# TEACHERS' SELF-DIRECTED LEARNING AND TEACHING EXPERIENCE: WHAT, HOW, AND WHY TEACHERS WANT TO LEARN?

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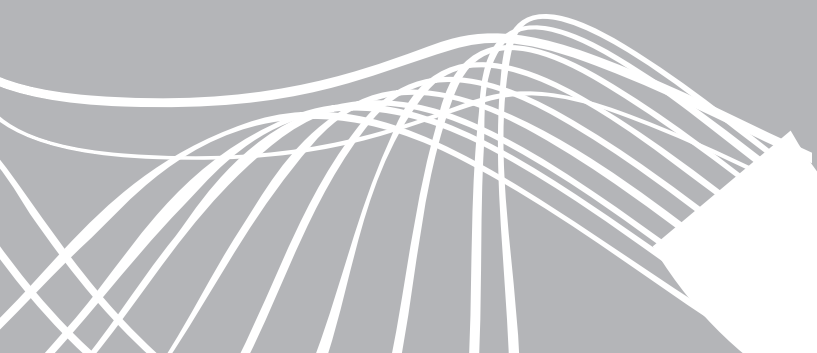

# TEACHERS' SELF-DIRECTED LEARNING AND TEACHING EXPERIENCE: WHAT, HOW, AND WHY TEACHERS WANT TO LEARN?[9]




## ABSTRACT

What teachers want to learn is often not taken into account when professional development (PD) initiatives are designed, nor are teachers portrayed as being able to direct their own learning. Another concern for PD design is that teachers' professional learning differs according to their level of experience. In this study, we took together the questions of what, how, and why teachers want to learn in the concept of teachers' *self-directed learning*; a concept derived from adult learning theories that accommodates for the idea that teachers are able to formulate their own learning needs and consequently direct their learning. A total of 309 teachers filled out a questionnaire on their preferences for learning domains ('what'), their preference for learning activities ('how'), and their reasons to learn about a selection of learning domains ('why'). In regression analyses we tested for linear and non-linear relationships between teachers' years of teaching experience with self-directed learning (what, how and why). The results showed three significant relationships. Teachers' learning about classroom management (what) showed a non-linear relationship with years of experience; early- and late-career teachers showed higher preferences compared to mid-career teachers to learn about classroom management domains. Furthermore, years of experience had a negative relationship with learning through experimenting in the classroom (how) and identified reasons for learning (why). As teachers are more experienced, they are less likely to have preferences for learning through experimenting, or learning because of the reason that a learning domain is personally important to them. Results are discussed through a comparison with studies on teacher effectiveness, teachers' PD, and reasons to learn.


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## 5.1 INTRODUCTION

In-service teacher learning is often referred to as (continuous) *professional development* (PD) and is considered a crucial factor for increasing teacher quality, and improving schools and student learning (Day, Sammons, Stobart, Kington, & Gu, 2007; Opfer & Pedder, 2011). Programs for teacher professional development have been criticized for not involving teachers in the choice of the content of these programs (Van Veen, Zwart, & Meirink, 2012), or not taking teachers' needs into account in PD design (Gravani, 2007). Several scholars suggested that adapting professional development programs towards teachers' learning needs could increase the programs' effectiveness (Gravani, 2007; Shriki & Lavy, 2012; Van Veen et al., 2012), especially if PD is understood as situated in the school context (Wilson & Berne, 1999). A problem in the mismatch experienced in PD is that teachers are often regarded as recipients of PD rather than active participants that are able to explicate their learning goals and have a say in their own learning (Ball & Cohen, 1999; Van Veen et al., 2012).

Another concern is that in the design of PD activities teachers' experience is hardly taken into account. Teachers at the beginning of their career have different aims for learning than mid- and late-career teachers, due to differences in expertise and professional life phases (Anderson & Olsen, 2006; Berliner, 2004; Day et al., 2007). It has been suggested that in order to design a curriculum for PD further research is needed on differences in teacher learning across a career (Van Veen & Kooy, 2012). However, empirical evidence on which to base such a differentiated curriculum is still lacking. When teacher learning research does take teaching experience into account this is mostly in settings for formal learning (e.g., participation in university courses), whereas in-service teacher learning has been found to occur in both formal and informal settings, both outside the school and in the workplace (Kwakman, 2003; Kyndt, Gijbels, Grosemans, & Donche, 2016).

Teachers show a high level of ownership over their own learning: they themselves decide what they learn from the learning opportunities the workplace offers them (Admiraal et al., 2015). This level of ownership can be seen as teachers' self-initiated or self-directed learning (Lohman & Woolf, 2001). Because teachers show great ownership when directing their own learning in the workplace, it is of interest to explore what teachers themselves choose as their learning goals, what kind of learning activities they choose to engage in, and what reasons teachers have for professional learning (Kyndt et al., 2016; Lohman & Woolf, 2001; Mansfield & Beltman, 2014; Thomson & Turner, 2013).

In this study, we combined the questions of what, how, and why teachers want to learn in the concept of teachers' *self-directed learning*, a concept derived from adult learning theories based on the view that teachers are able to formulate their own learning needs and consequently direct their learning. We explored teachers' self-directed learning by focusing on a) teachers' own learning goals, how they want to learn, and the reasons they have for why they want to learn, and b) differences in teachers' years of experience. The research question is: *To what extent does teachers' self-directed learning (what, how and why teachers want to learn) relate to their years of teaching experience?*

## 5.2 CONCEPTUAL FRAMEWORK

### 5.2.1 PD AND TEACHERS' SELF-DIRECTED LEARNING

Following Wermke (2011, p. 668), continuous professional development

> includes not only in-service education and training in the form of organised programmes but also every self-determined and systematic development such as the independent reading of books and journals, attending university courses, programmes and conferences, as well as interaction with colleagues and principals.



Moreover, studies point to the importance of regarding teachers as active agents in educational change efforts (Hoban, 2002) and teachers as undertaking self-initiated professional learning activities (Kwakman, 2003; Lohman & Woolf, 2001; Mushayikwa & Lubben, 2009). Therefore, we treated teachers as active agents in their own development who self-direct their learning. The research tradition on self-directed learning has been derived from theories on adult learning emphasizing adults' sense of personal autonomy in their learning. This means that learners take control of the goals and purposes of learning and assume ownership of learning (Garrison, 1997; Knowles, Holton & Swanson, 2015; Merriam, Caffarella, & Baumgartner, 2007). It also means that adults would like to be seen and treated by others as being capable of self-direction (Knowles, Holton & Swanson, 2015, p. 44). We assume that if teachers are treated as responsible individuals in control of their own learning they are more likely to be engaged in learning (cf. Ellinger, 2004). Also, viewing teachers as capable of self-direction means that teachers are treated as professionals, which would solve the central mismatch experienced in PD if a program neglects teachers as active participants in designing their own professional learning (Van Veen et al., 2012).

