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Student teachers’ learning patterns in school-based teacher education programmes: the influence of person, context and time

M. D. Endedijk, Vincent Donche and I. Oosterheert

INTRODUCTION

One of the key tasks of teacher education is to support student teachers to develop a way of learning that enables lifelong learning (Hagger et al. 2008). In order to design teacher education programmes to foster this development, scientific knowledge is needed about student teachers’ learning patterns, the influencing factors and how student teachers’ learning patterns develop over time. Previous research on learning patterns has focused predominantly on understanding individual differences in academic learning in higher education contexts (Vermunt and Vermetten 2004). In this way, ‘academic’ learning patterns have been widely investigated in first year higher education contexts and to some extent in teacher education programmes (Donche and Van Petegem 2009). The vast body of research has indicated that these learning patterns are relatively dynamic factors and are influenced by several personal and contextual factors, which to some extent can explain why students’ learning patterns can be adaptive across time (Donche et al. 2010, Richardson 2011, Vermunt and Vermetten 2004). Further details on this body of research can also be found in the preceding chapters of this monograph on student learning in higher education (see also Vanthournout et al.) In this chapter, we focus on students’ learning patterns in teacher education programmes, which, in contrast with other university contexts and study programmes, have received far less attention.

In the past decade, evidence has been growing that student teachers’ learning patterns are more diverse than what previous student learning models regarding academic learning were able to capture (e.g., Cassidy 2004, Lonka et al. 2004, Vermunt and Vermetten 2004). Many of these former student learning models have neglected the fact that many students in diverse higher education contexts not only learn by studying course materials but also learn, for instance, through experiential learning when involved in internships or practice placements—for example, in teacher education (Korthagen et al. 2006, Tryggvason 2009).

More than a decade ago, Oosterheert (2001) started all over again to question how student teachers learn, working on the assumption that student teachers could not only learn by studying course materials but also by being involved in internships in which many sources of regulation for learning can be distinguished, such as mentors, pupils and co-workers.
Based upon phenomenography and subsequent survey research using the Inventory Learning to Teach Process (ILTP), a framework for studying individual differences in learning to teach during internships could be validated. Not only could different dimensions in student teacher learning be distinguished but the presence of learning patterns was also investigated. This study has led to a rich account of how student teachers learn and indicates the presence of different learning patterns, which we will discuss below.

In the last five years, multiple cross-sectional and longitudinal studies across different countries have been carried out using the same ILTP questionnaire. These studies have been partially replicating the original ILTP studies but have also expanded the explanatory framework regarding personal and contextual factors, as well as further investigating how variable these learning patterns are across time. By describing, examining and comparing the results of these studies, we aim to present in this chapter an integrative framework for describing individual differences in how student teachers learn to teach and how their learning patterns are related to various personal and contextual variables and how these learning patterns develop over time.

All studies that are included in this overview have been selected based on three overarching criteria by which the comparability across studies can be increased: (1) the explicit use of the conceptual framework of Oosterheert regarding student teacher learning; (2) the use of the ILTP questionnaire as the main data collection tool to distinguish dimensions or patterns of student teacher learning and; (3) evidence that the scientific outcomes of these studies have been peer reviewed, either through publication in a scientific journal, presented as a conference paper or published as an academic dissertation. In Table 1, an overview can be found of these different studies, including details on the research contexts, designs, respondents and key variables and measurement instruments.

This chapter is organised as follows. In the first section, we describe the different dimensions and learning patterns found in the first ILTP studies carried out by Oosterheert (2001). In the second section, we focus on the development and characteristics of the instrument (ILTP) that is commonly used across all included studies to measure individual differences in learning to teach. In the following sections, we briefly describe the design and
main outcomes of all recent ILTP studies. We first describe studies that have contributed to the further validation of the ILTP by describing the validation in Belgium, the concurrent validity by relating the outcomes of the ILTP to other measurements of learning and some studies contributing to the predictive validity by describing the relation between the outcomes of the ILTP and other measures. Secondly, we address ILTP studies in which changes over time in learning patterns were measured. Thirdly, we provide an overview of relations between student teachers’ learning patterns and person-related variables. Finally, we discuss the results of studies in which context-related variables were also included, such as the perception of the learning environment and the influence of two different tracks of teacher education programmes.

LEARNING PATTERNS OF STUDENT TEACHERS

Research into student learning over the last few decades has identified individual differences in how students learn in academic settings (Entwistle and McCune 2004, Richardson 2011). Reproduction-oriented learning and meaning-oriented learning have consistently been identified as the two main dimensions for describing these individual differences. In many teacher education programmes, student teachers learn from a combination of theoretical sources and sources in practice (professionals, their own teaching experience). Nowadays, teacher education programmes try to integrate learning in these two contexts as much as possible to overcome a theory practice gap (Korthagen 2010). This means that qualitative differences in how student teachers learn are often related to how they are dealing with this combination of theory and practice (Hagger et al. 2008, Buitink 2009).

