Improving classroom practices: the impact of leadership, school organizational conditions, and teacher factors

Thoonen, E.E.J.

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CHAPTER II

Can teachers motivate students to learn?*

ABSTRACT

Research on motivation has mainly concentrated on the role of goal orientation and self-evaluation in conducting learning activities. Systematic research into the supportive influence of the classroom as a learning environment on students' motivation and the role of teachers in primary education is scarce. In this paper, we examine the relative importance of teachers' teaching and their efficacy beliefs to explain variation in student motivation. Questionnaires were used to measure the well- being, academic self-efficacy, mastery goal orientation, performance avoidance, intrinsic motivation and school investment of students (n = 3462), and the classroom practices and teachers' sense of self-efficacy (n = 194) in primary schools. Results of the multi-level analyses show that connection to the students' world and cooperative learning methods had a positive effect on students' motivation, while process-oriented instruction by the teacher had a negative effect on motivational behaviour and motivational factors of students. Finally, the results lend credence to the argument that teachers' sense of self-efficacy has an impact on both teachers' teaching and students' motivation to learn.

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INTRODUCTION

A decrease in motivation for school in secondary education is a well-known phenomenon in many countries (Peetsma, Hascher, van der Veen, & Roede, 2005; Peetsma & van der Veen, 2010). Some evidence for a possible decrease in motivation in primary school has also been found: students' motivation seems to decrease throughout the primary years and then increases again just before the transition to secondary education (Gottfried, Fleming, & Gottfried, 2001; Stoel, Peetsma, & Roeleveld, 2003).

A dominant explanation for a decrease in motivation for school is lack of 'person-environment' fit, that is poor integration of students' personal world into the school environment (Eccles & Midgley, 1989). A school environment that is not well tuned to the interests needs and values of students will adversely affect their identification with school and, as a consequence, will lead to a decrease in their motivation and efforts in the long run. Though scholars have recognised the supportive role of teachers as part of the school environment (Vedder, Boekaerts, & Seegers, 2005; Urdan & Schoenfelder, 2006), researchers in educational psychology have concentrated mostly on the role of students' goals and self-concepts. Systematic research into the supportive influence of the classroom as a learning environment on students' motivation and the role of teachers in primary education is scarce. This study aimed to make a contribution to this line of research by examining the relative importance of teachers' instructional behaviour and efficacy beliefs to explain variation in student motivation. We started from the assumption that the way teachers create supportive learning environments that fit the learning needs and interests of students in primary schools would positively affect different aspects of the motivation of their students. We used psychological theories on motivation and current conceptions of learning and instruction to identify several elements of a supportive learning environment that affect students' motivation to learn.

CONCEPTUAL BACKGROUND

Students' motivation to learn

In motivation research a distinction has been made between motivational behaviour and motivational factors. Motivational behaviour, including investment in school and academic achievement, is positively influenced by motivational factors (Maehr & Braskamp, 1986; Roede, 1989). School investment, or just 'investment', refers to "concrete behavioural manifestations which reflect the underlying motivation and which can be predicted by using a 'motivation' concept" (Peetsma, 2000, p. 177). Motivational factors typically comprise three components: affective, expectancy and value components (Peetsma, Hascher, van der Veen, & Roede, 2005; Pintrich & De Groot, 1990).

The *affective component* concerns students' feelings or emotional reactions to the task or school in general. If students feel worried or anxious, they need extra processing capacity to suppress this concern before they can turn back to the task they are working on. Earlier studies have found positive correlations between general well-being at school and school investment, academic achievement and academic self-efficacy (Boekaerts, 1993; Peetsma, Hascher, van der Veen, & Roede, 2005).

The *expectancy component* includes students' beliefs about their ability to perform a task, often referred to as students' academic self-efficacy. Previous research has shown that academic self-efficacy is related to students' level of effort: students who are self-efficacious not only work harder and persist longer but also use more cognitive and meta-cognitive strategies (Bandura, 1997; Pintrich & Garcia, 1996; Zimmerman, 2000).