In self-directed learning processes different phases can be distinguished (Knowles et al., 2015; Tough, 1979). These phases generally include a needs assessment, planning, engaging in learning, and evaluation. A learning need can be explained as a discrepancy or gap between the desired competencies and the learners' current level of ability (Knowles et al., 2015). Comparing desired with current competencies suggests a deficiency perspective on learning by focusing on skills or knowledge a learner has not mastered yet. We assume that learning needs not only relate to feelings of competence (i.e., sense of self-efficacy) but could also derive from professional growth, which means 'an inevitable and continuous process of learning' (Clarke & Hollingsworth, 2002, p. 947).

In both perspectives the needs assessment phase is important for determining learning goals and hence the direction of what is to be learnt. What learning domains teachers choose in this phase can vary. Following Shulman (1986) conceptual framework of teachers' knowledge, different domains can be distinguished, for example knowledge of subject content, classroom management, curriculum, and students' learning processes. We also distinguished less classroom-related domains of learning, such as learning about school organizations, about themselves as professionals, and how to act as mentor for novice colleagues (Mushayikwa & Lubben, 2009; Van Eekelen, Vermunt, & Boshuizen, 2006).

In the planning phase, learners choose the specific learning activities they would like to engage in and decide how to evaluate their learning. We assumed that teachers choose

those learning activities they have a strong preference for. In research on teachers' learning activities different categorizations are adopted, depending on the theoretical framework used (Evers, 2012; Hoekstra, Brekelmans, Beijaard, & Korthagen, 2009; Kwakman, 2003; Meirink, Meijer, & Verloop, 2007; Richter, Kunter, Klusmann, Lüdtke, & Baumert, 2011). For this study we followed the categorization by Meirink et al. (2007), in which four types of learning activities are distinguished: 1) learning by experimenting, 2) learning by reflecting on own teaching practice, 3) learning from others (with/without interaction), and 4) learning by doing. We expected that the last category, 'learning by doing', is such an ongoing part of teachers' practice, that it is less likely to be part of the 'planning learning activities' phase (Webster-Wright, 2009). Therefore, this category was not included in the study. In addition to these three categories, we distinguished a category 'keeping yourself up-to-date' (e.g., reading professional literature, follow training on your subject) (Kwakman, 2003).

Teachers' self-directed learning should not be understood as a solely individual activity, but is considered to be informed by the problems teachers experience in practice, school climate, recent learning experiences, tasks and responsibilities, and national and school policies (Kwakman, 2003; Mushayikwa & Lubben, 2009; Wilson & Berne, 1999). When teachers assess their learning needs their decision-making can be seen as influenced by a combination of these different internal and external factors (Merriam et al., 2007). It is likely that adult learners will consider something a learning need and consequently self-direct their learning if they hold the positive expectation that the object of learning will be valuable to their work situation, if they experience control over the learning, and if they think that the investment will actually lead to the goal (Deci & Ryan, 2000; Garrison, 1997; Knowles et al., 2015; Thomson & Turner, 2013). The 'most potent motivators are internal pressures (the desire for increased job satisfaction, self-esteem, quality of life, and the like)' (Knowles et al., 2015, p. 45).

To study why teachers want to learn the theory of self-determination (SDT) can be used, which has as its central assumption that all individuals have an inner tendency to strive for growth, integration, and well-being (Deci & Ryan, 2000). Deci and Ryan's SDT (2000) determines different types of motivation on a continuum from 'none' to completely 'self-determined behavior'. This continuum goes from external, to introjected, identified, and intrinsic regulated behavior (Gagne & Deci, 2005; Van den Broeck, Vansteenkiste, & De Witte, 2008; Vansteenkiste, Lens, & Deci, 2006). A general distinction is made between controlled motivation (i.e., external and introjected reasons for learning) and autonomous motivation (i.e., identified and intrinsic reasons for learning) (Van den Broeck et al., 2008). 'Controlled motivation' is learning that is externally controlled and induced by others, whereas 'autonomous motivation' is characterized by the individual's values and interest in the activity, i.e., more self-determined behavior. Another underlying assumption in SDT is that if professionals' learning activities are more self-determined, the quality of their learning increases. Positive outcomes of autonomous motivation are higher goal commitment and a longer engagement in learning (Deci & Ryan, 2000). According to SDT, motivation is never fully regulated through one type of motivation but can be a combination of different regulations, which reflects how professionals engage in learning in organizations (Jansen in de Wal, den Brok, Hooijer, Martens, & Van den Beemt, 2014; Vansteenkiste,

Sierens, Soenens, Luyckx, & Lens, 2009). Furthermore, previous research has shown that motivation to learn can be different for different (academic) subjects and different goals: the content does matter (Vansteenkiste et al., 2009). Therefore, we assumed that teachers can have different reasons to learn about different domains.

Teachers' motivations for PD have generally been found on altruistic (e.g., to help students) and intrinsic (e.g., because they enjoy it) reasons, although external motivators (e.g., administrative support, qualification) can be influential as well (Thomson & Turner, 2013). There are various studies on teachers' motivations for their careers (Hildebrandt & Eom, 2011; Mansfield & Beltman, 2014; Watt, Richardson, & Wilkins, 2013), on whether teachers are willing to learn in a context of educational innovation (Abrami, Poulsen, & Chambers, 2004; Van Eekelen et al., 2006), and on different levels of engagement in organized professional development activities (Gorozidis & Papaioannou, 2014; Thomson & Turner, 2013). However, these studies rarely address teachers' motivations for learning in their everyday work environment (cf. Kyndt et al., 2016; Thoonen, Sleegers, Oort, Peetsma, & Geijsel, 2011). In a recent study on teachers' motivations for engaging in learning activities it was found that teachers with an extremely autonomous motivation profile engaged more often in professional learning activities than teachers with externally regulated motivation profiles (Jansen in de Wal et al., 2014). This confirms the basic SDT assumption that stronger experiences of autonomous motivation will lead to more engagement in learning. In our study, we tested different motivations (i.e., reasons to learn) teachers can have to learn about particular learning domains.

For a comprehensive understanding of teachers' self-directed learning we examined what, how, and why teachers would want to learn in relation to teaching experience.

### 5.2.2 PD AND TEACHING EXPERIENCE

A recent review by Kyndt et al. (2016) showed that research on teachers' everyday learning in relation to teaching experience is scarce; from the 74 studies reviewed there were only 10 in which beginning teachers were compared with more experienced teachers. In the next sections we summarize findings from research on teachers' participation in learning activities and on teacher effectiveness, to provide a general (but not exhaustive) overview of empirical work on differences between teachers' learning for different experience ranges. A distinction is made between early- and late-career teachers. Mid-career teachers are often not studied as a separate group.

