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Feedback to support learning: changes in teachers’ practice and beliefs

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There are indications that teachers’ feedback practice is related to beliefs they hold about pupils’ learning and the purpose of feedback. This article presents changes in beliefs and practices of three teachers in lower secondary school taking part in an intervention to improve formative classroom feedback. Data includes interviews, observations and workshop dialogues with the teachers, plus interviews with six pupils (two for each teacher) taking place pre- and post-intervention. Results describe different trajectories, tracing changes in underlying beliefs that highlight the complexity of professional learning as well as the importance of tailoring interventions. The discussion addresses theoretical perspectives of change among teachers and elaborates on results in relation to professional workplace learning.

Keywords: instructional feedback; assessment; professional learning; teacher beliefs; formative assessment

Introduction

Assessment for Learning (AfL) and formative feedback are found to be particularly effective in promoting learning because good feedback encourages evaluation of an educational activity and provides information on both teaching and learning (Black and Wiliam 2009; Sadler 1989; Wiliam and Leahy 2007). Several researchers argue that feedback has one of the most powerful influences on learning and achievement when promoted in the service of supporting pupils’ academic needs (Black and Wiliam 1998a; Hattie and Timperley 2007; Sadler 1989; Shute 2008). Formative feedback is a hinge that joins teaching and learning (Pollock 2012), but the provision and use of feedback appears to be one of the more difficult tasks of teaching. Teachers are struggling with the content, timing and relevance of feedback (Black and Wiliam 1998b; Harris, Harnett, and Brown 2013; OECD 2011). Although there is evidence that teachers can learn to use AfL in their daily classroom practice (Ayala et al. 2008; Black et al. 2003; Wiliam et al. 2004), changing feedback practice from summative to formative seems to be difficult (Clarke 2000; Hawe, Dixon, and Watson 2008; Stobart 2008).

Teachers’ feedback practice relates to beliefs they hold about pupils’ learning and the purpose of feedback in learning activities (Askew and Lodge 2000; Ayala et al. 2008; Hargreaves, McCallum, and Gipps 2000). There are indications that classroom feedback to support pupils’ learning decreases from 5th to 13th grade...
(Furre et al. 2006; Wendelborg, Røe, and Skaalvik 2011). And, that teachers seldom provide the types of feedback interventions identified as effective to improve learning and development (Engelsen and Smith 2010; Harris, Harnett, and Brown 2013; Lee 2008; Voerman et al. 2012). A call for research with specific attention to teachers’ practice and conceptual understanding of the purpose of feedback in instructional systems is required (Hattie and Gan 2011).

The aim of this study is to contribute to a greater understanding of lower secondary school teachers’ perceptions and practices on classroom feedback, and how this might change during an intervention study built on professional learning (Borko 2004; Timperley 2011; Timperley et al. 2007). The intervention has the objective of improving classroom feedback and of investigating changes in perceptions and practice of formative feedback in learning activities. Within this paper, feedback is defined as ‘information provided by an agent (e.g., teacher, peer, book, parent, self, experience) regarding aspects of one’s performance or understanding’ (Hattie and Timperley 2007, 81) with the aim to support further learning and development (Sadler 1989).

Three teachers and six pupils (ages 13–15) of these teachers, in a lower secondary school in Norway, are the subjects of this paper taking part in an intervention study (2009–10). The research questions guiding this study are: How do teachers perceive the purpose of feedback in learning activities in class? What changes in beliefs and practices concerning feedback to support pupils’ learning can be made through an intervention over a school year?

**Professional learning for establishing formative feedback in classrooms**

Practicing teachers continue to learn about teaching and assessment in many ways throughout their professional careers, and professional learning is strongly shaped by the context in which the teacher practices. Teachers learn from reflection on their own practice, through their interactions with other teachers and external expertise (Borko 2004; Hill 2011; Timperley 2008). Teachers’ moment-by-moment decisions about learning activities are shaped by multiple factors such as teachers’ knowledge and their beliefs about what is important to teach, how pupils learn and how to manage pupil behavior and meet external demands (Desimone 2011; Timperley 2008). Daily experiences in teachers’ contextualized practice shape their understandings, and their understandings shape their experiences. The engagement of external expertise might therefore become necessary because substantive new learning requires teachers to understand new content, learn new skills and think about their practice (e.g. feedback) in new ways. External expertise can present teachers with new possibilities, challenge the social norms by which teachers operate, wherever these norms constrain professional learning, and keep the focus on pupils and their learning (Borko 2004; Desimone 2011; Pedder and James 2012; Timperley 2008, 2011).

Asking teachers to incorporate new feedback practice is not a straightforward matter, any more than it is for their pupils. Professional learning does not easily occur because of external regulations, it depends more on the extent to which the individual teacher experiences a need for change (Smith 2011). The belief that more expertise input will lead to a change of beliefs and a change in practice, fails to support professional growth (Fullan 1991; Smith 2011). Real changes involve transformations in classroom practices, not only in content but also in learning processes. Transforming processes, roles and relationships are a necessary condition for the
development of feedback practice as a genuine endeavor involving teachers and pupils individually and collectively as agents advancing the quality of learning (Hattie and Timperley 2007; Pedder and James 2012).

Teachers’ learning has different orientations based on teachers’ own values concerning the learning process (Pedder and Opfer 2012). Processes are more/most likely to support shifts in professional learning when they provide opportunities that are collaborative, contextualized in classroom practice, involve reflection and experimentation, emphasize applied practice-based knowledge about teaching and learning, and have a conceptual and practical coordination or coherence across programs and activities (Borko 2004; Pedder and Opfer 2012; Timperley 2008, 2011; Timperley et al. 2007).

When teachers and pupils use assessment information for supporting improvements in learning, they are fulfilling the educational purposes of assessment (Black and Wiliam 2009; Pedder and James 2012). Developing skills for effective use of formative feedback as a support for learning is essential for teachers and their pupils. Knowledge about classroom feedback, and how it influences learning, is relatively new. Many teachers have not yet had an opportunity to learn about the latest in this field, but are expected to change their practices. One of the most persistent threats to teachers’ professional learning in formative assessment is that it is conscripted to support the demands of summative assessment, as in the claim that regular test practice and monitoring scores are formative (Stobart 2012).

