How teacher education can make a difference

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Many studies reveal a huge gap between theory and practice in teacher education, leading to serious doubts concerning the effectiveness of teacher education. In this paper, the causes of the gap between theory and practice are analysed. On this basis, and grounded in a three-level model of teacher learning, the so-called 'realistic approach' to teacher education has been developed. It takes the causes of the theory–practice divide into account, and shows a new direction in the pedagogy of teacher education. Several evaluative studies into the realistic approach will be summarised. They lead to significant conclusions about the need for careful programme design based on: (1) an elaborated view of the intended process of teacher learning; (2) specific pedagogical approaches; and (3) an investment in the quality of staff members. The conclusions and implications are put into an international perspective.

Keywords: teacher education; teacher development; practical knowledge; reflection; situated cognition; theory–practice gap

Introduction

The article will first discuss the gap between theory and practice which has made teacher education a difficult enterprise. Next, the causes of this gap will be analysed. Central to the argument of the article is the presentation of a three-level model of teacher learning that helps to frame the relationship between practice and theory in a specific manner. The model shows that professional learning is a bottom-up process taking place in the individual student teacher. The model will also be situated within existing psychological and educational theories.

Based on this model, the so-called 'realistic approach' to teacher education will be described, which aims at supporting the bottom-up process starting from experiences and leading to fruitful knowledge about teaching. After presenting the central principles of realistic teacher education, the approach will be illustrated by looking at a typical programme element, the so-called *one-to-one*. Realistic teacher education takes the causes of the theory–practice divide into account, and shows a new direction in the pedagogy of teacher education. Evidence of its effectiveness will be presented through a brief description of a number of studies evaluating the approach, which show that it does really make a difference.

Finally, the paper then discusses several implications for the pedagogy of teacher education as well as the organisational structures needed to support this pedagogy. At that point, some critical remarks will be made about current professional habits with regard to both theory and practice.

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The link between theory and practice: a perennial problem of teacher education

Already in 1904, John Dewey noted a gap between theory and practice in teacher education (Dewey 1904), and he discussed possible approaches to bridging this gap (see also Shulman 1998). Nevertheless, during the whole of the twentieth century, the relationship between theory and practice has remained the central problem of teacher education world-wide (Lanier and Little 1986).

During the late nineteenth and early twentieth century, as psychological and pedagogical knowledge grew, academics wanted to provide this knowledge to teachers in order to change education and to promote the use of scientific insights. It seemed only logical to teach important theories to pre-service and in-service teachers, who could then apply this knowledge base in their teaching. Clandinin (1995) calls this 'the sacred theory-practice story', and Carlson (1999) speaks about the 'theory-to-practice approach'. Wideen, Mayer-Smith, and Moon (1998, 167) put it like this:

> the implicit theory underlying traditional teacher education was based on a training model in which the university provides the theory, methods and skills; the schools provide the setting in which that knowledge is practiced; and the beginning teacher provides the individual effort to apply such knowledge. In this model, propositional knowledge has formed the basis of university input.

The theory-to-practice model has led to teacher education programmes in which experts in certain domains taught their 'important knowledge' to prospective teachers. As Barone et al. (1996) argue, the result was that many programmes consisted of a collection of isolated courses in which theory was presented with hardly any connection to practice.

Schön (1983, 21) speaks about the technical-rationality model, and states that this model is based on the notion that 'professional activity consists in instrumental problem solving made rigorous by the application of scientific theory and technique.' In fact three basic assumptions are implicit in this view:

(1) Theories help teachers to perform better in their profession;
(2) These theories must be based on scientific research;
(3) Teacher educators should make a choice concerning the theories to be included in teacher education programmes.

The technical-rationality model has been dominant for many decades (Sprinthall, Reiman, and Thies-Sprinthall 1996; Imig and Switzer 1996, 223), although many studies have shown its failure in strongly influencing the practices of the teacher education programmes' graduates. Zeichner and Tabachnick (1981), for example, discussed that many notions and educational conceptions, developed during pre-service teacher education, seem to be 'washed out' during field experiences, although they emphasised that they may in fact have never impacted student teachers in the first place. Comparable findings were reported by Cole and Knowles (1993) and Veenman (1984). Veenman also points towards the severe problems teachers experience once they have left pre-service teacher education, a phenomenon known as 'the transition shock'.