#### 5.2.2.1 What? Learning domain and teaching experience

Teaching is inherently complex due to many classroom aspects involved that needs to be monitored simultaneously (e.g., organization and structure, instruction, within-classroom differentiation, dealing with student misconduct) (Doyle, 2006). Studies on teacher quality bring forward that this complexity of teaching suggests a particular order in which teaching skills are mastered (Berliner, 2004; Kyriakides, Creemers, & Antoniou, 2009; Maulana, Helms-Lorenz, & Van de Grift, 2015; Seidel & Shavelson, 2007). For example, an increase in impact on students' learning for teachers in their first teaching years was found, and a general stabilization of teaching skills was found after approximately seven years of teaching (Berliner, 2004). Recently, a large-scale observation study found that

after 20 years of experience reach a plateau and even show a gradual decline in their pedagogical teaching skills (Van de Grift, Van der Wal, & Torenbeek, 2011). In line with this finding, self-report data show that teachers' participation in professional learning activities gradually decreases as they become more experienced (Richter et al., 2011). Teachers' interest in the learning domains of subject content, pedagogies & psychology, and subject-specific pedagogies shows an increase towards mid-career and a decrease after that point which can be expressed as curvilinear relations between teacher learning and experience (Richter et al., 2011). For the domains school organization, coaching, and professional well-being no effect with experience was found, probably because these are not chosen very often (Richter et al., 2011). However, in another study experienced teachers (more than eight years of teaching) were found to have an increased interest in learning about role effectiveness, possibly due to taking up different roles in the school (Day et al., 2007). A large-scale study by Day et al. (2007) found (disruptive) pupil behavior to be a consistent concern for a substantial proportion of teachers in all experience groups, but particularly for early- and late-career teachers.

In teacher education research beginning teachers' learning is characterized by classroom management, developing teacher-student relationships, instructional and pedagogical mastery, and being accepted in the school context and learning about school politics (Brekelmans et al., 2005; Feiman-Nemser, 2001; McCormack, Gore, & Thomas, 2006; Veenman, 1984). An increased interest in administration tasks and a wish to increase impact is also specific to early-career teachers (Anderson & Olsen, 2006). More experienced teachers' interests are associated with experimenting with new teaching methods, further developing instructional repertoire, and combining management and teaching (Kyndt et al., 2016; Richter et al., 2011; Shriki & Lavy, 2012). Late-career teachers are often characterized as confident in their teaching abilities and having high job satisfaction due to their teacher-student relationships and high student achievements (Day et al., 2007; Kyndt et al., 2016). Another group of late-career teachers have been found to become more distant from students due to the increasing age difference (Brekelmans et al., 2005), and as a result a wish to learn about interacting with students (Kington, Reed, & Sammons, 2014; Shriki & Lavy, 2012).

#### 5.2.2.2 How? Learning activities and teaching experience

In recent studies, experienced teachers have been found to undertake as many learning activities as beginning teachers but to prefer different activities (Grosemans, Boon, Verclairen, Dochy, & Kyndt, 2015; Richter et al., 2011). These studies suggest that beginning teachers are more in favor of observing colleagues, interaction with experienced colleagues (i.e., a mentor), and university courses on their subject domain. However, experienced teachers are more in favor of sharing and collaborative initiatives, experimenting, and reading professional literature. Richter et al. (2011) found a negative curvilinear relationship between age and in-service training (i.e., seminars, conferences, and school-specific professional development), which means low levels of a teacher participation at the start of a teacher's career, a peak in mid-career, and lower levels again at the end of the career. In addition, there are contradictory findings regarding the relationship between teaching experience and learning in interaction and learning from experimenting

(Flores, 2005; Krečič & Grmek, 2008; Richter et al., 2011). For example, Richter et al. (2011) found a negative relationship between age and teachers' learning in interaction (i.e., cooperation with colleagues), which would indicate that experienced teachers cooperate less often. Krečič and Grmek (2008), on the other hand, found that teachers' perceptions of the importance of cooperative learning did not differ with teachers' varying levels of experience.



#### 5.2.2.3 Why? Reasons for learning and teaching experience

In general, studies have shown early- and mid-career teachers to be more 'eager' for PD (Flores, 2005; Kyndt et al., 2016; Richter et al., 2011). Studies on differences in goal setting and reasons for learning in early- mid-, and late-career teachers seem to indicate that teachers' motivation to learn varies with teaching experience. For example, early-career teachers have been found to be mostly mastery-oriented and intrinsically motivated for instructional, personal, and career goals (Mansfield & Beltman, 2014). Mid-career teachers are motivated for learning to increase their impact on students' learning (Shriki & Lavy, 2012), or for career promotion and external incentives (Hildebrandt & Eom, 2011). Late-career teachers seem predominantly motivated because of their own interest in their subject (Shriki & Lavy, 2012).

## 5.3 METHOD

### 5.3.1 SAMPLE AND PROCEDURE

We studied teachers' self-directed learning, conceptualized as what, how and why teachers want to learn, by means of a questionnaire administered in 11 Dutch secondary schools in the spring of 2015. Schools were recruited through convenience sampling, i.e., most participating schools were partners of the teacher education institute where the researchers work and located in the same region. Ten schools were located in urban and suburban areas in the western part of the Netherlands, and one school in the southern part. The levels of schooling offered at these schools varied from pre-vocational to pre-university secondary education, or a combination of different levels. The questionnaire was web-based and administered through an e-mail link. We sent the link directly to teachers in three schools; in the other eight schools, the link was sent to the teachers by the school management. As a consequence of school management being in charge of forwarding the link to their teaching staff, we only have a rough estimate of the number of teachers from these schools. The link was sent to approximately 920 teachers. A total of 309 teachers (55.2 % female) finished the questionnaire, which implies a response rate of 34 %. The sample characteristics are shown in Table 5.1. The average number of years of experience was 14.23 years (SD = 11.30) and 122 teachers were second-career teachers (i.e., they had a previous career before entering the teaching profession). Because the number of years of experience is an important variable in this study, we used the categories from the professional life phase model of Day et al. (2007), in which teachers' effectiveness and motivation for work and learning were found to differ for these specific groups. [10]

*[10] Because there are no estimates available of the distribution of years of experience in the Dutch teacher workforce, we compared our sample characteristics with the distribution of teachers' ages. In a 2013 estimate of the secondary school teacher workforce there are two peaks in the distribution: teachers between 25 and 35 years of age, and teachers between 55 and 65 years of age, with the latter group taking up one-third of the total workforce (Lubberman, Van Kessel, Wester, & Mommers, 2013). In our sample teachers from the latter category seem to be underrepresented, which means that we have to be careful when making inferences about the very experienced teachers.*

**Table 5.1** *Sample characteristics.*

| | Number of teachers | Percentage |
|---|---|---|
| **Years of teaching experience[a] (n = 302)** | | |
| 0 – 3 | 43 | 14.24 |
| 4 – 7 | 57 | 18.87 |
| 8 – 15 | 102 | 33.77 |
| 16 – 23 | 45 | 14.90 |
| 24 – 30 | 23 | 7.62 |
| 31+ | 32 | 10.60 |
| **Subject domain[b]** | | |
| Mathematics | 35 | 11.74 |
| Science | 60 | 20.13 |
| Social sciences | 53 | 17.79 |
| Language: Mother tongue | 39 | 13.09 |
| Language: Modern foreign | 63 | 21.14 |
| Language: Latin/Greek | 13 | 4.36 |
| Art & creative subjects | 31 | 10.40 |
| Physical education | 18 | 6.04 |
| Philosophy and religious studies | 11 | 3.69 |
| Otherwise | 26 | 8.72 |