Recommendations on how to support the necessary changes involve starting with teachers’ current belief and practices, allowing each teacher to find his or her own way of incorporating the lessons and ideas that are set out into her or his own patterns of classroom work (Black et al. 2003; Hayward and Hedge 2005; Hill 2011). If teachers are committed to engaging in the risky business of problematizing their own practice, seeking evidence to evaluate in order to judge where changes are needed, and then acting on their decisions, they are thus engaging in assessment for learning processes with respect to their own professional learning (Hill 2011; Pedder and James 2012; Timperley 2011). Hence, teachers’ professional learning is a key condition for establishing and embedding AfL and quality feedback to support pupils’ learning in classrooms (Pedder and James 2012; Smith 2011).

Professional learning is essential to support teachers’ re-conceptualization (Ayala et al. 2008; Pedder and James 2012; Timperley 2011), and external expertise is necessary to challenge existing assumptions and develop the kinds of new knowledge and skills associated with positive outcomes for pupils (Desimone 2011; Timperley 2008). Timperley (2011) states that teachers cannot achieve the kinds of deep changes in mindsets and practices required for successful implementation of formative assessment on their own, and that external expertise is needed.

**Assessment for Learning and feedback in classrooms**

Assessment for Learning can be understood as a set of skills and activities that are undertaken by teachers to provide feedback to enhance teaching and pupil learning (Black and Wiliam 1998a). Assessment functions formatively when evidence about pupil learning is elicited, interpreted and used by teachers, learners or their peers to make decisions about further steps that are likely to improve performance and the learning process (Wiliam 2011; Wiliam and Leahy 2007). Black et al. (2003) find that well-developed content knowledge is a necessary precondition for AfL practices...
if teachers are to interpret the responses of their pupils, ask good questions, provide quality feedback that focuses on what pupils can do to improve, and adapt their teaching with the aim of supporting pupils’ learning.

A goal for feedback practice in AfL is the improvement of pupil learning. To reach this goal, teachers will need to provide embedded feedback in learning activities and take advantage of the ‘moments of contingencies’ elicited for building pupils’ learning (Black and Wiliam 1998a, 2009). Hattie and Timperley (2007, 87) have made a model for how feedback can reduce the discrepancies between current understandings/performance and a desired goal. In this model, effective feedback answers three questions: Where am I going? How am I going? Where do I go next? Each of these questions works at four levels (task, process, self-regulation and self), each of which should be used to move learning forward.

Several researchers have proposed how feedback can support learning. Feedback must be an integral part of the teaching and learning process (Andrade 2010; Black and Wiliam 2009; Hattie and Gan 2011; Hattie and Timperley 2007; Sadler 1998), and be understandable to the receiver (Black and Wiliam 1998b; Ramaprasad 1983; Sadler 1989, 1998). The receiver must be allowed to act upon the feedback (refine, revise, practice and retry) (Sadler 1998; Wiggins 1997), and the feedback should cause pupils to think (e.g. reappraisal, planning) (Black and Wiliam 2009; Perrenoud 1998; Wiliam 2011). Furthermore, feedback should be linked to learning goals (Hattie and Timperley 2007; Locke and Latham 1984; Sadler 1989, 1998).

Not all kinds of feedback are effective supports for learning (Hattie and Timperley 2007; Kluger and DeNisi 1996). Evaluative feedback such as scores, person-focused praise, reward or punishment are found to preclude learning (Dweck 2008; Hattie and Timperley 2007; Kluger and DeNisi 1996). Feedback, like grades and scores, allow learners to compare their performance with their peers’. Such feedback seems to reduce volition strategies, which mean metacognitive knowledge to interpret strategy failure and knowledge of how to buckle down to work (Boekaerts and Corno 2005). Researchers regard volitional engagement as essential if a learner is to remain persistent and overcome threats to self-esteem (Black and Wiliam 2009; Boekaerts and Corno 2005). Pupils who, for example, repeatedly receive low grades/scores come to believe that they cannot succeed, and tend to disengage from learning (Stiggins 2007). When teachers praise the process, pupils understand that learning is valued (Dweck 1986, 2008; Hattie and Timperley 2007). Through descriptive feedback that focuses attention on improvement, everyone can succeed, because everyone can improve (Black et al. 2003).

Teachers seem to be surprised to learn that the effect of giving both grades and comments is the same as that of giving grades alone (Butler 1987; Wiliam 2011). Results from Butler’s study (1987) show that if teachers are providing quality feedback and then putting a grade on the work, they are wasting their time. Even though teachers are almost certain that grades draw pupils’ attention away from teacher feedback, they continue to give grades (Lee 2008). Summative assessment, as represented in grades, is mainly a documentation of pupil achievement, and is used for school accountability (McMillan 2007). The purpose and the characteristics of AfL are different from those of summative assessment and the two assessment practices might clash or come into conflict. Nevertheless, it is necessary to state that summative assessment can enhance classroom learning if the information elicited is used formatively (Black et al. 2011).
There are differences between oral and written feedback. Brookhart (2008) argues that the teacher has less time to make decisions about how to say something when s/he does it (i.e. something) orally compared to giving written feedback. This might influence teachers’ information about a pupil’s work in terms of strengths and aspects for improvement when feedback is oral. Black and Wiliam (2009, 17) mention this ‘prognostic in choosing the optimum response’. It involves complex decisions, often to be taken with only a few seconds available. Oral feedback involves all the word-choice issues that written feedback does, but it also includes some unique issues (Brookhart 2008). Some of the uniqueness lies in its capability to provide room for clarification, its ability to expose misconceptions and to avoid them by making sure that the feedback provided is understood, and in its ability to build learning from dialogue. Questions teachers might have to ask are where and when they should give oral versus written feedback, and what to say to bridge the gap between present performance and desired goal (Sadler 1989). Another issue is that the quality of teachers’ instructional feedback seems to be dependent upon pupils’ level of achievement (Black and Wiliam 1998b; Engelsen and Smith 2010). Low achievers seems to get more general feedback as ‘Well done!’ and ‘Very good!’, a kind of feedback that provides little information about the qualities of the work and what to do to improve, while high achievers receive more specific feedback related to task and process (Engelsen and Smith 2010).

