



Formative Use of Assessment to Foster Self-Regulated Learning: the Alignment of Teachers' Conceptions and Classroom Assessment Practices

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Accepted: 23 October 2023 / Published online: 9 November 2023
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Abstract

This study investigates the pivotal role of self-regulated learning in higher education and explores to what extent teachers' conceptions of formative assessment influence the development of students' self-regulated learning skills. Despite the recognised significance of self-regulated learning, many students in higher education lack effective self-regulation strategies. Therefore, the teachers' role is paramount. We investigated teachers' beliefs and practices concerning assessment and the influence on self-regulated learning development through qualitative interviews with 16 teachers from different programmes. Findings reveal that teachers, influenced by their conceptions, strive to provide feedback primarily at the task and process levels, not adequately addressing the self-regulation level. While teachers acknowledge the importance of fostering self-regulated learning when inquired, their classroom practices lack a focus on the self-regulation level, often assuming students acquired the necessary skills from previous education. The study underscores a misalignment between teachers' recognition of the importance of self-regulation learning and their actual practices. Recommendations emphasise the necessity of raising awareness among teachers about the important role of feedback in enhancing students' self-regulation, addressing the current gap in educational support. Future research should explore how to bridge this awareness-practice gap and create an environment conducive to the development of self-regulated learning.

Keywords Formative assessment · Self-regulated learning · Fostering self-regulated learning · Teacher conceptions · Teacher classroom assessment practices

Introduction—Teacher Support on Students' Self-Regulated Learning

Students' success in higher education (HE) depends greatly on their self-regulated learning (SRL) skills (Boekaerts, 1999; Hannigan et al., 2022). However, many students in HE are not able to self-regulate their learning, and, therefore, their SRL skills have to be developed (Bjork et al., 2013; Russell et al., 2022; Van de Pol et al., 2019). Students' development of SRL skills can be fostered by a rich environment created by teachers through classroom assessment practices, especially for students with lacking SRL skills (Biwer et al., 2020a; Cai et al., 2022; De Bruin & Van Gog, 2012; Nugent et al., 2019; Peeters et al., 2016; Russell et al., 2022). HE teachers' conceptions of the formative use of assessment to foster SRL have an influence on their classroom assessment practices (Barnes et al., 2017; Brown et al., 2019; Opre, 2015). In turn, teachers' assessment practices can have a major influence

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on student learning and on the regulation of this learning process (Becker et al., 1968; Boekaerts & Corno, 2005; Broekkamp & Van Hout-Wolters, 2007; Fernandez & Jamet, 2017; Greene, 2020; Norman et al., 2010; Nugent et al., 2019; Van der Linden et al., 2021). The probability for such a rich environment most conducive for developing SRL is high where teachers are cognizant of the need to create the necessary classroom assessment practices. It is therefore important to investigate teachers' conceptions of the formative use of assessment to foster the development of SRL skills and to explore to what extent their conceptions are aligned with classroom assessment practices aimed at developing SRL skills.

In this paper, we will discuss the formative use of assessment, argue how assessment practices can foster the development of SRL, look at the role of HE teachers in fostering SRL development and the influence of HE teachers' conceptions about assessment on SRL development. We will present the results on teachers' conceptions, task conceptions and their classroom assessment practices. Concluding, we will discuss the influence of teachers' conceptions and task conceptions on the focus of their classroom assessment practices on SRL.

The Formative Use of Assessment to Foster SRL

Assessment can serve a number of purposes, such as informing progress on student learning, evaluating teaching quality and evaluating programme and institutional accountability (Boud, 1995; Carless et al., 2006; Cortez Ochoa et al., 2023; Fletcher et al., 2012). In practice, most variations reduce to three purposes: (1) improving learning; (2) certifying that learning has taken place or (3) evaluating the quality of instruction (Brown, 2008; McInerney, 2009). From a teacher's perspective, the purpose to improve learning, that is to say, the influence of assessment on learning, is more and more recognised (Archer, 2017; McInerney, 2009; Segers et al., 2006; Van der Vleuten et al., 2012). For this purpose to come into its own, assessment has to be used in a formative way because only then it has the potential to promote student learning (Allal, 2010, 2019; Andrade & Heritage, 2017; Black & Wiliam, 2009; Greene, 2020; Hattie & Timperley, 2007; Lau, 2016; Wiliam, 2011). Assessment used for formative purposes can elicit evidence about student achievement, which can be used to steer the learning process (Black & Wiliam, 1998; Boud et al., 2018; Segers et al., 2006; Van der Vleuten et al., 2012). This steering can start with the teacher and gradually be handed over to the student when the necessary SRL skills are being acquired (Russell et al., 2022; Simons, 1993). In this paper, we consistently address formative as a purpose of assessment. However, the term formative assessment is also

frequently used in literature (Allal, 2019; Gunter & Kenny, 2021; Roscoe & Craig, 2022). We choose not to make a distinction between formative and summative assessment. Instead, we consider formative and summative to be a function of assessment, so in principle every assessment can avail both functions (Brown, 2019; Brown et al., 2009; McInerney, 2009). Within this view, information from both formative assessment and summative assessment has the potential to be used formatively.

