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Expressions of Agency within Complex Policy Structures: Science Teachers' Experiences of Education Policy Reforms in Sweden

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Expressions of Agency within Complex Policy Structures: Science Teachers' Experiences of Education Policy Reforms in Sweden

We explore the experiences of school science teachers as they enact three linked national curriculum and assessment policy reforms in Sweden. Our goal is to understand differing teachers' responses to these reforms. A sample of 13 teachers engaged in 2 interviews over a 6–9-month period. Interviews included exploration of professional background and school context, perceptions of the aims of the policy reforms and experiences of working with these reforms in the classroom. Analysis was guided by an individual-oriented sociocultural perspective on professional agency. Here teaching is conceptualised as an ongoing interplay between teachers' knowledge, skills and personal goals, and the characteristics of the social, institutional and policy settings in which they work. Our analysis shows that navigating the ensuing continuities and contradictions results in many different expressions of teacher agency, e.g. loss of autonomy and trust, pushing back, subversion, transfer of authority, and creative tensions. Typically, an individual teacher's enactment of these reforms involved several of these expressions of agency. We demonstrate that the sociocultural perspective provides insights into teachers' responses to education policy reform likely to be missed by studies that focus largely on individual teacher knowledge/beliefs about reform or skills in 'implementing' reform practices

Keywords: education policy, curriculum reform, teacher agency

Introduction

Schools are required to respond to continually shifting education policy reforms that are imposed upon them (deBoer, 2014, 2011; Fensham, 2009). However, studies show that the enactment of education policy reforms often differs significantly from that intended by reform designers, and that initial changes are often not sustained over time (Kahle, 2007). Teachers are the key mediators of such policy in classrooms (Ball, Maguire, & Braun, 2011; Day, Sammons, Stobart, Kington, & Gu, 2007; Sahlberg, 2012; Spillane, 1999). However, studies demonstrate that teachers are frequently frustrated by the outcomes of science education policy reform in schools (Author, 2013; Sarason, 1990). Our research objective is to deepen our understanding of teachers' responses to education policy reforms. In this paper we pursue this objective through a study of teachers' experiences of three linked national and local curriculum and assessment policy reforms in Sweden. Our analysis is framed by a sociocultural perspective on the work of teachers with a focus on the concept of teacher agency. Below we present the key features of this perspective and why we believe it is highly suitable in pursuing our research objective of understanding teachers' responses to education policy reforms.

Eteläpelto, Vähäsantanen, Hökkä, & Paloniemi (2013) provide a review of different conceptualisations of professional agency in studies of workplace learning. Their analysis identifies four broad approaches to agency: social science, post-structural, sociocultural and life course/identity. These perspectives differ in how they frame an individual's 'choices' (intentionality), how agency in the present is related to the past and future (temporality), and the relationship between the individual and his/her broader social context. Eteläpelto et al. (2013) make the case for an individual-oriented sociocultural perspective as most appropriate to capturing the ongoing complexities of workplace practices. This is the approach taken in this paper. In this perspective agency is centered on the individual. Agency is a practice that is framed by the individual's personal goals. The individual is strongly participative in choices and decisions (i.e. intentionality); decisions are not simply the outcome of external forces. Furthermore, actions in the present are framed by the past (through personal biography) and the future (through personal goals), i.e. agency is a long-term developmental practice rather than a set of actions at a specific point in time. However, despite this focus on the individual, agency is constrained and supported by broader social and institutional working contexts, but with personal goals and biography as fundamental resources for action. Thus, the sociocultural conditions of the workplace (e.g. material resources, power relations, work culture, dominant discourses) have a mutually constitutive relation with an individual's professional agency. However, and crucial for the study reported here, the individual-oriented sociocultural perspective argues that studies of professional agency can separate individual experiences (e.g. as explored in interviews) from the operation of broader social and institutional working contexts in the workplace.

Here we apply this sociocultural perspective on professional agency to the specific context of being a teacher in a school setting. Thus, teacher agency becomes a central concept in understanding teachers' practices in general, and their responses to education policy reforms in particular. Teacher agency encompasses the professional goals of the teacher, e.g. their beliefs about the purposes of education and the role of young people within this, and also their professional biography, e.g. the ongoing impact of professional activity in previous, potentially very different, school or other work environments (Goodson, 2003). Teacher agency also captures the choices teachers make concerning their working practices, e.g. what resources to deploy in the classroom, how much class time to give to each area of the

curriculum, and how they engage their students in teaching/learning tasks. However, the sociocultural perspective also emphasises how teacher agency is, in part, constituted by the social and institutional structures of the school workplace. Examples of such structures include: teacher-student authority relations in the classroom; the traditional use of practical work in science lessons; the role of subjects (mathematics, history etc.) and their perceived hierarchy (e.g. science as a 'core' subject in many curricula); the role and status of assessments of student attainment; routines of school life such as the role of subject departments and how teachers work socially within and across these; and forms of leadership within schools. Such structures have a significant impact on teacher agency. They provide constraints and affordances on the 'choices' that teachers can make about how they organize their classrooms, the resources and activities they engage in.

This perspective on teacher agency is particularly fruitful in understanding and interpreting teachers' responses to education policy reforms. Firstly, education policy reforms are agenda setting, they generate 'framing discourses' on what gets noticed, they are underpinned by (often hidden) values, and carry strong lines of authority (Colebatch, 2009). The sociocultural perspective on teacher agency emphasizes the central role of these policy power relations in shaping, constraining and supporting teachers' practices. The teacher-oriented perspective also emphasises policy enactment in schools as a 'site of negotiation and contestation' (Milne, Scantlebury, & Otieno, 2006, p. 327) with teachers are at the heart of the struggle. Perspectives on teacher behavior that focus on the individual teacher and his/her practices, knowledge, beliefs, skills etc. need to bring in the role of policy as an 'external' influence. Such analyses often underplay the central role of policy (and the social) in many teachers' working lives. Secondly, the sociocultural perspective (through the emphasis on temporality) represents agency as a long-term developmental practice, rather than an outcome at a single point in time. This is highly relevant given that teachers experience often very significant shifts in educational policy during their working lives, including 'policy cycles' that see a return to previous policies over time. Thirdly, the sociocultural perspective on teacher agency emphasizes the role of context in teachers' working lives, not as a 'backdrop' for an exploration of teachers' changing knowledge or practices, but as a central shaping influence. Furthermore, this context is not just the classroom or the school department, but also refers to whole school 'ethos', and district and national education policies. For example, many contemporary national educational policy contexts embody a neoliberal 'marketisation' of schooling (Ball, 2008; Kuiper & Berkvens, 2013). This often results in mechanisms of accountability with high authority, typically through school inspection and large-scale external measures of student attainment (Anderson, Chiu, & Yore, 2010). Stephen Ball has highlighted the significant struggles many teachers experience working within such structures (Ball, 2003). Strong policy discourses of what counts as a 'good' teacher (i.e. framing discourses, what is seen as important) often work against the personal goals of individual teachers resulting in negative impacts on teachers' sense of wellbeing and professionalism (Jeffrey & Woods, 1998).

The sociocultural perspectives presented above have been deployed in previous studies of teacher agency. Buchanan (2015) provides an analysis of how nine teachers in the US resist and negotiate powerful national and local accountability mechanisms to shape their practice and professional identities. Buchanan identifies two kinds of teacher agency: 'pushing back' and 'stepping up'. Pushing back is a form of protest through which teachers subvert, adapt or reject a reform with which they do not agree. This form of agency has been identified in many earlier studies that provide typologies of individual teacher responses to educational reforms (e.g. Coburn, 2004; Cuban, 1995). However, Buchanan also identifies the process of

‘stepping up’ in which teachers go ‘above and beyond’ the perceived expectations of their role. For example, this form of agency is exhibited by one teacher who talks of a ‘mission fit’ with her local school culture. She receives positive institutional reinforcement within the school in the form of leadership recognition and exemplary annual teacher evaluations. This demonstrates how forms of teacher agency can be strongly linked to, indeed shaped by, structural characteristics within specific social, institutional and policy contexts.

Biesta, Priestley & Robinson (2017) report an ethnographic study of teachers in primary and secondary school contexts in Scotland. They demonstrate how teacher talk in and about education plays a key role in their practice of agency. This supports our focus on ‘expressions’ of agency and our use of teacher interviews as the central data source. Furthermore, their study shows that the vocabulary of many teachers about education is ‘limited and closely connected to policy discourses’ (p.52). This reflects the influence of ‘framing discourses’ within policy (Colebatch, 2009). In their study such discourses appear to constrain teacher agency. By contrast, Milne, Scantlebury, & Otieno (2006) provide case studies of two teachers’ experiences of an externally-imposed professional development course that promoted an inquiry-based instructional model for chemistry teaching. For one of the teachers (Beth) navigating the resultant personal and workplace tensions ultimately resulted in enhanced motivation and a strong sense of personal development. Structures within her school empowered her to demonstrate ‘expanded agency’ in response to these policy shifts, echoing the process of ‘stepping up’ identified by Buchanan (2015).

