Developing Theory from Practice in Teacher Education

By Theo Wubbels, Fred Korthagen, & Mieke Brekelmans

Introduction

A century ago teaching was mastered mainly by trial and error: the (student) teacher was an apprentice of a master teacher and usually imitated his or her teaching. Gradually teacher education was professionalized and via, among others, normal schools we have now moved in Europe and on other continents to teacher education institutes, often as part of universities, in which theory and skills are taught (Wubbels, 1992a).

Theo Wubbels is a professor of education and chair and Fred Korthagen and Mieke Brekelmans are associate professors of education, all with the IVLOS Institute of Education, Utrecht University, Utrecht, The Netherlands.

From the literature, we know that the quality of student teachers' learning effects in student teaching practice and in the first years of teaching can be questioned. Many studies in the last ten years have shown that student teachers do not learn everything we want them to learn (e.g., Ashton, 1996). Training at the preservice level has not a high impact on attitudes and beliefs of student teachers (Richardson, 1996). Skills and theories that have been taught on campus often are not used in student teaching practice. Many teacher education students even have negative attitudes towards theory presented to them

at the teacher education college. They think that these theories contribute little to good teaching or even worse, that they are counterproductive to good practice (Sanders & McPeck, 1976; Lasley, 1980). Theory is conceived of as something for study, but not for use in the classroom. There is a poor transfer of theory taught and skills trained on campus to classroom teaching practice.

Many student teachers perceive the transition from the teacher education institute to student teaching or to teaching as a novice classroom teacher as an emotionally disturbing period. They are confronted with a reality, with responsibilities and complexities in the classroom, that they have not been aware of until then. This is often a period of severe stress and difficult problems (Veenman, 1984) described as a reality shock (Müller-Fohrbrodt, 1978) or transition shock (Corcoran, 1981). More progressive attitudes that have been acquired during teacher education are quickly washed out by school experience (Zeichner & Tabachnick, 1981) once student teachers have left teacher education colleges.

With these problems in mind, many strategies have been proposed to integrate theoretical and practical components in teacher education productively, for example in the training of complex skills (Cruickshank & Metcalff, 1990; McIntyre, Byrd & Foxx, 1996) and in strategies to promote reflective teaching such as action research, ethnography, writing, supervision and curriculum development, and analysis (Zeichner, 1987). Although these strategies sometimes have positive effects, none of these seems to be the final solution for the problematic gap between theory and practice.

This paper analyses the gap between theory and practice and will conclude that an important reason for this gap is the neglect in teacher education of non-rational human information processing. It will then describe learning to teach as a process of experiential learning and present some considerations for decisions about teacher education programs that take student teachers' experiences as starting points for learning.

The Gap between Theory and Practice

Several hypotheses about the origins of the gap between theory or skills taught in teacher education and the teacher's actions in teaching practice have been put forward (Wubbels, 1992b) and we mention them here as follows.

The Nature of Theory and Practice

First, the gap between theory and practice can be described as the difficulty to use or apply theoretical notions in classroom practice. The context of practice differs from the context in which the theory was developed and theory in essence is an abstraction of reality, whereas practice is concrete. We think that therefore very seldom educational theory as taught on campus gets a place in the practical teaching process. Teacher educators can help student teachers to translate educational theory

towards their teaching, for example with assignments to use certain principles or to practice skills. In our experience, however, it seems to be more a matter of coincidence than of rule when student teachers feel that theory from campus is helpful for the specific problems in their classrooms. It seems that from the student teachers' perspective this *deductive* approach widens the gap between theory and practice rather than narrows it (Hermans, Créton & Korthagen, 1993).

Compartmentalization

A second view is based on a cognitive psychological perspective. From this perspective, it is expected that if theory is taught without a direct connection with teaching practice or if skills are learned only in a laboratory setting this will result in compartmentalization in memory (*e.g.*, Gagné & White, 1978). Compartmentalization makes the theories and skills that have been learned on campus poorly accessible in practice (Anderson, 1983; 1985). Following this line of reasoning, integration of theoretical components of teacher education and the field experiences in student teaching can be advocated to improve the accessibility of the scientific knowledge base about teaching in practice.