It is interesting to note that this transition shock is described in studies from many different countries. For example, at Konstanz University in Germany, large-scale research has been carried out into this phenomenon (Müller-Fohrbrodt, Cloetta, and Dann 1978; Dann et al. 1978). It demonstrated that teachers pass through a quite

distinct attitude shift during their first year of teaching, in general creating an adjustment to existing practices in the schools, and not to recent scientific insights into learning and teaching. Building on the work of the Konstanz research group, Brouwer and Korthagen (2005) reported on an extensive quantitative and qualitative study among 357 student teachers, 128 cooperating teachers and 31 teacher educators in the Netherlands, which again showed the dominant influence of the school on teacher development.

In their overview of the literature on teacher socialisation, Zeichner and Gore (1990) state that it is very difficult for an individual teacher to really influence established patterns in schools. Educational change appears to be a beautiful ideal of teacher educators, but generally speaking, indeed not much more than an ideal. As a result, the impact of teacher education on their students' practice is limited, as Wideen, Mayer-Smith, and Moon (1998) conclude in a thorough and extensive review of the international research into the outcomes of teacher education, a conclusion that was also drawn by the AERA Research Panel on Teacher Education in a meta-analysis of North American research (Cochran-Smith and Zeichner 2005). Several of the cited studies show that beginning teachers struggle for control, and experience feelings of frustration, anger, and bewilderment. The process they go through is more one of survival than of learning from experiences.

Causes of the gap between theory and practice

As Robinson (1998, 17) reminds us, 'narrowing the research–practice gap is not just a matter of disseminating research more effectively or of using more powerful influence strategies.' The causes of the gap lie deeper, and a variety of these causes have been put forward in the literature. First, we have already seen that from a sociological perspective one can frame the problem as one of socialisation towards patterns existing in the schools.

A second cause often mentioned in the literature is the complexity of teaching (e.g. Hoban 2002, 35–40). Hoban (2005, 9) states: 'what a teacher does in a classroom is influenced by the interaction of many elements such as the curriculum, the context, and how students respond to instruction at one particular time.' Hoban continues by saying that this view of the nature of teaching necessitates 'holistic judgement' (cf. Day 1999) about what, when and how to teach in relation to a particular class, and this is something for which it is hard to prepare teachers. Moreover, practice is generally ambiguous and value-laden (Schön 1983).

A third cause of the theory–practice divide often mentioned has to do with the learning process within teacher education itself, even before the stage in which theory can be applied to practice. According to many researchers, teachers' prior knowledge plays a powerful role in their learning (e.g. Wubbels 1992). Their preconceptions show a remarkable resistance to change (Joram and Gabriele 1998), which in part can be explained by their firm roots in the many years of experiences that student teachers themselves have had as pupils within the educational system (Lortie 1975).

A final cause of the transfer problem to be mentioned is of an epistemological nature. Teachers often have little time to think and thus need prompt and concrete answers to situations (Eraut 1995). What they need is rather different from the more abstract, systematised and general expert-knowledge teacher educators often present to student teachers (Tom 1997). Various terms are used to name this

tension, but the one generally used is the distinction between *practical knowledge* and *formal knowledge* (e.g. Fenstermacher 1994). The former type of knowledge develops in teachers by participating in and reflecting on their own actions and experiences.

However, is it really only knowledge that is involved? Many studies on teacher development show that teaching is a profession in which feelings and emotions play an essential role (Day 2004; Hargreaves 1998), but 'the more unpredictable passionate aspects of learning, teaching and leading … are usually left out of the change picture' (Hargreaves 1998, 558). The problem of promoting fundamental professional change is first of all a problem of dealing with the natural emotional reactions of human beings to the threat of losing certainty, predictability or stability. This affective dimension is too much neglected in the technical-rationality approach, which seems to be another cause of the transfer problem.

A three-level model of teacher learning

The latter analysis shows that, in order to further develop our understanding of the theory–practice divide, we need a theory on teacher learning. For this purpose, Korthagen and Lagerwerf (1996) developed a model which contributes to a deeper insight into the phenomena described above (see Figure 1).

The model distinguishes between three main levels, the first of which is the *gestalt level*, which is rooted in practical experiences, and which is often unconscious and certainly not only of a cognitive nature. Through reflection on the gestalt level, a teacher may develop a *schema*, and, at the next level, a logical ordering within this schema, called a *theory*. Below, the three levels will be briefly explained.