*[a] Categories are from Day et al. (2007) [b] No exclusive categories: a sound number of respondents taught in more than one subject domain*



### 5.3.2 INSTRUMENT

#### 5.3.2.1 Development of the questionnaire

Teachers' self-directed learning was measured for three areas. First, we assumed that teachers would vary regarding the domains they want to learn about ('what?'); second, teachers can vary regarding the learning activities they want to engage in ('how?'); and third, we assumed that teachers can vary regarding their reasons for why they want to learn ('why?'). For our instrument, we first explored existing questionnaires measuring related constructs (e.g., learning activities, preferences, motivation, values, teacher competence). If there were no existing questionnaires that related to our aims we designed our own questions on the basis of a previous interview study on teachers' learning goals (see Chapter 2). In this earlier study we conducted semi-structured interviews with 31 secondary-school teachers about the type of learning activities they wanted to engage in and what they wanted to learn. As response category we chose degree of preference on a five-point scale, because it accommodates the idea of teachers' volition in describing what and how they want to learn. Also, this scale offered a continuum of response options (i.e., not preferred, slightly preferred, somewhat preferred, moderately preferred, strongly preferred) which are easier to answer than dichotomous response options (e.g., I do not want to learn about … vs. I want to learn about …) (Krosnick & Presser, 2010).

Next, we assessed the phrasing of the items by asking two expert teachers to think aloud when answering the questions. Whenever items were not clear or could be interpreted in more than one way, we adapted the items. Third, we conducted a pilot study in which 55 teachers from two schools who did not participate in the study filled out the questionnaire. The pilot results were used to gain feedback on the length and complexity of the questionnaire. We also conducted tests for collinearity and reliability of the items to reduce the number of questions. Lastly, we used the pilot results to make adaptations to the different scales, in order to reduce the item load of the questionnaire (from 135 items to 67 items) and keeping reliability of the different scales to at least .60.

#### 5.3.2.2 Variables in questionnaire

##### *5.3.2.2.1 Learning domains*

An existing questionnaire that fit our aims was not available. Therefore, we based our questions on our earlier interview study in which we interviewed 31 teachers on their professional learning goals. In the analyses of these interviews we used Shulman's knowledge domains (1987) to code teachers' learning goals. We now used these knowledge domains to design items for learning domains. As a result, teachers were asked to rate their preference for a particular learning domain (18 items in total) on a five-point rating scale (*1= not preferred, 5 = strongly preferred*). To find latent dimension scores for further analyses we conducted an exploratory factor analysis. Four items were excluded from this analysis because they did not belong to any of Shulman's knowledge domains, and nor did they form a separate dimension because of their distinctive content. These items were: personal effectiveness, other tasks in the school (e.g., coordinator, manager), ICT technologies, and supporting new and beginning colleagues. In our analyses we treated these four separate items as one-item dimension scores.

For the exploratory factor analysis we preferred oblique rotation over varimax rotation because factors are generally assumed to be correlated, and in fact had inter-item correlations above .32 (Brown, 2009). After exploratory factor analysis with oblique rotation, three components were distinguished on the basis of the Eigenvalue-greater-than-1.0-rule (Kaiser, 1960), namely a) Classroom management and organization domains (3 items), b) Subject matter-specific domains (6 items), and c) Individual student care domains (3 items) (see Table 5.2). Cronbach's alphas were satisfactory and the division into three components reflected Shulman's domains of pedagogical knowledge (classroom management and organization), subject matter knowledge, pedagogical content knowledge, and curricular knowledge (taken together in the dimension 'subject matter-specific'), and knowledge of learners and their characteristics (individual student care). The three components explained 65 percent of the total variance.

##### *5.3.2.2.2 Learning activities*

These questions were partly derived from Ever's TPD@Work scale (2012), intended to measure teacher participation in professional learning activities, and partly inspired by Dutch studies on teachers' learning activities during a nationwide reform (Bakkenes, Vermunt & Wubbels, 2010; Hoekstra, Brekelmans, et al., 2009; Kwakman, 2003; Meirink et al., 2007). We started with the 21 TPD@Work items, adapted the response scale to

**Table 5.2** *Factor loadings of exploratory factor analysis with oblique rotation for learning domains*

| Learning domain items | Classroom management and organization | Subject matter-specific | Individual student care | $h^2$ |
|---|---|---|---|---|
| Creating a safe learning climate in the classroom | .948 | | | .903 |
| Organizing structure and discipline in the classroom | .844 | | | .707 |
| Good relationship with students in the classroom | .798 | | | .719 |
| Testing and assessment | | .783 | | .577 |
| School curriculum | | .657 | | .518 |
| Developing lesson materials | | .640 | | .370 |
| Instructional pedagogies specific to my subject | | .608 | | .371 |
| Subject content | | .594 | | .408 |
| Students' learning process | | .575 | | .412 |
| Students with behavioral- and learning problems | | | .872 | .694 |
| Cultural differences between students | | | .645 | .487 |
| Guiding individual students (e.g., mentoring, coaching) | | | .516 | .438 |
| *Cronbach's alpha* | .914 | .828 | .756 | |

***Note.*** Direct oblimin rotation, delta = 0. Factor loadings below |.300| were suppressed.

match the questions on learning domain (instead of a four-point scale for frequency, we used a five-point Likert scale for preference), and deleted items with a specific content focus. Six items derived from our own interview studies were included, so that we ended up with 17 items measuring four dimensions of preferred learning activities: learning from interaction, reflection, experimenting, and learning from keeping up-to-date. The initial exploratory factor analysis with oblique rotation revealed five components based on the Eigenvalue-greater-than-1.0 rule (Kaiser, 1960); however, there was one item (i.e., 'trying out new teaching methods in my lessons') with a factor loading above 1. probably due to its high degree of multicollinearity with the other items (Jöreskog, 1999). The item could not be removed because the category 'experimentation' consisted of only two items in the first place. After trying out multiple solutions, we found that the six items derived from our interview study loaded on multiple dimensions or had low initial communalities. After we deleted these six items we found a three-factor solution whose components were easy to interpret (see Table 5.3). The different components were labeled a) Reflection on practice & collaboration (5 items), b) Training and keeping up-to-date (4 items), and c) Experimenting (2 items). In this solution we found the items for 'reflection on practice' and 'collaboration' were combined in one component, which makes sense because reflection often occurs in interaction with others (Meirink et al., 2007). The three-factor solution explained 52 % of the total variance; Cronbach's alphas for each component were satisfactory.