Vähäsantanen (2015) studied how vocational teachers in Finland respond to a reform that seeks to break down the separation of school and the professional workplace. This study provides insights into the ‘temporality’ of teacher agency. Her analysis includes both teachers’ position on the reform (e.g. resistant, approving, inconsistent) but also their actions over time (e.g. passive, engaged, innovative). Mirroring the studies cited above she identifies ‘reserved’ teacher agency (resistant positions with minimal action) and ‘progressive’ agency (approving positions with active engagement and innovation around reform goals). Vähäsantanen sees these as forming a reserved-progressive continuum along which teachers might be positioned. Crucially, and reflecting the temporality described earlier, her data shows how many teachers changed their place on this continua over time, often very significantly.

Taken together these studies exemplify how the practice of agency involves an ongoing negotiation of personal beliefs and goals within shifting social, institutional and policy structures. Our goal in this paper is to explore the practice of agency in the context of education policy reforms in Sweden. This is a distinctive policy context since it involved multiple, but related, curriculum and assessment reforms introduced at different points in time. Thus our study emphasizes the contextual complexities of the work place and the temporal nature of teacher agency in the context of a typically ongoing process of education policy reform. We use interview data to examine this issue from the perspective of teachers. Our specific research question is: ‘what are teachers’ experiences of agency within the specific social, institutional and multiple national policy structures of their workplace’. The term ‘expressions of agency’ used in our paper title captures two aspects of our study: firstly we are interested in how teachers talk about their experiences of agency in relation to the structures of their workplace (echoing Biesta et al., 2017); secondly the term emphasizes agency as an ongoing practice continually expressed through their actions within the workplace.

Education policy reform context in Sweden

Our study examines teachers' experiences of three distinct education policy reforms: national curriculum reform and local grading (for all subjects), and (within science) national tests at Y6 (students aged 12-13 years). These, and other reforms in Sweden, have been characterised in terms of a systemic shift towards 'standards-based accountability' (Author, 2015; Sundberg & Wahlström, 2012). This reflects an increasingly neoliberal educational context within many educational systems with education becomes increasingly controlled and centralised; education as a 'market' with 'product value' measured through student attainment (Hamilton, Stecher, & Yuan, 2008; Kuiper & Berkvens, 2013; Smith, 2011). Below we provide details of these reforms with an emphasis on aspects specifically referred to by the teachers in our study.

National curriculum reform: capabilities; core content; grading criteria

A revised national curriculum (LGR11) for all school subjects within compulsory schooling[2] was introduced across Sweden in September 2011 (Skolverket, 2011)[3]. This new curriculum includes detailed statements of curriculum goals and values, followed by individual sections on each school subject. The previous national curriculum (Lpo94) included similar statements of goals and values (Skolverket, 1994). However, in LGR11 more detail of subject teaching content is provided. Science is presented in three distinct sections: biology, physics and chemistry. Each of these sections begins with a detailed statement of aim. This includes identification of three capabilities. The capabilities for biology are reproduced below (there are similar formulations in physics and chemistry):

1. use knowledge of biology to examine information, communicate and take a view on questions concerning health, natural resource use and ecological sustainability;
2. carry out systematic studies in biology;
3. use concepts of biology, its models and theories, to describe and explain biological relationships in the human body, nature and society.

In this paper we characterise these capabilities in turn as communication, investigative study and use and understanding of concepts. Each science section then presents detailed core content identifying knowledge to be taught within Y1-3, Y4-6 and Y7-9. This is followed by statements of 'knowledge requirements' for each subject for the end of Y3, Y6 and Y9. These are presented as grading criteria at Y6 and Y9. The grading criteria are provided in tables that emphasise the specific grades A, C and E with grades B and D position as 'between' these (and F denoting 'fail').

In the school year following the introduction of the new national curriculum two reforms to assessment policy were introduced: local grading at Y6 in all subjects, and the use of national tests in science.

Local grading at Y6

National policy from September 2012 requires that teachers assigned every Y6 student a grade in all subjects. Previously grading had been used only from Y8 onwards, with feedback on Y6 student progress often provided through open discussion, e.g. during a teacher-student-

[2] In Sweden there are nine years of compulsory schooling from Y1 (age 7-8 years) to Y9 (age 15-16 years). These are preceded by pre-school (age 1-5 years) and one year of pre-school class (age 6-7 years) that are not compulsory, although around 96% of students do attend the pre-school class.

[3] Skolverket is the Swedish government National Agency of Education.

parent meeting. With the introduction of the local grading reform a single grade is required in each of biology, physics and chemistry at the end of every semester[4]. Teachers are expected to draw upon the grading criteria provided within the national curriculum. However, the national grading policy does not state how these grades should be assigned. The outcomes of local grading at the school level are publically available.

National tests for science at Y6

National tests in science were first implemented at Y6 in April 2013[5]. The main purposes identified in the policy documentation are to support teachers in the assessment of students' knowledge and to encourage consistent grading between schools (Skolverket, 2015). Each school is assigned one science subject in which Y6 national tests will be administered. Schools are informed of their subject focus typically 2-6 weeks in advance of the tests being administered.

Aspects of the operationalization of these tests feature in teachers' accounts presented later. Therefore we provide some detail here. The tests are completed in three parts, following the three capabilities within the overall national curriculum: communication, investigative study and use and understanding of concepts. The tests comprise both closed and open written response questions, supplemented with a set practical task as part of the investigative study capability. An example test question (Wind Power) is provided in Figure 1.

[Insert Figure 1 around here]

Each written question includes a matrix indicating which capabilities are assessed by the question, and at which grading levels. The form of matrix is highly stylised in the national test questions, as a small image without labelling seen by both teachers and students (in Figure 1 the matrix image appears bottom right). Table 1 provides a labelled matrix form for the Wind Power question, indicating that it is assessing the capability 'communication' across all grade levels A-E.

[Insert Table 1 around here]

Schools are responsible for marking the national tests, but with no national policy statement on how this should be done. Thus, different schools adopt distinct approaches. School-level marks are published on the internet and are accessible to the public.

Study methodology and design

Our study addresses the research question 'what are teachers' experiences of agency within the specific social, institutional and multiple national policy structures of their workplace?' We explore this question through semi-structured interviews with teachers. Such interviews have formed the main data within many previous studies of teacher agency (Buchanan, 2015; Ketelaar, Beijaard, Boshuizen & Den Brok, 2012; Milne, Scantlebury, & Otieno, 2006; Priestley, Biesta & Robinson, 2015). The individual-oriented sociocultural perspective on teacher agency focuses on the ongoing goals and choices of the teacher as s/he navigates

[4] In some schools this is operationalised as a single grade for science.

[5] National tests in science at Y9 became mandatory from 2009. National tests in mathematics, Swedish and English at Y9 have been mandatory since 1980. Education policy does indeed undergo constant reform: following the study reported here the national tests in science at Y6 were made voluntary in 2015 and were then abolished altogether from February 2016.

shifting social, institutional and policy contexts. Interviews provide an opportunity for teachers to elaborate on these personal goals and choices. Furthermore, within interviews it is possible to explore the range of social, institutional and policy structures from the teacher's perspective. Extended interviews (up to one hour) enable teachers to express inherent tensions, constraints, affordances and sources of power in their lives as teachers. Furthermore, the extended and narrative genre of interviews ensures that there is no assumption of a coherent, stable or consistent response. By also conducting a second interview after a 6-9 month period we provided an opportunity to revisit teachers' experiences of the reforms, supporting the trustworthiness of our data and providing an opportunity to explore potential changes in teacher agency over time.

Interviews were conducted with 13 teachers from 10 schools[6] over a 6-9 month period within 2013-14. A key criterion for the selection of teachers was that they taught science to Y6 in the first year that the grades and national tests were introduced. Beyond this, purposive sampling was conducted to ensure a broad variation in teaching experience, teacher educational background, student catchment area and school type. To recruit teachers, school principals were contacted by telephone, introduced to the project and requested to contact teachers that might be willing to participate in an interview. Following this we contacted teachers direct to seek their agreement to participate. They were assured that they could withdraw their participation at any time without giving a reason.

Teacher and school characteristics are summarised in Table 2. Significant for this reform of Y6 assessment practices, six of the teachers taught in schools comprising Y4 through to Y6, with the remainder in schools running Y6 to Y9. In Y4-6 schools teachers tend to have a single class to which they teach all subjects. Typically they have studied one semester for science in their pre-service teacher education programme. By contrast, within Y6-9 schools teachers are subject specialists and students have different teachers for each main subject. Science teachers within Y6-9 schools have typically studied two or more of biology, physics or chemistry within pre-service education for at least one semester on each subject. Most of these Y6-9 teachers teach all three science subjects and also mathematics. Overall, this teacher sample has considerable professional experience in teaching. Only two of the teachers have less than 12 years teaching experience. Furthermore, these teachers worked in schools with very different characteristics in terms of overall student attainment and location (i.e. urban, suburban, rural).