The gestalt level

Based on a general psychological perspective, Epstein (1990) argues that the manner in which humans deal with most situations is mediated by the so-called *experiential body-mind system*, processing information in a rapid manner. According to Epstein, the experiential system functions through emotions and images, functions in a holistic and often subconscious manner, which means that the world is experienced in the form of wholes, in which cognitive and emotional aspects are not separated (Epstein 1990, 168, 1998; cf. Bargh 1990). Epstein's analysis is highly relevant to the teaching domain, as many studies on teacher routines (e.g. Halkes and Olson 1984) emphasise
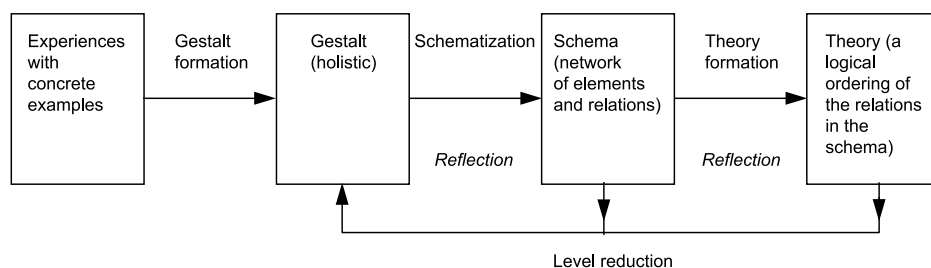

Figure 1.   The three-level model of teacher learning and the accompanying learning processes.

that automatic or mechanical behaviour is characteristic of much teaching. Dolk (1997) states that most teacher behaviour is *immediate behaviour*, i.e. behaviour occurring without reflection. A similar position is taken by Eraut (1995).

This view implies that much of a teacher's behaviour is grounded in unconscious and instantaneously triggered images, feelings, notions, values, needs or behavioural inclinations, and often on combinations of these aspects. Exactly because they often remain unconscious, they are intertwined with each other (Lazarus 1991), and thus form a whole that Korthagen et al. (2001) call *a gestalt,* based on Korb, Gorrell, and Van de Riet (1989). This implies a broadening of the gestalt concept, which was originally used to just describe the organisation of the visual field (Köhler 1947).

A gestalt is thus considered to be a dynamic and constantly changing entity, encompassing the whole of a teacher's perception of the here-and-now situation, i.e. both sensory perceptions of the environment as well as the images, thoughts, feelings, needs, values, and behavioural tendencies triggered by the situation. This implies an holistic view of teachers as persons.

The gestalt concept concurs with the observation by brain researcher Damasio (1994, 83–4) that behaviour is grounded in many parallel bodily systems, and that emotion is strongly linked to the primary decision-making process (see Immordino-Yang and Damasio 2007 for a more detailed elaboration and a model of the complex relations between cognition and emotion).

We can illustrate the notion of a gestalt with an example from a study by Hoekstra et al. (2007) into informal learning among 32 Dutch teachers. The aim of the research study was to find relationships between the teachers' behaviours and the accompanying internal processes, and their influence on their professional learning in the workplace. The 32 experienced teachers were monitored over a period of 14 months with the aid of questionnaires, digital reports on their learning experiences, and interviews. In an in-depth component of the study, four of the 32 teachers were observed more intensively, using video recordings of their teaching, and post-lesson interviews. One of the teachers, Albert, was observed while teaching on the topic of potential energy. In the interview after the lesson, Albert said:

> I later noticed they did not have a clear idea of what that [potential energy] was. … And looking back, I am not quite satisfied with how I've done it. Some concepts were not clear enough to the pupils. To understand the whole story, you actually have to know more about the phenomenon 'potential energy'. I ignored that concept, because it had been talked about in the previous assignment. But in that very assignment, the question of 'what exactly is potential energy?' had not been dealt with either.

This is a good example of a phenomenon well-known in teaching: the teacher goes on, although, from the perspective of his objectives, something seems to be going wrong. A sequence of actions unfolds, probably triggered by the (conscious or unconscious) need to get the concept of potential energy across, and based on a (perhaps not even completely conscious) notion that the concept had already been dealt with. Albert chose to give an explanation to the class. After the lesson, Albert becomes aware of the fact that his teaching strategy was not very effective, and he also reflects on why he did what he did. This may have been triggered by the fact that he was being interviewed about the situation. In many cases, however, teachers are not really aware of the effects of their behaviour and its underlying causes, as several authors (e.g. Clark and Yinger 1979) have found.

The schema level

As noted above, many of the sources of a teacher's behaviour may remain unconscious to the teacher. However, through reflection, they may become aware of at least some of these sources. In the example, Albert became aware of at least one underlying cause of his behaviour, namely his (wrong) idea about the previous assignment. During such a reflection process, notions or concepts become interrelated. Hence, when a teacher reflects, often a previously unconscious gestalt develops into a conscious cognitive schema, i.e. a conscious network of concepts, characteristics, principles, and so on, helpful in describing practice. This is an important next level in the learning process.