How Assessment Practices Can Foster the Development of SRL Skills

What and how students learn depends, among other things, greatly on how they self-regulate their learning (Biwer et al., 2022; Boekaerts, 1999; Kitsantas, 2013; Pintrich, 2000; Van der Linden et al., 2021; Winne & Hadwin, 1998). The most cited definition of SRL, and the one that we will use, is from Zimmerman: "Self-regulation refers to self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals" (2000, p. 14). It is therefore important for students to be able to monitor and regulate their learning and to develop these SRL skills (Butler et al., 2017; Kitsantas, 2013; Schunk & Zimmerman, 2012; Van der Linden et al., 2023; Van Loon, 2014).

From a student's perspective, Sadler states that there are three indispensable conditions for learning: (a) understanding the standard of performance, (b) information about the performance gap and (c) strategies to remedy that gap (1989, p. 121). Teachers play an important role in these conditions by co-regulating the learning process, for instance, by assessing if students understand the standard of performance or by guiding students to choose a learning strategy by modelling (Russell et al., 2022). Therefore, teachers need to understand not only *what* a student knows and can do but also *how* the students learn; what the learning process has looked like or can look like. This understanding will come from information elicited from classroom assessment practices. Therefore, an important aspect of assessment used for formative purposes is the provision of feedback which Shute (2008) defines as "information communicated to the learner that is intended to modify his or her thinking or behaviour for the purpose of improving learning" (p. 154). This "information" can be used by the teacher to establish how a student is learning, and thereby a teacher can use this information to provide feedback to the student, thereby scaffolding the SRL process of the student. The formative purpose of assessment is therefore a necessary condition to improve not only learning of a task, aimed at the acquirement of cognition, but also for the underlying learning process and the development of SRL (Hattie & Timperley, 2007).

The Role of Teachers in Fostering SRL

One integral component of developing students' SRL are classroom assessment practices used in a formative manner (the elicited information), accompanied with actionable feedback from teachers (Black & Wiliam, 2009; Broadbent et al., 2021; Hattie & Timperley, 2007; Panadero et al., 2019; Wiliam, 2011). According to the model of Hattie and Timperley, effective feedback consists of answers to three important questions: (1) Where is the student going?, (2) How is the student doing? and (3) Where to next? (2007, p. 87). As a consequence, feedback has three respective directions: (1) feed up, (2) feed back and (3) feed forward. In addition, they argue that feedback can exist on four levels: (a) task level, (b) process level, (c) self-regulation level and (d) self-level. Hattie and Timperley argue that powerful feedback exists on the process level and on the self-regulation level in terms of deep processing and mastery of tasks. We will therefore, for the purpose of this study, discard the self-level. The three feedback directions and the three remaining levels create nine fictitious strategies (Table 1) for teachers to provide feedback (Van de Pol, 2012).

Since institutions mostly determine what students have to learn, feed up mostly consists of classroom actions to clarify this. As a consequence, teacher feedback and feed forward strategies are important in this model: diagnostic strategies and scaffolding strategies (Van de Pol, 2012, p. 33); especially if these strategies are aimed at the process level or the SRL level. Combined, we can create a lens to examine the degree of focus of classroom actions of teachers on the various levels.

Influence of HE Teachers' Conceptions About Assessment on SRL Development

SRL skills, such as goal setting and strategy use, can be learned from instruction and modelling by teachers (Biber, 2022; Zimmerman, 2002). Teachers can have a considerable impact and are therefore crucial actors in providing all students with opportunities to develop SRL skills (Peeters et al., 2014, 2016; Russell et al., 2022). These opportunities can be created in the classroom by the use of assessment practices used formative to generate feedback that can be used by students to steer SRL skill development (Dignath & Büttner,

2008; Hui & Hui, 2021; Kitsantas, 2013; Leenknecht, 2021; Muis et al., 2016; Van de Pol et al., 2019; Van Loon, 2014).

We know that teachers' classroom assessment practices are influenced by their conceptions about assessment (Barnes et al., 2017; Brown et al., 2019), and that these conceptions are relatively stable over time (Entwistle & Peterson, 2004). We also know that teachers' conceptions of fostering SRL are a predictor for SRL in students (Ewijk et al., 2013; Russell et al., 2022). Therefore, the best chance for a rich environment conducive for SRL is when teachers have had the chance to develop their conceptions (Allal, 2010; Andrade & Heritage, 2017; Cauley & McMillan, 2010; Nicol & Macfarlane-Dick, 2006).

