CHAPTER 2

Teachers’ innovative behaviour: the importance of basic psychological need satisfaction, intrinsic motivation, and occupational self-efficacy

This chapter is based upon
Abstract

Teacher innovative behaviour and professional development are considered important aspects of high quality education. It is often thought that motivation influences teachers’ innovative behaviour and professional development. The main purpose of this study is to gain more insight in motivational processes contributing to teachers’ innovative behaviour. Using Self-determination theory both intrinsic motivation and basic psychological need satisfaction are addressed. From an organisational psychology perspective also occupational self-efficacy is included in the hypothesized model. Online survey data from teachers in primary, secondary or vocational education in the Netherlands (n = 2,385) are analysed using structural equation modelling. Results show that basic psychological need satisfaction affects both intrinsic motivation and occupational self-efficacy, and that the latter strongly supports innovative behaviour.
2.1 Introduction

Our current society is often characterized as a knowledge society, in which generating, processing, and circulating knowledge have become essential (Hargreaves & Lo, 2000). Teachers are expected to prepare their students for learning and working in such a society. In this knowledge society, teacher professional development has become a lifelong responsibility (Scheerens, 2010), essential to be able to deal with the high demands placed upon teachers nowadays. For example, more than ever teachers are required to be able to use different methods, to change their teaching approaches when needed, to acquire the skills necessary to make use of digital resources in class, and to know how to use information-management systems in order to monitor learning performances of students (Schleicher, 2012).

In order to deal with the societal, technological, and educational challenges, it is important that new ideas are brought into schools. The extent to which teachers themselves bring in those new ideas is not only determined by the professional skills and knowledge teachers have, but also by their motivation and feelings of efficacy (Pyhältö, Pietarinen, & Soini, 2012). With the intention to understand more about the relevance of these two psychological aspects and about the interrelatedness between them, this study takes a closer look at different motivational forces that influence the extent in which teachers come up with, promote, and implement new ideas. In other words, this study focuses on the impact of different and interrelated aspects of motivation and self-efficacy on teachers’ innovative behaviour at work.

Innovative behaviour

Recently, a study among respondents working in both public and private organizations in Denmark, Norway, and Sweden revealed that innovative behaviour is high among teaching staff (Bysted & Hansen, 2015). This individual innovative behaviour at work is important for high-performance organizations (Carmeli, Meitar, & Weisberg, 2006). It can be described as a type of extra-role behaviour at work that is necessary for organizations to survive (Tuominen & Toivonen, 2011). In this study the following definition of innovative behaviour at work is used: “the intentional creation, introduction, and application of new ideas within a work role, group or organization, in order to benefit role performance, the group or the organization” (Janssen, 2000, p. 288). Innovative behaviour thus goes beyond creativity, because it not only includes generating novel ideas, but also consists of the adoption and implementation of those ideas or solutions as well (Scott & Bruce, 1994).

Several studies in different sectors have been performed to gain more understanding of factors that influence or support innovative behaviour at work (e.g., De Jong & Den Hартог, 2007; De Jong & Kemp, 2003; Hartmann, 2006; Janssen, 2005; Knol & Van Lingen, 2009; Nederveen Pieterse, Van Knippenberg, Schippers, & Stam, 2010). However, relatively few studies focus specifically on teachers’ innovative work behaviour and its determinants.
Studies among teachers point at the effects of different factors such as function or task, and self-efficacy (Runhaar, 2008), work engagement (Konermann, 2011), job control and creative requirements (Binnewies & Groner, 2012), and openness, motivation, job satisfaction, and interaction within the job (Messman & Mulder, 2014). Although these studies show that different motivational factors may contribute to innovative behaviour, they also leave room questions with regard to the combined effect of different motivational factors. The aim of this study is therefore to increase our understanding of the impact of motivational constructs on teachers’ innovative behaviour while taking into account the interrelatedness of those motivational constructs. This knowledge is helpful in creating more stimulating environments in which teachers’ motivation and innovative behaviour at work can flourish.