Finally, the social context is found to be critical when promoting feedback (Hattie and Timperley 2007). A positive relationship in the classroom is based on the teachers’ willingness to care about all the pupils, their capability to show interest in the individual and his/her situation, and their ability to be supportive and have expectations about development (Rakoczy et al. 2008). The power of feedback is found to lie not only in when and how it is given (Hattie and Timperley 2007), but also in when and how it is received (Cowie 2005; Hattie and Gan 2011; Waldrip, Fisher, and Dorman 2009). Learners (teachers and pupils) need to know what to do, and have the will to work, to be successful in the classroom (Boekaerts and Corno 2005; Hill 2011; Pedder and Opfer 2012; Sadler 1998).

**Teachers’ beliefs and practice in instructional feedback**

The majority of feedback studies address the act of teacher feedback per se, and less is known about teachers’ beliefs and the extent to which their beliefs translate into practice. Askew and Lodge (2000) say that teachers’ beliefs about instructional feedback have been described as falling mainly into two categories, either as a ‘gift’ or as ‘collaborative work’. When feedback is perceived as a gift, it is something the teacher gives her/his pupil(s), e.g. written comments or a grade. There is no expectation that the pupils take part in developing an understanding of what feedback is necessary, or that there is a need for them to use feedback actively in their own learning process. Feedback as ‘collaborative work’, on the other hand, involves just that. These teachers engage their pupils in dialogue, investigate how their pupils think and understand so that they can better support the development of understanding, and function as scaffolding as their pupils become active learners who learn to set their own goals and assess their learning and needs (Andrade 2010; Butler and Winne 1995; Hattie and Timperley 2007; Sadler 1998).

The study of teachers’ conceptions of assessment is important because evidence exists that teachers’ conceptions of teaching, learning and curricula strongly
influence how they teach and what pupils learn or achieve (Brown 2004). Hargreaves, McCallum, and Gipps (2000) conducted a study where they examined how teachers’ beliefs affect their feedback practice and found that teachers who believed in a transmission model of teaching were more likely to construct evaluative feedback, whereas those working from a constructivist viewpoint were more likely to use descriptive feedback strategies. Watkins (2000) finds feedback between teachers as oriented towards judging the performance of the other, and less on learning competencies. The person giving feedback appears to take on a responsibility for the other person’s development, especially if they also start to set targets for the other person to achieve, and the receiver in turn is not understood as an active participant (Watkins 2000).

The possibility for change in practice and beliefs is illustrated in a study by Pegg and Panizzon (2007–08), who found that discussions about assessment moved from being focused on summative end-of-topic tests to the importance of gauging pupils’ understanding on a daily basis. Black et al. (2003) state that for change of assessment practice it is important to emphasize the critical criterion; formative assessment is a process in which information about learning is evoked and then used to modify the teaching and learning activities in which teachers and pupils engage. Teachers who learn to emphasize formative assessment seem to change their underlying beliefs about what counts as ‘good teaching’, since their focus is less on teaching and more on the learning in their classroom (Black et al. 2003).

A study on mismatches between teachers’ beliefs and written feedback practice has been conducted by Lee (2008). The study reveals a number of gaps between teachers’ beliefs and practice in written feedback, which teachers may or may not be aware of. The results demonstrate that although teachers think pupils should learn to locate and correct errors, their written feedback practice does not often allow this to happen. Lee also finds that teachers respond mainly to weaknesses in pupils’ writing, although they know that feedback should cover both strengths and weaknesses. Lee also reveals that teachers adopt a product-oriented approach although they are aware of the benefits of process pedagogy: they ask pupils to do one-shot writing although they think process writing is beneficial. Another result is that teachers give grades even though they are aware of the harm that can be done to pupils’ learning process by using grades instead of descriptive feedback as comments (Lee 2008).

Teachers’ existing beliefs can function as constraints and increase the need for support when developing new practices. Teachers with initial beliefs that are more in line with the theories presented for making improvements are more inclined to further change, develop and improve in the same direction (Opfer and Pedder 2011; Pedder and Opfer 2012). It can be difficult to expand repertoires of assessment from summative to formative, and the strength of teachers’ summative assessment practices may defeat the purpose of the formative embedded assessments (Ayala et al. 2008).

This paper builds on the research studies above with the aim to contribute to further understanding of teachers’ beliefs and practices on providing formative feedback in learning activities, and how beliefs and practices can change during an intervention over a school year. The research questions to be answered in this paper are: How do teachers perceive the purpose of feedback in learning activities in class? What changes in beliefs and practices concerning feedback to support pupils’ learning can be made through an intervention over a school year?
Participants, methods and analyses

The study contains a sample of three practicing lower secondary school teachers taking part in an intervention (without control groups) over a school year (2009–10) to improve formative feedback practice. In addition six pupils were selected for interviews – two for each teacher. Changed teaching practice should ultimately lead to challenging pupils with new learning experiences (Smith 2011; Timperley et al. 2007). What impact the changed feedback practice has on pupils as learners will be examined by conducting pre- and post-interviews of the intervention study with these pupils.

The selection of participants (teachers and pupils) was a purposeful selection (Maxwell 2005). All three teachers (Lisa, Ann and Tom, all pseudonyms) volunteered to take part and were interested in learning more about feedback. Like the majority of Norwegian teachers, they have more than 10 years of teaching experience, and they teach in classes of 20–29 pupils. They teach at the same rural lower secondary school, which has 350 pupils covering 8th, 9th and 10th grade (pupils are 13–16 years old). Lisa is between 40–45 years old and teaches Mathematics, English Language Arts and Music. Anne is between 45–50 years old and teaches Norwegian Language Arts, Social Studies, and Christian Knowledge and Religious and Ethical Education. Tom is only a few years away from retirement, and teaches Mathematics, Music and Physical Education.