[Insert Table 2 around here]

Teachers were offered a choice on the location of interviews, resulting in most interviews being held at the teacher's school. Visits to schools also provided insight into each teacher's social and institutional setting through informal observation and discussions with various staff at the school. The resultant field notes included details of whether staff were designated as subject specialists, whether each class teacher followed a single class of children as they advanced through the school years, staff roles when working with the national tests, and the process of leadership within the school. The first semi-structured interview, held individually with each teacher, explored the following themes in turn: teacher's professional background; nature of the school; organization of science teaching at Y6; the purposes of teaching science; experiences of teaching science at Y6; approaches to lesson planning; perceived aims of the Y6 curriculum and assessment reforms; advantages/disadvantages of the national tests and

[6] An eleventh school ('School 5') dropped out of the study before the first interview.

grading; whether/how these reforms had impacted on his/her teaching activities. At the end of the interview teachers were given the opportunity to add any further comments. These interviews were timed to explore their teaching experiences after the first round of local grading and national testing. A second interview was arranged 6-9 months later[7]. These interviews were typically conducted in pairs to enable teachers to hear, and react to, other teachers' opinions and standpoints. The main purpose of the second interviews was to explore teacher's commentaries on specific assessment items within the national tests – the focus of a related research study not reported here. However, in doing so many teachers also referred to their broader experiences of the reforms providing insights relevant here. Interviews lasted between 36 minutes and 63 minutes. All interviews were conducted in Swedish, transcribed professionally and then translated into English by two of the Swedish co-authors. As a starting point translations were completed word by word but with the ambition to make spoken language understandable in English. As a result, phrasing or word order has often been altered significantly. Nevertheless, in spoken language people use colloquial expressions and idioms. We sought to leave these in this everyday form in the English translation.

Analysis procedure

Our analysis draws upon the individual-oriented sociocultural perspective on teacher agency to address the research question: 'what are teachers' experiences of agency within the specific social, institutional and multiple national policy structures of their workplace?' We identified the personal teaching goals expressed by each teacher (e.g. motivating students to study science further, encouraging deep conceptual understanding rather than surface recall). We also identified statements on key shifts in practices made by teachers in relation to the reforms (e.g. to 'protect' students from the school focus on the outcomes of grading, to adapt national test items for use in the classroom). Following the conceptualization presented earlier we also identified structural dimensions of the teacher's workplace that featured in teachers' accounts of their experiences, for example 'agenda setting' (such as statements about the national focus on student grades and local marking) and the role of 'framing discourses' (such as other teachers in the school emphasizing grading in the classroom as 'good teaching'). Our analysis identified sources of power in teachers' daily lives such as the requirement to conduct national tests and local grading, but also teachers' immediate 'in the moment' authority over their classroom activities. We also identified the role of local, internalized norms or traditions, e.g. using individual student action plans rather than grades or emphasising intrinsic aims for learning science when working with students). However, our analytical goal was not to identify each of these elements in isolation; the sociocultural perspective emphasizes the significance of ongoing interactions of personal goals, social and policy structures, and local traditions in an understanding of teachers' practices. Thus, our findings do not simply categorise the different teaching goals expressed by participants, or list the distinct sources of power referred to. Rather, we identify distinct episodes, termed here 'expressions of teacher agency', within the interviews in which teachers elaborated on how they were navigating a way through the multiple goals, choices, structural dimensions, sources of power and local traditions. Furthermore, each expression of agency does not necessarily fully characterize a single teacher's experiences; as shown below individual teachers often elaborate on several expressions of agency in the interviews.

Expressions of agency within education policy reform enactment

[7] Teachers 2B and 11 declined this second interview.

The sections below present and exemplify the different expressions of teacher agency we identified in our data. However, as will become clear below, many of these expressions have overlapping characteristics. A basic overview of these expressions of agency is provided in Table 3. Expressions A-D emphasise the authority of personal teaching goals. Expression E emphasizes the authority of policy structures. Expressions F-J reflect agency experienced as an active/shifting engagement of personal goals and broader structures. In expressions F-J we see evidence of teacher agency as an ongoing, developmental, process involving an interplay of personal goals and policy structures with associated tensions, alignments and changes. Each expression of agency is illustrated and elaborated below using a selection of extracts from the teacher interviews. Within each section (and summarised in Table 3) we also indicate how these expressions of agency are represented in the interviews across the full sample of teachers.

[Insert Table 3 around here]

A. Loss of autonomy and trust

Teacher 8 described the assessment reforms as highly prescriptive. She experienced this as a negative outcome: 'it was much better without the grades'. As an experienced teacher with 45 years in the profession she had established traditions (e.g. using individual student development plans) and personal values (e.g. promoting student co-operation in the classroom). She experienced the assessment reforms as a process of domination over these traditions and values:

> Twenty-one[8] tests for me to correct and to know how to teach during the spring semester in [Y6]. This no other category of worker in Sweden would do. No dentist would agree to this, for example. T8[9]

A second teacher in our sample similarly positioned her experience of the reforms against her perceptions of other occupations:

> It's about a check on us. I do not think that raises the status of the teaching profession, but there must be a belief in us in our profession. It is we who are educators. I find it hard to believe that they would introduce this kind of control on what doctors do (…) I feel attacked. T6

These negative experiences of loss of autonomy and trust surfaced repeatedly at different points through the first interview with teacher 6. She refers to a 'conflict of interest' between the direction of the national tests and what she felt was good for her students. Elsewhere she reports how 'you get very controlled in a negative way' by the national tests. Despite some softening in her responses to the reform over time (see Expression J) these concerns surfaced again in her second interview. For example, reflecting on a reduction of time spent on experiments in the classroom in order to make links to the national tests: 'it tears the heart because I've never worked quite like this before'. Teachers 6 and 8 strongly emphasised the assessment reform as an experience of loss of autonomy that had negative consequences for the pursuit of their personal goals and related traditions. From these experiences both teachers referred to a perceived loss of trust in them as professionals.

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[8] This teacher is referring to all the national tests across several subjects, including all the separate parts in each subject.

[9] Quotes are from the first interview, unless stated otherwise.

B. Pushing back

Teacher 9 identified her personal goals in teaching as ensuring that students have 'fun' in science lessons and that they work for intrinsic rewards:

> I feel, teaching the lower [year groups], that I want to get them to be interested, that's my main goal. Then, I want to make them want to come running to science study lessons and find it fun to get there and feel the curiosity. T9

She saw the national testing and grading policy at Y6 as working against these personal goals resulting in a tension that she was struggling with:

> How to get kids to understand this with the grades (…) so it does not become like a whip; that they're working because of [the whip] instead of working because it´s fun. Working for your own sake, that's my mantra [to students]. T9

She positioned her response to national grading against those of another teacher in the school, revealing a further tension:

> I am so scared [for my students] because my colleague out there talking about the grades, like "this is what you must do", to use them as a motivation thing [with students]. And I have not even mentioned the word grades [to my students]. Instead I have said I want you to think about this (…) that you really write so that you understand the experiment when you read it in six months or so. T9

Thus, her response to these tensions was to push back; to subvert the authority of the external policy: 'I have very few tests (…) I do not want to believe that my teaching should be changed'. This expression of agency echoes that ascribed to some of the teachers in Buchanan's study of how teachers negotiate strong national and local accountability mechanisms in the US (Buchanan, 2015). Similarly, in the study of vocational teachers in Finland elaborated earlier, Vähäsantanen (2015) identifies 'reserved' teacher agency in which teachers take a resistant position with minimal action.

Teacher 9 also reflected on her concerns for the teaching profession as a whole:

> 'I fear for anyone who becomes very driven and will focus in a completely wrong way, workbook, textbook – and all the workbooks are structured by [the national curriculum]. They forget to think for themselves'. T9

However, in her second interview she shows how this subversion is difficult to sustain, referring to her regret that her teaching was changing as a result of the national tests: 'you let this guide teaching. I take questions and makes lessons from them (…) unfortunately'. This reluctant shift in practice demonstrates the impact of a national policy framework on teacher's intentionality. The difficulty this teacher experienced occurred despite a very supportive local leadership context. This teacher had a long term and supportive professional relationship with the school head teacher who had broadly similar views on the impact of national testing. Indeed, once the national tests became voluntary this school took a collective and, as they saw it, easy decision not to perform the tests.

Similar expressions of tensions, subversion, pushing back were expressed strongly by two other teachers in the sample. Teacher 7 identified distinct student responses to grading and the national tests. One group of students 'sharpen themselves and really engage in the lessons'. However, 'for some it may be quite the opposite effect (…) it becomes a stress that makes them underachieve instead'. This is a tension between the reality of testing/grading and her desire to motivate and encourage her students: 'These students I don't want to grade (…) I have so many who are weak, who I think can be cracked by this'. Similarly, teacher 8 stated that 'I am not putting an F – there I have my freedom'. She goes on to rationalize this pushing back response as 'I think of the children'. Here we see an exercise of local authority: the teacher has authority over the detail of her work as a marker. This echoes the individual-oriented sociocultural perspective on agency: there is a strong emphasis on these teachers' intentionality; their actions are not simply shaped by external forces.