The *value component* comprises students' goals for doing a task or taking a course (task value), their beliefs about its importance and their interest in the task. A number of distinctions have been made, including the distinction between orientation on mastery goals and performance-avoidance goals (e.g., Schunk, 1996), and between intrinsic and extrinsic motivation (Pintrich & De Groot, 1990).

Goal orientation affects how students experience learning tasks in achievement settings and how they give meaning to learning opportunities. Students with a mastery goal orientation have learning goals focused on the development of competence or task mastery (Elliot & Harackiewicz, 1996). Mastery-oriented students perceive the school setting as a challenge, and this facilitates concentration and orients the student toward success-relevant and

mastery-relevant information. Mastery orientation is positively related to perceptions of academic efficacy (e.g., Middleton & Midgley, 1997) and leads to an increase in self-regulated learning and higher achievement (e.g., Urdan & Midgley, 2000).

Performance-avoidance *orientation* refers to the aim of avoiding unfavourable judgements on competence. A performance-avoidance orientation is focused on avoiding showing incompetence, and this avoidance orientation is viewed as evoking processes that are antithetical to the intrinsic motivation construct. Research has suggested that performance-avoidance orientations reduce the opportunities to expand knowledge (Seegers, van Putten, & de Brabander, 2002).

In the motivation theories a distinction is made between intrinsic and extrinsic motivation, based on the different reasons or goals that give rise to an action, Intrinsic motivation refers to "doing an activity simply for the enjoyment of the activity itself, rather than its instrumental value" (Ryan & Deci, 2000, p. 60). Extrinsically motivated students do something only because it leads to a separable desired outcome. Intrinsically motivated behaviours are performed out of interest, do not require a reward other than the spontaneous experience of interest and enjoyment in doing a task and they result in high-quality learning (Ryan & Deci, 2000).

In this study, we focused on both motivational factors and motivational behaviour and examined the relative influence of different aspects of the learning environment that teachers create to explain variations in students' motivation to learn.

Student motivation and teachers' teaching

As mentioned earlier, research on motivation has mainly concentrated on the role of goal orientation and self-evaluation in conducting learning activities. Although some scholars have emphasised the importance of the teachers' role with respect to students' motivation (e.g., Vedder, Boekaerts, & Seegers, 2005; Urdan & Schoenfelder, 2006), studies on relations between specific aspects of classroom practices and student motivation have been scarce. In this study we assumed that different aspects of teachers' teaching would affect their students' motivation for school. We used current conceptions of learning and instruction to identify the following four aspects of teaching that may affect students' motivational behaviour and factors: process-oriented instruction, differentiation, connection to the students' world and cooperative learning.

Recent research shows that increasing students' self-regulation seems to have positive effects on students' motivation and performance, although it is unclear whether these findings apply to all students (Oostdam, Peetsma, & Blok, 2007). A model of teaching that facilitates and enhances self-regulated learning is called process-oriented instruction (Bolhuis & Voeten, 2001; Vermunt, 1995; Volet, 1995). Process-oriented instruction implies that the external control of the learning process by teachers shift gradually to an internal control over the learning processes by students themselves. Furthermore, teachers using process-oriented instruction focus on knowledge-building in the domain (subject-area), pay attention to emotional aspects of learning and treat learning process and results as social phenomena (Bolhuis, 2003). Performing process-oriented instruction facilitates independent learning, supports students to become proficient learners and prepares them for lifelong learning.

Besides the emphasis on self-regulated learning, constructivist conceptions of learning also acknowledge differences between student's learning due to differences in social, cultural and cognitive characteristics such as socio-economic background, ethnicity, social and cultural capital, intelligence, and cognitive strategies (Verschaffel & de Corte, 1999). Teachers should therefore pay attention to these differences and differentiate in their instruction and tasks. Through attuning their instruction to the *potential* competence of students, often referred to as Vygotsky's zone of proximal development, teachers stimulate students' competence and learning.