#### *5.3.2.2.3 Reasons for learning*

To understand teachers' reasons to learn about the different learning domains, we used instruments based on the self-determination theory (Deci & Ryan, 2000). Deci and Ryan (2000) distinguish different motivations to learn on a continuum from controlled to

**Table 5.3** *Factor loadings for exploratory factor analyses with oblique rotation of learning activities.*

| Learning activity items | Reflection on practice & collaboration | Training & keeping up-to-date | Experimenting | $h^2$ |
|---|---|---|---|---|
| Critical reflection on teacher's experiences | .593 | | | .404 |
| Asking students for feedback in the lessons | .571 | | | .372 |
| Reciprocal classroom visits with colleagues | .538 | | | .250 |
| Preparing lessons with colleagues | .496 | | | .419 |
| Assembling a school working group or committee with colleagues | .349 | | | .250 |
| Participating in (subject-specific) conference | | .667 | | .419 |
| Consulting books, subject-specific journals etc. | | .629 | | .447 |
| Participating in a training course | | .555 | | .347 |
| Visiting educational sites on Internet | | .517 | | .368 |
| Trying out new teaching methods in my lesson | | | -.745 | .607 |
| Testing alternative teaching materials in class | | | -.636 | .499 |
| *Cronbach's alpha* | .695 | .692 | .685 | |

***Note.*** Direct oblimin rotation, delta = 0. Factor loadings below |.300| were suppressed.



autonomous motivation (external, introjected, identified, intrinsic). We adapted items from the Academic Self-regulation Questionnaire (Vansteenkiste et al., 2009), which reflects the idea that motivation is dependent on the topic of learning. To prevent item overload, we designed one item per reason (cf. Koestner, Lekes, Powers, & Chicoine, 2002).

In the questionnaire teachers were first asked to select a maximum of five domains (minimum of one) they wanted to learn about. Then, they were asked to state for each of these why they wanted to learn about this particular topic. The response options were 'because somebody else (e.g., management, colleagues, pupils) expects me to' (external), 'because I would feel a bad teacher if I did not learn about this topic' (introjected), 'because I personally think it is important to learn about this' (identified), and 'because I experience it as interesting and fun to learn about this' (intrinsic). For each reason, they were asked to indicate on a five-point scale to what extent this reason was applicable to this particular learning domain. In this way we could assess which reasons prevail for different learning domains. Of the 309 teachers, 255 teachers filled out these questions completely.

### 5.3.3 DATA ANALYSIS

To answer the research question on how self-directed learning can be described, we inspected the descriptive statistics of the different learning domains ('what'), learning activities ('how'), and the reasons for learning ('why') to see which domains, activities, and motivations had high or low scores. We used paired-samples t tests to compare the high and low scores with each other. To answer the research question about how teaching experience related to what, how, and why teachers want to learn, we used linear regression analysis. After inspection of the scatterplots and the Curvefit command (SPSS Statistics 23), we decided whether to test for linear or for non-linear relationships. For assumed non-linear relationships we used polynomial regression analysis with teaching experience as predictor (Kutner, Nachtsheim, & Neter, 2004; Richter et al., 2011). In these

analyses we first introduced the linear term ($x$) for teaching experience in Model 1, and then a quadratic term ($x^2$) of teaching experience in Model 2. We used the difference in $F$ values and $R^2$ were used to compare models to see whether the linear or the polynomial predictor fitted the data best.

The level of significance was set at $p < .05$ for the paired-samples $t$ tests and we corrected for multiple significance testing with the Holm Bonferroni adjustment for the regression tests (Ludbrook, 1998). We used unstandardized regression coefficients ($b$) to interpret linear relationships and standardized regression coefficients ($\beta_{experience}$, $\beta_{experience}{}^2$) to interpret non-linear relationships. We used Pearson's correlation coefficient to indicate the size of the effect (Field, 2009). Effect size was interpreted according to Cohen's (1988) criteria: .1 = small effect, .3 = medium effect, .5 = large effect for $r$ and .01, .09, .25 for $R^2$ (for the model comparison).



## 5.4 RESULTS

### 5.4.1 DESCRIPTIVE RESULTS

Table 5.4 provides the descriptive statistics for teachers' preferences for learning domains and learning activities. Regarding the learning domains, we found teachers' preferences to be higher for the *subject matter-specific domains* and *ICT* than for the other domains (all paired-samples $t$ tests were significant, $df = 303$, $p < .001$). Regarding the learning activities, teachers' preferences for *experimenting* (M = 3.54, SD = .82) were significantly higher than for *training and keeping up-to-date* (M=3.23, SD = .81, $t = -4.954$, $df = 303$, $p < .001$). Teachers' preferences for learning from *reflection on practice & collaboration* (M = 3.45, SD = .72) were higher than for *training & keeping up-to-date* (M = 3.23, SD = .81, $t = 4.304$, $df = 303$, $p < .001$).

**Table 5.4** *Descriptive statistics for teachers' preferences for learning domains and learning activities.*

| | Mean | SD |
|---|---|---|
| **Learning domains** | | |
| Classroom management and organization | 2.86 | 1.29 |
| Subject matter-specific | 3.44 | .79 |
| Individual student care | 2.76 | .97 |
| ICT | 3.27 | 1.21 |
| Mentoring novice colleagues | 2.80 | 1.27 |
| Personal effectiveness | 2.79 | 1.29 |
| Management tasks | 2.56 | 1.37 |
| **Learning activities** | | |
| Reflection on practice & collaboration | 3.45 | .72 |
| Training & keeping up-to-date | 3.23 | .81 |
| Experimenting | 3.54 | .82 |

In Table 5.5 the descriptive statistics for the motivation scores across all learning domains (i.e., mean scores of each reason to learn over the selected one to five learning domains). The mean scores show that teachers' motivation for learning about a self-selected learning domain was stronger for the identified and intrinsic reasons than for the external and introjected reasons (all paired-samples *t* test were significant, $df = 248$, $p < .001$). The correlations between different reasons showed that the two autonomous (i.e., external and introjected) and the two controlled (i.e., identified and intrinsic) motivation types are positively correlated with each other. An exploration of the variation in reasons specific to each learning domain did not uncover any patterns; each learning domain showed low mean scores for external and introjected reasons, and high mean scores for identified and intrinsic reasons. On the basis of this first inspection we did not analyze any further our assumption that teachers' reasons to learn was domain specific.

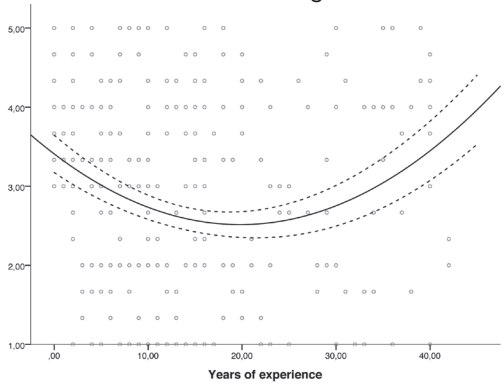
**Table 5.5** *Descriptive statistics and inter-item correlations for teachers' reasons to learn (n = 255)*

| Reasons to learn | Key word in item | Descriptives | | Inter-item correlations | | |
|---|---|---|---|---|---|---|
| | | *Mean* | *SD* | *External* | *Introjected* | *Identified* |
| External | *Others* | 2.22 | 1.19 | - | | |
| Introjected | *Bad teacher* | 2.70 | 1.28 | .345** | - | |
| Identified | *Important* | 4.32 | 0.67 | -.062 | .058 | - |
| Intrinsic | *Interest* | 4.27 | 0.74 | -.060 | .031 | .266** |