Oosterheert and Vermunt (2001) conducted three consecutive studies to develop a framework describing individual differences in learning to teach: one qualitative study followed by two quantitative studies. The studies took place in several Dutch dual pre-service teacher education programmes: these are teacher education programmes in which student teachers learn in parallel at the teacher education institute and in and from practice. This professional learning component is often designed as an internship but student teachers might also already have a (part-time) job as a teacher, including full teaching responsibilities. The framework describing individual differences in student teachers’ learning is built from a combination of learning conceptions, learning activities and regulation activities, as well as emotion regulation. Student teachers’ learning patterns were distinguished by using person-
oriented data analyses on scales tapping individual differences in student teacher learning. In the first study, in which student teachers’ narratives were explored in a phenomenographic way, five qualitative different ways of learning to teach could be distinguished: survival oriented, closed reproduction oriented, open reproduction oriented, closed meaning oriented, and open meaning oriented. The survival oriented learning pattern described student teachers holding tenaciously to their own field experience and scarcely being able to report on self-regulation. The other four learning patterns differed in whether they were meaning oriented or reproduction oriented and how they approached their problems: whether they acknowledged that they have a problem (open) or that the problem remains implicit (closed). In two follow-up studies, an inventory was developed (ILTP) to test these learning patterns on a larger scale (Oosterheert et al. 2002b). The existence of the initial learning patterns was confirmed, except for the open reproduction directed oriented way of learning. In the cluster analysis, this learning pattern disappeared, since all students showed characteristics of this way of learning. Since the main distinction between the meaning oriented patterns is whether a student teachers is self-regulative in identifying and interpreting their problems and improving their teaching, or more dependent on others, the differences can be more clearly characterised with the distinction dependent versus independent meaning oriented learning. This leads to the following description of four learning patterns (Oosterheert et al. 2002a).

1. **Inactive / survival oriented learning pattern.** These student teachers stress that all one needs for learning to teach is a lot of teaching practice and experience. They do not appreciate the help of others in order to become aware of their teaching but also do not think that they should regulate their learning themselves. They rarely use the available sources in their learning environment and are very avoidant and not preoccupied with bad lesson experiences.

2. **Reproduction oriented learning pattern.** These student teachers are focused on improving their teaching performance within their actual frame of reference. They are not directed at further developing this frame of reference, resulting in a limited use of available sources. They acknowledge bad lesson experiences and have serious worries about these.

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1 Originally, Oosterheert used the term ‘learning orientations’ to describe individual differences in student teacher learning. The concept of learning orientations, however, has also been used to refer to the motivational and volitional component of learning (Vermunt and Vermetten 2004). Nowadays, researchers have embraced the more neutral term of ‘learning patterns’ to refer to consistent relationships between cognitive, affective, regulative learning activities, beliefs about learning and learning motivations. Therefore, from this point forward we will also use the term ‘learning pattern’ for what Oosterheert called in her previous work ‘learning orientations’ (Oosterheert 2001; Oosterheert Vermunt and Veenstra 2002a; Oosterheert and Vermunt 2001; Oosterheert Vermunt, and Denessen, 2002b).
3. **Dependent meaning oriented learning pattern.** These student teachers try to extend their frame of reference and depend on external sources in doing so, which they highly value. They do not rely much on their own perceptions and thinking yet; others have to help them to interpret their experiences. They are extremely preoccupied with their bad teaching experiences.

4. **Independent meaning oriented learning pattern.** These student teachers are most independent in learning to teach: they try to develop their frame of reference, make broad use of external sources and are highly self-regulative. They define problems of learning to teach not only as problems of performance, but also of meaning. On average, they are not very preoccupied with bad lesson experiences.

**MEASURING STUDENT TEACHERS’ LEARNING PATTERNS: THE INVENTORY LEARNING TO TEACH PROCESS (ILTP)**

**Construction of the ILTP**

An important starting point for the measurement of student teachers’ learning patterns was the phenomenographic study conducted by Oosterheert and Vermunt (2001) in which 30 in-depth interviews were carried out. The study revealed a rich description of individual differences in learning to teach (Oosterheert and Vermunt, 2001). In the next step, the interview statements of the student teachers were used to develop the items of the first version of a closed-ended and self-report questionnaire, resulting in a set of 103 items (Oosterheert et al. 2002b). In the pilot study, a total of 169 student teachers participated. Exploratory factor analysis on the survey data led to the removal of weak items and the identification of eight scales: one scale measuring a mental model; five learning activities scales and; two emotion regulation scales. Cluster analyses on the scores of these scales showed four clusters of learners (survival, closed reproduction, and dependent and independent meaning orientated learning). In a subsequent survey study, a version of 67 items was administered to 382 student teachers. Exploratory factor analyses resulted in the removal of weak items. This time, a factorial structure of three factors describing different mental models was found in addition to five factors describing learning activities and two factors describing emotion regulation. The latter two were comparable with previous research findings. Cluster analysis showed the same outcomes as in the previous studies. Based upon these studies, the ILTP emerged and this
version has also been used and unaltered in the subsequent studies that are reported in this chapter.