**Self-determination theory: a focus on intrinsic motivation**

People who enjoy their work are more likely to come up with ideas for improvements and to contribute to the implementation of new ideas (De Jong & Kemp, 2003). Furthermore, intrinsically motivated employees are more likely to try and find ways to improve methods or activities in their work, resulting in higher job performance (Jung, Chow, & Wu, 2003). Even though creativity and innovative behaviour are not interchangeable, studies on the relationship between intrinsic motivation and creativity provide interesting insights on the importance of intrinsic motivation. Amabile, Conti, Coon, Lazenby, and Herron (1996) for example showed that intrinsic motivation functions as a mechanism between contextual factors and creativity. Intrinsic motivation might therefore be an important aspect in the support of innovative behaviour.

This study builds on Self-determination theory (SDT; Deci & Ryan 1985; 2000), a leading theory on human motivation with a focus on intrinsic motivation. Within SDT a distinction is made between different types of motivation, divided in two main categories: controlled and autonomous motivation. Controlled motivation covers those types of motivation that are based on thoughts of reward or punishment, for example, striving for approval or trying to avoid shame. In other words, people with controlled motivation experience external or internal pressures to think or act in certain ways. Autonomous motivation entails a process of identifying oneself with the value of the activity at hand and/ or integration into the sense of one’s self. It also includes intrinsic motivation. Being intrinsically motivated means doing something for its inherent satisfaction and is frequently measured by self-reports of interest and enjoyment in performing the activity at hand (Ryan & Deci, 2000). As pointed out by Deci and Vansteenkiste (2004), intrinsic motivation is the basis for all individuals’ learning and development.

Central in the support of intrinsic motivation is the degree to which people feel their environment supports their basic psychological needs (Deci & Ryan, 2008). SDT posits that all individuals have three innate, psychological needs: the need for competence, the need for autonomy, and the need for relatedness. The need for competence reflects the desire
The need for autonomy reflects the desire to experience freedom and volition. The need for relatedness concerns the desire to interact with, care for, and be connected to others. Environments, in which the basic needs are insufficiently met, are considered to have a negative impact on intrinsic motivation. External control, for example, hampers feelings of autonomy, which consequently may have a diminishing effect on intrinsic motivation (Deci & Ryan, 2000).

All three basic psychological needs are relevant for intrinsic motivation, especially autonomy and competence (Deci & Ryan, 2000; Koestner & Losier, 2002). Relatedness might be of less importance as far as intrinsic motivation is concerned, due to the fact that people often also engage in intrinsically motivated solitary activities (Deci & Ryan, 2000).

Basic psychological need satisfaction and the effect it has on motivation and wellbeing is said to be generalizable across different contexts and different cultures (Deci, Ryan, Gagné, Leone, Usunov, & Kornazheva, 2001). Importantly, basic psychological need satisfaction is also associated with other outcomes such as employee performance. Baard, Deci, and Ryan (2004), for example, found that employees who reported higher need satisfaction were considered by their supervisors to perform better.

**Teachers’ intrinsic motivation and basic psychological need satisfaction**

Intrinsic motivation in general is positively associated with a greater degree of job satisfaction and wellbeing (Ilardi, Leone, Kasser, & Ryan, 2003). Teachers’ intrinsic motivation is also considered to be an important factor in educational performance. Some researchers have found positive relations between teachers’ intrinsic motivation and students’ achievement (Knowles, 1999), students’ interest and persistence (Radel, Sarrazin, Legrain, & Wild, 2010), and students’ motivation (Lam, Cheng, & Ma, 2009). Given these positive outcomes of intrinsic motivation, it is of high interest to understand the conditions that support or hinder this kind of motivation. SDT posits that satisfaction basic psychological needs are important predictors of intrinsic motivation. Unfortunately, regarding teachers’ basic psychological need satisfaction, relatively little is known about the degree to which teachers feel their basic needs are being met (LaPointe, 2006). LaPointe’s study is one of the few examples in which teachers’ level of basic psychological need satisfaction is measured. A weak but positive relationship was found between school characteristics and teachers’ overall basic psychological need satisfaction.

More recently, a few other studies have been performed on teachers’ intrinsic motivation and their basic psychological need satisfaction. Lam, Cheng, and Choy (2010) studied how school support relates to teachers’ motivation and willingness to implement an educational innovation, namely project-based learning. The results of their study indicated that teachers were more motivated to persist in project-based learning when they perceive their school to be more supportive of their need for feeling competent and autonomous. In addition, Wagner and French (2010) focused on early childhood teachers’ motivation. Their findings also supported the idea that feelings of competence, autonomy, and relatedness
are important for teachers’ intrinsic motivation to develop themselves professionally and to improve their teaching practice.