The following two expressions of agency also emphasise the authority of personal goals but in contrast to the cases above there is less tension, and more alignment, with external policies.

C. Agency in external policy development

Teacher 11 positioned himself as an 'insider' to the national reforms: 'we had the privilege to be involved in the writing of the curriculum'. His school was involved as a 'reference school' for the national tests[10]. He stated that he was involved in 'writing the [national] curriculum' and that he had engaged with the Swedish National Agency of Education in criticizing their 'review form'[11]. In addition, he was also an experienced practitioner in his school. He described this dual role as having a positive impact on his enactment of the reforms:

> We were lucky here, I think, as we were a reference school when the national tests were written, so we got to join in and have opinions and criticize and reflect. And it was very, very valuable, because we do not feel strange when it came out then as a final print. So it was very valuable. T11

He was very supportive of the reforms and saw the different policy elements as coherent in supporting his personal goals as a teacher, providing continuity. Indeed, he expressed his frustration at the idea of the national tests becoming voluntary for schools:

> There is the suggestion that they should be voluntary. And it is very wrong thinking. I just scream about it (…) [the national tests] should not be optional. T11

This is the only example in our study of a teacher who positions him/herself as having had agency in the development of the policy reforms. He supported the reforms and was confident in how he enacted them in his local context. In contrast to the expressions above he does not refer to tensions in lines of authority. Indeed, this teacher expressed significant authority within his school context. For example, once the national tests became voluntary the head

[10] Reference schools were involved in piloting assessment instruments and engaged in discussions with the test constructors.

[11] In Y4-5, in which students do not get formal grades, teachers are required to use a standardised review form to report student performances. This is simply a report of fail/pass/pass with distinction. Teacher 11 argued that this review form needed to be more nuanced.

teacher suggested that they opt out of the tests. However, teacher 11 rejected this view and the school did subsequently continue with the national tests.

D. Coherence between personal goals, institutional context and national policy

Teacher 2A welcomed the introduction of local grading and national testing at Y6. She believed that the use of grades and tests motivated students to focus on their school work.

> Now I am not saying that the grade determines everything, but I can say that, from the students' perspective, then I think it becomes much more serious [to them]. In any case, after so many years I have worked with [Y9]. T2A

The teacher is referring here to her work in a Y6-9 school. Therefore, she had prior experience of the national testing and grading policy at Y9. Grading at Y6, within a Y6-9 school, provides a within-school baseline for subsequent grading of students. Thus, for this teacher there is a coherence between the Y6 and Y9 testing and grading policies that arises from her institutional context. This coherence was also expressed by teacher 1A and 2B – both working in a Y6-9 school.

For teacher 2A the new testing and grading policy was also coherent with her biography:

> I come from [a country] where there is grading already from Y1, and if you fail to meet the grade so you have to take Y1 again. Why not? It will be more effective, I think, it becomes more serious. T2A

She also stated that her father was a professional chemist and that ‘my view of things has always been in a different way than perhaps many others around me. I see it in a completely different way’, positioning her personal goals and traditions as distinctive within her school context. This is reflected in a strong confidence in her teaching of science. For example, she planned to put videos of many of her science lessons on YouTube. Furthermore, she reported a coherence between perceived needs of her students and their experiences of testing and grading:

> They are always interested in the mark, ‘what mark did I get?’ (…) I think it is a kind of acknowledgment of their work. It brings more order. T2A

Here grading is seen as providing a positive external recognition of the value of students' work.

These coherences of personal goals, institutional context and biography result in a strong legitimation of this teacher's prior and ongoing practice. The national tests had a strong impact on her practice. For example, in her second interview she stated that the results of national tests for her classes resulted in her lowering the grades she gave locally, and that she used adapted national test items in her teaching. Similar examples of coherence and legitimation of ongoing practice are provided by other teachers in our sample:

> I like that based on national tests you get that " yes, but you're on the right track. It is like what you have thought." As a confirmation. T2B

> You get some kind of confirmation that I'm right. T3A

> Yes it was a good test. It's nice, then, partly because there will be no difficulty with grades, but it's also nice because if you then think that I have probably been teaching at the right level. T3B

In the examples above the expression of personal goals through practice is largely supported by a coherence across multiple policies, differing sources of authority, personal goals and institutional structures; the sociocultural conditions of the workplace have a mutually supportive relation with these teachers' agency. This reflects findings from the study of vocational teachers in Finland referred to earlier. Vähäsantanen's (2015) identifies 'progressive' teacher agency in which teachers take an approving position with active engagement and innovation action. Such expressions of agency contrast strongly with the earlier examples of tensions and negative experiences within expressions A and B (loss of autonomy and trust, pushing back).

E. Transfer of authority

Several teachers welcomed external guidance over their work. Teacher 1B described how the more she worked with the new curriculum knowledge requirements the more she struggled to enact them effectively in her work – especially the capabilities. Following from this, she talked about how she relied heavily on the national tests:

> Yes, the national tests are surely what is good. There is still something concrete where one can see: "yes, what is it they [government policy makers] want?", Because it's pretty sketchy in the curricula. T1B

Later in the interview she referred to the national tests as providing: 'a hint about what is planned'. Teacher 10 makes similar statements in both of her interviews:

> National tests influence teaching a lot. What is in focus, and what they are looking for, simply put? How do they want you to think about teaching? T10

> It is always good to know a little bit what they're looking for and to get ideas how to plan teaching based on the [national test items]. You can use these. So I think that's good.
> T10 (second interview)

Similarly, teacher 11 stated that whilst he often used a historical perspective in his science teaching, nevertheless:

> I go entirely according to the syllabus (…) I have chosen to follow the syllabus structure (…) it is the curriculum that controls. T11

However, the following teacher, whilst recognizing that external reforms were strongly guiding aspects of her practice, expressed uneasiness about the consequences of this:

> I try to vary a little bit with tests, but quite often it will be the classic written test, and more for the grade (…) I think it's a pity, and really wish that I had not done this, but I have begun to have more written assessments (…) I think it's a shame. T3B

These teachers' statements evidence a transfer of authority over aspects of their working practices to external policy makers. In contrast to the expressions A-D there is an emphasis on the authority of external policy structures. Such tendencies have been identified elsewhere. In a study of teacher agency in the context of curriculum reforms in Scotland Priestley et al. (2015) identify 'just tell us what to do' (p.162) as a common attitude amongst teachers. They ascribe this to performativity demands, increased workload and a systemic lack of trust in teachers. Similarly, Donnelly, Buchan, Jenkins, Laws, & Welford (1996) identify what they term a 'ceding of authority' for some teachers in their study of science curriculum reform enactment in England.

The remaining expressions F-J emphasise the experience of agency as an active and developmental process. These expressions provide evidence that, whilst personal goals and biography are fundamental resources for action, the practice of agency is constrained and supported by broader social and institutional working contexts.

F. Creative tensions: External policy as a catalyst for teacher change

The following case refers to tensions experienced by a teacher. Such tensions were seen earlier within expressions A and B (loss of autonomy and trust, pushing back). However, here these appear to constitute, over time, a catalyst for creativity and change. Teacher 7 positioned herself as a teacher who is keen to try out new approaches in teaching:

> I'm the kind that throws myself out a little bit on thin ice. I mean in science I drop the textbook, for good and bad. I think it is a bit difficult, but it's fun too. T7

Following from this personal characteristic to try new things and take risks she described how working with the knowledge requirements within the national curriculum reform resulted in some significant and (for her) positive changes in her teaching:

> I was looking at the knowledge requirements and thought: what can I do, and what do I have to stand and recite about, and how much can I dare to do as individual [student] tasks? I did a really exciting thing where they got to do research on various inventions, with certain criteria from the syllabus. This can be read at grade level E, this can be read at grade level C and so on (…) and it was so exciting, because it started so much, for all, and everyone was excited. T7

For this teacher the externally imposed challenge of implementing the new knowledge requirements and grading resulted in tensions with her current practice: she was unused to emphasising individual student tasks in the classroom. However, this requirement of the reform became a catalyst to try out new teaching approaches. This individually-driven response reflected local staffing and leadership structures within her school. This was a small school and teacher 7 was the only science teacher; she had significant local autonomy in her response to the reforms. This was the only strong episode in the interview transcripts in which a teacher clearly expressed a tension as a result of the reforms but then went on to say how this tension had initiated a personally exciting process of trying out new practices. In his exploration of meaning-making and learning in the workplace Wenger (1998, p. 66) suggests that 'inherent tension and complementarity' can provide 'richness and dynamism'. From the example above enacting policy resulted in a 'creative tension', generating a space within

which this teacher could exercise local autonomy with positive outcomes for herself and, as she reports it, her students.