**Structure of the ILTP**

The ILTP is a 52-item questionnaire with ten scales that covers learning conceptions, learning activities (including regulation activities and concerns) and emotion regulation. The reliability of these scales varied in the different studies but was satisfactory (Cronbach’s alpha’s above .60). An overview of the scales and sample items are given in Appendix A. These scales will be described in more detail below (Oosterheert et al. 2002a).

Three scales measure different learning conceptions. *Practising and testing* consists of nine items. When student teachers score highly on this scale, they conceptualise learning to teach as practising while obtaining concrete teaching suggestions in practice, finding out what works and what does not. The primary role of teacher educators is to give them these practical suggestions. *Strong self-determination in performance improvement* is a three-item scale. This dimension reflects a high preference by student teachers for self-regulation in determining what they need to improve in their teaching. The last scale, *Raising consciousness under external control*, contains seven items. This scale mirrors the student teachers’ desire that others help make them aware of their own teaching behaviour, how it might be improved and how teaching situations could be interpreted.

The learning activities, including cognitive and regulation activities, are measured with five different scales. *Proactive, broad use of the mentor* has six items and the scale measures the extent to which student teachers use their mentor not only for practical suggestions but also for interpreting teaching situations. The second scale, *Independent search for conceptual information*, uses five items to measure to what extent student teachers recognise a problem and are independent and proactive in their search for conceptual information. The next dimension, *Actively relating theory and practice*, contains five items and refers to the activities that student teachers undertake to use conceptual information from others to interpret their own practice. The scale *Developing views/ideas through discussion*, refers to the intentional use of experienced colleagues by the student teachers in developing their ideas and vision on teaching and to gain insights into alternative teaching methods (five items). The last scale in this domain is the three-item scale *Pupil-oriented evaluation criteria*, which refers to the criteria student teachers use to evaluate their teaching. It captures the extent to which student teachers use their pupils’ well-being or learning outcomes as a reference.
Two scales measure emotion regulation. The two components are *Avoidance* (five items) and *Preoccupation* (four items). Avoidance is a recoded scale that refers to the extent to which student teachers avoid or approach the unpleasant experience of bad lessons. If they score low and, as a consequence, show less avoidance behaviour on this dimension, they use negative lesson situations as a vital source of information for meaning making and learning. *Preoccupation* measures the extent to which students experience long and intense periods of worrying about negative teaching experiences. Others can have a role in taking their worries and low self-confidence away.

**Scale scores and cluster analyses**

The ILTP questionnaire provides scale scores on ten different and important facets of student teacher learning within three components of learning patterns: students’ learning conceptions; learning and regulation activities; and emotion regulation. Students’ learning patterns are usually distinguished in the data after carrying out cluster analyses techniques on the ten separate ILTP scales. Across all former ILTP studies the most typical learning patterns found are the survival oriented, reproduction oriented, dependent meaning oriented and independent meaning oriented cluster, as described above.

**FURTHER VALIDATION OF STUDENT TEACHERS’ LEARNING PATTERNS MEASURED WITH THE ILTP**

After the publication of the ILTP questionnaire in 2002, the questionnaire has been further validated in subsequent research. In 2005, a cross-sectional study was carried out by Donche and Van Petegem in which 366 third year student teachers from one institution in Belgium participated and filled in the questionnaire at the time they were involved in a long internship period at a secondary school. Student teachers from kindergarten, primary and secondary education participated in this study. In order to be able to compare the results with previous findings, the same data analysis techniques were used, such as exploratory factor analyses to ascertain the dimensional structure of the ILTP and cluster analyses (Ward’s method) to map differences in learning patterns. The study confirmed the expected dimensional structure in the data and enabled to assess individual differences in student learning along three components and ten dimensions capturing mental models of learning, cognitive and regulative activities and emotion regulation. Also, differences in learning patterns could be
distinguished. In general, three out of the four expected learning patterns could be replicated: dependent meaning oriented, reproduction oriented and survival oriented. The outcomes of the study further supported the external validity of the ILTP questionnaire.

Endedijk and Vermunt (2013) further investigated the validity of the ILTP questionnaire by examining the relationship between the learning patterns measured by the ILTP and the concrete learning activities of student teachers at the university and in practice. This study showed that relations exist between learning patterns and actual learning activities of students when taking multiple concrete learning experiences of student teachers into account. The results showed that survival-oriented student teachers are more inactive in their learning, reproduction-oriented student teachers learn most by ‘learning by doing’ to improve their teaching behaviour, dependent meaning-oriented student teachers are strongly influenced by previous negative experiences and independent meaning-oriented student teachers show the most deep and the most active way of learning. Overall, the typology as described by Oosterheert (2001) was resembled in the relations of the learning patterns with the concrete learning activities. However, all learning activities were found to some degree among student teachers with all different patterns, meaning that on the level of the individual, student teachers’ dissonant relations (Lindblom-Ylänne and Lonka 2000, Vermunt and Verloop 2000) were found. This study gives evidence for the concurrent validity of the ILTP.