**Self-efficacy beliefs at work**

As pointed out, SDT is a leading theory on human motivation with a focus on intrinsic motivation. However, many other theories on motivation exist with different focal points (see for a theoretical overview for example Boekaerts, Van Nuland, & Martens, 2010; Eccles & Wigfield, 2002). Other focal points include for example expectancies or beliefs concerning self-efficacy, of which Bandura’s theory on self-efficacy (Bandura, 1997) is a well-known example.

Many studies have shown the importance of self-efficacy on human achievement in various contexts, such as education, health, and business (Bandura, 1997). Self-efficacy is defined as an individual’s judgement of how well he or she “can execute courses of action required to deal with prospective situations” (Bandura, 1982, p. 122). It refers to acquired cognitions and is directed at new tasks or future activities. It differs from the need to feel competent (i.e. one of the basic psychological needs), which is an affective experience, based on previous or current experiences, such as mastering a task (Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010).

Regarding the self-efficacy of teachers numerous studies have been conducted. Often studies on teacher self-efficacy focus on efficacy beliefs regarding instructional strategies, for classroom management, and for student engagement (Tschannen-Moran & Woolfolk Hoy, 2001). Other studies that investigate self-efficacy beliefs of teachers examine more specific types of activities related to teaching, such as making use of digital learning materials (Vermeulen, Van Acker, Kreijns, & Van Buuren, 2014), or regarding pre-service teachers’ behaviour management strategies (Reupert & Woodcock, 2011). Regardless of the object of feelings of efficacy, self-efficacy can serve as a predictor for different kinds of teacher behaviour and as a relevant aspect in explaining the influence of teachers’ perception of their work environment on their behaviour or activities.

In terms of behavioural intentions self-efficacy beliefs are considered to be proximal variables: variable that are close to the behaviour at hand (Fishbein & Ajzen, 2010). Proximal variables on their turn are influenced by so called distal variables, such as school characteristics and individual teacher characteristics (see for example Kreijns, Van Acker, Vermeulen, & Van Buuren, 2013). An individual’s perception of the extent to which he or she feels the environment satisfies his or her basic psychological needs can be viewed as a distal variable. Basic psychological need satisfaction (a distal variable) is expected to influence self-efficacy (a proximal variable). Relatively few studies in different settings have related psychological need satisfaction to self-efficacy. Findings of a study among executive and middle managers from a high tech company showed that basic psychological need satisfaction predicts self-efficacy (Moen & Skaalvik, 2009). Recently, in an educational set-
This study focuses on the occupational self-efficacy of teachers. Occupational self-efficacy is described as the beliefs people have in their own ability to face occupational challenges and to act successfully in various situations and tasks in their job (Schyns & Von Collani, 2002), regardless of their current work environment (Abele & Spurk, 2009, as stated in Jungert, 2012). Relatively little is known about teachers’ occupational self-efficacy. Konermann (2011) however studied for example Dutch teachers’ occupational self-efficacy and found that it mediates the positive relationship between teachers’ work engagement and their innovative behaviour at work. Studies on occupational self-efficacy in different professional settings have shown positive relations with task performance and organizational citizenship behaviour (König, Debus, Häusler, Lendenmann, & Kleinman, 2010), and with intrinsic job motivation (Fletcher, Hansson, & Bailey, 1992). In addition, Jungert (2012) examined the relationship between occupational self-efficacy and autonomous motivation, which entails intrinsic motivation. In his study among research and development professionals and care giving workers a weak but positive relationship between both constructs was found. Although some studies exist in which both motivation and occupational self-efficacy are included, empirical studies that examine both basic psychological need satisfaction and occupational self-efficacy are lacking. The relation between satisfaction of the basic psychological needs, occupational self-efficacy, intrinsic motivation, and innovative behaviour is therefore unclear.