Teachers' conceptions of assessment can be understood in terms of their agreement or disagreement with the purposes of assessment (Brown, 2004; Brown et al., 2011). It is unclear what influence teachers' conceptions of assessment have on teachers' classroom assessment practices to foster students' SRL skills. We know from previous research that teachers focus more on providing feedback on the task level and not on the process and SRL level (Airasian, 1997; Brooks et al., 2019). However, there is a paucity of research in the field of formative assessment (Baartman et al., 2022), especially with the aim to stimulate the development of students' SRL skills in HE (Russell et al., 2022). It is therefore interesting to investigate teachers' conceptions of assessment used formatively and the aim of teachers' classroom assessment practices. Are these practices in line with their conceptions? And are these also aimed at the process and SRL level, since literature shows that feedback at the task level is the most common but not the most effective (Airasian, 1997; Hattie & Timperley, 2007)? The current study therefore focuses on teachers' conceptions of assessment used formatively to foster self-regulated learning and the influence of these conceptions on the creation of a rich environment through classroom assessment practices, conducive for students' SRL development. The main research question is as follows: To what extent is the formative use of assessment to foster SRL aligned with the teachers' conceptions and classroom assessment practices? To answer this question, the following sub-questions were formulated: (1) What are teachers' conceptions on the formative use of assessment to foster SRL? (2) What are teachers' task conceptions on

Table 1 Focus of feedback

Feedback direction	Feedback level		
	Task level	Process level	SRL level
Feed up	Clarify task strategies	Clarify process strategies	Clarify SRL strategies
Feedback	Diagnostic strategies on task	Diagnostic strategies on process	Diagnostic strategies on self-regulation
Feed forward	Scaffolding strategies on task	Scaffolding strategies on process	Scaffolding strategies on self-regulation

the formative use of assessment to foster SRL? (3) What is the focus of teachers' strategies in classroom assessment practices?

Methods

We chose qualitative self-report measures in the form of interviews to explore teachers' conceptions of assessment and their actions in fostering SRL as the main data source (Creswell, 2014). Most of the research that explores teachers' conceptions on SRL uses self-report questionnaires through interviews (Perry, 2002; Zimmerman, 2008). However, there is some critique on the correlation with other types of assessment or performance data (Veenman, 2011a; Winne & Nesbit, 2010; Winne & Perry, 2000). Although interviews have the disadvantage that teachers can report what they think is appropriate instead of what they think, we chose this method because interviews enable an in-depth investigation of teachers' perceptions and conceptions (Chua et al., 2009) on both SRL and assessment functions and the interplay between both conceptions and teachers' role in the development of students' SRL. Moreover, the interviewer can ask supplementary questions if terminology is not clear (Ewijk et al., 2013). The advantage of this constructivist grounded theory approach is that participants and researchers both add value to the interpretation of the data (Boeije, 2014; Charmaz, 2006). In addition, focussing on the teachers' role in students' SRL development in the learning process enhances ecological validity (Lai, 2011). Despite the knowledge that retrospective reports on metacognition have limitations, for the exploratory nature of our research question, interviews are the most fitting means of collecting data (Akturk & Sahin, 2011).

The constructivist part of this approach implies that relevant literature on SRL and the formative use of assessment availed the development of the research questions, the interview guideline and the data analyses. We asked teachers, for instance, their perceived value of assessment, for which purpose they used information from assessment, where their feedback was aimed at and if they influenced students' self-regulation with their use of assessment.

Design

Individual semi-structured interviews were chosen as the main data source. This allowed us to address topics of interest related to the development of SRL and the influence of the appertain assessment system to ask supplementary questions if needed, and it allowed the teachers to speak freely. A semi-structured interview guideline was constructed based on the literature.

The qualitative interviewing method (Panadero et al., 2016; Veenman, 2011b) presents disadvantages that we

compensated for by implementing specific actions. First, to reduce memory distortion, we interviewed teachers during the semester, while they were teaching. Second, we used a semi-structured interview based on the literature, which helps identify individual variations, combining the teachers' perspectives with the topics we considered relevant. Third, we did not specify and address the assessment and teaching activities, so participants could use their own words. Further, we asked participants detailed questions in order to gain insights into the interplay between their classroom assessment practices towards students' SRL and their conceptions and task conceptions of assessment functions. This resulted in extensive and highly detailed transcripts.

Study Context

The study was conducted late 2022 at a large University of Applied Sciences in the Netherlands, with over 4200 employees and over 37,500 students across 110 associate degree, bachelor and master programmes.