Current conceptions of learning also pay attention to the situated nature of learning. Although the idea that learning is a situated activity has already been reflected in the work of John Dewey in the beginning of the 20th century, recently some educational psychologists have started to systematically examine the situated nature of knowledge and learning (Putnam & Borko, 2000; Anderson, Reder & Simon, 1996). These theorists emphasize that human thought and the appropriation of knowledge is inextricable linked to the social and cultural context and that learning can therefore be fundamentally considered as a situated activity (Clancy, 1997). Learning should therefore take place in authentic contexts or so-called 'practice-fields', in which learners can practice skills and domain-related activities that they will encounter outside school as well. This implies that student learning is less decontextualized and that relevant tasks and types of learning activities are more connected to the personal world of students. Teachers who use these kind of instructional strategies encourage a better person-environment fit and enhance students' motivation and performance in a positive way.

A rather well-conceived and studied teaching practice that influences student outcomes is cooperative learning. Both motivational and learning perspectives form the theoretical basis of cooperative learning (Slavin, 1996). Drawing on motivational theories, it is assumed that positive interdependence (cooperation) is based on intrinsic motivation and interaction which encourage and facilitate learners' efforts. This could result in high achievement, positive relationships and psychological well-being (Johnson & Johnson, 1999; Krol, 2005). Based on theories about learning, it is assumed that social interaction between students will increase student achievement (De Lisi & Golbeck, 1999). From this view, students can learn from exchanges of ideas, information, perspectives and opinions from competent peers which mediate the development of higher mental functions such as language, thinking and reasoning (Piaget, 1959; Tudge & Winterhoff, 1993, Vygotsky, 1978). Research into cooperative learning has shown that cooperative learning positively influences both cognitive and non-cognitive outcomes (Johnson & Johnson, 1989; Slavin, 1995).

Teachers' sense of self-efficacy

Although the four classroom practices discussed above are expected to have a positive influence on students' motivation, teachers' self-efficacy beliefs also matter. Some researchers have suggested that teachers' self-efficacy influences students' motivation and achievement (e.g., Midgley, Feldlaufer, & Eccles, 1989; Ross, Hogaboam-Gray, & Hannay, 2001). Self-efficacy is a future-oriented belief about the level of competence that a person expects he or she will display in a given situation (Bandura, 1997). When teachers have a high sense of self-efficacy they are more creative in their work, intensify their efforts when their performances fall short of their goals and persist longer. Teachers' sense of self-efficacy had to do with their belief in their ability to influence the learning and motivation of students, even if their students were unmotivated or considered difficult (Guskey & Passaro, 1994). Studies have found positive correlations between teachers' efficacy beliefs and several cognitive and non-cognitive outcomes for students, such as achievement in core academic subjects (e.g., Anderson, Greene, & Loewen, 1988; Moore & Esselman, 1994; Ross & Cousins, 1993), motivation (Roeser, Arbreton, & Anderman, 1993), attitudes toward school (Miskel, McDonald, & Bloom, 1983) and performance and skills (Midgley, Feldlaufer & Eccles, 1989; Ross, Hogaboam-Gray, & Hannay, 2001). From this, we would expect teachers' sense of self-efficacy to have a positive influence on students' motivation to learn.

Teachers' perceived self-efficacy not only affects students' motivation directly but also indirectly via the instructional strategies teachers use to create a supportive learning environment (Dembo & Gibson, 1985). Teachers with a strong sense of efficacy tend to do more planning and be better organised, be more open to new ideas and more willing to experiment with new methods, work longer with students who are struggling, and exhibit greater enthusiasm for teaching (Tschannen-Moran & Woolfolk Hoy, 2001). Research has indeed shown that teacher efficacy positively influences teachers' classroom practices (Smylie, 1988; Geijsel, Sleegers, Stoel, & Krüger, 2008; Wheatley, 2002) Self-efficacy therefore seems to be a rather strong predictor for the way teachers shape their classroom practices in order to foster students' motivation to learn. Based on these findings and our earlier formulated expectation on teachers' self-efficacy, we therefore hypothesised that the effect of teachers' sense of self-efficacy on students' motivation to learn would be mediated by their classroom practices.

METHOD

Sample

This paper reports the results of a survey on school improvement in primary education. Participants were teachers from 34 primary schools (students aged 4 to 12 years). Schools were situated in the south and east of the Netherlands. The 34 schools had varied background characteristics (denomination, number of pupils and teachers, percentage of pupils with low SES).