The present study

This study aims to contribute to the body of knowledge on teachers’ innovative behaviour in order to gain more understanding of different and possibly interacting psychological processes leading to teachers’ individual innovative behaviour at work. The main question addressed in this study is:

*How do basic psychological need satisfaction, occupational self-efficacy, and intrinsic motivation predict teachers’ innovative behaviour?*

Based on literature and empirical findings we constructed a model (Figure 2.1) that hypothesizes that the support of the three basic psychological needs contributes positively to feelings of intrinsic motivation and occupational self-efficacy, which in turn both lead to teachers’ innovative behaviour at work. The testing of this model is accompanied with the following hypotheses regarding the positive effects of the individual constructs:

Hypothesis 1: Satisfaction of the need for autonomy, competence, and relatedness is positively related to teachers’ intrinsic motivation.

Hypothesis 2: Occupational self-efficacy relates positively to teachers’ intrinsic motivation.
Hypothesis 3: Satisfaction of the need for autonomy, competence, and relatedness is positively related to teachers’ occupational self-efficacy.
Hypothesis 4: Teachers’ intrinsic motivation relates positively to teachers’ innovative behaviour at work.
Hypothesis 5: Occupational self-efficacy relates positively to teachers’ innovative behaviour.

Figure 2.1 Conceptual model showing the hypothesized impact of satisfaction of the three basic psychological needs, occupational self-efficacy, and intrinsic motivation on innovative behaviour

2.2 Method

Data collection
An online questionnaire was administered among teachers in the Netherlands. In order to obtain a reliability level of 95%, a response of 1,152 teachers was sought, equally divided among primary, secondary, and vocational education. Because response rates on anonymised online inquiries are expected to be around 5 percent, a large group of teachers had to be addressed. Therefore, a database compiled by the Onderwijs Innovatie Groep (Education Innovation Group) and comprising of 37,888 Dutch school employees was used to invite teachers by e-mail to participate in the online questionnaire. As the response of teachers working in vocational education lagged behind in comparison to teachers working in primary and secondary education, a reminder was sent after two weeks to this group. The questionnaire was closed two weeks after this reminder. The study was conducted in the autumn of 2011.

Participants
In sum, 3,573 school employees started the questionnaire, of which 245 did not belong to the target group of teachers. The questionnaire was fully completed by 2,385 of the re-
remaining 3,328 respondents, resulting in a final response percentage of 6.3 percent. Of the participating teachers, 690 worked in primary education, 1,414 in secondary education, and 255 in schools for vocational education. The remaining 26 teachers worked in other types of education, such as special education. The respondents (1,130 men and 1,255 women) ranged in age from 20 to 67 years ($M = 49.18$, $SD = 10.06$).

The number of respondents in this study is equivalent to approximately 1% of the total population of teachers in primary, secondary, and vocational education in the Netherlands. Compared to this total population of teachers in the Netherlands, the response group comprised slightly more teachers of 45 years of age or above. In secondary and vocational education male teachers were somewhat over-represented in this study. For this reason, and because the aim of the study does not involve the search for differences across certain groups based on background variables, age, gender, and type of school teachers mainly teach at (primary, secondary or vocational education) were controlled for in the analyses.

**Measures**

All constructs reported in this study were mapped using existing scales on basic psychological need satisfaction at work, intrinsic motivation, occupational self-efficacy, and innovative behaviour at work. When needed, items were translated into Dutch and were reworded or adjusted while keeping as close as possible to the original meaning of the items. All items were measured using seven-point Likert type scales, ranging from 1 (not at all true) to 7 (very true).

*Basic psychological need satisfaction.* Most work-related measures of basic psychological need satisfaction used in previous studies are ad hoc instruments with lacking evidence of their validity (Brien et al., 2012). An exception is the scale constructed by Van den Broeck et al. (2010), but as Brien et al. (2012) point out, this scale also has certain weaknesses concerning the operationalization of some of the constructs.

In this study the original Basic Need Satisfaction at Work Scale was used which aims to determine the extent of employees’ psychological need satisfaction in the workplace (Kasser, Davey, & Ryan, 1992). This scale, which for example also has been used among teachers (LaPointe, 2006), has three subscales: Autonomy (seven items), Competence (six items), and Relatedness (eight items). Examples of items are “I feel like I can make a lot of inputs to deciding how my job gets done” (Autonomy), “I do not feel very competent when I am at work” (Competence) and “I really like the people I work with” (Relatedness).