G. Enhanced agency through new social interactions

The policy reforms require that national tests are marked locally by teachers. However, there was no central policy prescription on the ways in which teachers should mark the tests. This resulted in a wide range of different approaches devised by individual schools, and in some cases groups of schools. Teacher 3B described how the need to mark national tests locally resulted in productive teacher collaboration in her school:

> There are very good educational discussions when we mark together. It is a very good skill to sit together and think about how important this is and discuss what to follow up in class. It feels good with the national tests in that way. But perhaps it is not really the main purpose of the tests, I do not know, but it is certainly a result of them which I think is good. T3B

Similarly, teacher 4 referred to productive collaborations between teachers from different schools within a municipality, again as a result of the need to devise local approaches to the marking of national tests. This response is supported by school 4 being a public school located within a municipal leadership structure with the resources to initiate inter-school work practices. Teacher 10 reported that in her school they had worked a great deal in teacher groups to interpret the curriculum requirements and consider how these might be assessed. Teachers 2A and 8 also stated, in their second interviews, that they had worked productively with other teachers in their schools to mark the national tests.

These episodes show that the flexibility within the national policy on test marking resulted in new, locally instigated, professional interactions between teachers. In the example above these social interactions had positive outcomes for the teachers involved and enhanced their agency in the enactment of the reforms. In his multi-case analysis of collaboration and learning in the workplace Engestrom (2008) highlights the role of 'disturbances' (i.e. deviations from the norm) as 'potential triggers of qualitative transitions in team interaction' (p67). Here, local marking of national tests provides an example of such a 'disturbance', leading to new forms of teacher collaboration.

H. Reinterpreting policy elements in local contexts

As detailed earlier, assessment matrices appear in the national curriculum in the form of three capabilities and associated grades (Table 1) and in stylised form on national test questions (Figure 1). These representations of a particular approach to curriculum and assessment constitute a framing discourse, repeatedly signalling what gets noticed and what is considered important in terms of educational outcomes (Colebatch, 2009). Teacher 1B often referred to her work with these matrices. For example, she described how she developed a matrix for her students to conduct peer assessments:

> I used a matrix when I assessed the test[12]. So I have not put marks but I have tried to sort out what knowledge is and how to display them in matrix form (…) I prepared a matrix in which I had proposed three different levels on how to answer the questions, so that it might be a little easier for them, so they had to put one, two or three points (…) What they had answered of

[12] This is a test that she designed herself to assess students' conceptual understanding.

> course was not exactly as I had written, but then they had to ponder and think about what they thought was the closest (…) so they've got to assess each other also in terms of a matrix. T1B

Teacher 1B mobilised the matrices as presented in national policy documents but reinterpreted them for use in her classroom, in this case to support her personal goals around student peer assessment. Teacher 2A also described her use of assessment matrices:

> It is the way I have been working during these two years, since [the introduction of the new national curriculum] very much with matrices. I love making matrices, and I cannot live without matrices. I cannot have lessons and planning without matrices. So when I make a planned test I always do a complete matrix, and based on the matrix I give the students an evaluation of what they have learned, accomplished, and also evaluate myself. T2A

She incorporated matrices within her teaching plan documents. These planning texts showed a similar matrix form to that in Table 1 but with less emphasis on capabilities and more on core content statements. This emphasis on matrices continues to be evidenced in the second interview with this teacher in which she talks at length on how she linked matrices to specific national test items.

These two teachers exercise agency by mobilising a specific element within the education policy reforms (assessment matrices). However, this enactment involved significant reinterpretation by the teachers; they adapted this policy element to their personal goals and local working contexts. This reflects the sociocultural perspective in that agency is seen as a long-term developmental practice. The assessment matrices supported these teachers in making meaning of core policy statements in their distinctive school communities. This outcome was enabled by a crucial feature of the policy: the assessment matrices carried sufficient flexibility to enable local adaptation whilst retaining core features of the policy reform.

I. Balancing local autonomy and external accountability

Following from the active process of policy reinterpretation referred to above, here we identify interview extracts within which teachers emphasise their accountability to external policy when talking about local enactment of policy elements:

> National tests, then there are examples of tasks on the National Agency for Education. You use them more to see the level, areas and so. You work from them in various ways. So that's how you are affected by national tests. You know what is important and then you try to steer the teaching to what you might not previously have emphasised. T4

This teacher accepted the authority of external reforms to guide her work, i.e. she saw herself as accountable for the enactment of government policy. However, she also describes herself as active in enacting policy elements locally: ‘you work from them in various ways’, ‘you try to steer the teaching’. At several other points in this interview teacher 4 repeats the idea that her response to the reforms involved her in exercising local autonomy whilst also being accountable to the enactment of the external policies: ‘it’s always individually how to

interpret things and how closely you follow it'. Referring to the role of the national tests she says that they help to: 'address the right areas – not only what you yourself thought was fun'.

Teacher 1A made similar comments stating that 'tests are to guide us' but then comparing his current practice with a previous school in a different country in which: 'you knew exactly what you should teach. So it was much more controlled there. It will never be like that here'. Similarly, teacher 2B described how she worked actively with the national curriculum core content to identify specific goals for each lesson: 'you don't take these directly from the syllabus (…) you look and then I adjust it'. Teacher 3A stated that she was aware that the national tests had the outcome that 'you get a little controlled' but she actively tried to respond to that by not just focusing on 'factual recall' in her classroom work. All of these extracts evidence teacher agency as an active process of meaning making, a reinterpretation of policy resources in local settings. In particular, they emphasise this exercise of agency as a balance between two sources of power: external policy and teachers' immediate authority (intentionality) over their activities within schools and classrooms.

J. Developing expressions of agency over time

Teacher 3A referred explicitly to what she had learnt over the time they had worked with the reforms: 'one thing I've learned on national tests is that I have become more precise with concepts, or with words'. Teacher 4 referred to the ongoing process of forming a response to the reforms: 'it takes a very long time before you get into how to think'. Teacher 10 reported how she had become more comfortable in the process of grading since the first year of the reforms. These examples again demonstrate agency as an active and ongoing developmental process. Two teachers were particularly explicit on how working with the reforms over time had resulted in a significant change in their views about the reform. Teacher 2B referred to her new and unexpected support for grading at Y6 as a result of working with the reforms: 'I never thought I would say that, a U-turn'. Teacher 6 provides a clear case of shifting expressions of agency. In her first interview she stated that the introduction of national tests and grading focused on issues she considered to be of limited educational value:

> The national tests, I do not think give a better education at all, I do not. And the local grades (…) it controls the content in ways that maybe are not quite what I think is the best for the students. T6

Here she positions local grading as an authoritative framing discourse that influences curriculum content in ways that contradicted with her personal educational values. This is further evidenced for teacher 6 within expression A (loss of autonomy and trust). However, in the second interview (seven months later) she appeared to soften her concerns:

> I remember that I was very critical for us to have national tests in science, and in social science for that matter. But I'm not quite as critical anymore. I think it has given me very much. But I think it is too wide and I do not think we should have the A part [i.e. the 'communication' capability]. T6 (second interview)

In the second interview teacher 6 was more secure and confident when talking about the reforms. For example, she reported that she was now better able to support high attainment amongst her students. This was important for this teacher given her institutional working context and local traditions. She worked in a high performing school with largely middle class parents where there was a strong emphasis on high academic performance by parents

and students. In the second interview she also stated that the national tests had helped her to interpret the knowledge criteria. Despite some continuing tensions the second interview showed that she had more experience of reinterpreting the policy in her specific context, enhancing her sense of agency[13]. In terms of the individual-oriented sociocultural perspective presented earlier (Eteläpelto et al., 2013) these teachers' experiences demonstrate the 'temporality' of teacher agency; how agency in the present is related to the past and future They provide evidence of agency as a long-term developmental practice. This emphasizes agency not as a fixed outcome (such as rejection, adaptation or compliance) but as an ongoing process that can shift over time in an interplay of personal goals with social, institutional and policy structures.

Discussion

Our findings demonstrate the suitability of exploring teachers' responses to education policy reforms using an individual-oriented sociocultural perspective on professional agency. Each of the key elements of this perspective are strongly represented in our data. The expressions of agency summarized in Table 3 demonstrate the central significance of teachers' personal goals and beliefs about education. Only expression E (transfer of authority) shows a subjugation of personal goals and beliefs to external policy. Teachers' personal goals and beliefs are particularly emphasised in expressions A-D but remain significant in expressions F-J. However, Table 3 also shows the active role of social, institutional and multiple policy structures in shaping teachers' responses to reforms. These structures are particularly emphasized in expressions F-I. We see external policies acting as a catalyst for the development of new forms of inter/intra-school social practices. We also see in-school discourses of what it means to be a 'good' teacher influencing teacher experiences of reforms. Material policy elements are also active in shaping teacher responses, e.g. the role of adaptation of assessment matrices (Table 1 and Figure 1) in expression H.