All of the teachers in these schools participated in the survey. The questionnaire was submitted to 751 teachers, 621 of whom returned the questionnaire: a response rate of 82.6%. Of these 621 teachers, 194 taught year 4, 5 or 6; some teachers taught more than just one class and many classes had more than one teacher. In addition to the 194 teachers, we also asked all 3,677 students in years 4 to 6 to fill out a questionnaire on student motivation. 3,462 students (58.2% male) returned the questionnaire (response rate of 94.2%) of which 1,185 were in year 4, 1,222 in year 5 and 1,055 students in year 6.

Measures

The concepts in this study were operationalised and measured using existing scales and items on motivational factors and motivational behaviour of students

(Peetsma, Wagenaar, & de Kat, 2001; Midgley et al., 2000; Pintrich & de Groot, 1990; Roede, 1989; Seegers, van Putten, & de Brabander, 2002), classroom practices (Roelofs & Houtveen, 1999; Geijsel, 2001; van Zoelen & Houtveen, 2000) and teachers' sense of self-efficacy (van Woerkom, 2003). Until now the motivation scales and items have been used in secondary education. Given our sample of students in primary schools, we translated the items (some were originally in English) and adapted them to make them appropriate for the primary school context. The teachers could in a questionnaire indicate the extent to which the item referring to the four classroom practices (process-oriented instruction, connection to students' world, cooperative learning and differentiation) and their self-efficacy applied to them on four-point scales (1=hardly ever applies to me, 2= sometimes applies to me, 3= often applies to me, 4=almost always applies to me).

The students could indicate on a four-point Likert scale (1=strongly disagree, 2= disagree, 3=, agree and 4=strongly agree) the extent to which the items referring to affective (well-being in class and school), expectancy (academic self-efficacy) and value components (mastery goal orientation, performance-avoidance, intrinsic motivation) of motivation and their behaviour (school investment) applied to them. Items in the student questionnaire referring to expectancy and value components and students' motivational behaviour were related to maths tasks. Items referring to students' well-being in class and school were formulated in more general terms.

Confirmative factor analyses were used to guide scale construction, resulting in exclusion of a few items from the scales because of a lack of correlation or stable factor structure. On the basis of the results of the factor analyses, for each variable a scale was constructed by averaging the item scores, and means were computed if the participant had completed at least 80% of the items. Where several teachers were teaching the same class, the mean scores were averaged, allowing for the number of days worked by each teacher. The scaled variables, example items, number of items and reliabilities are summarised in Table 1.

Table 1. Overview of scaled variables

Variables	Example item	Items	α
Teacher efficacy	I have the feeling that I am successful in my work	5	.81
Classroom practices			
Process-oriented instruction	I ask students how they arrived at a solution, and what the steps in their thought processes were	6	.78
Connection to students' world	I adapt the content of my lessons as much as possible to the students' perceptions of their environment	3	.73
Cooperation	In group assignments, I ask students to come up with a joint result	4	.73
Differentiation	If more talented students are ready, I give them additional subject matter connected with the basic subject matter	5	.73
Student motivation			
Well-being in class	I get along well with my classmates	4	.68
Well-being in school	I am settled in this school	4	.68
Academic efficacy	I can do even the hardest maths tasks in this class if I try	4	.81
Intrinsic motivation	I think what I am learning in maths is interesting	4	.59
Mastery goals	I prefer difficult work from which I can learn something new, to easy work	5	.69
Performance-avoidance	During maths tasks I am afraid that the other children will notice that I make mistakes	4	.71
School investment	I put a lot of effort into maths	4	.75

Analyses

We conducted a series of regression analyses (using *SPSS 16.0*) to investigate the hypothesis that the effect of teacher efficacy on student motivation is mediated by teachers' teaching. For each of the seven student motivation variables, a multilevel model (Model 1) was fitted with teacher efficacy directly affecting student motivation (N = 3,404 students). For each of the classroom practices variables, an ordinary regression model (Model 2) was fitted with teacher efficacy affecting classroom practices (N = 160 teachers). Finally, for each of the seven student motivation variables, a multilevel model (Model 3) was fitted with teacher efficacy and classroom practices both affecting student motivation (N = 3,404 students). Figure 1 gives a graphical representation of Model 3.