The pupils were selected randomly from a larger group of volunteers with parental consent to participate. They were drawn based on their level of engagement in learning activities as perceived by teachers (one pupil = high engagement [HE], one pupil = low engagement [LE]). Adding pupils’ voices provided an additional perspective on classroom feedback practice and enabled analyses of whether and how a change in classroom feedback practice over the intervention study was perceived by the pupils.

The objective for the intervention was to improve teachers’ feedback practice and to investigate changes in beliefs and practice in formative feedback. The design of the intervention was built on a professional learning model (Timperley 2011; Timperley et al. 2007, xliii) which was used as a knowledge-building cycle with the teachers (see Figure 1). The knowledge-building cycle was implemented over a two-month period, and was re-engaged three times (three cycles) during the intervention study, as the intervention lasted for six months. Each cycle was structured by three levels: (1) a two-hour common workshop for all teachers participating, (2) teachers trying out new ideas: videotaping teachers’ lessons, and (3) an individual workshop for teachers with video-stimulated reflective dialogues (Moyles, Paterson, and Kitson 2003).

The knowledge-building cycle held five dimensions, which were systematically introduced throughout the cycle. Each knowledge-building cycle started with a common workshop where the teachers and the researcher focused on the first of the five dimensions: how to determine what knowledge and skills pupils have and need for further improvement. And how classroom feedback can assess and improve learning by providing information to bridge the gap between what pupils know and can do, and what they need to know and do to master it (satisfy the requirements of the curriculum).

Deciding what kind of knowledge and skills the teachers need for promoting and improving instructional feedback to support learning, was the second dimension
discussed in the knowledge-building cycle. Here teachers were asked to (try to) identify what it is they need to know and do to be more effective in the areas of pupil needs when providing instructional feedback (see Figure 1). At this point, theory on formative assessment (AfL) and principles of good feedback practice (Nicol and Macfarlane-Dick 2006) were introduced to the teachers, and further elaborated on by the teachers and the researcher. The researcher used an approach suggested by Wiliam et al. (2004): directions that might be fruitful to explore were suggested, and teachers were supported in their discussion and choice, but the researcher avoided the trap of dispensing tips as to what would be ‘best practice’ for teachers. The theoretical emphasis where directions for development were laid down was given by referring to research by several acknowledged researchers in the field: Black and Wiliam (1998b, 2009), Dweck (2007, 2008), Engelsen, Eide, and Meling (2009), Hattie and Timperley (2007), Nicol and Macfarlane-Dick (2006), Shute (2008), Smith (2007) and Tveit (2009). These above articles and/or synopses were also handed out to the teachers at the second common workshop, after an introduction by the researcher.

Four recurring questions drawn from analysis of pre-observations in classrooms and pre-interviews with teachers and pupils prior to the intervention were used throughout the intervention study for teacher inquiry and knowledge building on formative feedback practice in the classroom. These recurring questions were: (1) To what extent is your feedback aimed at pupils’ learning? (2) What do you stress when you provide feedback in the classroom? (3) Are there differences in feedback you provide for diverse pupils? (4) How is feedback used by the pupils and you as a teacher? These questions had the objective to build awareness of a dissonance between

Figure 1. Teacher inquiry and knowledge-building cycle for improving instructional feedback (based on Timperley 2011; Timperley et al. 2007).
practice, research on AfL and feedback, and the participating teachers’ beliefs about feedback to support learning (dimension 3 in the knowledge-building cycle).

Classroom observations were videotaped by the researcher between three and five weeks after each common workshop, and in this period teachers practiced practical techniques and engaged their pupils in new learning experiences through the use of formative embedded feedback (dimension 4). At this point teachers, in partnership with the researcher, had identified important practices to develop, and the purpose of the experimentation and observations focused on enhancing the teachers’ (and pupils’) capability to use, reflect upon and answer the assessment questions: ‘Where am I going, How am I going, Where to next?’ (Hattie and Timperley 2007; Sadler 1989; Timperley 2011). Through this process, teachers’ engagement in professional learning was driven by an understanding of what it is they need to learn and do when providing feedback that moves learning forward.

The fifth and last dimension in the knowledge-building cycle was to reflect if there had been a change in classroom feedback practice and, if so, what the impact of the changed actions had been. Video recordings and video-stimulated reflective dialogues (VSRD) were used as tools for professional learning by studying teachers’ classroom practice and how pupils respond to new practices. Each individual VSRD workshop lasted for one hour. The teacher together with the researcher studied sequences from their recorded lessons to identify successful feedback practice and important issues to develop.

Data collection for analyzing teachers’ changes in practice was conducted throughout the whole research project: prior to the intervention (classroom observations and pre-interviews), during the intervention (dialogues during the common workshops, observations of lessons and VSRD) and at the completion of the intervention (post-interviews). Furthermore, a closer description is given.

**Pre-intervention data**

Two video recordings of lessons (about 45 minutes each) for each teacher (October) were used to inform the intervention as well as the pre-interviews for teachers and pupils. Individual semi-structured pre-interviews (Kvale 2001) were conducted with the pupils (N = 6) and teachers (N = 3) at the outset of the intervention study. The pre-interviews (Oct/Nov) lasted from 51 to 57 minutes (M = 54 minutes) with the teachers, and from 24 to 45 minutes (M = 36 minutes) with the pupils. Interview questions with teachers and pupils focused on how they perceived feedback in classroom, what kind of feedback was given, when feedback was given and by whom, how feedback was used for further learning, and what feedback they perceived as useful for support of learning. All pre-interviews were transcribed verbatim.