Preconceptions

Following work of Bep H. Corporaal (1988), we consider the poor transfer of theory to practice in teacher education from the perspective of constructivism (*e.g.*, Magoon, 1977; Resnick, 1983; Duffy & Jonassen, 1992). This perspective can be considered an extension of the cognitive psychological line of reasoning. In the constructivist perspective, humans are seen as subjects who actively construct understanding from experiences using their already existing frameworks. People continuously build their personal theories (Groeben, 1981; Groeben & Scheele, 1977), and therefore student teachers enter teacher education with knowledge, attitudes, and beliefs, that are deeply rooted in experiences (*cf.*. Clark, 1988). These experiences act as strong frameworks to interpret things that happen in classrooms and they help people to interact with their environment and to anticipate future actions (Groeben, 1981). Following and integrating theories from cognitive psychology and constructivism, Corporaal (1988) interprets the poor transfer of theory to practice as a lack of integration of the theories presented in teacher education (teacher educator theory) with the conceptions student teachers bring to the teacher education program. The quick "washing out of progressive attitudes" (Zeichner & Tabachnick, 1981) after student teachers have left teacher education colleges can be caused in part by too little awareness on the part of teacher educators of the conceptions that student teachers hold when they enter the program.

Student teachers' preconceptions show a remarkable resistance against traditional attempts to change them (Wahl, *et al.*, 1984; more in general in Fiske & Taylor, 1984; Turk & Speers, 1983). The stability of student teachers' cognitions can in part be explained by its firm roots in the many years of experiences that

student teachers have had as students in education (Lortie, 1975). Renée T. Stofflett and Trish Stoddart (1994), for example, argue that teachers' conceptions of teaching are strongly influenced by the way in which they themselves have learned the subject content. They have shown that student teachers who themselves experienced learning in an active way are more inclined to plan lessons that facilitate students' active knowledge construction. D.M. Kagan (1992, p. 145) states that especially "a novice's self-image as a teacher may be strongly related to the novice's self-image as a learner." She argues that in constructing images of teaching, student teachers "may extrapolate from their own experiences as a learner, in essence, assuming that their pupils will possess learning styles, aptitudes, interests, and problems similar to their own." Ineke Huibregtse, Fred A.J. Korthagen, and Theo Wubbels (1994) showed that even for experienced teachers there is a strong relationship between their preferred way of teaching and the way they want to learn themselves: they have a one-sided view of the learning styles of their students and therefore may tend to project their own way of learning onto the learning of their students.

Also, stereotyped examples of teaching shown by film and television programs may contribute to the stability of student teachers' conceptions of teaching (Lasley, 1980). Further, the knowledge that directs action has a procedural character and this type of knowledge is, according to John R. Anderson (1983), more difficult to change than declarative knowledge. Finally, a certain one-sidedness in the approaches used in teacher education may be a reason for the lack of influence of teacher education programs on the student teachers' preconceptions (Korthagen, 1993; Wubbels, 1992b). We will discuss this one-sidedness in more detail in the next section.

One-sidedness in Teacher Education Approaches

In the teacher education literature, descriptions of preconceptions that guide student teachers' actions are usually limited because they tend to focus on just one type of human information processing, neglecting another type (*e.g.*, Hollingsworth 1989; Weinstein, 1989). The psychological literature is full of dichotomies revolving around the duality of human information processing (Korthagen, 1993). One type of information processing can be described as rational, logical, or analytical, and the other as intuitive, non-rational, or holistic. We therefore use the term preconceptions to include *images* or *gestalts* as entities that guide human actions. With the terms images and gestalts, we want to refer to conglomerates of needs, values, meanings, preferences, feelings, and intentions for actions united into one inseparable whole. These gestalts can be conceived of as frozen experiences. They evolve as a result of a person's earlier experiences, for example with other important persons.

Whereas in everyday teaching non-rational information processing may be quite common, for example when teachers act routinely, in teacher education the

emphasis is on rational information processing. Therefore one of the reasons that program impact can be limited in scope is that non-rational information processing is neglected.

Experiences as Starting Point for Learning

Long student teaching periods or early entrance into the field can be proposed as contributions to a solution for the problematic relationship between theoretical and practical components of teacher education. The alternative schemes in which novice teachers go to teach in schools with very little theoretical preparation, for example, are not only supposed to be an answer to teacher shortages but sometimes also to the criticisms on the relevance of teacher education theory for practice (*e.g.,* Sandlin, Young, & Karge, 1992). We think that starting from practical experiences can be a viable avenue in teacher education to help integrate theoretical notions in teacher actions and to help take into account both types of human information processing. Such an approach to teacher education does, however, not guarantee success. In fact, it has been shown that long student teaching periods can be a socializing factor rather than that they give an opportunity for professional development. Marvin F. Wideen, Jolie Mayer-Smith, and Barbara J. Moon (1993), for example, conclude from a review of studies on effects of teacher education programs that "...the student teaching experiences were so devastating that little learning seemed to take place." In the following section we will offer suggestions for careful planning, structuring, and supervision to make practical experiences indeed a learning experience. First, we will elaborate on the processes that may evolve if teacher education is organized as learning from experience.