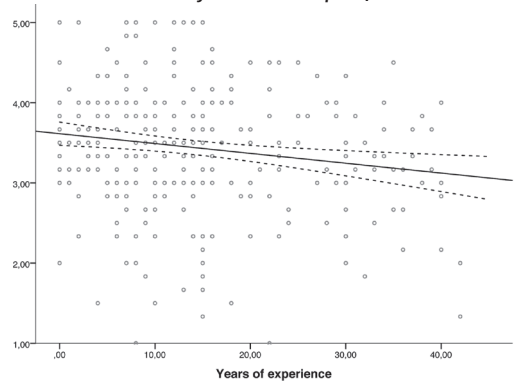
### 5.4.2 RELATING WHAT, HOW AND WHY TEACHERS WANT TO LEARN TO TEACHING EXPERIENCE

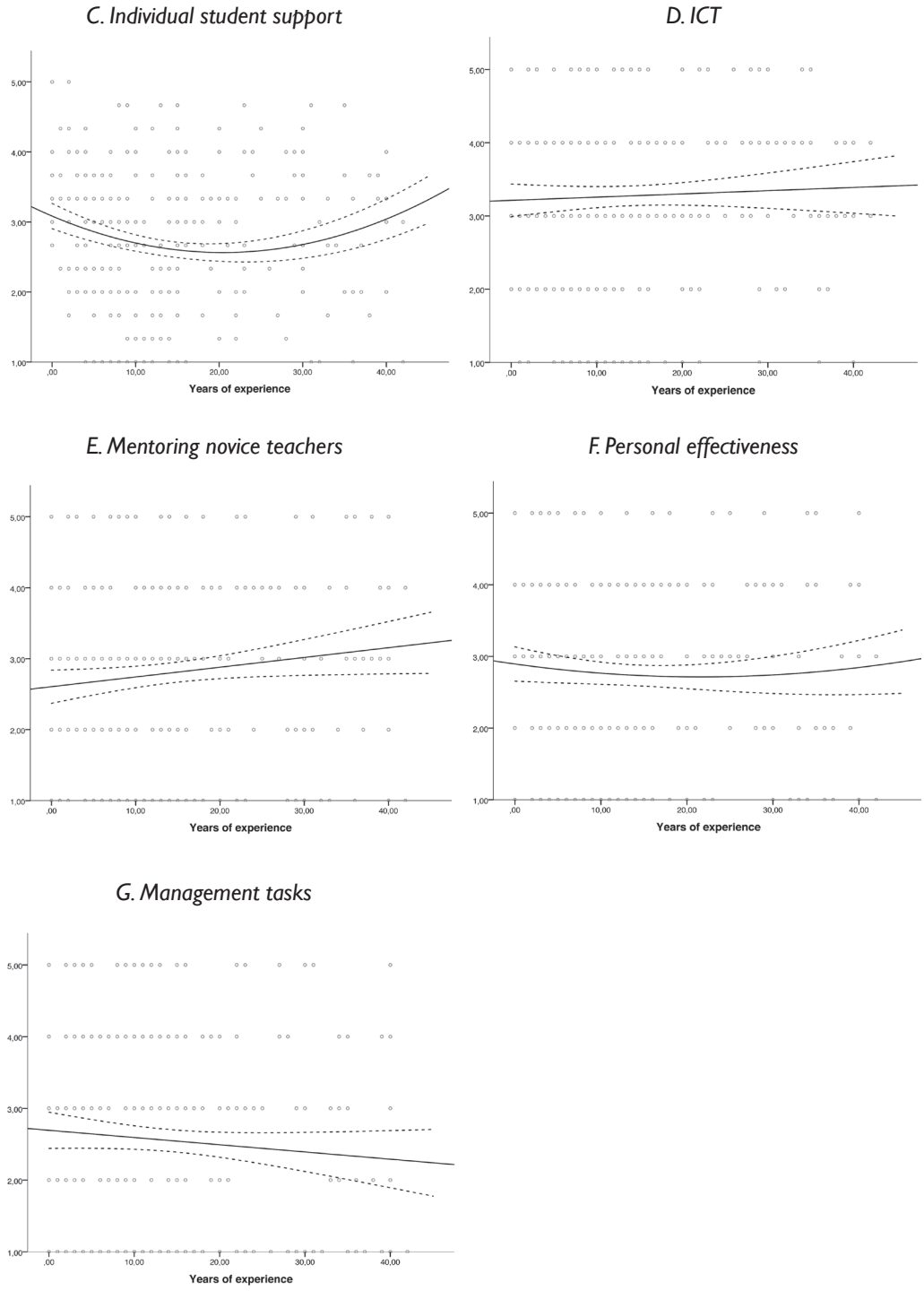
To explore the direction of the relationships between teachers' self-directed learning and teaching experience, we first inspected graphical representations of these relationships with scatterplots in which lines had been fitted with the SPSS CURVEFIT command (see Figures 5.1, 5.2 and 5.3). These lines provided an opportunity to inspect the linear and non-linear relationships between our independent and dependent variables. The graphs seem to indicate that some of the learning domains follow non-linear trends (e.g., classroom management and individual student support). We tested for both linear and non-linear trends for the learning domains, and expected linear trends for learning activities and reasons for learning.

*A. Classroom management*




*B. Subject matter-specific*

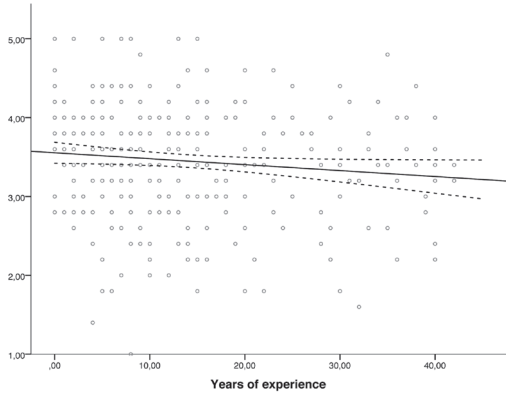




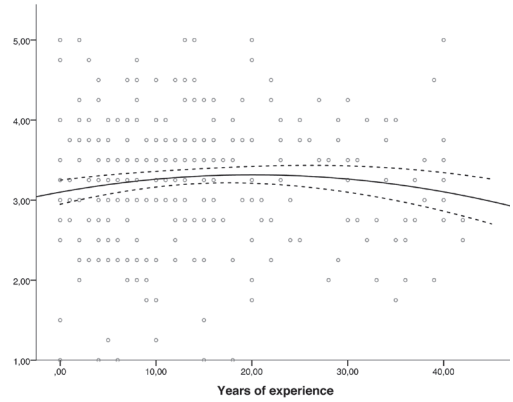

***Note.*** Dotted lines indicate 95% confidence interval.

**Figure 5.1** *Scatterplots and fitted lines for teachers' preferred learning domains*

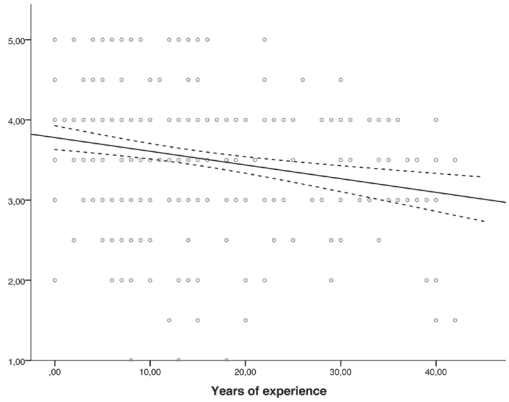
*A. Reflection on practice & collaboration*