The outcomes of learning to teach are quite hard to measure. Standardised tests, such as the traditional multiple-choice paper and pencil test have proven to be irrelevant for measuring teachers’ classroom effectiveness (Darling-Hammond and Snyder 2000). Different forms of multi-perspective authentic assessments are promising, but still face many problems (Tillema 2009). Therefore, the predictive validity of the ILTP is hard to assess. Nevertheless, we would like to mention three ILTP studies that have shed some light on this phenomenon.

A study (Hooreman, 2008) in which the ILTP was used to explain differential effects of synchronous coaching of 60 student teachers showed that learning patterns could predict whether a student teacher was suitable for synchronous coaching. Student teachers with a survival oriented learning pattern did not respond positively to synchronous coaching. They preferred ad hoc solutions to problems and disliked being steered through a synchronous intervention. Trainee teachers with a dependent meaning oriented learning pattern benefited most from being prompted synchronously, followed by reproductive and independent meaning oriented learners. A second study (Donche and Van Petegem 2005) examined the relation between the learning patterns of 366 student teachers and their preferences for their future teaching environments. Three preferences for learning environments were found to be
related to student teachers’ learning patterns: (1) a preference for a learning environment in which pupils’ interests and experiences are taken into account; (2) a learning environment in which constructive and cooperative learning is centralised and; (3) a learning environment in which discovery oriented learning takes place and in which self-regulated learning is supported. The results indicated that dependent meaning oriented student teachers prefer more constructive and cooperative learning environments which indicates a similarity between student teachers’ own ways of learning and which learning they find important to stimulate in future teaching practice. Similarity between student teacher learning and their preference for teaching practice was also found in the group of survival oriented student teachers. These student teachers, who make very little use of different sources of regulation when learning to teach, were also found to express considerably less preference for taking the interests and experiences of pupils into account and fostering discovery oriented learning in their future teaching practice. The study provides evidence that student teachers’ learning patterns are associated with preferences for learning environments and might be a valuable influencing factor for explaining differences in teaching practice. In another study, Donche et al. (2009) explored whether teachers’ sense of self-efficacy regarding their own teaching as developed through teaching practice during their internship could be predicted by the separate ILTP scales. In the study, 195 students from a university teacher education programme participated. Regression analyses results show that up to 28% of the variance in student teachers’ self-efficacy could be explained by students’ motivational drive and the component of emotion regulation within the ILTP framework. Higher levels of self-efficacy regarding own teaching practice were found among students showing less preoccupation and avoidance behaviour.

In their study, Oosterheert et al. (2002a) measured the concerns of the student teachers: the extent to which they were focused on ‘pupil discipline/classroom management’, ‘pedagogy’ and ‘pupil learning and motivation’ (cf., Oosterheert 2001). A preoccupation with pupil discipline/classroom management appears to be least indicative of a particular learning pattern. In contrast, concerns about ‘pedagogy’ and ‘pupil learning and motivation’ were clearly associated with a particular learning orientation. Student teachers with a meaning orientation were found to be most concerned with ‘pedagogy’ and ‘pupil learning and motivation’ whilst student teachers with a survival/inactive orientation were not. The question, then, is whether concerns determine the way of learning or the way of learning determines the (range of) concerns? The former implies an automatic shift of concerns in connection with a changed way of learning. The latter suggests that a shift of concerns may not occur automatically in all student teachers. Given the characteristics of the four learning
patterns and our knowledge on learning to teach, we are inclined to think that learning habits—including emotion regulation—determine the (range of) concerns of student teachers. ‘Survival’, then, is a very fundamental concern shared by all student teachers, whereas a concern for ‘pupil learning’ may require changes to the self and therefore not emerge automatically (Oosterheert and Vermunt 2003).