Learning in student teaching can be seen as a form of experiential learning. It is, for example, described in the model of David A. Kolb and Ronald Fry (1975) as a cyclical process of concrete experience, reflective observation, abstract conceptualization, and active experimentation. This model, however, does not account for the non-reflective learning that is an important part of learning (Bandura, 1978). It suggests, on the one hand, that learning from experience is a natural, almost autonomous process that leaves little room for guided learning. On the other hand, it overemphasizes the role of abstract concepts at the cost of concrete plans and concepts, images, feelings, or needs. To develop teacher education programs, other descriptions of the processes during learning from experience are necessary. We prefer the view on experiential learning as acquisition of knowledge, attitudes, and skills with respect to oneself and one's environment by means of one's own observation of and participation in situations, and by systematically thinking about this under supervision[1] (Erkamp, 1981).

Korthagen (1985) describes this experiential learning as a cyclical process of reflection. He distinguishes five steps: (1) action; (2) looking back on the action; (3) awareness of essential aspects; (4) creating alternative methods of action; and (5)

trial, which is a new action and therefore a starting point of a new cycle. If reflection is organized according to this model, an *inductive* approach is followed that builds on learning processes that take place automatically during action. Different from the *deductive* approach that was referred to earlier, the inductive approach starts from student teachers' experiences and images rather than from the objective theories on learning and teaching from the literature.[2] Student teachers go to schools for observations, teaching experiences, and other assignments very early in an inductively-arranged teacher education program. In this way, experiences are created that can be used in the reflection process to help investigate the preconceptions that student teachers have developed from experiences earlier in their life. Next, for example, conflicts can be created between conceptions that have been built in the period as a student in teaching and experiences during teaching as a student teacher, thus addressing the non-rational type of information processing.

Interpreting learning in student teaching as experiential learning is not far-fetched, but this interpretation can be taken a step further to apply also to other parts of teacher education, such as seminars on campus. The inductive approach can be followed at the level of a class on campus by creating an experience in class that is the basis for learning.

An important condition for learning from experience is a feeling of safety on the part of the student teacher. Learning or professional development can be seen as a process of (personal) growth, and it is well-known that the human organism resists growth if the need for safety is not fulfilled (Maslow, 1968; Fullan, 1991). Student teachers, for example, are preoccupied with concerns about survival (Fuller & Bown, 1975) and this can hinder their learning about other topics (Kagan, 1992). A teacher educator's empathy can help to create a safe environment. In our experience, another very powerful tool to build a positive learning climate is to reward student teachers consequently for positive elements in their performance. By emphasizing their strong points, they become more willing and able to face their weaknesses and invest their energy in risk-taking actions that are necessary for improvement of weaknesses. Rewards give them the feeling that there is a positive basis from which they can work.

Learning from experiences in a cyclical process of reflection is not a way of learning that many students have encountered in schools before they entered teacher education. Therefore, they may show resistance to engage in such a learning process. A strategy of gradualness may help to get student teachers acquainted to actively and consciously learning from their experiences. Some student teachers are more inclined to engage in reflection than others. This seems to be another difference in the preconceptions that student teachers bring to the teacher education program. According to Korthagen (1988), the first group can be called internally oriented, whereas the second are more externally oriented; they want to be guided from outside sources.

Implications for Teacher Education

The view of student teacher learning that has been presented in the preceding section has implications for teacher education. We describe some of these on three different levels: the level of interaction between an individual student teacher and a teacher educator (be it university staff, cooperating teacher, or mentor), the level of separate program elements, and the level of program structure.

Supervisory Conferences

Teacher educators who want to stimulate student teachers' learning from experience in, for example, supervisory conferences need a rich interpersonal repertoire to guarantee a safe climate. The phase of looking back in the reflection process asks for acceptance, empathy, genuineness, and concreteness. To be able to help student teachers become aware of essential aspects, the supervisor needs to add more directive skills such as confrontation to his or her repertoire and to help create alternative actions, problem-solving skills, and useful instruction.