**Intervention data**

Dialogues from three common workshops (two hours each) for the teachers (January, March and May), observations of lessons (video recordings) during each knowledge-building cycle with the teachers (five lessons each teacher) and individual VSRD workshops with each teacher (January/February and April/May) were the process data for this study. Video recordings of lessons throughout the intervention were used to analyze feedback practice and trace changes, and all common workshops and VSRD were transcribed verbatim.
Post-intervention data

After three knowledge-building cycles, over a six-month period, individual semi-structured post-interviews were conducted with teachers and pupils (June). The interviews were conducted to ascertain the participants’ reports of changes in their beliefs and practices over the intervention study of providing and using feedback that moves learning forward. Interviews lasted from 49 to 111 minutes ($M = 76$ minutes) with the teachers, and from 34 to 59 minutes ($M = 44$ minutes) with the pupils. Post-interviews were transcribed verbatim for analysis.

All data was analyzed from a person and content approach (Thagaard 2009). Inductive coding was used. Inductive codes are defined as codes that are generated by the researcher by directly examining the data during the coding process (Johnson and Christensen 2011). Pre- and post-interviews with teachers were analyzed based on how they perceived feedback as support for pupils’ learning and what they emphasized when giving and seeking feedback. The pupil interviews were analyzed to extract what type of feedback was given during learning activities by their teacher, if there were some changes in classroom feedback practice during this last semester and, if so, how these changes were perceived as support for further learning. Video recordings of lessons were content analyzed and used to trace practical changes in feedback practice.

Data were analyzed according to five inductive categories derived from teachers’ beliefs on the purpose of feedback in learning activities: the purpose of feedback, feedback content (types), timing of feedback, relationships to pupils, and learning target(s)/aim(s). These categories were further classified into variables (see Table 1).

Teachers’ beliefs about ‘Purpose of feedback’ were coded into four variables. The variable ‘control’ (monitoring) was used when feedback was understood to monitor performance and achievement, while the variable ‘documentation’ was used when the purpose of feedback was understood as a means to collect documentation about performance and achievement based on a rationale that indicates strengths or

<table>
<thead>
<tr>
<th>Category</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose of feedback</td>
<td>Control (monitor performance, achievement)</td>
</tr>
<tr>
<td></td>
<td>Documentation (pupil performance, achievement)</td>
</tr>
<tr>
<td></td>
<td>Motivation (intrinsic, mastery oriented; extrinsic, performance oriented)</td>
</tr>
<tr>
<td></td>
<td>Support learning (improvement, development)</td>
</tr>
<tr>
<td>Feedback content (type)</td>
<td>Evaluative (grades, correctness)</td>
</tr>
<tr>
<td></td>
<td>Specifying attainment and improvement (task, process, self-regulation)</td>
</tr>
<tr>
<td></td>
<td>Effort regulation (approval, disapproval of effort)</td>
</tr>
<tr>
<td></td>
<td>Praise (person, task, process focused)</td>
</tr>
<tr>
<td>Timing of feedback</td>
<td>During assignment/instruction (when in process, learning activity)</td>
</tr>
<tr>
<td></td>
<td>After assignment/instruction (when task, assignment is completed)</td>
</tr>
<tr>
<td>Relationship to pupils</td>
<td>Emotional support (having interest for the individual, well-being)</td>
</tr>
<tr>
<td></td>
<td>Instructional support (having expectations about learning improvement)</td>
</tr>
<tr>
<td>Learning targets/aim</td>
<td>Learning goal(s) (what pupils are/will be learning)</td>
</tr>
<tr>
<td></td>
<td>Activity goal(s) (what pupils are/will be doing)</td>
</tr>
</tbody>
</table>
weaknesses of the work. The variable ‘motivation’ (mastery or performance oriented) was used when the purpose of feedback was understood as an aim to enable pupils to gain and develop motivation to work on, add further effort in the work and give the pupils an experience of being seen by the teacher. The fourth variable for the purpose of feedback, ‘support learning’, was used when the purpose of feedback was understood by a teacher as an activity to enable pupils to use feedback information to improve and shape further learning, and increase achievement.

The category ‘Feedback content’ (type) was sorted into four variables; evaluative (grades, points, evaluative comments given after performance which can be understood as summative assessment), specifying attainment and improvement (task, process, self-regulation), effort regulation (approval/disapproval of effort) and praise (person, task, process focused). Person-focused praise can be seen as ego-involved feedback, and according to research might preclude learning (Dweck 1986, 2007; Hattie and Timperley 2007). The feedback type ‘specifying attainment and improvement’ with its three sub-nodes (task, process, self-regulation) aligns with research by Hattie and Timperley (2007). The category ‘Timing of feedback’ was divided into two categories: during assignment and after assignment. ‘Relationships to pupils’ was coded as emotional support and instructional support. The last category, ‘Learning targets/aim’, was divided into two variables: communicating learning goal(s) and communicating activity goal(s). These five categories and variables were used throughout the intervention study to monitor changes in teachers’ beliefs and practice of feedback to support learning in learning activities in classrooms.

The data set contains a rather extensive amount of data, but the selection of only three teachers and six corresponding pupils made it possible to conduct an intensive intervention to map these teachers’ beliefs and practice of feedback in classrooms, and their change processes of feedback practices through an intervention built on professional learning (Timperley 2011; Timperley et al. 2007).

Results – changes in beliefs and practice of feedback to support learning

An overview of the teachers’ changes in perceptions and practices of instructional feedback in the classroom to support pupil learning over the intervention is found in Table 2, which charts the teachers’ beliefs and practices both prior to and after the intervention study. Descriptions of teachers’ changes will further be presented separately. Pupils’ voices are added to each teacher to identify pupils’ perceptions of classroom feedback provided and to elicit if there are any changes in the feedback practice during the last semester (intervention study). Following this, the discussion will address theoretical perspectives on conceptual and practical changes in instructional feedback practice among teachers and also in relation to professional workplace learning in schools.