*Intrinsic motivation.* In order to assess the degree of intrinsic motivation teachers claim to have for their job, the Interest/Enjoyment scale consisting of seven items of the Intrinsic Motivation Inventory (Deci & Ryan, n.d.) was used and adjusted for this study’s purpose. Examples of items in this scale are “I enjoy my work as a teacher” and “I would describe working as a teacher as very interesting”.
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Occupational self-efficacy. Using the short version of the Occupational Self-Efficacy Scale (Schyns & Von Collani, 2002), the degree to which teachers feel confident to face the challenges of changes and unforeseen situations was determined. The scale comprises eight items, such as “If I am in trouble at my work, I can usually think of something to do” and “I remain calm when facing difficulties in my job because I can rely on my abilities”.

Innovative behaviour. Innovative behaviour at work was assessed using the Innovative Behaviour scale of De Jong and Den Hartog (2005). This scale determines the degree in which the respondent feels he or she behaves innovatively at work. It consists of eight items such as “People I work with think of me as somebody who likes to do new things” and “I enjoy trying new approaches”.

Data preparation

The scales used to assess intrinsic motivation, occupational self-efficacy, and innovative behaviour have previously proven to be useful in a Dutch-speaking educational context (e.g. Konermann, 2011; Visser-Wijnveen, Stes, & Petegem, 2012). The internal consistencies of these scales in this study varied from .89 (Occupational Self-efficacy, eight items) to .91 (Innovative Behaviour, eight items). The reliability of the scale Intrinsic Motivation was improved by removing one item of the original scale (“Working as a teacher does not hold my attention at all”). This led to a scale consisting of six items with a Cronbach’s alpha of .90.

Empirical evidence of the dimensionality of the Basic Need Satisfaction at Work Scale is lacking (Johnston & Finney, 2010). In order to replicate the structure of the Basic Need Satisfaction at Work Scale, an explorative factor analysis (PCA with varimax rotation) was performed. Due to a misfit of the factor solutions and low reliabilities, replicating the original factor structure wasn’t possible. Instead, based on reliability analyses, factor analyses, and content analyses, a new scale to measure teachers’ basic psychological need satisfaction at work was constructed, with one factor consisting of ten items, which contains items of all three subscales (competence - three items, autonomy - four items, relatedness - three items). The factor has an eigenvalue of 4.71, accounting for 41.35 percent of the variance and having factor loadings ranging from .55 to .73. Table 2.1 shows the factor loadings of the individual items in the scale, ordered by the three needs as proposed by SDT. Cronbach’s alpha for the constructed measure was .87.

Because data preparation led to less constructs concerning the measurement of basic psychological need satisfaction, hypotheses 1 and 3 were reformulated as follows:

Hypothesis 1: Basic psychological need satisfaction is positively related to teachers’ intrinsic motivation.
Hypothesis 3: Basic psychological need satisfaction is positively related to teachers’ occupational self-efficacy.

Table 2.1 Factor analysis on the adjusted scale to measure teachers’ basic psychological need satisfaction at work (PCA, varimax).

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have been able to learn interesting new skills on my job (c)</td>
<td>.61</td>
</tr>
<tr>
<td>Most days I feel a sense of accomplishment from working (c)</td>
<td>.59</td>
</tr>
<tr>
<td>People at work tell me I am good at what I do (c)</td>
<td>.55</td>
</tr>
<tr>
<td>My feelings are taken into consideration at work (a)</td>
<td>.71</td>
</tr>
<tr>
<td>I feel like I can pretty much be myself at work (a)</td>
<td>.69</td>
</tr>
<tr>
<td>I am free to express my ideas and opinions on the job (a)</td>
<td>.65</td>
</tr>
<tr>
<td>I feel like I can make a lot of inputs to deciding how my job gets done (a)</td>
<td>.63</td>
</tr>
<tr>
<td>People at work care about me (r)</td>
<td>.73</td>
</tr>
<tr>
<td>I really like the people I work with (r)</td>
<td>.64</td>
</tr>
<tr>
<td>People at work are pretty friendly towards me (r)</td>
<td>.63</td>
</tr>
</tbody>
</table>

Note. (c) = item originally reflecting competence, (a) = autonomy, (r) = relatedness

In addition, the conceptual model was adjusted by replacing the three separate basic needs with one construct: basic psychological need satisfaction at work (Figure 2.2).