If a supervisor is also responsible for evaluation in the process of deciding about licensure or graduation, tension evolves between that responsibility and the safety necessary for stimulating learning. For many supervisors, this tension can be hindering their role as facilitator of learning to a large degree. This is similar to the case of teachers in schools who have dual responsibilities towards their students, and teacher educators will need to develop their skills to cope with this tension.

Program Elements

Joost J. Hermans *et al.* (1993) propose a five-phase procedure to structure student teachers' learning from experience in separate elements of teacher education programs. We will discuss here this procedure, focussing on activities that are not directly connected to student teachers' actual classroom teaching.

Phase 1—Pre-structuring through assignments. In this phase, student teachers get assignments that pre-structure the experiences that they will acquire in class at the institute or in teaching in a student teaching school. For example, in dealing with motivation the first assignment can be to try and map the motivation of students via an interview with one or more students. For the theme "tests," experiences can be pre-structured by having student teachers plan a test to check homework, administer the test, and bring the results back to the institute.

Phase 2—Experiences. Secondly, student teachers go to a place to have experiences, for example the student teaching school. They teach, interview, administer a test, etc. It is often necessary to prepare these experiences by training of skills on campus. In the class on campus, the experience can be in a role play, a group discussion, etc. For the theme "questioning," for example, student teachers

can be asked to conduct a seven-minute interview with a colleague on what they want to learn in the seminar.

Phase 3—Structuring. Experiences are reported so that they can be structured by others for clarification, classification, and generalization. Such a report, for example, can take the form of an open, lengthy presentation in much detail with the help of video recording, or just a five-minute talk on the basis of closed questions of the teacher educator.

In this phase, a first theoretical input can be seen. In the case of motivation, for example, one of the categories of experiences can be factors that, according to student teachers, demotivate students in school, such as abstract theoretical subject matter, having to listen very long, seeing no connection between the school subject and everyday life, or getting low marks. The teacher educator might then introduce the terms extrinsic and intrinsic motivation to structure this list further. The input from theory in this phase has the form of labeling or classification according to theoretical notions, and is therefore rather an input of theoretical elements than of complete theories. Relations between theoretical elements are usually not introduced in this phase. Student teachers do not perceive this kind of input as theoretical, because it is so obviously related to their experiences.

Phase 4—Focusing. After (usually a wealth of) experiences have been structured, it is possible to focus on some parts of these and analyze them in greater detail. It can be possible to focus on many different things, such as commonly-perceived learning needs of the student teachers, essential aspects or generic features of a concept or competency, student teachers' gestalts, the relation of these gestalts to the classroom reality, student teachers' strengths and weaknesses in relation to a particular competency, what they have learned and what their learning aims are for the future, etc. Beforehand, the staff can choose features that they think are important or student teachers can be invited to bring up elements to focus on. If, for example, the theme is motivation, the staff may decide that they want to be certain to have the possibility to connect the student teachers' experiences with Maslow's needs' hierarchy, and therefore they focus on students' needs observed by the student teachers in the interview reports. In this phase, theoretical notions may become more clearly visible for the student teachers because the trainer will not only label experiences or things student teachers have said on a more abstract level, but also will point to theoretical interpretations, connections between different categories, and causal relationships.

The form of theory in this phase is still not as it is usually found in books (with, for example, emphasis on descriptions of theoretical constructs and conceptual networks or research reports), because the descriptions are still directly connected to the student teachers' experiences or future plans.

Phase 5—Introduction of theories. In this last phase, the teacher educator

may introduce theories from the literature in a more traditional form, such as a chapter on motivation in a book on educational psychology. Now, relationships between theoretical concepts are presented. The introduction can, for example, be in the form of a lecture or a written presentation. If a standard text is used, then it will usually be necessary to make explicit what the connection is between the theory and the experiences of the student teachers.

If the theory is in conflict with the student teachers' preconceptions, it can be necessary to start a longer and more elaborated procedure in which first the status of ideas that student teachers have upon entering the program element are lowered in order to allow student teachers to be motivated to learn about alternative theories.

In addition to analytical approaches, interventions addressing non-rational information processing are also available for the introduction of theories. Theoretical notions can be translated to be used in video-tapes, or into figurative language such as metaphors. Guided fantasies and behavior prescriptions are other, not very frequently-used interventions, to facilitate student teachers' adoption of new theories (Korthagen, 1993; Wubbels, 1992b).