Lisa

Lisa starts out with beliefs that feedback in learning activities has the purpose of monitoring performance and documenting achievement at the end of an instructional segment, that receiving grades is a motivator for persistence and that her role is to monitor and control pupils’ performance (see Table 2). The feedback Lisa stresses in class during the outset of the intervention consists of giving grades, correcting tasks and offering personal approval feedback (person-focused praise). Lisa says
Table 2. Teachers’ changes in perceptions and practices of formative feedback; before and after intervention.

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Purpose of instructional feedback</th>
<th>Feedback content (type)</th>
<th>Timing of feedback</th>
<th>Relationship to pupil(s)</th>
<th>Communicating learning target(s); aim</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lisa</td>
<td>Control; monitor performance.</td>
<td>Evaluative; grades, correctness. Effort regulation. Person-focused praise.</td>
<td>After assignment; instruction.</td>
<td>Emotional support given to low achievers.</td>
<td>Communicate activity goal(s).</td>
</tr>
<tr>
<td></td>
<td>Documentation of achievement.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>Feedback as extrinsic motivation; grades will motivate for learning.</td>
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<td>Feedback as intrinsic motivation; mastery-oriented feedback will motivate for learning.</td>
<td>Specifying attainment and improvement on task and process.</td>
<td>During and after assignment; instruction.</td>
<td>Instructional and emotional support for all pupils.</td>
<td>Communicate learning goal(s).</td>
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<td>Anne</td>
<td>Control; monitor achievement.</td>
<td>Evaluative; grades, correctness. Effort regulation. Person-focused praise.</td>
<td>After assignment; instruction.</td>
<td>Emotional support.</td>
<td>Communicate activity goal(s).</td>
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<td>Specifying improvement on task.</td>
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<td>Tom</td>
<td>Support learning.</td>
<td>Specifying attainment and improvement on task. Effort regulation. Person-focused praise.</td>
<td>During and after assignment; instruction.</td>
<td>Instructional and emotional support given to low achievers.</td>
<td>Communicate activity goal(s).</td>
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<td>June 2010</td>
<td>Specifying attainment and improvement on task, process, self-regulation. Task- and process-focused praise.</td>
<td>During and after assignment; instruction.</td>
<td>Instructional and emotional support for all pupils.</td>
<td>Communicate learning goal(s).</td>
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person-focused praise is especially important for those pupils who get low grades, ‘they need approval for something’ (Lisa, Nov 2009).

In the individual pre-interview, Lisa’s HE pupil says she gets evaluative feedback, approval and cues for improvement, while the LE pupil says that he mostly gets told that he is clever (person-focused praise), but that he would prefer to know what to improve. The pupils do not mention grades as a motivator, but say that feedback specifying improvement is mostly given too late to support their performance.

During the intervention study, Lisa comes to believe that classroom feedback should support learning – and not just document achievement – and starts providing feedback which specifies improvement and which is embedded in learning activities during both the task and the process. The change in beliefs generates new dimensions in Lisa’s feedback practice. Lisa becomes aware of instructional support, feedback content (e.g. her use of person-focused praise to the low-achieving pupils – and the disengaged pupils), timing, the adjustment cycle, the need to communicate learning intentions and how feedback might become a tool to improve her teaching for support of pupils’ learning. The VSRD workshops become important for Lisa’s re-conceptualization. By studying her own practice (video) in relation to presented theories, she becomes aware of her interaction practice with her pupils and finds that she seldom builds on the pupils’ responses, their background knowledge or misconceptions. Her feedback practice is geared more to evaluation of responses/giving ‘the right’ answers, than supporting the pupils’ learning and thought processes.

In the individual post-interview, Lisa’s pupils describe how her feedback practice has changed during the semester. Both pupils express that her feedback is now more targeted towards what they should do to improve learning than it was during the fall semester. ‘I now get told what I need to practice more, and what I need to learn better’ (HE pupil, June 2010). Lisa provides feedback more often than earlier, and her pupils believe this is to make sure they will understand the task. If an assignment (task) is not understood, Lisa now explains it during lessons. ‘Lisa gives me feedback which helps me to achieve better and to increase understanding. We don’t always get grades any longer, just comments. Still, I believe that the grade will improve if we use the feedback’ (LE pupil, June 2010). Lisa’s pupils say they find the feedback practice to have become embedded in the learning activities. ‘Feedback is provided while I’m on task, informing what can be improved. Earlier I got these messages when I had completed the task’ (HE pupil, June 2010).

Anne

Anne starts out with belief that the purpose of feedback in learning activities is to monitor and assess pupil achievement. She explains that a part of her job is to monitor pupils’ achievement and give grades. Ann says that she believes grades will motivate her pupils to work on the assignments, and that emotional support needs to be given during work, while feedback on strengths and weaknesses of performance needs to be given at the end of an instructional segment (see Table 2).

Anne’s pupils explain how the feedback is perceived; ‘Feedback in learning activities is mostly written and given too late – when work is finished’ (HE pupil, Nov 2009). ‘Oral feedback from Anne is mostly approval of effort if I have worked out of the ordinary or if homework is completed’ (LE pupil, Nov 2009). They both say they would like to receive more embedded feedback that moves learning forward, and that the written feedback provided is useless since it is given too late.
Anne remains consistent in her belief that the purpose of instructional feedback is to monitor and record pupils' learning and says she has not changed practice much over the intervention. However, video analysis shows that she develops her feedback practice to become more task related (less person-focused praise), more individual oriented (less group oriented), and increases use of feedback related to learning goals. In the post-interview Anne says the main purpose of feedback is to evaluate pupils’ work, and make sure that pupils do not complain about a given grade because it is so thoroughly assessed – and therefore feedback has to be given when work is completed.