Subjects

We used a purposive sampling strategy for the interviews. Participants were recruited from nine different programmes. Participants were teachers identified by their peers or leaders in their programmes as having a predilection for creating a rich environment through formative assessment practices. We did this because a rich environment is a prerequisite for developing SRL. We ascertained teachers in programmes with different views on assessment by using our network in the university, preparing the invitations with some key colleagues and handpick a few programmes. These key colleagues then approached teachers in their programmes who felt efficacious and highly motivated by using assessment in a formative way with a request to participate in the study.

Data Collection

Participants comprised sixteen teachers (three male and thirteen female) from nine programmes: applied psychology, communication, facility management, oral health sciences, sport and exercise and teacher education in geography, German, French and healthcare and welfare. They participated in individual semi-structured interviews with a researcher, lasting between 28 and 67 min with an average of 42 min. A total of 670 min of interviews were collected, and 304 pages of transcribed text were analysed.

All interviews were conducted by the first author. After the first two, the interviews were evaluated. The evaluation indicated that the semi-structured interview guideline was adequate. Only minor adjustments were made, for instance,

an evaluative question if the teachers had missed a subject was added.

Procedure

The study was approved by the Ethical Research Committee of HAN University of Applied Sciences, approval no. ECO 371.05/22. Teachers could apply for the study through an MS Forms URL which was included in an invitation email sent by the key colleagues. The form provided a choice of dedicated timeslots for the interviews and consent for the participation in the study and recording of the interviews. Interviews were planned and recorded via MS Teams. Interviews were then transcribed verbatim, and any identifying data was then removed from the original interview transcripts.

Data Analysis

The interview data were analysed through template analysis (Brooks et al., 2014; Creswell, 2014) using Atlas-Ti 23. Initial analyses started with two transcripts: the transcripts were read in detail, coded with aid of the previously mentioned lens as a template (see Table 1 Focus of feedback) and emerging themes were identified. The remaining transcriptions were then analysed. The analysis can be seen as a deductive approach, using the lens and the themes as a template.

The interpretation of the authors in the analysis served the goal of reaching an in-depth understanding of the conceptions and actions towards SRL. Template analysis is systematic but always subjective. Our design is a constructivist grounded theory approach which does not require a consistent estimate of the same phenomenon (Cheung & Tai, 2021; LeCompte & Goetz, 1982). We acknowledge that data in this study are co-constructed by interactions with the participants, as are the interpretations and meaning we gave to these data (Watling & Lingard, 2012). We used a constant comparison method to establish the reliability (Charmaz,

2006). The first and the last author discussed the emerging codes from the first analysis with the second and the third author. Codes were merged into groups which led to themes in iteration with all authors. The first author then recoded all interviews according to the latest themes. This provided a template with an overview per theme which was used as a basis for the description of the results (Table 2).

Results

As expected, teachers in our sample created a rich environment through classroom assessment practices which they formatively utilised to provide students with feedback. We organise our findings around the thematic elements of our three research sub-questions; teachers' conceptions on the formative use of assessment to foster SRL, teachers' task conceptions on the formative use of assessment to foster SRL and the focus of teachers' strategies in classroom assessment practices. Within each element, we highlight quotations that elucidate our findings. We conclude by indicating to what extent the focus of strategies aligns with the teachers' conceptions and task conceptions.

Teachers' Conceptions on the Formative Use of Assessment to Foster the Learning Process and SRL

Most teachers do not mention the use of formative assessment to foster SRL by themselves. Although not apparent at first, when teachers were asked if feedback could also play an important role in fostering SRL, without exception, all teachers acknowledged that the fostering of the process level and the SRL level was important, and that feedback from assessment could potentially play an important role in these latter levels as well.

"I did my graduation research on self-regulation when I was still working in secondary vocational education,

Table 2 Analyses template

<i>Conceptions of assessment functions</i> (McInerney, 2009)		<i>Teachers' conceptions</i>	
		<i>I teachers' conceptions</i>	<i>II teachers' task conceptions</i>
Improvement of teaching and learning		TCAF	TTCAF
<i>Direction of teachers' classroom assessment practices</i> (Hattie & Timperley, 2007; Van de Pol, 2012)		<i>III teachers' reported classroom actions aimed at</i>	
<i>Feedback level</i>	<i>Teacher (classroom) action aimed at</i>		
Task level	Feed-up, -back or -forward at task level	TRCTL	
Process level	Feed-up, -back or -forward at process level	TRCPL	
SRL level	Feed-up, -back or -forward at SRL level	TRCSL	

in the optional subjects. I find it an incredibly interesting topic. And I don't know whether it's a hobbyhorse for me, because I'm still struggling with it myself, how to pay proper attention to it in my own lessons. But I do notice more and more that I think: oh, how little attention we consciously pay to this in our students' learning process." Teacher 13

All participants acknowledged the formative purpose of assessment as being important in providing themselves and students with the necessary feedback to steer processes of development. Teachers feel that this development should be monitored and steered throughout the course through formative assessment practices.