The transition from the gestalt to the schema level is one of *de-situating* the knowledge derived from specific situations (Hatana and Inagaki 1991; Lauriala 1998). Still, practitioners' schemata are very much coloured by the desire to know how to *act* in particular situations, instead of having an abstract *understanding* of them.

The theory level

If someone aims at developing a more *theoretical understanding* of a range of similar situations (as researchers often want and do), this may lead to the next level. This is the level at which a logical ordering is constructed in the schema formed before: the relationships within one's schema are studied or several schemata are connected into one coherent 'theory'. The logical theory is helpful in understanding a certain class of situations on the basis of a logical framework.

According to Kuhn (1977), there are at least five characteristics of a 'good' theory: it is accurate, i.e. consistent with known data; it clarifies a broad range of data; it is both internally consistent and consistent with other accepted theories; it is simple, i.e. it brings order to a variety of isolated phenomena; and it is fruitful, i.e. it generates new results. Interestingly, in the study by Hoekstra et al. (2007) on teachers' informal learning, no examples were found in which teachers demonstrated this level. Perhaps this is understandable. The theory level is aimed at deep and generalised understanding of a variety of similar situations, whereas practitioners are often focusing on directions for taking action in a particular situation, and as a consequence, often do not reach the theory level. This was also the conclusion of an empirical study by Korthagen and Lagerwerf (1996, 170–3).

Level reduction

If a teacher does reach the theory level, the knowledge at this level first has to become part of an action-guiding schema in order to start influencing behaviour, or even better, it has to be integrated into a gestalt in order to become part of the teacher's routine. This is called level reduction (see Figure 1). Often, however, level reduction does not take place at all, for it requires much practising in realistic contexts, and even then there may remain a friction between already existing gestalts and the new theory. This is an important cause of the gap between theory and practice.

The theoretical basis of the three-level model

Originally, the three-level model was developed by Van Hiele (1973, 1986) as an adaptation of Piaget's theory, which assumes the existence of general stages of cognitive

development that are directly related to age. Van Hiele did not consider these stages (levels) specifically age dependent, and showed that educational encounters can stimulate level transitions. According to Van Hiele, and concurrent with Piaget's theory, reflection on the concepts and relationships within one's mental structure at one level, promotes the transition to the next level. Later, many other researchers, such as Epstein, have further built on this idea. His distinction between an experiential and a rational system within the human organism reflects the distinction between on the one hand the gestalt level, and on the other the schema and theory level. Concurrent with Van Hiele, Epstein (1990) states that through reflection on the functioning of one's experiential system, the rational system can influence the experiential system. The rational system as defined by Epstein operates analytically and logically. It is specific and detailed, which concurs with the concept of a schema. Bartlett (1932) is credited with being the first to propose this concept, based on studies in which subjects recalled details of previous experiences. Later, many other researchers have refined the body of knowledge on schemata (see e.g. Anderson 1980).

Other authors whose work shows similar lines of thinking are Johnson (1987) and Lakoff and Johnson (1999). They talk about the *embodied mind*, and emphasise the importance of *image schematic structures*, which are of a non-propositional and figurative nature, and mostly unconscious:

> These are gestalt structures, consisting of parts standing in relations and organized into unified wholes, by means of which our experience manifests discernible order. When we seek to comprehend this order and to reason about it, such bodily based schemata play a central role. For although a given image schema may emerge first as a structure of bodily interactions, it can be figuratively developed and extended as a structure around which meaning is organized at more abstract levels of cognition. (Johnson 1987, xix–xx)

Building on neuroscience, Lakoff and Johnson (1999) discuss how bodily experiences, such as movement, can later develop into cognitive structures, which they call *motor schemata*. Their view of the important and mainly unconscious role of bodily experiences concurs with findings from neuroscience showing that much of our decision-making is rooted in subconscious processes in our brain, and that decisions are made unconsciously, even before our conscious mind thinks we make such decisions deliberately (William 2006). Brain researcher Gazzaniga (1999, 73) points towards the same phenomenon in that '[m]ajor events associated with mental processing go on, measurably so, in our brain before we are aware of them.'

