

School change and educational reform: How activity theory could respond to Sarason's insights

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Resumo

Este artigo aborda três perspectivas no sentido de reconhecer a centralidade da agência participante na mudança da escola e da reforma educacional. Primeiro, observações feitas por Sarason em relação à mudança da escola e à reforma educacional. Em seguida, a metodologia intervencionista baseada na teoria da atividade de Engeström, visando o reconhecimento da agência na condução de intervenções locais. Finalmente, um caso empírico de colaboração entre a investigadora e a professora num projeto de intervenção numa aula de Matemática de 4.º ano na Suécia. Aqui encontra-se a possibilidade de ver a mudança da escola e a reforma educacional em termos dos interesses dos alunos e da agência da professora no âmbito das intervenções na sala de aula.

Palavras-chave: mudança da escola, reforma educacional, teoria da atividade, intervenção formativa, agência



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Abstract

Three perspectives are brought together in this paper, towards recognising the centrality of participant agency in school change and educational reform. First, observations made by Sarason in relation to school change and educational reform. Second, Engeström's activity theory based interventionist methodology, which seeks recognition of agency in the conduct of local interventions. Finally an empirical case of teacher-researcher collaboration and project based intervention at a Grade four mathematics classroom in Sweden. Herein lies the possibility of viewing school change and educational reform in terms of students' interests and teacher agency within classroom interventions.

Keywords: school change, educational reform, activity theory, formative intervention, agency

Résumé

Trois perspectives sont réunies dans cet article visant à reconnaître la centralité de l'agence participant au changement de l'école et à la réforme de l'éducation. Tout d'abord, les observations faites par Sarason sur le changement de l'école et la réforme de l'éducation. Deuxièmement, la méthode interventionniste basée sur la théorie de l'activité de Engeström, qui cherche la reconnaissance de l'agence dans la conduite des interventions locales. Enfin, un cas empirique de collaboration enseignant-chercheur dans un projet d'intervention en cours de mathématiques de quatrième année, en Suède. Là réside la possibilité de voir le changement de l'école et la réforme de l'éducation en termes d'intérêts des étudiants et de l'agence de l'enseignant au sein des interventions en classe.

Mots-clés: changement de l'école, réforme de l'éducation, théorie de l'activité, intervention formative, agence

INTRODUCTION

In this paper I dwell upon school change and educational reform, aspects which while keenly pursued in educational systems worldwide remain weakly understood in theory and practice. In doing so I bring to discussion two sets of writings, which not only provide background to complex issues that could characterise change and reform but also provide means with which such attempts could be both dealt with and understood in everyday classrooms. First, I draw on writings by educational psychologist Seymour Sarason, whose extensive study of American schools five decades ago have insights which deserve revived attention and have potential to inform contemporary debate on school change and educational reform. Second, I draw upon writings by social scientist Yrjö Engeström, who extends Soviet psychological theory of activity in contemporary times and offers a framework with which to conceptualise and bring about local transformation and change. In bringing together arguments made by either I draw also on researcher experience in conducting a project based intervention, while collaborating with a teacher Lotta at her Grade four mathematics classroom in Sweden.

In his book titled *The predictable failure of educational reform: Can we change the course before it is too late?* Sarason (1990) highlights two issues which I take as point of departure

The first is the assumption that schools exist primarily for the growth and development of children. That assumption is invalid because teachers cannot create and sustain the conditions for productive development of children if those conditions do not exist for teachers. The second issue is that there is now an almost unbridgeable gulf that students perceive between the world of the school and the world outside it. Schools are uninteresting places in which the interests and questions of children have no relevance to what they are required to learn in the classroom. Teachers continue to teach subject matter, not children. Any reform effort that does not confront these two issues and the changes they suggest is doomed. (p xiv)

I quote Sarason at length to not only narrow the focus of a topic as broad as school change and educational reform, but also draw attention to two vital issues I wish to discuss in this paper - that schools are for teachers too and that it is children's interests and life experiences which need attention within instruction. Such interests in turn lead me to participant agency vital in conducting any manner of intervention within everyday instruction. In outlining a methodology called *Formative intervention* which incorporates human agency in bringing about transformation, Engeström (2011) is critical of research approaches which do not factor in participants' possible unwillingness towards intended change:

In discourse on "design experiments," it seems to be tacitly assumed that researchers make the grand design, teachers implement it (and contribute to its modification), and students learn better as a result. Scholars do not usually ask: Who does the design and why? This linear view is associated with notions of perfection, completeness, and finality. This is exemplified by the use of the absurd notion of capturing "all variables." ... This linear view ignores what we know of interventions as contested terrains, full of resistance, reinterpretation, and surprises from the actors below. (pp. 600 - 601)

In what follows I draw on arguments made by both Sarason and Engeström to dwell upon the centrality of participant agency within everyday instruction. In doing so I draw on joint conduct of a project based intervention, in collaboration with Lotta at her Grade four mathematics classroom (Gade 2014). This enables me to discuss school change and educational reform, in terms of agency that Lotta and her students had in the classroom intervention conducted. Of interest too is my own agency as researcher in conceptualising and guiding Lotta's project based intervention, which was conducted as a plenary and drew on principles of exploratory talk (Barnes, 2008). Elaborated later on in this paper, it is by drawing on this empirical case that I dwell upon how the agency of students and teacher lie at the heart of productive classroom interventions, besides school change and educational reform.