"I always hope that they develop further after the training, so they can see: hey, I have to do something about this. We want to get students into the workplace as lifelong learners, who can take control of their own learning. And that includes an inquisitive attitude. So that can't actually be separate." Teacher 9

Ultimately, for teachers, it is all about aiding students to pass the exam at the end of the course.

"Ultimately, it is also up to me to help them that they can take the exam. That is also one of the biggest goals because ultimately that is what they earn credits for. So that's the system. And that's where I feel a duty, or an appeal, that I at least provide that. And on top of that, I try to enthuse them, encourage them, make them aware of the usefulness of everything else." Teacher 29

Some teachers describe that passing exams only shows that students are competent at the end of the course, not that or how they have developed. Moreover, in educational settings where passing exams is paramount, the development of SRL is commonly not regarded as a goal. Emphasis is on students passing the exams; hence, the information from these exams is not used formatively.

"In conventional assessment it is mainly working towards the trick [the exam]. Show that and then you can forget it. Because then you've passed the mark." Teacher 9

However, this does not mean that these teachers consider using assessment in a formative manner. Some teachers regard exams used in a purely summative manner as unnecessary, not worthy of their time which they rather invest in providing feedback to students.

"I actually prefer to invest my time into supporting their learning, or engaging with them, and coaching and things like that. Rather than actually marking all kinds of assessment afterwards. I think there's just much more learning gain in that." Teacher 4

Teachers in our sample strongly believe in the potential of assessment used formative as a tool to foster SRL. They develop their conceptions in collaboration with peers with which they form their conceptions about the formative use of assessment. However, the conceptions do not focus on the SRL level. Teachers do not self-evidently consider using assessment to foster SRL. Moreover, most formative use of assessment is in the service of passing exams and not designed to promote SRL.

Teachers' Task Conceptions on the Formative Use of Assessment to Foster SRL

In regard to the context of HE, most teachers acknowledge that the development of SRL is also a task for teachers in HE, even though teachers indicate that secondary education also has a role in this development. Learning at a university is seen as a different measure and more demanding and should therefore also (or still) be a topic of concern in HE.

"Well, I think even secondary education already has the task of developing empowered citizens, i.e. educating them, and that includes this [SRL development]. But I do think in a really different measure than in HE. I think there should be growth there and it would be very nice if it is an extension of whatever happens in secondary education." Teacher 7

Conceptions of formative use of assessment consist on the task or process level, illustrated by frequently asking questions like "where are you now?" or "what do you need?" (Teacher 6). When inquired, teachers acknowledge the importance of feedback on the SRL level but indicate that there is a development to be made in this regard.

Interviewer: "But are there elements in the classroom assessment that are focused on teaching a student how to learn?"

Teacher 2: "Less so, I think. Students find self-regulation really difficult. And I think we also don't support and encourage that enough. So I think we can really take another step in that, in self-regulation." Teacher 2

Upon enquiry about as to why SRL is not assessed and is not the focus of their feedback towards students, teachers mention that SRL is difficult to assess. In addition, the development of SRL is not regarded as a goal in itself. Lastly, developing SRL is not the focus of most teachers.

"Because things like soft skills, problem-solving skills, resiliency. Of course, that's harder to assess. And then it also tends not to be assessed because we don't know exactly how to do that. That is, if you wanted to assess it." Teacher 2

The task of developing SRL does not derive from frameworks or policies within most institutions, which are focused on the certifying function of assessment. On the one hand, the lack of frameworks means that teachers can feel at liberty to implement assessment practices used for formative purposes in the classroom if they wish.

“We have always felt that freedom to do it that way. And we think that’s important and we keep working on that and developing ourselves in that.” Teacher 4

On the other hand, teachers mention that there are also limiting factors. Some teachers suggest there should be guidelines on what to assess to prevent an overdiversification of classroom assessment practices. Teachers believe this may prevent one-sided feedback and ensure that appropriate and sufficient feedback moments can be built into the curriculum. One exception where teachers did not have nor needed that liberty that we encountered were courses where the principles of providing students with continuous feedback were implemented. There, the implementation of an integral school policy, which focuses on promoting feedback for learning and mentoring, required teachers to provide constant feedback to students to improve learning:

“I think the learning function in the way we assess is in the continuous feedback loop that the student actually has to go through.” Teacher 11

In line with the conceptions, teachers’ task conceptions are not naturally aimed at fostering of the process and of the SRL level. It seems that there is a blind spot for directing feedback at the learning process and especially on SRL.