Program Organization

At the level of the program organization there are two important considerations for the kind of experiences that student teachers are introduced to. First, these experiences should be offered in such a way that there is a balance between safety and challenge, and second, they should be planned as part of a long-term development process. In this section we first discuss these two aspects of the program organization and thereafter the necessarily integrated character of an inductive approach and finally the consequences for the communication between school and institute.

Balance between Safety and Challenge. We have previously discussed in the section on experiences as a starting point for learning the idea that a safe climate is necessary in order for learning to take place. At the same time, there must be some challenge in the experiences of student teachers to let these be good starting points for learning. Such challenges require assignments that create a distance between what a student teacher already can do, and what is being asked for. If, however, this distance is too large, the challenge becomes a threat and then learning is inhibited by feelings of unsafety. If too small challenges for student teachers are planned, they may feel in the end that they have been prepared insufficiently to teach completely independent and responsible and thus they may encounter a reality shock. Therefore, it is important that in student teaching there is a phase that makes student teaching as realistic as possible, however without making it an experience that is completely the same as independent teaching: that means there must still be supervision.

Besides possessing interpersonal skills to create a safe and challenging envi-

ronment, teacher educators have the possibility to create challenges rather than threats by choosing the character of the learning experience. Our program strives to construct an educational route that leads to gradual immersion in practice and gradual acquisition of professional competence. This means that complexity, workload, independence, and job responsibility gradually increase. This is evident in, among other things, the programming of school practice periods in such a way that they are increasing in length and degree of complexity: first observing, then teaching parts of lessons (*e.g.*, teaching ten minutes to an individual student with a cooperating teacher present and extended review afterwards about what happened), whole lessons, a short series of lessons, a long series of lessons, and finally a complete series of lessons at which neither fellow students nor the school supervisor are present and finishing with a test for the students. At the end of the period of gradual immersion there is in our program a phase in which student teaching is made as realistic as possible with only supervision "at a distance" (Koetsier, Wubbels & Van Driel, 1992). Such supervision in our program consists of discussions twice a week with a cooperating teacher who did not visit the lessons. In this independent final teaching period the student teachers assume responsibility as completely as possible for the education in a small number of classes, term grades included. Formally, of course, the school supervisor bears the ultimate responsibility.

Long-Term Learning Processes. During a teacher education program, student teachers will be confronted with many different experiences. It is important that these experiences are not separate, haphazard experiences, but that they are deliberately planned to be connected to each other for every individual student teacher. The learning process of student teachers has been described before as a cyclical process in which reflection on action leads to new actions. That description shows how experiences can be connected to each other via the reflection process. By improving actions again and again, the cyclical process becomes a spiral process of actions of ever-higher quality.

To help stimulate long-term learning processes, student teachers can, for example, use logbooks or diaries to document their strengths and weaknesses and consequently think about their learning wishes and aims. We think that every student teacher will follow his or her own individual and highly personal learning path for two reasons. First, this is a necessary consequence of the idiosyncratic character of student teachers' preconceptions and of the competencies that they bring to the program. Second, we think that the goals of the program have many individual elements for student teachers: there is no one way of good teaching, but instead there are many different ways to teach and therefore student teachers can develop their own style in accordance with their personality, competencies, and biography.

Integrated Program. Usually teacher education programs are structured according to disciplines such as educational psychology, foundations of education,

teaching methods, or linguistics. Such a structure can promote compartmentaliza-
tion of what is learned and may inhibit student teachers in integrating insights from
different disciplines for the solution of practical problems. An inductive approach
to teacher education takes the experiences of student teachers as starting points.
These experiences cannot be structured according to disciplines, and therefore a
thoroughly consistent inductive approach leads to a single completely-integrated
program. The program of Utrecht University indeed is organized to a large extent
around the practical experiences of student teachers. In addition, however, some
thematic organized elements are also present.

Students go through our program in cohort groups that do not follow different
classes, but just one "class": the program. The groups consist of students who are
being prepared to teach at the secondary level in one subject. Groups are formed of
students studying the same or a similar subject. Theories from different disciplines
are covered in the program, but always connected to the experiences in practice, and
therefore at the beginning of the program it cannot be said with certainty when a
particular theory will be taught. The program is characterized by integration:
teaching methods, general aspects of teaching, and subject-matter specific elements
are brought together in the program and most important in the program faculty. The
integration of diverse elements in one program has led to the decision that one staff
member is responsible for the complete learning path of a group of about fifteen
student teachers. This staff member teaches the majority of the program, but will
every now and then invite experts from different disciplines as guest teachers.