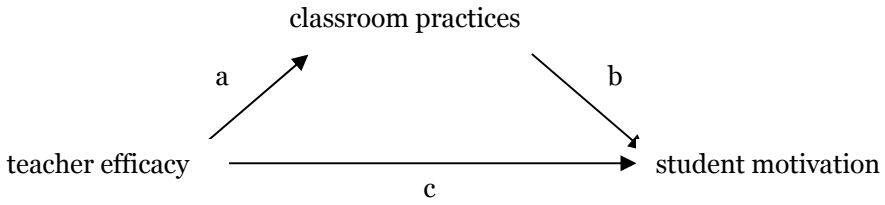

Figure 1. Path diagram showing mediation

According to Baron and Kenny (1986), to support the mediation hypothesis, four conditions must be met: (1) a significant effect of teacher efficacy on student motivation in Model 1 (Path *c* in Figure 1); (2) a significant effect of teacher efficacy on classroom practices in Model 2 (Path *a* in Figure 1); (3) a significant effect of classroom practices on student motivation in Model 3 (Path *b* in Figure 1); and (4) the effect of teacher efficacy on student motivation (Path *c* in Figure 1) should be smaller in Model 3 than in Model 1. If the effect of Path *c* is no longer significant, the mediation is called 'full'.

In all models we also included school year as a control variable, because previous studies have shown that students' investment in school seems to decrease throughout the years (Stoel, Peetsma, & Roeleveld, 2003). Students' sex was also included as control variable.

RESULTS

First, we present the mean scores and standard deviations on the scales to obtain a general insight into students' motivation and teachers' teaching and sense of self-efficacy (Table 2). The results show that the teachers involved in the study had moderate self-efficacy beliefs. Furthermore, the mean scores with regard to the four aspects of teaching were quite high, especially on process-oriented instruction. Teachers indicated that they paid a lot of attention to process-oriented instruction, often related their instruction to the students' personal world, stimulated cooperation between students, and often differentiated their instruction to suit students' needs and abilities.

The students who participated in this study scored very highly on both motivational factors and behaviour. They indicated that they felt very happy in class and at school, that they had great confidence in their ability to perform a maths task, and that they were highly intrinsically motivated. Furthermore, the

students reported that they did not experience many situations in which they were afraid that others would notice their shortcomings, that they were particularly focused on mastery goals and that their investment in maths was reasonably high.

Table 2. Mean (M), standard deviation (SD), and number of respondents (N) per variable (range 1 to 4).

	M	**SD**	**N**
Teacher motivation			
Teacher efficacy	2.99	.47	160
Classroom practices			
Process-oriented instruction	3.38	.36	160
Connection to students' world	3.00	.46	160
Cooperation	3.06	.48	160
Differentiation	3.03	.47	160
Student motivation			
Well-being: class	3.55	.56	3404
Well-being: school	3.35	.57	3404
Academic self-efficacy	3.16	.69	3404
Intrinsic motivation	3.34	.51	3404
Performance-avoidance goals	1.70	.70	3404
Mastery goals	3.43	.49	3404
School investment	3.21	.61	3404

Note: Regarding performance-avoidance goals, a low score has to be interpreted as positive. On the other hand, a high score on performance-avoidance goals means that students avoid performance, which could correlate negatively with motivated behaviours such as school investment and academic achievement.

As stated above, following Baron and Kenny (1986), three different regression models were fitted to examine the relative influence of different aspects of teachers' teaching and sense of self-efficacy on students' motivation to learn. Prior to these analyses we checked for possible dependence between students within classes and schools. As intra-class correlations of student motivation were both significant and substantial (Snijders & Bosker, 1999), Model 1 and Model 3 parameters were estimated through multilevel regression analyses. The results of Model 1 show that the effects of teacher efficacy on student motivation were not significant, except for the effect on *well-being in school* (b = .053, p = .029, 6.7% explained variance). We were therefore able to reject the mediation hypothesis for six of the seven student motivation variables.