Previous studies have also used sociocultural perspectives to explore teacher agency, as highlighted earlier in this paper. Our study supports the findings of such studies. We show how, in a specific multiple policy context in Sweden, the sociocultural perspective provides insights into teachers' responses to education policy reform that are likely to be missed by studies that focus largely on teacher knowledge about a reform, their skills in 'implementing' reform practices, or their beliefs about reform purposes. Rather, understanding teachers' responses to education policy reforms involves recognizing that such responses go beyond the individual. Teacher intentionality is fundamental; our findings show that personal goals and biography are fundamental resources for teacher action. However, our findings also show that teacher agency is strongly constrained and supported by broader social, institutional and policy contexts, as reported in other studies, e.g. 'stepping up' (Buchanan, 2015) and 'expanded agency' (Milne et al., 2006). Priestley et al. (2015) represent this as an ecological understanding of teacher agency, emphasizing agency as an ongoing practice, an emergent phenomenon, within particular (thus 'ecological') contexts.

Several of the expressions of agency identified in this study highlight distinctive features of teachers' responses to education policy reforms that have not been strongly highlighted in previous studies. Teacher 11 exhibited 'agency in external policy development' (expression D). His school acted as a pilot school for the assessment reforms and he was involved in

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[13] In our ongoing work with these teachers a third interview with teacher 6 showed her becoming still more positive about aspects of the reforms as she worked with them: 'I think the tests have great benefits (…) I think it was a really good implementation of the curriculum. I suddenly get it, "yes, that is what they mean"'.

commenting on draft materials. This teacher positioned himself as an 'insider' to the policy reforms, a view that aligned with his strong personal commitment to reform practices and goals. Wenger's analysis of meaning making within and between communities of practice highlights the role of 'brokers' between communities (Wenger, 1998). Brokers are individuals with a role in multiple communities of practices and are therefore well-positioned to support participatory activities that support meaning making. Our study did not focus explicitly on such brokers (although as suggested below this could certainly be a useful focus for future studies). However, the example of teacher 11 suggests the effectiveness of such a role. He emphasised the role of his interactions with policy makers. In addition, he also worked as an active teacher practitioner. His positive response to the reforms appeared to be supported by his mediating role within two communities of practice: teachers in his school and government policy makers. Thus, a message for policy makers from our analysis is that they recognise the potential role of 'policy mediators' in the enactment of policy within school communities. Policy makers should identify, and provide resources for, mediators who can act as intermediaries between policy and school communities (Leander & Osborne, 2008). Crucially these mediators need to take on a genuine two-way process of brokering, rather than acting as 'advocates' of external reform.

A more prevalent expression of agency, exhibited by five of the teachers in our sample, is that of 'enhanced agency through new social interactions' (expression G). These teachers talked about how specific features of the policy reforms (e.g. the requirement to mark national tests locally) resulted in new forms of social interaction (e.g. working with teachers in other local schools). Consideration of shifting forms of social interaction and their impact on teachers' work is a central feature of the sociocultural perspective, again highlighting the pertinence of this conceptualization of teachers' work. In the Swedish context studied here the need to mark national tests locally, but without a prescription on how to do this, resulted in (presumably unintended) leverage for new social practices. However, one implication suggested by this finding is that policy makers should plan for, and provide resources to support, new forms of social engagement of teachers as a designed feature of their policy 'implementation' plans.

To support teacher professionalism and wellbeing it is important to create a policy environment that supports, indeed encourages, teachers in achieving a balance between local autonomy and subjugation to external policy (Author, 2015): neither an 'anything goes' environment of complete teacher freedom, or an expectation that teachers should transfer authority to external 'experts'. Priestley et al. (2015) emphasize the distinction between teacher agency (as a process of balancing autonomy and accountability) and teacher autonomy (i.e. unregulated teacher freedom); a distinction they argue is often missed in accounts of the role of teachers in policy enactment and school change. The expressions of agency identified in our study provide examples of such balanced responses, e.g. creative tensions, enhanced agency through new social interactions, reinterpreting policy elements in local contexts. These provide evidence of a rich and ongoing process of enactment of policy that features an active role for both local teacher autonomy and accountability to external policy reforms. Furthermore, the episodes in our study suggest potential mechanisms to support such a policy environment. Several of the teachers told us how they were able to take elements of the reforms and actively adapt them, over time, to their local contexts with what they reported as positive outcomes for their teaching. Examples of reform elements that operated in this way are assessment matrices and locally devised marking of national tests. These policy elements provided a degree of in-built flexibility whilst also retaining core features of the external reform. For example, the assessment matrices emphasised the core

reform theme of individual student grading, whilst also enabling teachers to adapt them to be used across different capabilities and content areas of the curriculum. Their pictorial and tabular form meant they were easily adapted by teachers to be incorporated into lesson resources and planning documents. The use of assessment matrices and local marking practices are both examples of 'flexibly adaptive' resources within curriculum reforms (Squire, MaKinster, Barnett, Luehmann, & Barab, 2003). They had the properties of 'boundary objects', supporting meaning making between distinct communities of practice (Author, 2012; Wenger, 1998). The matrices were represented in diverse forms across key boundaries, e.g. in government national policy texts, national tests, classroom resources used by students and teacher planning documents. We suggest that policy makers need to design elements of reforms explicitly to have the character of 'boundary objects', i.e. a clear and robust representation of a core policy theme, but also encouraging or requiring adaptation to local contexts.

A distinctive feature of our study is the policy context in Sweden in which teachers are responding to multiple distinct, yet linked, national policy reforms in assessment and curriculum. The interactions of these policies (for example reinforcement, contradiction) had significant implications for these teachers' experiences of the reforms. This finding has major implications for policy makers. Rather than focusing on their 'own' specific policy and its enactment policy makers need to recognise that teachers experience multiple educational reforms and other influences on their practice all at once. This calls for a greater focus on policy coherence (Oates, 2011); ensuring that consideration is given to how a specific reform might interact (helpfully or otherwise) with other reforms impacting on schools and teachers (i.e. the role of continuities and contradictions in shaping teachers' practices).

Our analysis demonstrates how an individual teacher's responses to reforms can reflect multiple expressions of agency. For example, teacher 8 talked about a loss of autonomy and trust (expression A) and a process of pushing back (expression B). These expressions are consistent with an emphasis on the authority of personal teaching goals over the directives of external reforms. However, teacher 8 also referred to her positive experiences of working with other teachers following from the requirement to mark national tests locally (expression G). Similar multiple expressions of agency are seen for other teachers (e.g. teachers 2A, 3A). A focus on agency within a sociocultural account emphasizes the crucial role of social, institutional and policy structures in seeking to understand teachers' responses to reforms. These multiple structures introduce a necessary complexity that is reflected in our multilayered account. Our analysis is consistent with Ball et al. (2011) who provide a typology of eight 'policy actors' that teachers can exhibit (e.g. enthusiast, translator, critic). They emphasise that an individual teacher's response to reforms can exhibit multiple policy actor types. Thus our findings support calls to not 'label' teachers as having a specific, fixed 'response' to a policy reform (e.g. reject, adapt, support). Rather, teacher response is most appropriately seen as a process over time, with different features of a policy interacting in multiple ways with specific elements of a teacher's personal, social and institutional working contexts. This echoes Vähäsantanen's (2015) representation of teacher agency as including both position (e.g. resistant, approving) and action (e.g. minimal, innovative). Overall, these findings reflects the 'temporality' of teacher agency elaborated earlier; teacher agency as a long-term developmental practice (Eteläpelto et al., 2013).

The developmental feature of teacher agency is further reflected in our finding that seven of the 13 teachers in our sample exhibited shifting expressions of agency over time (expression J). For example, teacher 2B talked about a 'U-turn' in her response to grading at Y6, teacher

6 reflected in the second interview that she was 'not as critical anymore' on the use of national tests in science. Similar shifts in teacher agency have been identified in other studies (Pyhältö et al., 2014; Vähäsantanen, 2015). The extended time over which teachers develop and shift their responses to reforms has implications for the piloting and evaluation of education policy reforms. Many policy makers are driven by short term, often political, timescales. They are keen to demonstrate whether a reform has 'worked' or not. The message from our study, and others, is that policy evaluation activities need to extend over several years. They need to take account of the details of local context – including social structures, leadership and local institutional priorities. They also need to consider relationships with other local/national education policies that are not the explicit focus of the evaluation (i.e. the frame of policy coherence).

Implications for future research

The expressions of agency identified in this study provide an analytical framework that reflects an individual-oriented sociocultural perspective conceptualization of teacher response to reform. We have argued that several of these expressions of agency highlight features of the interplay of personal teacher goals and social/institutional/policy structures that have not been a strong focus of previous work. Furthermore, we find that individual teachers often exhibit multiple expressions of agency. Of course, our study involves a small sample of 13 teachers in one policy context in Sweden. Future studies could useful explore the applicability of this analytical framework in other policy contexts, and specifically the prevalence of distinctive expressions such as creative tensions or enhanced agency through new social interactions. Furthermore, we found one teacher who represented himself as a reform 'insider' within his school leading us to suggest that such 'brokers' between external policy and local school communities could support effective policy enactment. The roles of 'policy mediators' in different school and policy contexts could usefully be explored in future studies, with designed 'interventions' that support differing forms of policy mediation.