“Those learning skills, that bit of self-regulation, meta-cognition, that. No, I don’t think that we can really guarantee that this is really in the curriculum.” Teacher 4

This does not seem to be unwillingness but rather ignorance or felt incompetence.

“No formal attention. So you think: oh, they will learn from this. It’s not formal attention. And I also think a lot of teachers, including myself, have never been trained in how to do that either.” Teacher 2

We encountered one exception to this felt incompetence and task conception; among teachers in the psychology course. One teacher mentioned that her own profession makes a difference, since psychologists always envision the development of people.

“My assumption is that you have always that development in mind, perhaps more than the average car mechanic, to put it bluntly. With us it’s always central, we always work with check-ins for example. How are you doing? And where are you now? Almost every

lesson goes like this, also in the study career lessons. We were taught to always reflect throughout our entire training, so it’s kind of in the nature of the beast.” Teacher 17

Teachers thus see a task for themselves in supporting students through formative assessment practices, but for most teachers, the focus of their conceptions is on what matters to them: learning goals and students passing exams which assess those learning goals. This is what they perceive as important, and, therefore, their conceptions mainly focus on the task level.

Teachers’ Reported Classroom Actions on Learning and SRL

It is notable that most teachers mention a sudden change for students when entering an environment conducive for learning. Teachers provide students with a spate of feedback, although not all students are accustomed to hand in work before the exam and receive feedback. Teachers believe that students have to learn to preside over their own learning process. Not only is this difficult for students, but teachers may also be reluctant to give students such a high degree of freedom.

“I was also talking to a colleague about that, of: yes, but are they really going to do that? And are they really going to collect it? And so I do notice that I very much want to hold that in my hands and be very controlling about it. I don’t, I do hold back very much. But I do tend to do that. So it is also a matter of placing some trust in students.” Teacher 8

However, what is noticeable is that the direction of this feedback during classroom actions is mostly aimed at the task level and not at the process level or the SRL level.

“And I find that I then give students a lot of feedback, but not really with them [on the learning process] ... yes, it’s just about: oh, this and this, then you can look at this. Or yes, you got that right, but additionally this and this. So I’m much more concerned with steering on the end product so to speak.” Teacher 8

Steering the process often came down to providing feedback on the cognitive level, for instance, whether a particular task has been done well. As we mentioned before, all teachers acknowledged that the fostering of the process level or the SRL level was seen as important. However, when left to their own devices, most teachers did not provide feedback on the SRL level.

“I think, they really find that self-regulation very difficult. And I think we don’t support and encourage that

enough either. So I think we can really make another step in that, in self-regulation.” Teacher 2.

One reason for this lack of feedback on the SRL level, as mentioned before, is the perceived lack of skills (felt incompetence) to provide students with feedback aimed at the SRL level, for example, due to lack of training.

Interviewer: “Do you feel you are competent enough to shape students’ self-regulation properly?”

Teacher 7: “No, not really. No, we are working on that. No, but, among other things, that’s the reason of the professionalisation towards formative assessment. No, I really need to take steps there, for sure. Yes. Yes, absolutely.” Teacher 7.

The SRL level is only coming into play when they experience problems with the learning process of a student. Only then curative measures are taken, and only then the underlying process level and the SRL level become apparent.

“The moment a student doesn’t pass exams and if they contact you, you start looking at: How do you study? What can you do in another way? That is also part of the study career programme. So there are colleagues who then guide students, and I have been one myself. I do recognise that. That if a student fails several exams, if you start looking, what is the reason? Is it because of the way you study? How do you prepare for an exam? How do you make things stick for longer? Things like that, that’s more in there.” Teacher 2.

Teachers more or less assume that students have acquired the necessary learning skills in previous education. When asked, teachers do see a role for themselves in fostering the learning process and SRL, but their current actions are not aimed at these levels, mostly due to a lack of knowledge and felt incompetence to do so.

Discussion

Overall, the conceptions and task conceptions of teachers do indeed have an influence on the focus of their classroom assessment practices, albeit not at fostering students’ SRL skills. This is in line with research from Airasian (1997) and Brooks et al. (2019) who showed that teachers focus more on providing feedback on the task level.

Most teachers used their classroom assessment practices solely in a formative manner during the course, and for them, *assessment used formatively* equals to *formative assessment*. What stood out is that almost all notices on assessments used to develop learning and SRL came from teachers’ classroom assessment practices used formatively (which teachers mostly referred to as “formative evaluation”,

“formative assessment” or “formative teaching activities”). Although information from assessments used for summative purposes potentially can be of value, the common end-of-semester assignments seldom contribute to the development of SRL. Research shows that in order to cope with the perceived assessment demands, students consciously or subconsciously vary their study approaches (Harrison et al., 2015, 2017; Van der Linden et al., 2023; Van der Linden et al., 2021). This coping is often referred to as the backwash-effect of assessment or the pre-assessment effect (Segers et al., 2006). Students seldom change the way they learn after a summative assessment, precisely because students can no longer do anything with the information it provides, especially if they pass the test (Gijbels et al., 2008; Van der Linden et al., 2023). This is in line with Leenknecht and Carless who point us to one of the key problems with these end-of-semester assessments: “One of the key identified problems is that students are often relatively passively positioned as recipients of unidirectional written feedback after submitting end-of-semester assignments, so often find teacher inputs not useful or actionable” (2023, p. 1).

