Summary
Because of the ever-changing conditions under which present students will be expected to work in the future, and the related requirements of their future employers, we cannot ignore the importance of self-regulated learning within the educational context. It is generally assumed that the teacher can play an important role in stimulating students and developing student self-regulated learning, for example by arranging educational environments in which students learn and gain experiences with different types of learning skills. Nevertheless, not much is known about exactly how secondary education teachers support and stimulate the development of student self-regulated skills within their classroom practice. Therefore, this dissertation aimed to gain an understanding of teacher regulating activities related to student self-regulation.

**Measuring teacher regulating activities**

To investigate teacher regulating activities, a student perceptions inventory, the Pedagogical Practices Inventory (PPI), was developed. We chose to map teacher activities first of all through student perceptions. In line with constructivist claims, it is a student’s perception that determines the effect of an instructional act on student learning. Moreover, student perceptions can be obtained relatively easily, making them useful for and applicable to large-scale studies. Using the PPI enabled us to map the regulating activities of teachers from several secondary schools.

We investigated the reliability of the PPI by conducting a large-scale inventory study. The results showed that the five PPI subscales had good internal reliability, which means the PPI is a reliable instrument for measuring teacher regulating activities. The external validation of the PPI was examined by investigating the relationship between student perceptions inventory data and observational data. The results showed that student perceptions and observations measure the same to some extent, but they also encompass distinct features. Within the present dissertation, we therefore chose to use both student perceptions and observational data, and partly combined these two methods.

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1 We assume that learning activities are always performed by students themselves, and that teachers can carry out activities that enable students to regulate their own learning activities. When we write ‘teacher regulating activities’ we therefore mean: ‘teacher activities aimed at student regulation of learning activities’.
Modes of teacher regulation and teaching practice

Several studies distinguish different modes of teacher regulation: external, shared and internal regulation. What has been unknown until now is the extent to which the supposed phases of regulation, related to a gradual transfer from teacher regulation to student self-regulation, can be observed in classroom practice.

The PPI was used to investigate whether teachers differed in their pedagogical practices in terms of their mode\(^2\) of regulating student learning activities. The results revealed that in practice teachers combine external, shared and internal regulating activities. In relation to the PPI this means that teachers combined regulating activities such as telling, instructing (‘This teacher indicates exactly how we can improve our schoolwork’), with supporting, stimulating (‘This teacher helps us to come up with solutions when we are facing difficulties’) and allowing students to self-regulate (‘With this teacher, we ourselves reflect on what we know about a new subject’). These results suggest a more integrated view of teaching practice than described in models with different phases of teacher regulation.

Results further showed that teachers differed in the degree to which they show a combination of regulating activities – to a low, medium or high degree. The last group of teachers, for example, combined external regulating activities with shared and internal regulating activities, and executed all of these regulation modes to a high degree. As a result we distinguished three groups of teachers differing in the extent to which they carry out the combination of regulating activities.

To examine whether observers categorized teachers into the same groups as those distinguished based on student perceptions, 12 teachers, evenly distributed over the three categories, were videotaped during one complete lesson. Two independent observers scored the videotaped lessons using an observation scheme that incorporated five categories corresponding to the five subscales of the PPI. The observers also categorized teachers into one of the three categories after observing the videotaped classroom practices. The results showed that the observers placed teachers in the same categories as they had been categorized in based on student perceptions.

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\(^2\) We use the term ‘modes of regulation’ to refer to external, shared and internal regulation.
Teachers’ instructional modes and self-regulated learning components

To gain a better understanding of teacher regulating activities related to student self-regulated learning during classroom lessons, we investigated videotaped lessons of eight teachers. For this study an observation scheme was developed, including three components of self-regulated learning: metacognition, motivation and behaviour as well as three instructional modes in which teachers regulate these components: direct instruction, reasoned instruction and questioning. In the observational analyses, transcriptions of teachers’ regulating activities were combined with teachers’ verbal intonation to score verbal units for the eight teachers.