The three-level model also concurs with recent views of how knowledge develops in the interplay between the individual and social systems. The popular notion of *situated cognition* (Brown, Collins, and Duguid 1989) concurs with the basic assumption of the three-level model, namely that knowledge and insight develop in a bottom-up manner within the context of social experiences. Lave and Kvale (1995, 219) state that the idea of situated cognition represents 'a vision of cognition as the dialectic between persons acting and the settings in which their activity is constituted'. Gee (1997, 243) introduced the notion of *midlevel situated meaning,* which comes close to the gestalt concept. He defines situated meaning as 'specific patterns of experience tied to specific sorts of contexts' and states that 'these patterns represent midlevel generalizations, not too specific and not too general, not totally contextualized, not totally decontextualized.' Korthagen (2010) has shown that through the three-level model this idea can be connected to traditional cognitive psychology, thus linking the situated cognition view of learning with more traditional views.

Finally, empirical support for the existence of a theory level in experienced teachers can be found in Copeland et al. (1994), who discovered that teachers with more experience and expertise identified more causal relationships when viewing a video recording of a classroom episode. Further empirical data supporting the three-level model were presented in Korthagen and Kessels (1999), Korthagen et al. (2001, 185–190), and Korthagen (2010).

Realistic teacher education

An approach to teacher education taking the above analysis of the gap between theory and practice as well as the three-level model into account, is the *realistic approach,* which was originally developed at Utrecht University in the Netherlands. Its five guiding principles are formulated by Korthagen et al. (2001) as follows:

(1) The approach starts from concrete practical problems and the concerns experienced by student teachers in real contexts.
(2) It aims at the promotion of systematic reflection by student teachers on their own and their pupils' wanting, feeling, thinking and acting, on the role of context, and on the relationships between those aspects.
(3) It builds on the personal interaction between the teacher educator and the student teachers and on the interaction amongst the student teachers themselves.
(4) It takes the three-level model of professional learning into account, as well as the consequences of the three-level model for the kind of theory that is offered.
(5) A realistic programme has a strongly integrated character. Two types of integration are involved: integration of theory and practice and integration of several disciplines.

An example: the one-to-one

Korthagen et al. (2001) presented an elaborated discussion of the pedagogy of realistic teacher education, and its consequences for the level of the individual teacher educator and the organisational level. For the purpose of the present article, the focus is on one example of a programme element, namely the *one-to-one*.

The one-to-one has been developed in response to the problem that teaching a whole class on a regular basis appears to be a complex experience for beginning student teachers, an experience that tends to foster gestalts and concerns related to 'survival'. This is why the first teaching practice period has been simplified. Each prospective teacher gives a one-hour lesson to one high school pupil once a week for eight weeks (principle 1). Neither the university supervisor nor the cooperating teacher is present during the actual one-to-one lessons, but there are supervisory sessions and seminar meetings during the one-to-one period. The lessons are audio-recorded, and are subsequently the object of detailed reflection by the student teacher (principle 2). This reflection is structured by means of the ALACT model (named after the first letters of the five phases, see Korthagen et al. 2001, and Figure 2). The fifth phase is again the first phase of the next cycle, which means that we are dealing with a spiral model: the realistic approach aims at a continuing process of professional development.

In phase 3 of the ALACT model, a need for more theoretical elements can emerge and these can then be brought in by the teacher educator, tailored to the specific needs and concerns of the teacher and the situation under reflection.
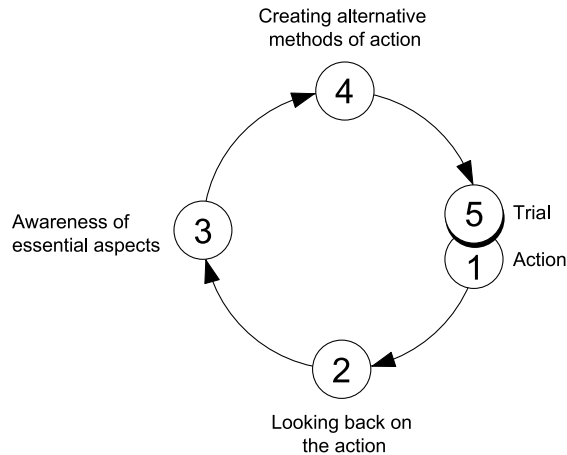
Figure 2.   The ALACT model describing the ideal process of reflection.

During the one-to-one period, the student teachers form pairs. Of the eight one-to-one lessons, four are discussed by the student teachers within these pairs, and four lessons are discussed by the pair and the teacher educator, thus creating a 'community of learners' (principle 3). The teacher educator can offer small theoretical notions fitting in with the process the student teacher is going through (principle 4). These notions can be derived from a variety of theoretical backgrounds (principle 5). After both types of discussion the student teacher writes a report with the most important conclusions.