THE DEVELOPMENT OF STUDENT TEACHERS’ LEARNING PATTERNS

Although the original conceptual base of the ILTP regards student teacher learning patterns as dynamic rather than stable characteristics, longitudinal studies were lacking in this domain of research. In 2001, Oosterheert hypothesised that—under the right circumstances—if student teachers change their learning orientation, this will probably occur from survival or reproduction oriented towards dependent meaning oriented and ending in independent meaning oriented learning. To move forward with this hypothesis, Donche and Van Petegem’s study (2007) investigated whether students’ learning patterns were more variable or stable across two measurement points. In this repeated measurement study, 253 final year student teachers from three different teacher education programmes (kindergarten, primary education and secondary education) from one institution in Belgium completed the ILTP twice during the final semester of their teacher education programme, once in the first phase of their internship and once during the last phase of their internship. In order to assess the variability of student teacher learning across time, inspections of changes on the ILTP scales as well as within the learning patterns were further investigated using paired-sample T-tests. The findings confirmed the expected variability across time within most of the ILTP scales. In particular, the scales tapping vital aspects of meaning oriented learning showed most variability and mean scores on those scales were found to generally increase between the two measurement points in time. Scales measuring dimensions of emotion regulation were also found to be variable, reflected in decreasing trends in self-reported aspects of preoccupation and avoidance behaviour. From these results it was inferred that the long internship period might be influencing these trends. In the next step, the study addressed whether some learning patterns of student teachers might be subject to more change than others. Paired-sample T-tests were carried out and were conducted on the cluster samples distinguished in the pre-test phase of the study and calculation of effect sizes took place. The results showed that changes were, in a sense, more sporadic for the dependent meaning oriented and reproduction oriented learning pattern in comparison with the survival oriented learning pattern, which was found to
be most subject to change across time. Differences in changes within the learning patterns across time could also be distinguished. The empirical study also gave a first indication that student teachers’ learning patterns are relatively variable constructs across time.

Ende dijk et al. (in press) studied intra-individual changes on the ILTP scales and of the learning patterns. Their study included 81 student teachers who were completing a one year postgraduate teacher education programme in the Netherlands. The ILTP was administered three, six and nine months after entering the programme. Longitudinal multilevel analyses of the ILTP scales showed no change over time for six scales. The learning conception scale, *Raising consciousness under external control*, decreased in the first half year and then slightly increased afterwards. *Independent search for conceptual information* increased over time. *Developing views/ideas through discussion* increased during the first half year and slightly decreased in the second semester. *Avoidance* increased over time. Only the increase of *Independent search for conceptual information* and *Developing views/ideas through discussion* support a development towards more independent meaning oriented learning. On the other hand, the scales *Strong self-determination in performance improvement* and *Actively relating theory and practice*, which are also related to independent meaning oriented learning, did not change over time. Analysis on the person-level outcomes in terms of the learning patterns showed that 37% of the student teachers did not change their learning pattern throughout the program. Thirty-four percent of the student teachers changed their learning pattern in the direction of independent meaning oriented learning, whilst 19% moved away from it. An independent meaning oriented learning orientation is regarded as essential in being prepared not only for academic learning but also for learning to teach and for further professional development (Bakkenes et al. 2010, Oosterheert 2001). This study showed that the majority of the student teachers did not change their learning towards this orientation during their programme.

**STUDENT TEACHERS’ LEARNING PATTERNS IN RELATION TO PERSON-RELATED VARIABLES**

In the study of Oosterheert et al. (2002a) also included several person-related variables. The 382 Dutch student teachers were also asked about several general characteristics and personality variables, such as the Big Five, their self-esteem and their tolerance of ambiguity. The student teachers with different learning patterns did not differ with respect to age, sex, the school discipline they taught, the number of hours they taught per week or their teaching
experience outside the formal educational system. The fact that the amount of experience with independent teaching is not associated with a particular learning pattern suggests that learning patterns do not reflect different stages in the learning-to-teach programme (Oosterheert et al. 2002a).

Significant relations, however, were found when the learning patterns were related to the Big Five, self-esteem and tolerance of ambiguity. The outcomes showed that independent meaning oriented learners scored highest on extraversion, emotional stability, openness to experience, tolerance of ambiguity and self-esteem. Dependent meaning oriented learners scored lowest on extraversion, self-esteem, tolerance of ambiguity and emotional stability. Reproduction oriented student teachers scored, together with their survival oriented peers, lowest on openness to experience and they also scored low on tolerance of ambiguity. Survival oriented learners scored average on most of these scales. No differences were found among the students with different learning patterns and their agreeableness and conscientiousness.

To further clarify the explanatory value of personal variables in relation to student teacher learning, Donche et al. (2009) explored whether individual differences in student learning are consistently associated with differences in academic motivation. In a cross-sectional study, 195 students from a university teacher education programme participated. In this study, dimensions of student teacher learning were measured by the ILTP and were related with differences in academic motivation. Academic motivation was assessed by means of the framework of self-determination theory (Deci and Ryan 2000), in which both the quality (autonomous and controlled motivation) and quantity of motivation as present in the construct a-motivation were taken into account. Structural equation modelling results show that a-motivation is a negative predictor for scales measuring meaning oriented and reproduction oriented aspects of teacher learning, such as developing one’s own ideas based on discussions with others and using different sources of regulation (mentors and peers). Autonomous motivation positively predicts the extent to which students are using particular self-regulatory skills, such as searching for information in an independent way. Controlled motivation positively predicts aspects of preoccupation and avoidance behaviour. A-motivation was also found to be a positive predictor for avoidance behaviour. None of the estimated relationships between students’ academic motivation and learning patterns were in conflict with theoretical expectations based on the self-determination theory. In this way, this study also provided more evidence of the construct validity of the ILTP. The findings support
the relative importance of adding motivational aspects to the explanatory framework to further clarify why student teachers learn the way they do.