Data analysis

Structural Equation Modelling (SEM) was used to test the path model presented in Figure 2.2 and its underlying hypotheses. SEM enables testing hypothesized models statistically in a way which allows for simultaneously examining all variables to determine the consistency of the model with the data (Byrne, 2012). This approach uses both factor analysis to model latent constructs (i.e. the measurement model) and path analysis to test the hypothesized relationships. Modelling was carried out by means of a strictly confirmatory approach (Jöreskog, 1993), using MPlus version 6.
Due to the multivariate non-normality of the data a robust maximum likelihood estimation was used (Byrne, 2012; Kline, 2011). Model fit is therefore reported by means of a Satorra-Bender chi square. The associated comparative fit index (CFI), the root mean square of error approximation (RMSEA), and the standardised root mean square residual (SRMR) are reported as well. Model fit is considered acceptable when CFI is .95 or more, RMSEA is .08 or less, and SRMR is .06 or less (Hu & Bentler, 1999).

2.3 Results

Table 2.2 shows the descriptive statistics of the constructs in the adjusted hypothesized model. The respondents scored the highest average on the scale Intrinsic Motivation \((M = 5.86)\), but these scores ranged a fair amount \((SD = 1.11)\). The lowest average was found on the scale Innovative Behaviour \((M = 5.04)\) with again a fair amount of deviation between the individual scores \((SD = 1.13)\).

All bivariate correlations between the theoretical constructs were significant \((p = 0.01)\). The strongest correlational relationship was found between basic psychological need satisfaction at work and intrinsic motivation \((r = 0.53)\). The weakest relationship found was the one between intrinsic motivation and innovative behaviour at work \((r = 0.33)\).

<table>
<thead>
<tr>
<th>Construct</th>
<th>(M)</th>
<th>(SD)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Basic psychological need satisfaction</td>
<td>5.38</td>
<td>.90</td>
<td>.87</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Occupational self-efficacy</td>
<td>5.81</td>
<td>.77</td>
<td>.44*</td>
<td>.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Intrinsic motivation</td>
<td>5.86</td>
<td>1.11</td>
<td>.53*</td>
<td>.42*</td>
<td>.90</td>
<td></td>
</tr>
<tr>
<td>4. Innovative behaviour</td>
<td>5.04</td>
<td>1.13</td>
<td>.37*</td>
<td>.46*</td>
<td>.33*</td>
<td>.91</td>
</tr>
</tbody>
</table>

Note. Reliability coefficients (Cronbach’s alpha) are presented in italics.
* Correlations significant at the .01 level (two-tailed)

Before testing the hypothesized structural relationships in the model, the fit of the measurement model was tested. For reasons of conciseness, these results are not reported here. By means of \(\chi^2\), the CFI, the RMSEA, and the SRMR, the model fit of the proposed model was calculated. Teachers’ age, gender, and type of school they teach at were added as background variables to control for. The results of the model testing indicated an acceptable fit: \(\chi^2(599) = 3,478.82, p = .00, CFI = .92, RMSEA = .05, SRMR = .05\).

The standardised regression coefficients (see Figure 2.3) confirmed that teachers’ intrinsic motivation is positively related to teachers’ basic psychological need satisfaction (Hypothesis 1; \(\beta = .45, p < .01\)). The more teachers felt satisfied in their basic psychological needs, the more they felt intrinsically motivated. Furthermore, occupational self-efficacy was also positively related to intrinsic motivation (Hypothesis 2; \(\beta = .21, p < .01\)), although this effect was not as strong as the effect of basic psychological need satisfaction on intrin-
sic motivation. Occupational self-efficacy was also affected by basic psychological need satisfaction (Hypothesis 3). This in fact was the strongest effect found in this study ($\beta = .51, p < .01$), meaning that the more teachers felt satisfied in their basic psychological needs, the more they felt confident in their ability to change whenever their job requires to do so. The least strong but still significant effect was the effect of intrinsic motivation on innovative behaviour (Hypothesis 4; $\beta = .12, p < .01$). In fact, innovative behaviour turned out to be affected more strongly by occupational self-efficacy. Occupational self-efficacy did relate positively to innovative behaviour (Hypothesis 5; $\beta = .44, p < .01$).

![Figure 2.3 Final structural model representing the standardised relationships](image)

*Note.* For the ease of exposition, only significant effects between the key constructs are presented in this figure ($p < .01$).