Data for our study comprised two rounds of interviews with teachers and field notes from associated school visits. We believe that this approach has provided important insights into these teacher's experiences of external reforms with clear implications for policy makers. This follows from the individual-oriented sociocultural perspective on agency (Eteläpelto et al., 2013) which emphasizes the value of analyses of individual teacher's experiences of agency of the kind presented in this paper. However, we recognize the value of studies that gather data more directly on the resources and traditions operating within schools (e.g. Cobb, McClain, de Silva Lamberg, & Dean, 2003). For example, observations and document analysis could explore how assessment and curriculum are represented within classrooms in terms of teacher/student practices, classroom discourse and teaching resources. Our study has also indicated the significance of teacher collaboration and teamwork in responding to education reforms. However, the forms and outcomes of this teamwork were not a focus of our data collection and analysis. Teamwork has been shown to be a key determinant of educational change (Engestrom, 2008; Fullan, 2007; Pil & Leana, 2009; Spillane, 1999). Future studies could usefully focus on teacher teamwork, and leadership, both as an outcome, and a determinant, of the enactment of education policy reform (e.g. Melville, 2008). Furthermore, our findings show how teachers' expressions of agency can change significantly over time. Other studies of reform enactment in schools also show significant changes in individual teacher responses (Bantwini, 2010; Pyhältö et al., 2014). Coburn (2004) has similarly argued for longitudinal, and more historical, analyses of teachers' enactment of policy, informed by her study of changes in the teaching and learning of reading in California

from 1983 to 1999. Thus, longitudinal studies (at least over three or more years) are needed to follow the ongoing development of teacher agency in complex institutional settings.

Conclusion

We have focused on the key role of teachers in the process of education policy reform. By exploring teachers' reflections on their experiences with national education policy reforms we have identified several features of their response that deserve broader attention by researchers and policy-makers: how distinct features of the complex policy network interact to create continuities and contradictions; the potential for 'creative tensions'; changes in teacher agency over time; and the challenge of maintaining a fruitful balance between accountability to external policy and local autonomy. We have also suggested some features of education policy reform that can support better, and more sustainable, outcomes for all stakeholders: planning for policy coherence; designing policy elements as boundary objects to support the practice of local flexibility; and the provision of policy mediators to enable effective meaning making in policy enactment across diverse school settings. Significant resources are invested in education policy development and enactment worldwide. Such policies strongly shape the work of science teachers and the experiences of students. There are often calls for the outcomes of educational research to inform the development of future education policy; a call we endorse. However, in addition, we believe that there is a strong case for research studies (as here) that explicitly focus on the development and enactment of current education policies within school settings.

References

Anderson, J. O., Chiu, M.-H., & Yore, L. D. (2010). First cycle of PISA (2000–2006). International perspectives on successes and challenges: research and policy directions. International Journal of Science and Mathematics Education, 8 373-388.

Ball, S. J. (2003). The teacher's soul and the terrors of performativity. Journal of Education Policy, 18(2), 215-228. doi: 10.1080/0268093022000043065

Ball, S. J. (2008). The Education Debate. Bristol: The Policy Press.

Ball, S. J., Maguire, M., & Braun, A. (2011). How Schools Do Policy: Policy Enactments in Secondary Schools. London: Routledge.

Banner, I., Donnelly, J., & Ryder, J. (2012). Policy networks and boundary objects: Enacting curriculum reform in the absence of consensus. Journal of Curriculum Studies, 44(5), 577-598.

Bantwini, B. D. (2010). How teachers perceive the new curriculum reform: Lessons from a school district in the Eastern Cape Province, South Africa. International Journal of Educational Development, 30(1), 83-90. doi: http://dx.doi.org/10.1016/j.ijedudev.2009.06.002

Biesta, G., Priestley, M. & Robinson, S. (2017). Talking about education: exploring the significance of teachers' talk for teacher agency. Journal of Curriculum Studies, 49(1), 38-53. doi: 10.1080/00220272.2016.1205143

Buchanan, R. (2015). Teacher identity and agency in an era of accountability. Teachers and Teaching, 21(6), 700-719. doi: 10.1080/13540602.2015.1044329

Cobb, P., McClain, K., de Silva Lamberg, T., & Dean, C. (2003). Situating Teachers' Instructional Practices in the Institutional Setting of the School and District. Educational Researcher, 32(6), 13-24. doi: 10.3102/0013189x032006013

Coburn, C. E. (2004). Beyond Decoupling: Rethinking the Relationship Between the Institutional Environment and the Classroom. Sociology of Education, 77(3), 211-244. doi: 10.1177/003804070407700302

Colebatch, H. K. (2009). Policy (3rd ed.). Maidenhead: Open University Press.
Cuban, L. (1995). The hidden variable: How organizations influence teacher responses to secondary science curriculum reform. Theory into practice, 34(1), 4-11.
Day, C., Sammons, P., Stobart, G., Kington, A., & Gu, Q. (2007). Teachers Matter: Connecting Lives, Work and Effectiveness. Maidenhead: Open University Press.
deBoer, G. E. (2014). The history of science curriculum reform in the United States. In N. Lederman & S. K. Abell (Eds.), Handbook of Research on Science Education, Volume II (pp. 559-578). New York & London: Routledge.
deBoer, G. E. (Ed.). (2011). The Role of Public Policy in K-12 Science Education. Charlotte, NC: Information Age Publishing.
Donnelly, J., Buchan, A. S., Jenkins, E. W., Laws, P., & Welford, G. (1996). Investigations by order : policy, curriculum and science teachers' work under the Education Reform Act. Driffield: Studies in Education.
Engestrom, Y. (2008). From teams to knots: Activity-theoretical studies of collaboration and learning at work. Cambridge: Cambridge University Press.
Eteläpelto, A., Vähäsantanen, K., Hökkä, P., & Paloniemi, S. (2013). What is agency? Conceptualizing professional agency at work. Educational Research Review, 10, 45-65. doi: http://dx.doi.org/10.1016/j.edurev.2013.05.001
Fensham, P. (2009). The link between policy and practice in science education: The role of research. Science Education, 93(6), 1076-1095.
Fullan, M. (2007). The new meaning of educational change (4th ed.). London and New York: Routledge.
Goodson, I. F. (2003). Professional Knowledge, Professional Lives. Maidenhead: Open University Press.
Hamilton, L. S., Stecher, B. M., & Yuan, K. (2008). Standards-Based Reform in the United States: History, Research, and Future Directions: RAND Corporation. Paper commissioned by the Center on Education Policy, Washington, D.C.
Jeffrey, B., & Woods, P. (1998). Testing Teachers: The effect of school inspections on primary teachers. London: Routledge.
Kahle, J. B. (2007). Systemic reform: Research, vision, and politics. In S. Abell & N. G. Lederman (Eds.), Handbook of research on science education (pp. 911-942). Mahwah, NJ: Erlbaum.
Ketelaar, E., Beijaard, D., Boshuizen, H. P. A., & Den Brok, P. J. (2012). Teachers' positioning towards an educational innovation in the light of ownership, sense-making and agency. Teaching and Teacher Education, 28(2), 273-282. doi: http://doi.org/10.1016/j.tate.2011.10.004
Kuiper, W., & Berkvens, J. (Eds.). (2013). Balancing curriculum regulation and freedom across Europe. CIDREE Yearbook 2013. Enschede, the Netherlands: SLO.
Leander, K. M., & Osborne, M. D. (2008). Complex positioning: teachers as agents of curricular and pedagogical reform. Journal of Curriculum Studies, 40(1), 23 - 46.
Melville, W. (2008). Mandated curriculum change and a science department: A superficial language convergence? Teaching and Teacher Education, 24(5), 1185-1199. doi: http://dx.doi.org/10.1016/j.tate.2007.03.004
Milne, C., Scantlebury, K., & Otieno, T. (2006). Using Sociocultural Theory to Understand the Relationship between Teacher Change and a Science-based Professional Education Program. Cultural Studies in Science Education, 1, 325-352.
Oates, T. (2011). Could do better: Using international comparisons to refine the National Curriculum in England. The Curriculum Journal, 22(2), 121-150.
Pil, F. K., & Leana, C. R. (2009). Applying Organizational Research to Public School Reform. The Academy of Management Journal, 52(6), 1101-1124.