This program organization asks for very experienced teacher educators who
are knowledgeable in the many disciplines that contribute to the quality of teacher
education. Most of our teacher educators who take responsibility for a cohort group
of student teachers have their background primarily in the field of education of the
subject of the student group (*e.g.*, science education or language education).
Usually they have considerable experience as a classroom teacher and cooperating
teacher before they join the university staff. When hiring staff, these experiences are
important selection criteria. We have an extensive induction and training on-the-job
tradition for new staff members. A small group of specialists in educational theory,
learning theory, educational psychology, curriculum development, information
technology, philosophy of education, etc., trains the teacher educators on a regular
basis in these fields and promotes professional development activities. In our
institute, we have a lot of professional development activities for the staff provided
by experts in the disciplines, both from inside our institute and from outside (*e.g.*,
the school of social sciences).

In order to ensure sufficient cross-group comparability in the program, many
activities are undertaken. The way the programs are run is documented in scenarios
that are shared between different teacher educators and discussed in seminars.
Every year several seminars are conducted for the whole staff to discuss the
principles underlying the program, the way these are put into practice, and new

developments. Student evaluations of the program are gathered by the central office and compared between groups. On a regular basis two teacher educators co-teach (parts of) the program.

Structuring the program around themes, such as classroom management, the place of a subject in the school system, and student motivation, may also help to promote integration of knowledge from different disciplines. This kind of organization is also used in some parts of our program. The thematic organization can have tension with an organization around student experiences. No matter how well experiences are pre-structured, they can be unexpectedly different from what the teacher educators intended. The focusing phase described before in the section on program elements is particularly suited to help diminish this tension.

Communication between School and Institute. A key factor in an inductive approach to student teaching is the relation between the student teaching school and the university or college. Several measures can be taken to build favorable circumstances for the communication between school and institute. We have cooperating teachers involved as much as possible on a level of equity in the planning of the program and in the evaluation of student teachers. They have released time for the supervision and they are trained in supervision skills. In the choice of student teaching schools the room in the school for experimenting, and the quality of internal communication, are important considerations.

Evaluation of the Program

Some evaluation studies on the program at Utrecht University have been carried out. An external review committee evaluated all Dutch universities in 1992 and 1996. Both times the program was evaluated very positively with regard to the level of competence of the graduates. Although no formal ratings were given, it is clear from the descriptions that the program was considered to be one of the best in The Netherlands. In 1996 it appeared that the program costs were lower than those of many other universities. From studies among all Dutch graduates, it appears that student satisfaction of the Utrecht University program in general is higher than of other programs. An evaluation study among Utrecht graduates between 1987 and 1991 showed that 86 percent of the graduates considered the program to be relevant or highly relevant to their present work as teachers (Koetsier, Wubbels, & Korthagen, 1997). In a qualitative study (Hermans *et al.*, 1993), all twelve participants said that there was a seamless connection between theory and practice, whereas the graduates of other programs frequently complained about this connection. Schools are eager to cooperate with Utrecht University for placement of students. Whereas other universities sometimes have problems in finding schools, we can select schools for the program from those that want to cooperate.

It seems to us that one of the main problems of this program (as of many others) is that guidance of beginning teachers as a follow up to the program cannot be

provided on a regular basis. Once student teachers have graduated, they are considered by law fully competent and it is the task of the schools to help them further develop. The university has no possibilities to help more than occasionally.

Conclusion

This paper has introduced the basic principles and underlying ideas of a teacher education program that uses an inductive approach to help bridge the gap between theory and practice in teacher education. This approach takes student teachers' experiences as starting points for learning. In the preceding sections we have mentioned that such an approach asks for very skillful university staff and cooperating teachers. In our institute we offer training and professional development activities for the program staff. These kinds of activities are necessary for every teacher education program because there is, at least in The Netherlands, no regular education for teacher educators. The activities in our institute are, however, not only a basis for an increase of competency of the staff, but these are also intended to have the staff experience the sometimes painful process of reflection. The program staff is expected to stimulate and facilitate reflection and professional development processes in their students and we think that it is therefore important that they go through these processes themselves. So in the activities for the staff, a field that is still in development, the same kind of processes that are stimulated for student teachers are modelled for the staff.