Table 3. Parameter estimates for multilevel models of student motivation predicted by teacher efficacy and classroom practices (scales 1-4): standardised regression coefficients and standard errors.

	Well-being (class)	Well-being (school)	Academic efficacy	Intrinsic motivation	Mastery goals	Performance-avoidance	School investment
Intercept	3.26 (.14)	3.48 (.17)	3.50 (.15)	3.75 (.13)	3.88 (.12)	2.30 (.15)	3.78 (.17)
Fixed effects							
Year	.04* (.02)	-.04 (.02)	-.01 (.02)	-.07** (.01)	-.05** (.02)	-.12** (.02)	-.08* (.02)
Sex	-.00 (.02)	.09** (.02)	-.18** (.03)	.02 (.02)	-.05** (.02)	.13** (.03)	-.03 (.02)
Teacher efficacy	. 02 (.02)	.03 (.03)	-.01 (.02)	.00 (.02)	-.01 (.02)	-.01 (.02)	-.01(.02)
Classroom practices							
Process-oriented instruction	-.06** (.02)	-.08** (.02)	-.02 (.02)	-.02 (.02)	-.02 (.02)	-.00 (.02)	-.05* (.02)
Connection to students' world	.03 (.02)	.04 (.03)	.02 (.02)	.03 (.02)	.05* (.02)	-.03 (.02)	.03 (.02)
Cooperation	.02 (.02)	.08** (.03)	.02 (.02)	.02 (.02)	-.01 (.02)	-.00 (.02)	.04 (.02)
Differentiation	.01 (.02)	-.02 (.02)	.03 (.02)	-.02 (.02)	-.02 (.02)	.02 (.02)	.01 (.02)
Explained variance							
of student scores	0% of .295	0% of .260	3% of .441	0% of .252	0% of .227	0% of .459	0% of .346
of class means	13% of .017	12% of .036	6% of .016	12% of .014	10% of .015	23% of .014	9% of .031
of school means		10% of .025					

Note: * $p < 0.05$, ** $p < 0.01$

Model 2 results show significant effects of teacher efficacy on all classroom practices. Teachers with a high sense of self-efficacy showed more process-oriented instruction (b = .214, p = .001, 7.6% explained variance), achieved a better fit between school and students' personal lives (b = .347, p = .000, 12.3% explained variance), stimulated cooperative learning in their class (b = .297, p = .000, 9.1% explained variance), and showed more differentiation in their instruction (b = .436, p = .000, 19.5% explained variance). The school year, included as a control variable, did not have a significant effect on any of the classroom practices.

The results of Model 3 are presented in Table 3. Table 3 shows that the control variables year group and sex affected most of the student motivation variables. Older students scored significantly higher on well-being in class, and lower on well-being in school, intrinsic motivation, mastery goals, performance avoidance, and school investment. Girls scored higher on well-being in school and performance-avoidance, and lower on academic efficacy and mastery goals.

As Table 3 shows, in Model 3 only one of the four classroom practices variables, process-oriented instruction, had a significant effect on students' *well-being in class*. The effect was negative (b = -.06, p = .002): process-oriented instruction appeared to have an adverse effect on the students' well-being in the class. The more a teacher used process-oriented instruction, the fewer students in that class reported high well-being. The mediation hypothesis was rejected, as Model 1 did not show a significant effect of teacher efficacy on well-being in class (b = .03, p = .122).

Comparing these results with Model 3 results for *well-being in school*, it seems that process-oriented instruction adversely affected the students' well-being in school (b = -.08, p = .002). On the other hand, stimulating cooperative learning in the class appeared to have a positive effect on students' well-being in school. The Model 1 effect of teacher efficacy on well-being in school was not found in Model 3. We therefore concluded that the effect of teacher efficacy on well-being in school was fully mediated by classroom practices (process-oriented instruction and cooperation).

None of the classroom practices had a statistically significant effect on students' *academic efficacy*, *intrinsic motivation* or *performance-avoidance*. However, some classroom practices significantly influenced students' orientation toward *mastery goals* and *school investment*. The more a teacher connected his or her teaching to the students' world, the more students oriented themselves toward mastery goals (b = .05, p = .012). Finally, contrary to our

expectation, process-oriented instruction seemed to have had an adverse effect on students' school investment.