The results showed that the majority of the teacher regulating activities were directed towards the self-regulated learning component of behaviour. Fewer teacher regulating activities were directed towards motivation and metacognition. Most regulating activities were guided by direct instruction. Teachers mainly focused on directing the learning activities of students, instructing and telling students to execute learning activities, and how. This meant that teacher regulating activities were hardly ever accompanied by information about the relevance of the learning activity, nor did they occur in a questioning mode.

Results of the earlier study with the PPI revealed that teachers can be categorised into groups according to the extent to which they carry out the combination of regulating activities. In this observational study, we investigated whether the two most contrasting groups – those who carry out a combination of regulating activities to a low degree, and those who do so to a high degree – differed with respect to the self-regulated learning components they show within these activities, and/or the instructional mode of regulating these activities.

Analyses showed significant differences for motivation and for the category of motivation by direct instruction. A more in-depth investigation of the scores, however, showed that nearly half of the scores in this category were for one and the same teacher. Although this teacher can be considered a good representative of the group based on student perceptions of his regulating behaviour, he apparently differs from the other teachers in the group in terms of the scores in the observation categories. We should therefore be cautious about interpreting the found differences as being differences between the two groups of teachers.

3 The term ‘instructional mode’ can be interpreted as a teacher’s method of instruction (how self-regulated learning components are regulated).
Teacher regulating activities and student learning outcomes

As part of the main aim of this dissertation – to find out more about teacher regulating activities related to student learning – we also examined the relationship between teacher regulating activities and student learning outcomes. Inventory data from the PPI were used to map the teacher regulating activities of 170 secondary vocational education teachers. In addition to the PPI, students answered questions about their learning outcomes, and about their liking for the teacher. Because teacher characteristics such as gender, age and years of teaching experience might influence self-reported learning outcomes, we also collected data on these teacher characteristics from the teachers themselves.

The results revealed that teacher regulating activities explained 78% of the variance in self-reported learning outcomes, of which two-thirds was a joint effect with the variable ‘liking the teacher’. Teacher gender appeared to have no significant effect on learning outcomes. Teacher age and teaching experience were strongly correlated, of which the factor teacher age appeared to be significantly correlated to self-reported learning outcomes. This effect appeared to operate jointly with that of liking for the teacher, with the effect of liking on self-reported learning outcomes being much larger. Based on our results, it seemed that when teacher age, and accordingly also years of teaching experience, increased, students liked teachers less and reported lower learning outcomes.

Conclusion

Student self-regulated learning has become increasingly important within education. Students who can regulate and adjust their learning behaviour learn more efficiently and achieve better academic results. The present dissertation sheds light on teacher regulating activities related to student self-regulated learning in secondary vocational education. Our main finding is that teachers in our study not only focused on instructing students or stimulating student self-regulated learning, but they combined various regulating activities. This finding suggests that instead of moving from one regulation mode to another, teachers and students would benefit more if teachers expanded their teaching repertoire and became proficient in handling all regulation modes.

Detailed investigations further showed that few regulating activities were related to the self-regulated learning components of metacognition and motivation, and that teachers mainly regulate students’ learning activities by direct instruction, rarely accompanied by an explanation about the how and the why of the learning activities. Nor were students
questioned about their learning activities. These findings might imply that it is difficult for teachers to find tools for implementing self-regulated learning components in their lessons. As a result it is recommended that both teacher education and professional development programmes pay more attention to the practical implications of theoretical insights into self-regulated learning. As a result of our research, we suggest further investigation of incumbent teachers who succeed in combining the various regulation modes to a high degree. These teachers could usefully serve as models for teachers who do not know how to apply theoretical insights in practice. Teachers may be encouraged to realise that the desired teaching repertoire partly consists of teaching tools that are already familiar. This is reassuring in their constantly challenging work of preparing students for an ever-changing society.