This training for the staff and the cooperating teachers, developed at our institute, has, during the last couple of years, also been taught at other teacher training institutes. Experiences with these courses and with the same training in other countries have shown that the basic principles underlying this program can also successfully be applied in other programs and countries. Worldwide, teacher education seems to be ready for a fundamental change. In this paper we have outlined how this change can be put into practice.

Notes

1. We will use the words supervision and mentoring as synonyms. They refer for us to activities of cooperating teachers, clinical faculty, mentors or university professors to help student teachers or novice teachers to learn from their experiences. They do not refer to evaluation for licensing or graduation nor to activities to guarantee the quality of the (student) teacher's teaching.

2. Recently use of cases in teacher education has been advocated as a way to integrate insights from different disciplines to apply to practical teaching problems (Shulman, 1992). This can also be an example of an inductive approach: student teachers' thinking about practical problems can be taken as starting point for theoretical input. Cases can however also be used in a deductive approach when student teachers are asked to apply their knowledge from disciplinary classes on practical problems presented in cases.

References

Anderson, J.R. (1983). *The architecture of cognition*. Cambridge, MA: Harvard University Press.

Anderson, J.R. (1985). *Cognitive Psychology and its implications*. New York: Freeman.

Bandura, A. (1978). *Social Learning Theory*. Englewood Cliffs, NJ: Prentice Hall.

Ashton, P. (1996). Improving the preparation of teachers. *Educational Researcher*, 25 (9), 21-22 & 35.

Clark, C.M. (1988). Asking the right questions about teacher preparation: Contributions of research on teacher thinking. *Educational Researcher*, 17 (2), 5-12.

Corcoran, E. (1981). Transition shock: The beginning teacher's paradox'. *Journal of Teacher Education*, 32, 3, 19-23.

Corporaal, A.H. (1988). *Bouwstenen voor een opleidingsdidactiek* (Building blocks for a theory of teacher education). Dissertation. De Lier, The Netherlands: ABC.

Cruickshank, D.R. & Metcalff, K.K. (1990). Training within teacher preparation. In W.R. Houston (Ed.), *Handbook of Research in Teacher Education* (pp. 469-497). New York: Macmillan.

Duffy, T.M. & Jonassen, D.H. (Eds.) (1992). *Constructivism and the technology of instruction: a conversation*. Hillsdale, NJ, Lawrence Erlbaum.

Erkamp, A. (1981). *Ervaringsleren* (Experiential Learning). Amersfoort, Netherlands: De Horstink.

Fiske, S. T., & Taylor, S.E. (1984). *Social Cognition*. New York: Random House.

Fullan, M. (1991). *The new meaning of educational change*. London, United Kingdom: Cassell.

Gagné, R.M., & White, R.T. (1978). Memory structures and Learning outcomes. *Review of Educational Research*, 48, 187-222.

Groeben, N. (1981). Die Handlungsperspective als Theorierahmen für Forschung im pädagogischen Feld. In M. Hofer (Ed.), *Informationsverarbeitung und Entscheidungsverhalten von Lehrern*, (pp. 17-49). München, Germany: Urban und Schwarzenberg.

Groeben, N., & Scheele, B. (1977). *Argumente für eine Psychologie des reflexiven Subjekts*. Darmstadt, Germany: Steinkopff.

Hermans, J.J., Créton, H.A. & Korthagen, F.A.J. (1993). Reducing the gap between theory and practice in teacher education. In J.T. Voorbach (Ed.), *Teacher Education 9, Research and developments on teacher education in the Netherlands* (pp. 111-120). De Lier, The Netherlands: Academisch Boekencentrum.

Hollingsworth, S. (1989) Prior beliefs and cognitive change in learning to teach. *American Educational Research Journal*, 26, 160-189.

Huibregtse, I. Korthagen, F. & Wubbels, Th. (1994). Physics teachers' conceptions of learning, teaching and professional development. *International Journal of Science Education*, 16, 1279-1301.

Kagan, D.M. (1992). Professional growth among pre-service and beginning teachers. *Review of Educational Research*, 62 (2), 129-169.

Koetsier, C.P., Wubbels, Th. & Driel, C. van (1992). An investigation into careful supervision of student teaching. In J.H.C. Vonk, J.H.G.I. Giesbers, J.J. Peters en Th.

Wubbels, *New prospects for teacher education II* (pp. 245-254), Amsterdam, The Netherlands: Universitaire Lerarenopleiding Vrije Universiteit & Hogeschool Holland.