A general finding is that by listening to the audio-recordings, the student teachers rapidly discover that they failed to listen to what the pupil was saying, or started an explanation before the problem was clear to the pupil. As one of our student teachers put it: 'The one-to-one caused a shift in my thinking about teaching, from a teacher perspective to a pupil perspective.' This quote is representative of the learning processes of most student teachers in the one-to-one. However, there also appear to be considerable differences between student teachers in what is learnt during such a one-to-one arrangement. To mention some examples, one student teacher focused on the lack of self-confidence in the pupil she worked with, and started to search for ways of improving the child's self-image, while another student teacher was confronted with her own tendency to explain things at a fairly abstract level. She developed the wish to include more concrete examples.

In sum, the one-to-one gives student teachers many opportunities to learn on the basis of their own experiences and the concerns they develop through these experiences. In this way the student teachers reflect on, and sometimes question, their initial gestalts and develop schemata that are personally meaningful to them. In this respect, the one-to-one is a good illustration of realistic teacher education.

We have to add, however, that once student teachers have developed their own schemata, it becomes important to offer them theoretical knowledge to be found in professional articles and books, in order to deepen and refine these schemata, and sometimes to challenge and adapt them. For this reason, the final part of the Utrecht programme has curriculum elements in which experts in areas such as learning psychology or classroom interaction, offer theoretical knowledge to the students. It is

also important at this stage that theory is built onto the experiences and insights the students themselves have already developed.

Empirical support for the realistic approach

The realistic approach is supported by considerable research. The following studies are noteworthy:

(1) *A national evaluation study* of all Dutch teacher education programmes preparing for secondary education and carried out by an external research office (*Research voor Beleid*; Luijten, Marinus, and Bal 1995; Samson and Luijten 1996) showed that 71% of a sample of graduates of the Utrecht programme ($n = 81$) rated their professional preparation as good or very good. This is a remarkable result, as, in the total sample of graduates from all Dutch teacher education programmes preparing for secondary education ($n = 5135$), this percentage was only 41% ($p < .001$).

With reference to the present article, a fundamental question is: Does the realistic approach indeed reduce the gap between theory and practice? Several studies focused on this more specific question:

(2) *An evaluative overall study among all graduates of the Utrecht University programme* showed that 86% of the respondents considered their preparation programme as relevant or highly relevant to their present work as a teacher (Koetsier, Wubbels, and Korthagen 1997).

(3) *An in-depth study* by Hermans, Créton, and Korthagen (1993) illustrates this finding with mainly qualitative data from an experiment with a group of 12 student teachers strictly incorporating all the principles mentioned in the two previous sections. All 12 student teachers reported a seamless connection between theory and practice, a noteworthy result, given the many research reports from all over the world showing the problematic relationship between theory and practice. Some quotes from student teachers' evaluations are:

The integration theory/practice to my mind was perfect.

Come to think of it, I have seen and/or used all of the theory in practice.

The things dealt with in the course are always apparent in school practice.

A critical note should be added here. What do these student teachers mean by 'theory'? It is probably not the same as that meant by many researchers. As the three-level model clarifies, the kind of theory that is meaningful to student teachers is often a personal schema grounded in gestalts, and this is different from the kind of theory found in the scientific community. On the other hand, as explained above, the Utrecht programme does offer student teachers more empirically-based theory, especially at the end of the curriculum. Thus, what the students call theory is probably a mixture of knowledge at the schema and theory level, and perhaps this is what real integration of theory and practice might mean.

(4) *An extensive longitudinal study* by Brouwer and Korthagen (2005) focused on the relationship between programme design and effects of 24 teacher education curricula in use at Utrecht University during the years in which the

realistic approach started to develop there. At various moments during these programmes and during the first two years in which the graduates worked as teachers, quantitative and qualitative data were collected among 357 student teachers, 31 teacher educators and 128 cooperating teachers. Concrete learning effects on the work of the graduates during their first professional year (measured by means of 14 variables) appeared to depend primarily on the degree to which theoretical elements in their preparation programme were perceived by the student teachers as being functional for practice during their student teaching, and on the cyclical alternation between school-based and university-based periods in the programme. In addition, a gradual increase in the complexity of activities and demands on the student teachers appeared to be a crucial factor in integrating theory and practice.