**STUDENT TEACHERS’ LEARNING PATTERNS IN RELATION TO CONTEXT-RELATED VARIABLES**

The study of Oosterheert et al. (2002a) was the first study to investigate the distribution of student teacher learning patterns across multiple types of teacher education programmes (cf., Oosterheert 2001): one-year postgraduate university programmes (UP) which prepare students for teaching in higher-level secondary schools; higher vocational education programmes (VP-sec) that prepare students for teaching in lower-level secondary schools and; higher vocational education programmes (VP-prim) that prepare students for teaching in primary schools. UP student teachers were more likely to have a dependent meaning or reproductive orientation when compared to the other student teachers. The four learning orientations were regularly distributed across the two types of VP students, with the exception being the independent meaning orientation, which was slightly more common among the VP-prim teachers. These differences may be related to the various length of the programmes: the VP student teachers are in the last phase of a four-year programme whilst UP student teachers are about halfway through a one-year programme. The way in which UP student teachers learn may therefore be less stabilised than the way VP student teachers learn. On the other hand, different pedagogies may have also caused these differences.

Endedijk’ study (2010) examined two different teacher education tracks within one university programme. Due to the shortage of teachers in the Netherlands, many student teachers following a university programme already have a job or have applied for a job when starting the teacher education programme. Therefore, the programme has a job track as well as an intern track. Student teachers who already have a job or applied successfully for a job follow the job track and start from the first day as a teacher at a secondary school. The other student teachers follow the internship track, in which they are more gradually exposed to the teaching profession; they start observing their peer student teachers and experienced teachers, undergo their first teaching experiences and reflect on these together. In the second semester, the interns change schools and do the internship alone whilst taking on more responsibilities as a teacher, including an increase in the amount of lessons they teach. The content of the academic part of the programme is the same for both tracks. Differences were found between these two tracks: student teachers in the job track scored higher on actively relating theory and
practice and developing views and ideas through discussion, scored lower on the learning conception that practising and testing is sufficient for learning to teach and they were less preoccupied with bad teaching experiences. Furthermore, student teachers with a job more often had a meaning oriented learning orientation than interns, who were usually more reproduction oriented in their learning. On the other hand, students from the intern track were more likely to change their way of learning. Explanations for the differences found might point to the richness of the experience of student teachers with a job and the responsibilities they have and take on. In an internship, student teachers may, particularly in the first semester, not feel like a regular teacher but more like an observer whilst someone else is responsible for the pupils’ learning (Endedijk 2010).

In Oosterheert et al.’s study (2002a), student teachers were also asked about their perception of the teacher education programme. These results show very clearly that both types of meaning oriented learners scored higher on the experienced ‘constructive communicative press’ and the extent to which the programme relates theory to practice. This means that these types of learners experience and appreciate more what the teacher education programme is doing to enhance their own learning.

CONCLUSION AND DISCUSSION

In this chapter we aimed to provide a general overview of the main outcomes of past ILTP studies which have been carried out against the theoretical background of student teacher learning as described by Oosterheert (2001). These studies have shed further light on the ILTP as a valid tool for measuring student teacher learning and learning patterns and provided insights into (1) how student teachers’ learning patterns are related to personal and contextual variables and (2) how these learning patterns develop over time. In what follows, we first summarise the most important conclusions and implications for further research in this field. We end this chapter with some reflections and suggestions for practice on how the ILTP can also be an important tool for enhancing student teacher learning and development.

Student teachers’ learning patterns in relation to person, context, and time

The set of studies presented in this chapter have shown that the ILTP is a valid tool for measuring student teacher learning in teacher education settings other than those in which the ILTP has been developed. However, not all learning patterns can always be found across all
ILTP studies, including the independent meaning-oriented learning pattern. This may be due to contextual differences or sample size.

ILTP scale scores show meaningful relations with other measures such as student teachers’ concrete learning activities, their preferences for their future teaching environments, their sense of self-efficacy of teaching and how they react to coaching interventions. This shows that the ILTP is a valid and reliable instrument to use, not only for further research, but also in helping practitioners predict how different types of learners behave in the various settings of their teacher education programmes. On the other hand, to determine the predictive validity of the ILTP, additional data about the quality of student teachers’ teaching needs to be collected; for example, observation scores of their teaching behaviour in practice placements and the academic outcomes of their learning.

Two ILTP studies have clearly shown that learning to teach patterns are—just like academic learning patterns (Donche et al. 2010, Vermunt and Vermetten 2004)—not stable over time. In general, student teachers appear to change towards more meaning oriented learning during the programme but movement away from this learning pattern was also found. Most changes with respect to student teacher learning were found amongst survival oriented students, which can be explained by the fact that this learning pattern can be regarded as a base level pattern; as soon as student teachers start developing their learning, they will change to another learning pattern. These two studies form only the first step in mapping the development of learning patterns in this context. Larger-scale studies in multiple programmes will hopefully make it possible to arrive at a deeper understanding of which personal and contextual factors evoke changes in learning patterns.