Based on the results, all hypotheses were accepted. The strongest path in the model was the path from basic psychological need satisfaction via occupational self-efficacy to innovative behaviour. Feeling satisfied in their basic psychological needs supports teachers’ feelings of confidence in facing the changes or unforeseen situations that might occur in their teaching job, which in turn predicted teachers’ innovative behaviour at work.

After controlling for the background variables gender, age, and school type, only few of these control variables appeared to have significant effects on the latent variables in the conceptual model. The largest significant effect found concerned a small impact of age on innovative behaviour ($\beta = -.113, p < .01$), indicating that, compared to older teachers, younger teachers might behave more often in an innovative way.

### 2.4 Conclusion and discussion

Teacher professional development and innovative behaviour are important assets of high-quality education that prepares students for learning, living, and working in a knowledge
society. It is often assumed that motivational problems hinder teachers’ professional development and readiness for innovation. However, the empirical underpinning of this claim is unclear. Nevertheless, motivation and self-efficacy appear to influence teachers’ innovative behaviour (Thurlings et al., 2015) and the extent to which teachers introduce new ideas in their school (Pyhältö et al., 2012). Therefore, the main focus of this study was to gain more insights into the relations between psychological processes leading to teachers’ innovative behaviour at work, specifically intrinsic motivation, basic psychological need satisfaction and occupational self-efficacy.

Our model confirms that a sequence of motivational constructs does affect teachers’ innovative behaviour. More specifically, both intrinsic motivation and occupational self-efficacy have a direct effect on innovative behaviour. However, the relationship between intrinsic motivation and innovative behaviour is significant but small, whereas the relationship between occupational self-efficacy and innovative behaviour is much stronger. This means that the model confirms that feeling confident in dealing with future changes in the teaching job leads to behaving more in innovatively at work. The strong relationship between the two constructs can be explained by taking into account that both constructs involve possible changes affecting the teaching job. In the case of innovative behaviour of teachers, those changes are initiated by teachers who create, introduce or implement new ideas themselves. In contrast, occupational self-efficacy involves beliefs regarding how well one may face challenges or changes that may occur within the job. Those challenges or changes may for example be imposed because of new educational policies or mandatory curriculum innovations. Having a higher confidence to face those changes relates positively to perceptions of teachers’ own innovative behaviour at work.

Our empirical study also shows that teachers’ basic psychological need satisfaction relates positively to intrinsic motivation for working as a teacher. This confirms one of the central ideas within SDT, namely that satisfaction of the basic psychological needs nourishes intrinsic motivation. However, replicating this construct as three separate psychological needs wasn’t possible. This problem of confirmation of three separate factors for autonomy, competence, and relatedness is not unique for this study. The same difficulties were found for example in a study among students (Vermeulen, Castelijns, Cools, & Koster, 2012). Additionally, studies in other fields encountered difficulties in replicating a three factor structure of existing work related basic need satisfaction scales as well (Dysvik, Kuvaas, & Gagné, 2013). Our study led to the construction of a short overall basic psychological need satisfaction scale, consisting of items from all three basic needs, thus testing the model with basic psychological need satisfaction as one factor. Although the use of one basic need satisfaction factor makes it impossible to test the extent in which autonomy, competence, and relatedness influences intrinsic motivation, the use of one overall score for the three basic needs is not uncommon (e.g., De Cooman, Stynen, Van den Broeck, Sels, & De Witte, 2013; Milyavskaya & Koestner, 2011; Vansteenkiste, Neyrinck, Niemiec, Soenens, De Witte, & Van den Broeck, 2007).
The relationship between this basic psychological need satisfaction and occupational self-efficacy turns out to be the strongest relationship in the model. This can partially be explained by the fact that competence as a basic need on the one hand, and feelings of self-efficacy on the other, are expected to correlate highly (Van den Broeck et al., 2010). However, the construct of basic psychological need satisfaction also includes autonomy and relatedness items, which together form a larger part of the factor with higher factor loadings than the competence items. Apparently, teachers who in their working environment experience a higher degree of support of their basic psychological needs are more confident in their own ability to effectively face changes during their work. As such, this basic psychological need satisfaction and occupational self-efficacy may not only be relevant in the light of innovative behaviour, that is self-initiated coming up with, sharing and trying out new ideas, but may also be important in other change or innovation processes such as implementing large scale centralised curriculum innovations.