A fundamental question is whether the graduates of the Utrecht programme have reached a sufficiently high level of teacher competence. Internationally, we witness an increasing emphasis on teaching standards and lists of teacher competencies, whereas realistic teacher education seems to focus more on the personal needs and individual development of student teachers, putting much more emphasis on the idiosyncratic character of teaching, and on the integration of the personal and the professional (cf. Korthagen 2004). However, the question is whether there is a genuine contrast here. It might well be that the pressure on meeting standards and the emphasis on standardisation coming from the political arena runs counter to the development of effectiveness in teaching, since the person of the teacher is often being overlooked. Especially when student teachers are stepping into the role of teacher for the first time in their lives, it is rather frightening for them to be confronted with lists of competencies.

In this context, it is worth mentioning that there are several indications that the Utrecht programme, which clearly follows a different approach, does produce high quality teachers. In 1992 and 1997, there were external evaluations carried out of the programme by official committees of experts on teacher education, researchers, and representatives from secondary schools. On both occasions, the programme received very positive evaluations. In 1997, 25 out of 34 evaluation criteria were scored as 'good' or 'excellent', including the criteria 'value of programme content' and 'professional quality of the graduates'. The school principals in the committees reported that they considered the Utrecht graduates to be the best teachers in their schools. On the nine other criteria, the programme received the qualification 'sufficient'. No other Dutch teacher education programme has received such high evaluations.

We can reconsider the whole issue of teaching standards from the point of view of the three-level model of teacher learning. Those politicians or researchers wishing to impose these standards on teachers, may well have the positive intention of improving education, but they seem to overlook the bottom-up, idiosyncratic, nature of professional learning. Hence, there is a risk that in the end, both policy makers and practitioners will be dissatisfied with the outcomes of a strong emphasis on standardisation.

Implications for teacher education

In sum, we may conclude that teacher education can make a difference, but that this may require: (1) careful programme design based on (2) an elaborated view of the

intended process of teacher learning, (3) specific pedagogical approaches, and (4) an investment in the quality of staff members (Korthagen, Loughran, and Russell 2006). In the development of a programme based on the principles of realistic teacher education, each of these components may take much time and energy, especially because they require a special and often unconventional role on the part of teacher educators. They need to have specific competencies:

(1) They must be able to create suitable learning experiences for student teachers, in which these student teachers can develop fruitful gestalts, being the basis for the next step.

(2) They must be competent at promoting further awareness and reflection in student teachers on their gestalts, thus developing fruitful schemata. It is often helpful to take *one* concrete, recently experienced and relatively short teaching situation as a starting point for analysis, a situation which still evokes some concern or question in the student teachers.

(3) They must be able to offer theoretical notions from empirical research in such a way that these notions fit into the student teachers' reflections on their existing gestalts and helps them develop fruitful schemata. The crux is that the student teachers will then start to 'perceive more' and will be better able to act upon their sharper perception. This also implies that as soon as they have reached the schema level, they should reflect on the relation between existing theory and their own thinking, and this is something they should learn during teacher education. Only then will a real integration of practice and theory take place.

All these teacher educator competencies imply the need for the professional development and training of teacher education staff and cooperating teachers, an issue often overlooked (Koster and Korthagen 2001). Of course, we should realise that many teacher educators, especially in North America, have to work with large cohort groups, in which close personal supervision of student teachers is not always possible. This problem is also recognised in the Utrecht programme, so structural methods have been developed in which student teachers do as much of the supervision as possible *together*. These methods of so-called *peer-supported learning* (Tigchelaar and Melief 2000) aim at structuring the intended five-step individual reflection process about concrete teaching experiences through a series of questions, as well as promoting reflective discussion of the teaching experiences in groups of three to four student teachers. For this purpose, the student teachers are trained in supervisory skills, which of course is also helpful to their work with pupils. Moreover, the small group discussion takes place according to a pre-structured format, leading to a report to the teacher educator with concrete issues and questions, to which the educator can to a large extent react in the meetings with the cohort group as a whole. Apart from the fact that such a method saves staff time, it prepares student teachers for peer-supported learning in communities of practice during the rest of their careers.

The realistic approach concurs with the model of teacher learning proposed by Clarke and Hollingsworth (2002), who also advocate 'to place "the pedagogy of teachers" (that is, the theories and practices developed by teachers) at the heart of our promotion of the professional growth of teachers' (965). This implies the need for flexibility, and limits the possibilities to pre-structure the teacher education programme.