Several personal variables turned out to be related to the learning patterns. The personality variables as student teachers’ motivation were different for the four types of learners. The differences between independent and dependent meaning-oriented learners in terms of their personality are particularly worth noting. Interventions for these student teachers to stimulate their quality of learning might therefore need to be adapted to their learning pattern in order to be effective.

The studies in which context-related variables were included showed that in different types of teacher education programmes different types of learners could be found. More research is needed to show whether this is related to the pedagogy of these programmes or that different types of learners enter these programmes. The results—that different types of learners perceive the same programme differently—is important information for teacher education institutes. Further research is needed to show to what extent student teachers
actually benefit from dominant pedagogies within teacher education programmes and if more differentiation is needed.

In sum, we have pointed to the relevance of a selected set of empirical studies in which empirical evidence is mounting that shows the internal, external and concurrent validity of the ILTP. However, additional validation studies are needed to further determine the predictive validity of the ILTP. Also, the quality of the instrument in repeated measurements to measure changes over time in learning patterns should be further explored. Furthermore, a component that is not included in the ILTP is student teachers’ motivation for learning to teach. The addition of this component might complete the picture of how and why student teachers learn to teach as they do. The ILTP is now focused on the individual learning process, whilst many teacher education programmes are presently using different forms of collaborative learning. How student teachers use various forms of informal and peer support might also be a valuable addition to the current framework. For practice, it would be helpful to develop a short version of the questionnaire that is easy to administer and to use in terms of follow-up of student teachers’ quality of learning to teach. We hope that this overview will boost and inspire a next generation of studies with the ILTP. Currently, studies have been carried out using a German translation of the instrument and a translation in English has been made in order to test the validity of the ILTP in other cultural contexts. As has been said in the introduction, there is a general shortage of studies in contexts in which learning in practice is included. Therefore, we also see possibilities for adapting the ILTP framework for learning in medical education or other forms of professional higher education programmes.

**Suggestions for practice**

An important benefit of the ILTP framework is the parsimonious set of components and dimensions which enables to grasp important differences in learning of specific learner groups. Highly similar individual differences in student teacher learning, as measured with the ILTP, are consistently found in different teacher education contexts. The key dimensions of student teacher learning have been found to be associated with important outcome variables, such as concrete learning activities and student teachers’ sense of self-efficacy in teaching. Also, the patterns appear to be subject to change. Therefore, it seems important to raise attention in teacher education programmes to the presence of these differences and to take these differences into account. Not all of the learning patterns are equally beneficial in becoming a teacher. Growing towards more active and meaning oriented learning is necessary
in becoming a teacher and in lifelong learning as a teacher (Bakkenes et al. 2010).
Fortunately, learning patterns appear to be subject to change, which opens perspectives for all
student teachers as they enter a teacher education programme. How can we address these
differences? A common reaction is to think immediately of differential approaches to
learning; different student teachers should be approached differently. We propose a three-step
approach to addressing these differences. The first is to align education, the second is to
design a curriculum in which there is some time to grow and the third is to help student
teachers to meet the expectations. We will close the chapter with making some remarks
regarding the use of the ILTP in teacher education.

Aligning education

In an aligned curriculum there is a very strong relationship between the learning goals, the
way student teachers are stimulated to learn and the way they are assessed (Biggs, 1996).
Within a year, topic or short period, the goals, instructions, means, feedback, guidance,
lectures, assessment criteria and assessment forms are perfectly aligned. There is also full
transparency for student teachers about this; they know where to strive for, how they can
work towards it and they also know how assessors evaluate their knowledge and performance.
As there is no greater impulse for learning than assessment (Biggs, 1996; Frederiksen, 1984),
in an aligned curriculum the various learners will feel they have to adapt their learning
behaviour in order to make progress. In meetings at the institute and in practice, they feel they
have to learn to show new behaviour or engage in new activities (mental, emotional or
physical) they would perhaps otherwise avoid or not initiate. So, the first step is to set the
goals clearly (content and level!) and teach and assess accordingly; initial learning patterns of
most student teachers will then be challenged without doing anything in particular for specific
student teachers.

Time to grow

As they enter teacher education, not all student teachers show a meaning oriented approach to
their learning. A fully aligned meaning oriented curriculum from the very start may therefore
be too selective for potentially good teachers. Therefore, a certain gradual approach during the
first year, for example, seems fairer. In curriculum design, the goals and standards should thus
give room for different student teachers to still grow as learners. Meaning oriented learning
should be stimulated from the beginning but standards should not be too high immediately.
To support student teachers in this growing process, they should be able to alternate practice and theory almost constantly; for example, in internships and from the very onset of the programme.