Koetsier, C.P., Wubbels, Th. & Korthagen, F.A.J. (1997). Partnership and cooperation between the teacher education institute and the schools. In M. Fuller, & A. Rosie (Eds.), *Teacher education and school partnership.* Mellen Press (in press).

Kolb, D.A. & Fry, R. (1975). Towards an applied theory of experiential learning. In C.L.Cooper (Ed.), *Theories of group processes* (pp. 33-58). New York: J. Wiley.

Korthagen, F.A.J. (1985). Reflective teaching and pre-service teacher education in the Netherlands. *Journal of Teacher Education,* 36, 5, 11-15.

Korthagen, F.A.J. (1988). The Influence of Learning Orientations on the Development of Reflective Teaching. In J.Calderhead (Ed.) *Teachers' Professional learning* (pp. 35-50). London, United Kingdom: Falmer Press.

Korthagen, F.A.J. (1993). Two modes of reflection. *Teacher & Teacher Education,* 9, 3, 317-326.

Lasley, T.J. (1980). Preservice teacher beliefs about teaching. *Journal of Teacher Education,* 31, 38-41.

Lortie, S. (1975). *Schoolteacher: a sociological study.* Chicago, IL: University of Chicago Press.

Magoon, A.J. (1977). Constructivist approaches in educational research. *Review of Educational Research,* 47, 651-693.

Maslow, A.H. (1968). *Towards a psychology of being (second ed.).* New York: Harper & Row.

McIntyre, D.J., Byrd, D.M. & Foxx, S.M. (1996). Field and Laboratory experiences. In J. Sikula (ed.), *Handbook of Research on Teacher Education* (second edition, pp. 171-193), New York: MacMillan.

Müller-Fohrbrodt, G. e.a. (1978). *Der Praxisschock bei jungen Lehrern.* Stuttgart, Germany: Klett.

Richardson, V. (1996). The role of attitudes and beliefs in learning to teach. In J. Sikula (Ed.), *Handbook of Research on Teacher Education* (second edition, pp. 102-119), New York: MacMillan.

Resnick, L.B. (1983). Mathematics and science learning: a new conception. *Science,* 220, 477-478.

Sanders, J.T., & McPeck, J.E. (1976). Theory into practice or vice versa? Comments on an educational antinomy. *The Journal of Educational Thought,* 10, 188-193.

Sandlin, R.A., Young, B.L. & Karge, B.D. (1992). Regularly and alternatively credentialed beginning teachers: comparison and contrast of their development. *Action in Teacher Education,* 14, 4, 16-23.

Shulman, J.H. (Ed.) (1992). *Case methods in teacher education.* New York: Teachers College Press.

Stofflett, R.T. & Stoddart, T. (1994). The ability to understand and use conceptual change pedagogy as a function of prior content learning experience. *Journal of Research in Science Teaching,* 31 (1), 31-51.

Turk, D.C. & Speers, M.A. (1983). Cognitive schemata and cognitive processes in cognitive-behavioral interventions: Going beyond the information given. In P.Kendall (Ed.), *Advances in cognitive-behavioral research and therapy* (pp. 1-31). New York: Academic Press.

Veenman, S., (1984). Perceived Problems of Beginning Teachers. *Review of Educational Research,* 54, 2, 143-178.

Wahl, D., Weinert, F.E., & Huber, G.L. (1984). *Psychologie für die Schulpraxis.* Ein handlungsorientiertes Lehrbuch für Lehrer. München, Germany: Kösel Verlag.

Weinstein, C.S. (1989). Teacher education students' preconceptions of teaching. *Journal of Teacher Education, 39,* 53-60.

Wideen, M.F., Mayer-Smith, J.A. & Moon, B.J. (1993). The Research on Learning to Teach: Prospects and Problems. Paper presented at the annual meeting of the American Educational Research Association, Atlanta, GA.

Wubbels, Th. (1992a). Teacher Education and the Universities in The Netherlands. *European Journal of Teacher Education,* 15, 3, 157-171.

Wubbels, Th. (1992b). Taking Account of Student Teachers' Perceptions. *Teaching & Teacher Education,* 8, 2, 137-149.

Zeichner, K. (1987). Preparing reflective teachers: An overview of instructional strategies in preservice teacher education. *International Journal of Educational Research,* 11, 5, 565-575.

Zeichner, K. & Tabachnik, B.R. (1981). Are the effects of university teacher education washed out by school experiences? *Journal of Teacher Education,* 32, 7-11.