The conceptions of teachers on the formative use of assessment have an influence on their classroom actions, but also the other way around. On the one hand, teachers, driven by their conceptions, go to great length to create and adjust their classroom actions to accommodate the provision of feedback. They are convinced by the necessity to convey information about students’ current performance in order to develop into professionals. On the other hand, the actions and experiences of teachers, often in collaboration with colleagues, shape their conceptions. This is in line with McInerney who states that “Perhaps, development of conceptions of assessment is a function of exposure and experience, rather than internal cognitive developmental processes” (McInerney, 2009, p. 7). Exposure and experience, in collaboration with others, seem to have a profound impact on the shaping of conceptions on formative assessment. These findings align with Yan and King (2023), who found that when teachers had colleagues who engaged in formative assessment practices, they were more likely to engage in formative assessment themselves. Tuning classroom actions by entering a dialogue with colleagues can have a large influence on teachers’ conceptions and on their classroom actions. Within one programme, conceptions developed largely due to an integral changing school policy regarding assessment and the use of feedback. In these cases, the initial perspective is that assessment itself has not changed much, but that the yields from the customary assessments are used to serve the learning process instead (or including) serving the system by collecting grades. This is not surprising because the development of conceptions depends on a mismatch with existing ways of thinking (Brooks et al., 2019, p. 422). Moreover, Darling-Hammond et al. (2009) stated that professional development tends to be more effective when it is an integral part of school policy.

When inquired, our teachers strongly believe in the potential of assessment used formative as a tool to foster SRL. However, for most teachers, both the conceptions and task conceptions focus on the formative use of assessment on the task level and on the process level but not on the SRL level. Although teachers in the psychology course deliberately used check-ins to elicit information on the process level and the SRL level, they did not consider this check-in as assessment used formatively. One exception that we encountered that used assessment in a formative manner to steer SRL was the programme that was going through an integral changing school policy regarding assessment and the use of feedback. This programme uses assessment in a way that requires students to receive mandatory feedback, including feedback on the SRL level; programmatic assessment (Schuwirth & Van der Vleuten, 2011). However, most teachers in our sample do not self-evidently consider using assessment to foster SRL. Instead, they focus on what matters to them: get students to pass exams. Therefore, the answer on the first two research sub-questions is that teachers' conceptions and task conceptions are aligned and focus on the formative use of assessment, mainly on task level. There are very few teachers that have conceptions or task conceptions that focus on fostering SRL.

Considering the classroom assessment practices, most teachers more or less assume that students have acquired the necessary SRL skills in previous education, which is striking considering the overwhelming evidence from research that this is not the case (Virtanen et al., 2015). As a result and to answer the third research sub-question, feedback attention to SRL in most of our teachers' classrooms is perfunctory at best. The provision of feedback is, although in line with their conceptions (research question four), consistently not focused at the learning process and SRL. Instead, most feedback or assessment processes are aimed at providing feedback on the task level and the determination of the attained level.

There are four reasons coming from our results that teachers' efforts are mostly aimed at the task level. The first is that teachers are not cognizant of the importance of SRL when providing students with feedback. Second, assessing SRL is not seen as necessary because it is not regarded as a goal in itself. Third, even if you were to assess SRL, doing so proves to be an arduous task and is therefore omitted. Lastly, if one would assess SRL, it would only avail students' development if all SRL assessment outcomes from different teachers and courses would coalesce, which it does not. Although resolving these issues is no mean feat, it is not impossible. Indeed, many studies have shown that training can have a significant impact towards attitudes and practices about assessment (Biwer et al., 2020b; Hui & Hui, 2021; Russell et al., 2022; Schelling & Rubenstein, 2023; Van Loon, 2014), and that there are assessment systems which focus on the continuous

development of students (Baartman et al., 2022; Bok et al., 2021; Heeneman et al., 2015; Jamieson et al., 2021; Schut et al., 2020; Van der Vleuten et al., 2014). However, the question may arise as to why these solutions are not commonly implemented. Although the feedback on the SRL level might not seem as a drastic change, the formative use of assessment to provide continuous feedback on the SRL level is in fact a drastic alteration of education. This is because this feedback is aimed at the development of students rather than the determination of the attained (task) level, which is far more common in literature (Airasian, 1997; Brooks et al., 2019) and in our teachers' classroom assessment practices.