CONCLUSIONS AND DISCUSSION

In this study, we examined the relative importance of teaching and teachers' sense of self-efficacy in explaining students' motivation to learn in primary education. In line with previous research on student motivation, we focused on motivational behaviour and motivational factors, including affective, expectancy and value components. We used current conceptions of teaching and learning and research on teachers' cognitions to hypothesise relations among four aspects of teaching (process-oriented instruction, connection to students' world, stimulating cooperation, and communication, and differentiation), teachers' sense of self-efficacy and students' motivation to learn. We tested the expectations and, we discuss our most important findings.

First, the results show that teachers' mean scores on the classroom practices were quite high, especially on process-oriented instruction. In previous studies in which the same teaching variables were used (Roelofs & Houtveen, 1999; Roelofs & Visser, 2001), comparable mean scores were not found. A possible explanation for our high mean scores could be that the data are somewhat biased. Teachers were asked to assess their own teaching and to report how often they applied specific aspects to their own classroom practice. The teachers participating in the study might have given a too rosy picture of their classroom practices and presented them more positively than they actually are. More research using student assessments and classroom observations as well as teacher questionnaires is needed to validate our findings.

Our data support the effect of teaching on students' motivation to learn. Although the effects were small, it appeared that three of the four classroom aspects affected students' motivational behaviour and affective and value components of motivation. Of the four classroom aspects, process-oriented instruction seemed to have the most influence on students' motivation to learn. Contrary to our expectations, however, the results show that process-oriented instruction adversely affected students' motivational behaviour and factors. Furthermore, we did not find any correlation between process-oriented instruction and the expectancy and value components, such as students' academic self-efficacy and mastery-oriented and performance-avoidance

behaviour. These results suggest that a model of teaching and learning that replaces external control over the learning process by paying attention to meaningful goals and self-regulated learning, would not always improve students' motivation. More than that, in our study it decreased students' well-being and investment in school. These findings did not confirm other research results which indicate that increasing students' self-regulation seems to have positive effects on their motivation (Oostdam, Peetsma, & Blok, 2007). One possible explanation could be the type of students involved in our study. As mentioned earlier, research has shown that it remains unclear whether the positive effects on motivation of increasing students' self-regulated learning apply to all students. Students with learning disabilities and students who have difficulties regulating their own learning might be better off with traditional classroom practices, in which the instruction and tasks are well structured. When these types of students receive process-oriented instruction, they may feel more anxious and consequently they may need extra processing capacity and time to suppress their worries and maintain their well-being. These feelings of discomfort not only affect the well-being of students, but also decrease their investment in school. Although we do not have information about the students' cognitive abilities and achievements, it might be that our sample contained a relatively large number of students with learning disabilities or problems. Future research should include data about the type of students, including learning disabilities and other difficulties, and about self-regulated learning activities, in order to increase our understanding of the interplay between the nature of instruction and students' motivation to learn as a key to self-regulated learning.

Besides the type of student, the negative effect could also be explained by the quality of the teaching itself. Process-oriented instruction as a constructive model of teaching and learning is not an easy model to use. Most teachers in the Netherlands are educated in and used to teaching with traditional teaching models, in which the teacher is the one who regulates the learning process of students. Process-oriented learning means that teachers need to focus on the learning and thinking activities of students, to gradually transfer control over learning processes from the teachers to students, to stimulate the development of students' mental models and to take into account their learning orientations (Vermunt & Verschaffel, 2000). Stimulating self-regulated learning and increasing students' motivation requires a shift from a classroom practice based on a knowledge-transmission model towards a knowledge-construction model. Changing one's teaching in this direction is not an easy thing to do for teachers

and it needs a lot of training and practice. It often takes years to master a new way of teaching effectively, so that it benefits student learning and motivation. Although the teachers who participated in our study reported that they often used process-oriented instruction, it might be that they had just recently started to change their practices into a more process-oriented model. This may have affected the quality of their teaching and as such negatively influenced their students' motivation to learn. More longitudinal research is needed to validate our findings and to test the relation between the nature and quality of process-oriented instruction and students' motivational behaviour and factors.