Organisational consequences

The realistic approach to teacher education not only has consequences for the types of interventions teacher educators should use to promote the intended learning process in the student teachers, but also at the organisational level of teacher education curricula. First of all, linking theory and practice with the aid of the ALACT model requires frequent alternation of school teaching days and meetings aimed at the deepening of teaching experiences. Second, in order to harmonise the interventions of school-based mentor teachers and institute-based teacher educators, close cooperation between the schools and the teacher education institute is necessary, which fits in with the international trend towards school-based teacher education. Not every school may be suitable as a practicum site: the school must be able to offer a sound balance between safety and challenge and a balance between the goal of serving student teachers' learning and the interests of the school.

Third, the approach advocated here implies that it is impossible to make a clear distinction between different subjects in the teacher education programme. The realistic approach is not compatible with a programme structure showing separate modules such as 'subject matter methods', 'general education', 'psychology of learning', and so forth, meant to provide student teachers with knowledge which they can later apply to their own practices. Relevant and realistic teacher learning is grounded in gestalts formed during experiences; and teaching experiences are not as fragmented as the structure of many teacher education programmes would suggest. But these existing structures also mean that in many international contexts, implementing the realistic approach will not be easy. Attempts to apply the principles of realistic teacher education in Germany, Australia, Japan, and several Scandinavian countries have shown that this often implies a profound cultural shift in the existing views of teacher education, which is often threatening to experienced educators. They need considerable support in making this shift, especially with regard to their behaviour. This is one of the reasons why, until now, the approach has been only partially introduced in these countries, and that this paper cannot report on solid research into the approach other than the Dutch studies. Perhaps we can say that we now know how teacher education can really make a difference, but that this is knowledge at the theory level, whereas the further introduction of realistic teacher education requires a bottom-up process in teacher educators, congruent with the way in which teachers develop their expertise on the basis of their existing gestalts.

Conclusion and discussion

We have shown it is possible to take a stance with regard to the gap between theory and practice that leads to a fruitful approach in teacher education. It puts the emphasis on the student teachers' experiences, concerns, and existing gestalts, and works towards level transitions in terms of the three-level model inspired by Van Hiele. Student teachers are viewed as whole human beings, which implies balanced attention to the cognitive, emotional, and motivational factors guiding their behaviour.

However, one may well ask if changes should only take place on the side of teacher education practices. We should also reconsider the nature of relevant theory. Traditional scientific research produces a kind of theory that we can generally situate at the theory level of the three-level model, whereas teachers need theory that more

easily fits into their schemata. In this respect, there seems to be an urgent need for a different type of knowledge more connected with practical problems (sometimes referred to as mode 2 knowledge, as opposed to the traditional mode 1 knowledge produced by academics; see Gibbons et al. 1994). Several authors have suggested that research by teachers or research that at least involves teachers as researchers, may thus help us surmount the gap between theory and practice. Indeed, changing practice is one thing, but in order to bridge the theory–practice divide, more is needed.

Teacher educators should also make their students aware of the problematic relationship between theory and practice, and help them understand why theory initially often does not seem to match their experiences and gestalts. But teacher educators should also help their students see that, through reflection, they can reach the schema level, and that from then on theory (also mode 1 theory) can be very helpful. This may offset the resistance towards theory that teachers often have: seeing the whole picture of all that is involved in the relationship between theory and practice, including their own responsibilities, may help teachers in being able to use theory in the right way at the right time.

Finally, a warning has to be given regarding an extreme elaboration of the realistic approach. In many programmes, the traditional approach of 'theory first, practice later' has been replaced by the adage 'practice first, theory later'. Alternative programme structures have been created in which novice teachers sometimes receive very little theoretical background, and teacher education becomes more of a process of guided induction into the tricks of the trade. In many places in the world, this trend is also influenced by the need to solve the problem of teacher shortages. Although this development may satisfy teachers, politicians and parents, there is a great risk involved. The balance seems to shift completely from an emphasis on theory to reliance on practical experiences. Such an approach to teacher education does, however, not guarantee success. Long ago, Dewey (1938, 25) already stated that 'the belief that all genuine education comes about through experience does not mean that all experiences are genuinely or equally educative' (cf. Loughran 2006, 22). As already discussed above, teaching experience can be a process of socialisation into established patterns of practice, rather than an opportunity for professional development (cf. Wideen, Mayer-Smith, and Moon 1998). Hence, there is a risk that in a 'practice first approach' the basic question, namely how to integrate theory and practice, will still not be solved. There is sufficient evidence that in this respect, the realistic approach does show a fruitful new direction, which may lead to a new view on the goals and practices of teacher education worldwide.

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