Limitations and Further Directions

There are limitations to our study that need discussing. First, the sample that we took was limited due to the qualitative nature of the study and because we restricted ourselves to teachers from one university. The latter was a consequence of our design choice of a purposive sampling strategy. We utilised our network to obtain a sample of teachers who were accustomed to using assessment in a formative manner. Therefore, causal conclusions cannot be readily drawn. We invite researchers to conduct analytic studies (preferably with control and experimental conditions) to establish relationships and strengthen our knowledge about the use of assessment to foster SRL. Another example of studies is participatory design studies, which are suitable for developing ecological valid understanding about teacher guidance of SRL (Stokhof & Van der Linden, 2023). A second limitation is that we studied the conceptions and task conceptions of teachers and their reported classroom assessment practices from a teachers' point of view. We already addressed that some teachers did not consider all practices that fostered SRL as assessment, for example, check-ins. We recommend future research to take an observational approach and study the use of assessment to foster SRL in the classroom.

Because one of the programmes we encountered seemed to actually foster SRL due to an integral changing school policy regarding assessment and the use of feedback, it would be interesting to study the influence of such integrally applied policies.

Practical Implications

As mentioned in the introduction, we since long know from literature that SRL can be developed through formative assessment practices. This study shows that the knowledge on how to foster SRL through the formative use of assessment is not common among our sample of higher education teachers. The practical implications follow from the

above and focus mainly on teachers' skills to enable and encourage students' development of SRL, and on what policymakers can do to widen teachers' knowledge about the potential of assessment as a tool to promote SRL. Literature refers to these skills and knowledge as assessment literacy (Meijer et al., 2023). Teachers' assessment literacy affects the quality of assessments and thus teachers' influence on students' learning and motivation to improve their performance (Andrade & Brookhart, 2016). Roscoe and Craig (2022) provide a framework with two fundamental principles to facilitate SRL: the Platform Principle (i.e., tools and features to engage in planning and monitoring) and the Support Principle (i.e., scaffolds for strategies, motivation). The self-determination theory (Deci & Ryan, 2011) posits that motivational orientations are formed through dialectic interactions between people and the contexts in which they function (Brenner, 2022; Reeve, 2009). Therefore, teachers can be motivated to use assessment formatively to foster SRL by encouraging these dialectic interactions, which then functions as a tool. Using approaches to foster SRL which go beyond individual teachers also merit consideration. A programme committed to using assessment to foster SRL might aim to embed this policy integrally across a sequence of courses, availing students and teachers to develop SRL in partnership. This suggestion aligns well with programmatic approaches to assessment used formatively and the use of feedback to promote learning (Schut et al., 2020; Van der Steen et al., 2023).

Conclusion

Despite their conceptions on the importance of fostering SRL when inquired, most teachers are not used to provide feedback on the process level or on the SRL level. They are neither cognizant nor able to do so. They do, however, see the need and the benefits when inquired. Our recommendation is to investigate how to raise awareness of the importance of providing feedback on the SRL level in order to address the current inability to provide adequate educational support.

Acknowledgements We would like to thank the teachers who participated in this study. Additional thanks goes to Marja van der Linden for her meticulous text revisions and to Bauke van der Linden and Harry Stokhof for their continuous substantive discussions and proofreading. We also gratefully acknowledge the financial support from HAN University of Applied Sciences, which made this research possible.

Author Contribution JvdL, TvS-M, LN and CvdV contributed to conception and design of the study. JvdL and TvS-M contributed to qualitative analysis and analysed and coded qualitative data, which was discussed in iteration with the whole team until results became clear. JvdL, CvdV and TvS-M wrote sections of the manuscript. LN provided directions for the clarity and alignment in writing the article. All authors contributed to the article and approved the submitted version.

Funding Financial support from HAN University of Applied Sciences made this research possible.

Data Availability The datasets presented in this article are not readily available because permission to make the raw data available was not obtained. Requests to access the datasets should be directed to j.vanderlinden@maastrichtuniversity.nl.

Declarations

Ethics Approval The studies involving human participants were reviewed and approved by Ethical Research Committee of the HAN University of Applied Sciences, approval no. ECO 371.05/22. The patients/participants provided their written informed consent to participate in this study.

Competing Interests The authors declare no competing interests.

Current Themes of Research Jeroen van der Linden: assessment, learning, self-regulated learning and teacher training in education. Tamara van Schilt-Mol: assessment, learning and teacher professionalisation in (higher) education. Loek Nieuwenhuis: expertise development and work-based learning. Cees van der Vleuten: learning and programmatic assessment in medical higher education.

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