In addition to the influence of process-oriented instruction on students' motivation, the results also show that connection to the students' personal world significantly affected their motivation to learn. Although we did not find a positive correlation with affective motivational factors, the results clearly show that relating instruction to students' personal world boosted goals focused on task mastery. This finding backs up the argument put forward by John Dewey at the beginning of the 20th century, namely that education should provide students with opportunities to work on realistic and situated activities (Dewey, in Roelofs, Visser, & Terwel, 2002).

Cooperative learning methods promote positive interdependence and social interaction between students, meet student needs for relatedness, and encourage and facilitate learners' efforts that result in psychological well-being. As in other studies (e.g., Cohen, 1994; Johnson, Johnson, & Stanne, 2000; Slavin, 1995, 1996), our results confirmed the role of cooperative learning in students' motivation. It appeared that students' well-being in their own class correlated positively with the extent to which teachers encouraged them to cooperate and communicate with other students.

Finally, the results lend credence to the argument that teachers' sense of self-efficacy has an impact on both teachers' practices and students' motivation to learn. The findings show that teacher efficacy had significantly positive effects on all aspects of their classroom practices. Highly effective teachers seemed to use more classroom practices based on new conceptions of learning than less effective teachers. These findings are in line with previous studies on the relationship between teachers' efficacy and their teaching (e.g., Tschannen-Moran & Woolfolk Hoy, 2001).

Furthermore, it appears that the effect of teachers' sense of self-efficacy on students' well-being in school was fully mediated by process-oriented instruction and cooperative learning. Although we know from other research that teachers' sense of self-efficacy appears to be an important psychological

factor for understanding their performance, few studies have reported an indirect effect of teachers' sense of self-efficacy on students' motivation. As mentioned earlier, most of the studies have focused on either the role of teachers' sense of self-efficacy for students' motivation to learn or for teachers' classroom practices. More research is needed in which teachers' psychological states, their teaching and students' motivational behaviour and factors are combined to validate our findings, using more sophisticated techniques (multi-level structural equation modelling). This could lead to a better understanding of the role of teacher efficacy for both teachers' classroom practices and students' motivation.

Limitations and future directions

This study aimed to contribute to the development of models to understand how teachers' teaching and sense of self-efficacy affect students' motivational behaviour and motivational factors. Although we used a large sample of teachers and students, our study was limited by the relatively small class-level and school-level variance we found (.014 to .036). These findings are not dissimilar to those of other studies on the influence of teachers' teaching (den Brok, Brekelmans, & Wubbels, 2004; Houtveen, van de Grift, & Creemers, 2004; Teddlie & Reynolds, 2000). Between 10 and 30% of the variance in students' behaviour and results is accounted for by the value added by schools (e.g., Reezigt, Houtveen, van de Grift, 2002; Scheerens & Bosker, 1997). Greater class-level and school-level variance could help future researchers to analyse the relations between teachers' teaching and students' motivation to learn in more depth. Follow-up research with larger and more heterogeneous samples, allowing for multilevel structural equation modelling, could contribute to the testing of more complex models and the development of theories about the impact of teachers' cognitions and classroom practices on students' motivational behaviour and motivating factors.

A second limitation of our study was that the different aspects of classroom practices explained only a small percentage of the variance between the different aspects of students' motivation. It is likely therefore that other factors not included in our model may also have affected the students' motivation. In future research the influence of other teacher- and student-related factors on student motivation should be explored. As mentioned earlier, we did not gather information about type of students, and student background variables (e.g., SES, ethnicity, past performances etc.) should be included, as previous research has shown that these variables can affect students' motivation to learn (e.g.,

Peetsma, Hascher, van der Veen, & Roede, 2005; Vedder, Boekaerts, & Seegers, 2003). Furthermore, the inclusion of classroom conditions (class size, population, academic heterogeneity) may also help us to understand the effect of peers on the motivation of students. Finally, in addition to assessing the extent to which teachers apply certain aspects of teaching, as we did in this study, researchers should also pay attention to the quality of teaching.