*B. Training & keeping up-to-date*



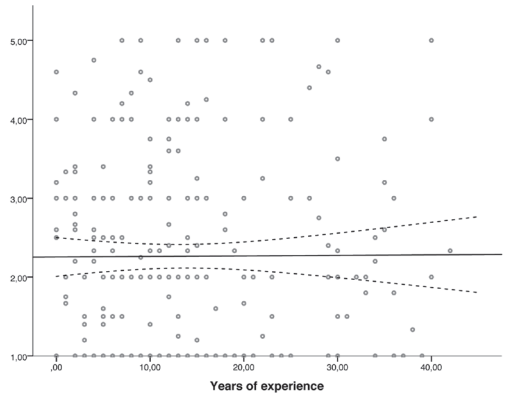

*C. Experimenting*



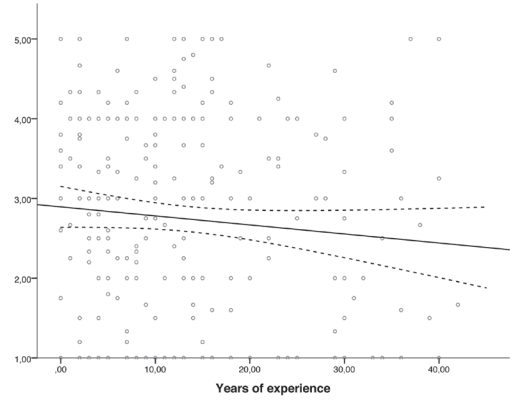

***Note.*** Dotted lines indicate 95% confidence interval

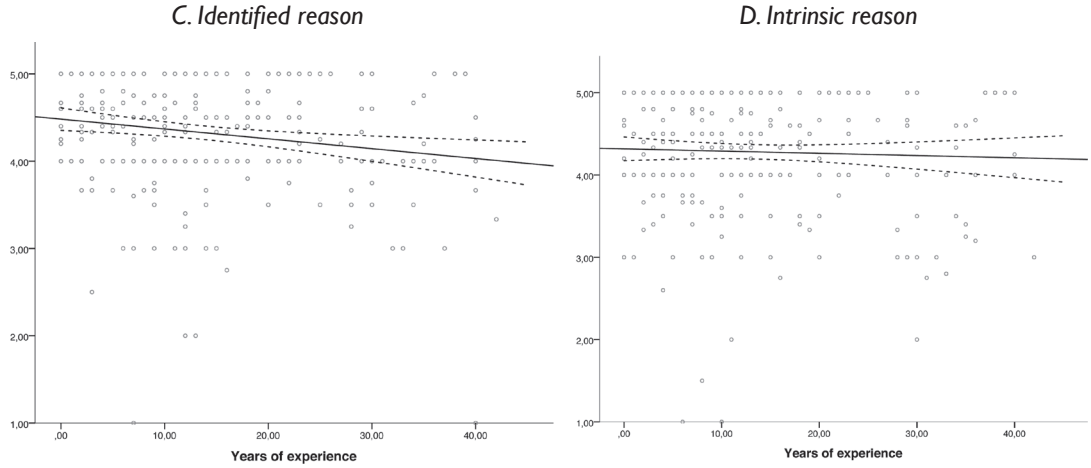
**Figure 5.2** *Scatterplots and fitted lines for teachers' preferred learning activities*

*A. External reason*




*B. Introjected reason*






***Note.*** Dotted lines indicate 95% confidence interval

**Figure 5.3** *Scatterplots and fitted lines for teachers' reasons for learning*

To see which linear or curvilinear trends were visible for teaching experience related to teachers' preferences for learning domains, we carried out a multiple regression analysis in which we entered Experience as predictor in the first model and the polynomial function of Experience in the second model (cf. Richter et al., 2011). For the learning domains only one curvilinear relationship was found. Teachers' preferences for learning about classroom management follow a positive curvilinear trend, $\beta_{experience} = -.751$, $p = .003$, $\beta_{experience}{}^2 = .746$, $p = .003$, based on a significant $F$ value change between models 1 and 2, $\Delta F = 14.861$, $p = .003$, $R^2 = .049$. A positive curvilinear trend means that both less experienced and very experienced teachers have high scores on their preferences for learning about classroom management and organization, whereas teachers with approximately 7 to 15 years of experience have lower scores. The size of the positive curvilinear effect was small according to Cohen's (1988) indicators. For the other learning domains we did not find significant linear or curvilinear relationships with years of experience.

For the learning activities one linear relationship was found. Teachers' preferences for learning through experimenting relates negatively with years of experience, $b = -.017$, $p < .001$, $r = -.224$. The other learning activities showed no relationship with experience. For the different reasons for learning, we found that the identified reason had a negative relationship with years of experience, $b = -.014$, $p = .005$, $r = -.209$. The other reasons showed no relationship. The effect sizes ($r$) were small according to Cohen's (1988) rule of thumb.

## 5.5 CONCLUSIONS

This study started from the assumption that teachers' different learning needs stem from differences in teaching experience, which has consequences for how teachers self-direct their learning in the workplace. To examine these presumed differences we measured what, how, and why teachers want to learn, and related these differences to their years of experience.

From the descriptive analyses, we found that teachers varied in what, how and why they want to learn. For example, considering learning domains we found that teachers strongly preferred subject matter-specific domains and ICT. The finding that teachers want to learn about ICT might be explained from the current emphasis on learning through digital devices and multimedia which is relevant to all teachers (cf. the OECD Teaching and Learning International Survey [TALIS] report 2013, where ICT skills integration was top ranked in teachers' professional learning goals) (Van Braak, Tondeur, & Valcke, 2004). All teachers strongly preferred learning about subject matter-specific domains. This can be explained by the nature of teaching: being an expert at explaining your subject and adapting your instruction accordingly to different student levels is at the core of a teacher's job (Shulman, 1986). Good and adaptive instruction is also considered the most complex skill involved in teaching and therefore requires continuous development (Van de Grift et al., 2011; Van Veen et al., 2012; Wilson & Berne, 1999). Another reason for learning about subject matter can be continuous curricular changes, resulting in a lifelong need to stay up-to-date in your subject domain.