The pupils express some changes in Anne’s feedback practice even though she believes to have remained unchanged:

Anne has started to give oral feedback after presentations. Earlier she just handed out a sheet of paper the next week with a grade and a short comment, now she talks with us one by one in a meeting room after a performance. It’s about our achievement, and what would have improved the assignment. I find this better than just getting a grade. (HE pupil, June 2010)

Feedback is still given after a task is completed, something her pupils find challenging:

Feedback is on how to perform better next time. But it’s just that I do the same thing each time. She says I should use PowerPoint in oral presentations, but we haven’t learned how. I don’t understand how to use it. So, well I didn’t manage this time either. (LE pupil, June 2010)

**Tom**

Tom has a different approach to that of his two colleagues, concerning the purpose of classroom feedback in learning activities. He starts out with a belief and practice that feedback in learning activities should support and regulate pupils’ learning and his own teaching. Tom does not change his beliefs but improves and develops his formative feedback practice. During the intervention his pupils become more active participants in their own learning process, and the feedback works on a task, process and self-regulation level.

At the outset, Tom explains it is important to give person-focused praise and instructional feedback on task to the lowest-achieving pupils so they manage to keep ‘their heads above water’. Tom says that person-focused praise is seldom given to the highest-achieving pupils, since ‘they will manage’. During the intervention Tom’s beliefs and practice change to awareness that feedback needs to be related to learning goals and to focus on task, process and self-regulation for all pupils. Tom also starts to argue that feedback should be promoted dialogically if possible, since pupils’ conceptions and understanding are better elicited and supported in this way.

Tom’s HE pupil says during the initial interview that he often gets instructional feedback from Tom, and that this is useful: ‘I think it is very nice to get feedback because then I know how and what to improve, what I manage and stuff like that’ (HE pupil, Nov 2009). The LE pupil explains that she seldom gets feedback specifying improvement in class: ‘I really do not get much feedback in learning activities. I should receive more feedback concerning what I do well and what is not good enough, and then I could improve on what I do not do right’ (LE pupil, Nov 2009). It is interesting at this stage that feedback from Tom seems to be based on pupils’
engagement in learning activities and not pupils’ achievement. (Both pupils are high achievers in Math, Music and Physical Education).

After the intervention, Tom’s pupils explain how they find his (and their) feedback practice to have changed this last semester where help-seeking and dialogue are used more often, together with more targeted feedback focusing on task and process. Both pupils say they find feedback from Tom useful to improve learning and achievement, besides they get approval when they have tried their best, something they appreciate.

**Discussion**

That the three teachers start the intervention with different beliefs about the purpose of feedback in learning activities is self-evident, but the study also found that the teachers followed different trajectories of change. During the course of the intervention, positive changes and development are identified in all three teachers’ feedback practice. They participated in the same common workshops, but the routes they travelled started to differ as they searched for new possibilities to use feedback to support pupil learning based on their former practice and beliefs, and therefore the outcome of the intervention differs according to the paths chosen by the participants. Results indicate that teachers with initial beliefs that are more in line with the theories presented for making improvements are more inclined to further change in the same direction, a result which is in agreement with previous research (Opfer and Pedder 2011).

During the pre-interviews, Lisa and Anne describe the purpose of feedback as documentation on achievement, to monitor performance and as grades leading to motivation for learning. Pupil motivation was built on beliefs that test scores and grades lead to learning, which is incorrect (Butler 1987; McMillan 2007). The characteristics of their feedback practice were found to be relatively summative, even though they argue as if it was formative.

Holding pupils accountable for more learning using summative assessment fails to engage with assessment as a means to support learning (Stiggins 2007). Lisa said throughout the study that she had not thought about how her feedback practice might preclude learning for her pupils, but external expertise and VSRD helped her to re-conceptualize her practice and beliefs. Teachers’ beliefs about formative assessment as used in a summative climate, as in the claim that regular test practice and monitoring scores are formative, are a threat to change in an intervention study (Ayala et al. 2008; Stobart 2012). We see a demonstration of Stobart’s observation in the cases of Anne and Lisa. This threat was answered in the intervention project by using VSRD and the four recurring questions to deepen professional knowledge and refine skills in formative feedback. A more focused inquiry takes place as information about pupil learning is unpacked to determine who is benefitting and who is not from the changes occurring as a result of engagement in the previous cycle of inquiry (Timperley 2011).

Previous research demonstrates that a difference between formative and summative assessment is to be found in its purpose, rather than in its timing (Sadler 1998). Misconceptions concerning the functions of formative feedback might make workshops less likely to be successful. If a teacher (e.g. Anne) does not see the purpose of feedback as a formative learning process, it is hard to make sense of, and utilize, feedback pointing towards improvement during the knowledge-building cycles. One
of the threats to an intervention intended to improve learning is that the learner might not understand, or have misconceptions about, what they are supposed to be learning (improving) and what reaching the intended standard will involve (Stobart 2012). This made the researcher aware that maybe including video clips of ‘best practices’ to allow a teacher to see what formative feedback processes can look like might have provided the teacher, e.g. Anne, with information that could have propelled her into a different trajectory. Video recordings of practice enable teachers to examine one another’s instructional strategies and pupil learning, and to discuss ideas for improvement (Borko 2004). In this intervention, the participants were promised that their video recordings would remain private, something that precluded the opportunity to share video recordings between the participating teachers.

Anne is the one who seems to not have changed much of her practice or her beliefs about feedback in learning activities during this intervention. Her feedback practice was found to be built on assumptions of person-focused praise (emotional support) and evaluation (grades and correctness) to enhance learning. This perspective might preclude development since conceptual beliefs of feedback level from person to task and process, and summative to formative feedback practice, are important to be able to work successfully with AfL (Black et al. 2003; Hattie and Timperley 2007; Stobart 2012). Existing beliefs about teaching models can function as constraints when developing new practices, as seen in the case of Anne. This is also demonstrated by previous research (Ayala et al. 2008; Lee and Wiliam 2005).

Put simply, a teacher who believes that s/he is implementing good formative feedback practice will expect to see some of the benefits that others claim to have experienced, and this expectation may not be satisfied if s/he has a practice which functions as summative and does not really adopt a formative practice. Formative feedback needs to be understood as information to further learning (Sadler 1998) and improving thought processes (Perrenoud 1998; Wiliam 2011). Formative assessment is a process in which information about learning is evoked and then used to modify the teaching and learning activities in which teachers and pupils engage (Black et al. 2003; Pedder and James 2012).