Differential guidance

What individual student teachers need in order to develop their skills and habits as learners depends on their initial predominant learning pattern(s). So, given a well-aligned curriculum and some time to grow as learners, the methods adopted to promote learning must vary from student to student. In our view, ‘flexibility’ and ‘facilitation’ should be the keywords for the approach of student teachers showing a predominantly independent meaning pattern. These student teachers are clearly virtually autodidactic and, as a result, do not need strong external regulation. They should not be obliged to follow strict rules with regard to the order in which they should think; reflection heuristics may impede their learning. What they do need is a wide variety of information sources, the opportunity to communicate with experts and the opportunity to teach. They need, like any other student teacher, encouragement and positive support from teacher educators and mentors during the process.

Student teachers with a dependent meaning pattern of learning typically need and welcome strong external support when it comes to sense-making activities such as the interpretation of their teaching experiences. As they do not (yet) rely sufficiently on their own insights, they need others to make them aware of their perceptions, interpret their perceptions and develop their perceptions of reality. They also need others to help them relate such information to their own experiences and thinking. Teacher educators must keep in mind that such student teachers often have low self-esteem and are relatively emotionally unstable. This calls for non-judgemental and positive communication which builds on and emphasises the strengths of such student teachers and encourages them to do more and more on their own accord. It is also then likely that these student teachers will develop into more independent thinkers and learners.

Student teachers with a reproductive learning pattern keep external resources at a distance when these are perceived as providing information which is not in accordance with their existing perceptions of reality or the goals they have stipulated for themselves. Teacher educators thus have the difficult task of carefully disrupting the comfortable equilibrium these student teachers have established for themselves. This can be done, for example, by
confronting them with multiple perspectives on events, situations and developments. Given their personality characteristics, these learners need non-judgemental and cautious guidance. The use of a mixture of student teachers during constructive (institutional) activities can also be recommended for such student teachers. Immersed in these activities, their fellow students may unintentionally serve as role models when they overtly show their doubts and their struggles with interpretative dilemmas. Closed reproductive student teachers may also benefit from genuine (shared) responsibilities in a modern school and the alternative perspectives on reality such a school often provides.

The inactive/survival ways of learning can be understood both from their mental model of learning to teach as well as from other factors, such as personal situations (e.g., not enough time to study). When a student teacher does not think or cannot ‘permit to’ think that teaching must and can be learned, he or she must experience the opposite. Short and frequent try-outs in the classroom imposed by teacher educators accompanied with thorough observation and supportive feedback may be needed to give these student teachers the experience that shows them it makes a difference to make a real effort. They may first need to learn to change their practice without being concerned with knowledge construction beyond their existing frame of reference. Trying out something different in their teaching (without knowing beforehand if it will work well) is already a big step for these student teachers. Previously avoided situations may now cause feelings of uncertainty and anxiety. Extensive guidance is then needed for these student teachers, in particular in ‘normalising’ that experiments and try outs will not all work out well. Also, guided discussions with these and other student teachers about their mental models of learning to teach and motivation for teaching may contribute to their change.

*Using the ILTP in teacher education*

Changing our way of learning is, in essence, changing our way of being in and approaching the world. It is a fundamental process. Therefore, in teacher education, it is of utmost importance to be clear on the one hand about what is needed to become a good teacher and on the other hand to be non-judgemental about the actual learning behaviour of student teachers. Learning behaviour should be seen as a first, dynamic adaptation of (most) students to a new learning context in which experiences are suddenly a valuable information source. In this respect, using individual ILTP scores as feedback information (in the context of assessment for learning) can have positive effects—it depends on how it is done and for what purpose. As
the study of Donche et al. (2012) showed in the context of academic learning, the learning pattern of the student is also related to the kind of feedback the student prefers with respect to their quality of learning. In our view, the ILTP scores are not really necessary to know how individual student teachers learn (although handy as a starting point, just for teacher educators). More important is that teacher educators get to know student teachers as learners, from their weekly activities with them. The structure and dimensions of learning underlying the ILTP are a valuable framework for learning to recognise the behaviour of student teachers. During their activities with students, teacher educators can then detect mental models, activities, regulation patterns and emotion regulation in student teachers, so as to be able to say or do something ‘just in time’ to encourage or ‘awake’ student teachers, possibly even without addressing individual student teachers explicitly. They can switch regularly from ‘content’ to ‘how to learn this content’, depending on what they see and hear (e.g., how to learn to recognise this theory in practice; what can you do). Also, then, they can build on the underlying structure of the ILTP to discuss ‘learning to teach as a process’ with student teachers. If ILTP scores are used to provide feedback or evoke some reflection on ‘how do I learn at this moment’, then the feedback should be given non-judgmentally in the zone of proximal development of ‘this student teacher at this moment’ (see above for a few suggestions).
REFERENCES