The weak relationship between intrinsic motivation and innovative behaviour can be explained by the distinction Vallerand (1997) makes in his Hierarchical Model between motivation on a global, a contextual, and a situational level. The global level of motivation is the general motivational orientation an individual has in interacting with his environment and can be considered as the motivational orientation on an individual’s personality level. The contextual level refers to the motivational orientation in a specific life domain, such as work and leisure. The situational level of motivation refers to a specific activity at a given point in time. The Hierarchical Model postulates that the level in which the consequences are situated depends on the level of motivational orientations (general, contextual or situational). Studies have shown for example that contextual motivations are the strongest predictors for consequences on a contextual level (Vallerand & Ratelle, 2002). Although intrinsic motivation for working as a teacher can be considered as the measurement of a motivational orientation on a contextual level, innovative behaviour is a specific type of professional teacher behaviour. As such there may be a difference in level between innovative behaviour and intrinsic motivation for working as a teacher in general.

Another explanation of the weak relationship between intrinsic motivation and innovative behaviour might be found in teachers’ perceptions of the teaching job, or otherwise stated, their professional orientation. Hoyle (1975) makes a distinction between restricted and extended professional orientations. Teachers with a restricted professional orientation focus mainly on their own teaching practice in the classroom. They are, for example, only little involved in other professional activities besides teaching and they read professional literature irregularly. Teachers with a more extended professional orientation focus on the school organization as an important part of their teaching practice, show high involvement in more and other professional activities, and regularly keep track of professional literature. As such, professional orientation might affect the relationship between intrinsic motivation for the teaching job and innovative behaviour in the sense that when having an extended professional orientation, the relationship between intrinsic motivation and innovative behaviour might be stronger.
Although the necessity for teachers to engage in self-initiated innovative behaviour might differ between countries and educational systems, the psychological determinants underlying intrinsic motivation, namely the satisfaction of the basic psychological needs are claimed to be universal (Deci et al., 2001). This means that these motivational constructs and the relations found in this study can be considered to be relevant in other countries as well. To summarize, teachers’ intrinsic motivation for their work flourishes in a work environment where they feel supported in their need for autonomy, competence, and relatedness. Having a work environment in which administrators, school leaders, and colleagues succeed in creating circumstances in which teachers experience enough autonomy and opportunities to make their own choices and decisions within their job, combined with feeling competent to act successfully as a teacher, and feeling connected to relevant others helps to remain intrinsically motivated. Not only that, it also leads to higher levels of occupational self-efficacy. Although co-workers might have a positive influence as well, research has shown that according to teachers their supervisors or principals seem to play a key role in creating an autonomy supportive work culture in schools (see Chapter 5).

Limitations

Some limitations of this study have to be mentioned at this point. First, although our model featured causal relationships, causality cannot be established because the model is fit to correlational data. Second, the results are based on teachers’ self-reports. It is conceivable that other sources of information, like school principals or colleagues might shed a different light on for example teachers’ innovative behaviour. Third, this study focuses on only a few psychological constructs that might influence teachers’ innovative behaviour positively. Other aspects are important to examine as well, for example other types of motivation, professional orientation, and organisational factors such as school leadership. Professional orientation and work context have also been mentioned as factors that influence teachers’ professional agency, i.e. taking responsibility as a teacher for both individual problem solving as well as contributing to the professional community by collaborating and coming up with new ideas, and combining, implementing, and monitoring this process (Pyhältö et al., 2012). Finally, although the number of respondents was high, the response rate calls for caution regarding conclusions about the generalizability of the findings. Additional research is needed to strengthen empirical evidence on motivational factors that contribute to teachers’ innovative behaviour. Both motivation and self-efficacy are challenging constructs to measure quantitatively in terms of reliability and validity. Quantitative research methods are needed when aiming to test theoretical models. However, qualitative research methods or a combination of both might be helpful in further examining these constructs as well.

Nevertheless, this study shows that basic psychological need satisfaction is a predictor for teachers’ intrinsic motivation and occupational self-efficacy. Additionally, it demonstrates that the concept of occupational self-efficacy is a stronger predictor of innovative
behaviour than intrinsic motivation. Because teachers are the key to good education, enhancing their feelings of occupational self-efficacy may prove to be important to advance educational innovations.
References


