in the case of various results, further research is needed.
2. To what extent are the attributes and correlates determined by the chosen definition and operationalization of reflection? In other words, which aspects are specific to the chosen conceptualization, and which are of a more general nature?
3. To what extent are the attributes and correlates determined by the context of the

Dutch educational system? Various authors have pointed to the influence of the social context on educational research (e.g. Hamilton, 1983). In the light of the relationship between the concept of reflection and the accompanying perception of good teaching which we have stressed here, the results would appear to be of necessity culturally determined.

4. Which of the results reported above are particular to reflective student teachers, and which are valid for reflective practitioners in general?
5. Do reflective graduates of the SOL program teach according to the principles of good teaching formulated in Section 2? If this question is to be adequately addressed, much more research will have to be done in the area of instrument development. In any case, the answers to this question can make a very real contribution to research pertaining to the last question which we would like to put, a question which is perhaps the most important of all for the future development of this field of study:
6. Can the attributes and correlates discussed in this paper be embedded in a theory in which empirically based relationships are established between a definition of reflection, characteristics of reflective practitioners and principles of good teaching?

Concluding remark

This paper offers a number of initial building blocks for such a theory, which have arisen from the definition of reflection for which we have opted. However, no small amount of empirical research will be required to establish a sound theoretical basis for teacher education based on the aim of promoting reflection. We believe that also for other approaches of the concept of reflection a great deal of empirical research will be needed if we are to leave behind the realm of vague notions and beliefs about the benefits of reflective teaching and the effects of programs designed to promote it.

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