Tom did not change his beliefs about the purpose of feedback during the intervention but improved his formative feedback practice. He became aware that all pupils need feedback to improve, and that formative feedback should be related to task, process and self-regulation. This practice aligns with research by Hattie and Timperley (2007) where feedback related to the task will have the greatest impact on learning when teachers can help to make pupils aware of their (mis-)conceptions, and show them how to produce a higher quality of performance. Feedback on the process level will give the pupils an understanding of their own learning process, so that they can initiate the right processes to further their performances; a type of feedback that will be helpful for developing pupils’ self-regulation. What is interesting is that even though Tom at the outset explains that a purpose of feedback is to support learning, his practice at the outset focuses mainly on giving pupil feedback on the task and less on the process, and self-regulation and adaptation of his own teaching. This aligns with results from Lee (2008) where teachers’ beliefs do not match their practice. In this study none of the teachers mentioned some form of self-assessment as essential for classroom feedback to support pupils’ learning at the onset of the intervention, a finding that coincides with results from another Norwegian classroom study conducted by Engelsen and Smith (2010). For comparison, Wiliam et al. (2004, 55) find that almost all the teachers in their intervention study mention some
form of self-assessment in developing assessment for learning. At the outset, Tom was not aware of this shortfall in his practice, and became surprised throughout the intervention study that he had not thought of this earlier.

The intervention study is built on a professional learning model where teachers need to move from perceiving assessment information as something separate from teaching and learning processes to seeing the information as an integral part of it for both themselves and their pupils (Timperley 2011). Becoming aware of the function of formative feedback as regulation of a teaching process to improve pupils’ learning, the relationship between feedback and learning target(s), and what opportunities are provided for the pupils to seek and use feedback in the learning activities, were all important realizations for at least two of the teachers in this study (Lisa and Tom). A conceptual change, perhaps even a paradigmatic change, was involved in realizing that the power of feedback does not only lie in when and how it is given, but more on when and how it is received and used to develop teaching and learning. The latter has been stated as a ‘key’ for feedback with a means to support learning – formative feedback needs to be used and should cause improvement (Hattie and Timperley 2007; Sadler 1998; Wiliam 2011; Wiliam and Leahy 2007).

When teachers are prepared and committed to engage in the risky business of problematizing their own practice, to seek evidence in order to change and develop practice and then act upon the elicited information and their decisions, they are thus engaging in assessment for learning with respect to their own professional learning (Pedder and James 2012). A result from the study is that those teachers who derive conviction and confidence that they can improve (Lisa and Tom) seem to be willing to use effort to improve their practice. As the teachers discover that their new professional knowledge and assessment practice are having a positive impact on their pupils, they begin to feel more effective as teachers, a result that coincides with previous research (Black et al. 2003; Black and Wiliam 1998b; Leahy and Wiliam 2012; Pedder and Opfer 2012).

Through conducting an intervention with these three teachers, the study reveals that there is a need for external expertise, and that VSRD might be helpful to challenge teachers’ mindsets and practices on formative feedback in order to deepen knowledge and refine skills directed towards pupil learning. At the same time, a variety of approaches and examples of how feedback can be implemented in the service of improvement is needed because of teachers’ differing beliefs about the purpose of feedback in learning activities. If teachers are to develop feedback practice, they must see that there is a gap between current and desired performance based on how to provide feedback that moves learning forward.

**How pupils perceive the instructional feedback**

The pupils provided valuable information and insights into feedback processes and practices in the classrooms. The changes that teachers made to feedback practice during the intervention project in learning activities were noticeable, appreciated and recognized as valuable supports for pupils’ learning.

During the outset, there were indications of a difference in how the feedback practices were perceived by the pupils ranked as being highly engaged (HE pupil) and the pupils ranked as being minimally engaged (LE pupil) in their coursework. All six pupils said feedback in learning activities should support their learning, but it was the HE pupils who reported receiving this kind of feedback during the first
phase. Feedback types such as ‘effort regulation’ and ‘person-focused praise’ were the ones most often given in learning activities to the LE pupils at the onset of the intervention.

A result from the intervention is that all the pupils interviewed experienced that classroom feedback improved and provided a means to support their learning. In addition, a few of the pupils (except pupils in Tom’s class) seem to have ‘been given’ the knowledge and skills necessary to seek feedback on their progress and self-regulation by conducting the three assessment questions: ‘Where am I going, How am I going, Where to next?’ through self-evaluation tasks.

**Conclusion**

The three teachers started the intervention with different beliefs about the purpose of feedback in learning activities and they followed different trajectories of change.

To various degrees, the three teachers involved did change their mindset and/or practices when it came to using formative feedback to support pupils’ learning. Results indicate that teachers with initial beliefs that are more in line with the theories presented for making improvements, are more inclined to further change, develop and improve in the same direction, a result which is in agreement with previous research (Opfer and Pedder 2011). When changing feedback practice, teachers need to conceptualize, develop and value expanded roles for themselves and their pupils in teaching and learning. Teachers need to be willing to engage in the risky business as to problematizing their own practice – a prerequisite some teachers (e.g. Anne) might have problems getting into if their practice does not coincide with the learning intention for professional workplace learning. External expertise for re-conceptualization, video recordings from practice and VSRD are found to be helpful tools for developing formative feedback practice in classrooms.

**Limitations and further research**

The study was restricted to only three lower secondary school teachers and six of their pupils. However, analyses have resulted in a conceptual mapping of these teachers’ beliefs about feedback that can be used in future research and can also be further validated in larger samples in different contexts (see Tables 1 and 2). How will this conceptual map match beliefs among teachers in other countries?

Change in beliefs and practice during an intervention study might be affected by other factors that this study did not take into account. They include (among others) interpersonal factors such as the relative status among these teachers, teachers’ content knowledge (Black et al. 2003) and personal values such as teachers’ learning orientations (Pedder and Opfer 2012).

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References