Priestley, M., Biesta, G., & Robinson, S. (2015). Teacher Agency: An Ecological Approach. London: Bloomsbury.
Pyhältö, K., Pietarinen, J., & Soini, T. (2014). Comprehensive school teachers' professional agency in large-scale educational change. Journal of Educational Change, 15(3), 303-325. doi: 10.1007/s10833-013-9215-8
Ryder, J. (2015). Being professional: Accountability and authority in teachers' responses to science curriculum reform. Studies in Science Education, 51(1), 87-120.
Ryder, J., & Banner, I. (2013). School Teachers' Experiences of Science Curriculum Reform. International Journal of Science Education, 35(3), 490–514.
Sahlberg, P. (2012). Finnish Lessons: What Can the World Learn from Educational Change in Finland? Teachers' College Press.
Sarason, S. B. (1990). The predictable failure of educational reform : can we change course before it's too late? San Francisco: Jossey-Bass.
Skolverket. (1994). Curriculum for the compulsory school system, the pre-school class and the leisure-time centre Lpo 94. Retrieved December 2017, from http://www.skolverket.se/om-skolverket/publikationer/visa-enskild-publikation?_xurl_=http%3A%2F%2Fwww5.skolverket.se%2Fwtpub%2Fws%2Fskolbok%2Fwpubext%2Ftrycksak%2FRecord%3Fk%3D1070
Skolverket. (2011). Curriculum for the compulsory school, preschool class and the recreation centre. Retrieved December 2017, from http://www.skolverket.se/om-skolverket/publikationer/visa-enskild-publikation?_xurl_=http%3A%2F%2Fwww5.skolverket.se%2Fwtpub%2Fws%2Fskolbok%2Fwpubext%2Ftrycksak%2FRecord%3Fk%3D2687
Skolverket. (2015). Nationella prov. [National tests]. Retrieved December 2017, from http://www.skolverket.se/bedomning/nationella-prov
Smith, D. V. (2011). One Brief, Shining Moment? The Impact of Neo-liberalism on Science Curriculum in the Compulsory Years of Schooling. International Journal of Science Education, 33(9), 1273 - 1288.
Spillane, J.P. (1999). External reform initiatives and teachers' efforts to reconstruct their practice: The mediating role of teachers' zones of enactment. Journal of Curriculum Studies, 31(2), 143-175.
Squire, K. D., MaKinster, J. G., Barnett, M., Luehmann, A. L., & Barab, S. L. (2003). Designed curriculum and local culture: Acknowledging the primacy of classroom culture. Science Education, 87(4), 468-489. doi: 10.1002/sce.10084
Sundberg, D., & Wahlström, N. (2012). Standards-Based Curricula in a Denationalised Conception of Education: The Case of Sweden. European Educational Research Journal, 11(3), 342-356. doi: 10.2304/eerj.2012.11.3.342
Vähäsantanen, K. (2015). Professional agency in the stream of change: Understanding educational change and teachers' professional identities. Teaching and Teacher Education, 47, 1-12. doi: http://doi.org/10.1016/j.tate.2014.11.006
Wenger, E. (1998). Communities of practice: Learning, meaning and identity. Cambridge: Cambridge University Press.

	Grade E	Grade C	Grade A
Communication			
Investigative study			
Use and understanding of concepts			

Table 1 Labelled form of assessment matrix used in Swedish National Tests

Teacher label[14]	Gender	Teaching experience	Employment	Description of the school[15]
T1A	M	35 years	Subject teacher (Y6-9)	Public school, low performance, factory town
T1B	F	18 years	Subject teacher (Y6-9)	
T2A	F	3 years	Subject teacher (Y6-9)	Free school, medium performance, suburban
T2B	F	13 years	Subject teacher (Y6-9)	
T3A	F	15 years	Subject teacher (Y6-9)	Public school, medium performance, suburban
T3B	F	6 years	Subject teacher (Y6-9)	
T4	F	12 years	Subject teacher (Y6-9)	Public school, medium/low performance, suburban/rural
T6	F	13 years	Class teacher (Y4-6)	Public school, high performance, residential area in town
T7	F	14 years	Class teacher (Y4-6)	Free school, medium performance, immigrant-dense suburb
T8	F	45 years	Class teacher (Y4-6)	Public school, high performance, inner-city
T9	F	30 years	Class teacher (Y4-6)	Public school, high performance, rural
T10	F	20 years	Class teacher (Y4-6)	Public school, medium performance, suburban
T11	M	33 years	Class teacher (Y4-6)	Public school, medium performance, rural

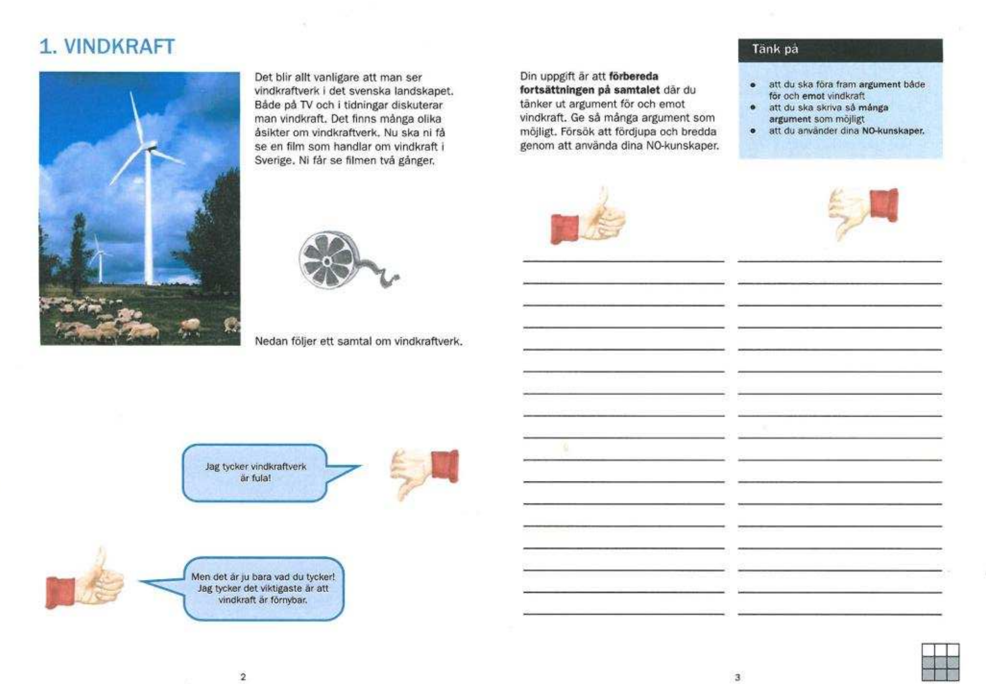
Table 2 Details of teachers and schools involved in the study

[14] The number refers to a particular school.
[15] Public schools are managed by the local municipality. Free schools are institutions run by associations, cooperatives, religious foundations and/or limited companies. In Sweden around 80% of students attend public schools. Both public and free schools are publically funded and must follow national policies.

Emphasis on authority of personal teaching goals	**A**	Loss of autonomy and trust	6, 8
	B	Pushing back: tensions, subversion and framing discourses of the 'good' teacher	7, 8, 9
	C	Agency in external policy development	11
	D	Coherence between personal goals, institutional context and national policy	1A, 2A, 2B, 3A, 3B
Emphasis on authority of policy structures	**E**	Transfer of authority	1B, 3B, 10, 11
Agency as an active ongoing process. Personal goals, social, institutional and policy structures shaping each other over time.	**F**	Creative tensions: External policy as a catalyst for teacher change	7
	G	Enhanced agency through new social interactions	2A, 3B, 4, 8, 10
	H	Reinterpreting policy elements in local contexts	1B, 2A
	I	Balancing local autonomy and external accountability	1A, 2B, 3A, 4
	J	Developing expressions of agency over time	1A, 1B, 2B, 3A, 4, 6, 10

Table 3 Expressions of teacher agency and their prevalence across the sample

Figure 1 Example Test Question



1. VINDKRAFT

Det blir allt vanligare att man ser vindkraftverk i det svenska landskapet. Både på TV och i tidningar diskuterar man vindkraft. Det finns många olika åsikter om vindkraftverk. Nu ska ni få se en film som handlar om vindkraft i Sverige. Ni får se filmen två gånger.

Nedan följer ett samtal om vindkraftverk.

Jag tycker vindkraftverk är fula!

Men det är ju bara vad du tycker! Jag tycker det viktigaste är att vindkraft är förnybar.

2

Din uppgift är att **förbereda fortsättningen på samtalet** där du tänker ut argument för och emot vindkraft. Ge så många argument som möjligt. Försök att fördjupa och bredda genom att använda dina NO-kunskaper.

Tänk på

- att du ska föra fram **argument** både **för** och **emot** vindkraft
- att du ska skriva så **många argument** som möjligt
- att du använder dina **NO-kunskaper.**

3

WIND POWER

It is becoming increasingly common to see wind turbines in the Swedish countryside. There are also discussions about wind power on the TV and in magazines. There are many different opinions about wind turbines. Now you will get to see a film about wind power in Sweden. You get to see the movie twice.

Below is a conversation about wind turbines.

- I think wind turbines are ugly!
- But that's just what you think! I think the main thing is that wind energy is renewable.

Your task is to **prepare for the continuation of the conversation** where you work out the arguments for and against wind power. Give as many arguments as possible. Try to deepen and broaden using your science skills.

Keep in mind

- you should set out arguments both **for** and **against** wind power
- you should write **as many arguments** as possible
- you should use your **science skills**.