To answer our research question, we found one learning domain, one learning activity, and one reason for learning to be significantly related with teaching experience. The learning domain of classroom management and organization follows a positive curvilinear trend in relation to years of experience. This means that early- and late-career teachers show a stronger preference for learning about this domain than mid-career teachers. Late-career teachers' learning about classroom management and organization can be explained by the results of Shriki and Lavy (2012), who found that late-career teachers want to adapt themselves to today's young generation in order to find mutual respect and have good relationships with students. Student perceptions of teachers' proximity in teacher-student relationships seem to confirm this concern; teachers with more than 25 years of experience show lower proximity scores than teachers with 0 to 10 years of experience (Brekelmans et al., 2005). Our finding that early-career teachers want to learn about classroom organization confirms previous findings. Also, early-career teachers are generally found to be concerned with mastering *all* aspects of classroom teaching, including organizing their classroom and developing subject pedagogies (Feiman-Nemser, 2001; McCormack et al., 2006; Veenman, 1984).

With respect to how teachers want to learn, the questionnaire findings show that with increasing experience teachers' learning preference for developing their teaching skills through experimenting decreases. Learning from training and keeping up-to-date, for example by consulting professional literature and participating in workshops, does not vary with years of teaching experience. This contradicts with the study by Richter et al. (2011), in which experienced teachers were found to spend more time on reading professional literature but participate less in in-service training than their inexperienced colleagues. Apparently, staying informed and up-to-date is relevant to all teachers regardless their years of experience, and this can be done by attending workshops or reading professional literature. However, we did not distinguish between those two forms of professional learning activities.

Finally, teachers want to learn about a self-selected learning domain because they experience it as interesting (intrinsic reason) and/or because they feel it is important to

learn about (identified reason). This shows that teachers' reasons to learn about self-selected learning domains is highly autonomous. Although the effect was small, the 'identified reason' (i.e., whether the topic is important to learn about) was negatively related to years of teaching experience. A possible explanation can be found in a study on teachers' professional lives in which late-career teachers were found to have more emotional distance to their work (Day et al., 2007) and maybe also to their learning, which would mean they see it as less important.



## 5.6 DISCUSSION & IMPLICATIONS

The trends in what teachers want to learn as found in this study resemble findings from large observation studies on teacher skills and research on teachers' effectiveness (Day et al., 2007; Kyriakides et al., 2009; Van de Grift et al., 2011). These studies suggest a sharp increase in pedagogical and instructional teaching skills and impact in the first years of teaching peaking at mid-career. After mid-career, teachers' skills level off, stabilize, or even gradually decline (Van de Grift et al., 2011). In our study, mid-career teachers formulated less preference to learn about classroom management and organization than early-career teachers, probably because of their high competence levels in managing classrooms. The similarities of our study with these large-scale studies on the development of teaching skills show that teachers' self-directed learning follows a similar course.

Our findings on the learning domain 'classroom management and organization' follow a positive curvilinear relationship with 'years of experience', which contradicts the findings by Richter et al. (2011). They found a negative curvilinear trend, which implies that mid-career teachers are more interested in learning about classroom management than early- and late-career teachers. An explanation can be found in a different measurement in the study of Richter et al.: they studied the content of teachers' *formal* learning activities over the past five years, whereas in our study, we emphasized the use of *all* kinds of learning activities involved in learning about these domains. Richter's results are dependent on the number of formal learning activities teachers have participated in, and hence these content-related results reflect mid-career teachers' participation in formally organized learning activities. The fact that our findings differ from Richter's is caused by different approaches to discussing teachers' PD in relation to teaching experience[11] . If only organized and formal learning activities are taken into account for teachers' PD, this means that not the full range of teachers' self-directing their learning in the workplace is addressed. We argue that PD can consist of multiple learning activities and should be addressed as part of everyday school life, because teacher learning does not necessarily happen in organized PD settings alone (Little, 2012; Wilson & Berne, 1999).

For many of the learning domains we did not find any significant relationships with years of experience. This may be due to the large variation in the data. Teachers' self-directed learning is influenced not only by their experience in teaching, but also by current national policies and societal discussions in education (e.g., which explains teachers' strong preference for learning about ICT), by school context, and by individual factors related to teachers' professional and personal lives (cf. Day et al., 2007). Future research could address these antecedents of teachers' self-directed learning and find connections between

*[11] In the study by Richter et al (2011) teacher age was used as predictor, but the researchers found a .90 correlation between age and experience, which makes the results comparable to the findings we report here if experience had been used. However, in line with Kington et al. (2014), we argue that teachers' age is not a valid indicator of teachers' current learning needs in relation to the teaching job, also because of the increasing influx of second-career teachers in the profession. For example, one third of our sample consisted of teachers that had had other careers before teaching.*

these different factors (cf. Kyndt et al., 2016).

There are several limitations that could have influenced our results. For example, our sample was relatively small due to teachers' signing up voluntarily. Furthermore, the very experienced group was underrepresented in our sample, which implies that our findings about this group should be interpreted with caution. Another limitation might be that we used cross-sectional data to make inferences about teachers' career development, so that we cannot make inferences about what teachers' developmental pathways might look like. A final limitation of our study is that we studied teachers' self-directed learning through presenting a list of possible learning domains and activities which might not represent the self-determined nature of teacher learning in the workplace. Nonetheless, we did find small effects on experience-related aspects of self-directed learning, which we corrected for multiple significance testing.

Our study presents an example what the perspective of self-directed learning in relation to teaching experience might look like: teachers seem to differ in what, how, and why they want to learn. Therefore, our findings can inform PD because differential motivations and different preferences were taken into account. Such a differentiated approach can enhance the effectiveness of PD, and ultimately result in a career-long PD curriculum based on differential teachers' learning preferences (Gravani, 2007; McMahon, Forde, & Dickson, 2015; Van Veen & Kooy, 2012). Such a curriculum could focus on, for example, late-career teachers' learning about managing classrooms and coping with (disruptive) student behavior (cf. Day et al., 2007). Future studies could address the question how subject matter-specific domains might be different for teachers with varying experience levels, taking into account the different levels of teaching complexity and domain-specificity in teaching (Seidel & Shavelson, 2007; Van de Grift et al., 2011).

We further argue that self-directed learning provides a relevant contribution to the current debate on teachers' PD. Previous studies have already shown that teachers do set their own learning goals and direct their own learning, although they might need some assistance in this process of reflection and enactment (Janssen, Kreijns, Bastiaens, Stijnen, & Vermeulen, 2012; Mushayikwa & Lubben, 2009; Shriki & Lavy, 2012)(cf. Chapter 2 and 3). In addition, our study indicates that teachers have autonomous reasons to learn about self-selected learning domains, which sets the expectation that teachers will be very determined to learn about these learning domains (Jansen in de Wal et al., 2014; Van den Broeck et al., 2008). In practice, teachers' learning goals should be taken into account whenever constructing individual professional development plans, or PD facilitators try to address individual teachers' learning preferences in their program design. For this to happen, we suggest that future studies address the question of how teachers' articulated goals result in concrete action plans on the part of the teachers themselves (i.e., the next phases of self-directed learning) and how best to provide support to teachers setting their own learning plans (Janssen et al., 2012; Shriki & Lavy, 2012).