I preface my discussion of agency by drawing upon two relevant research traditions. In the first and from within action research, Somekh (2009) argues agency as the capability of any person to take action that will have impact on a social situation. Somekh's attention to agency is with intention of bringing about change in instructional practices, by creating opportunities

for students' learning that are consonant with a teacher's intentions, values and purpose. In line with perspectives of activity theory Somekh also views teachers' actions as not separate from, but originating in situated perceptions and imaginings of his or her human mind. In the second and from sociological research, Sewell (1992) dwells on the dynamic and inextricable dialectic between human agency on one hand and prevalent social structures on the other. Arguing that social action can be empowered, constrained and even implied by the very existence of social structures, Sewell recognises human agency as varying across individuals and contexts besides being collective in nature. Human agency and social structure, he reiterates, both shape and are shaped by each other. In attempting to understand the centrality of human agency with respect to Lotta's plenary conduct of exploratory talk, I first outline Seymour Sarason's insights with regards to school change and educational reform, next highlight Yrjö Engeström's activity theory based methodology and finally portray the nature of participant agency which was possible to realise in Lotta's project based instructional intervention. Guided by Sarason's school based insights and Engeström's methodological arguments I thus ask, in what manner was teacher, student and researcher agency central to the conduct of classroom interventions as well as school change and educational reform.

SARASON'S INSIGHTS

Seymour Sarason's study of schools, classrooms, students and teachers was extensive and his writings prolific. In presenting his insights for my purposes at hand, I first highlight Sarason's (1999) simple yet astute observation that schools are not things or objects, but institutions within larger educational systems which need to be conceptualised. It is possible, Sarason added, that parts of these systems could not hear what other parts had to say, with some even being at cross purposes with another. While the scenario Sarason alludes to is not a difficult one to imagine, I mention how a state sponsored initiative within the Swedish educational system provided fillip to my extended collaboration with Lotta at her Grade four classroom. Such collaboration was predated with my conducting a six month pilot study with Lotta's prior batch of Grade six students in the previous academic year, at her Grade 4-6 school (Gade, 2010). It was during summer vacation which followed this pilot study, that Lotta applied for project funding announced nationwide by Swedish National Agency for Education (Skolverket <http://www.skolverket.se>). Lotta's project funding correlating communication and mathematics, provided a thematic focus for our collaboration in the year ahead. While I have detailed the development of teacher-researcher collaboration as a case of what Engeström calls *expansive learning activity* elsewhere (Gade, 2015a), I presently turn to the kind of project related support we received. In line with Sarason, Lotta's project funding was an example of how the Swedish educational system of which Lotta's school was a part, took initiative towards empowering the instruction of mathematics. While their funding enabled Lotta's school to purchase laboratory materials for her school on one hand, my association as researcher in her project facilitated utilising contemporary research and conducting classroom interventions on the other. Such manner of funding was not entirely without issue however, since Lotta's receipt of project funding did meet with some resentment from fellow teachers at her school. Sarason (1982) recognised such manner of state sponsored funding in addition, to be a result of societal pressures which emerged from outside local schools themselves. In

all probability the project funding which Lotta applied for and obtained was rooted in wider concerns felt in Swedish society at that time, of reports relating to falling standards of Swedish students in comparative international tests like the PISA and TIMSS.

Having outlined how the wider educational system in Sweden may have had bearing on Lotta's project related interventions, I turn next to Sarason's insights which relate to how cultures of schools and their organisational routines impact everyday classroom instruction. Fried (2003) summarises twelve of these ideas in the introduction of his book titled *A Seymour Sarason Education Reader*, of which I offer the first seven relevant to my discussion:

- (1) Every school has a culture that manifestly defines how people within it operate.
- (2) The 'regularities' of that culture - patterns, rules, and procedures that are mostly unseen and assumed - tend to undermine the basic purposes of educating our youth.
- (3) The overarching purpose of school ought to be that children should want to keep learning more about themselves, others, and the world, yet that purpose is mostly ignored.
- (4) The educational 'system' has an oppressive impact, and when that system continues unseen and unacknowledged, progress is stifled.
- (5) The system, as it currently functions, is intractable, not easily reformed, and reform efforts that ignore systemic regularities and inherent obstacles will predictably fail.
- (6) More specifically, reforms that do not change the power relationships between and among people in schools are fated to suffer paralysing inertia, if not direct opposition.
- (7) Sustained and productive contexts of learning cannot exist for students if they do not simultaneously exist for teachers. (pp. 3-5)

Sarason's insights listed above allow me to conceptually bridge systemic aspects of project funding which provided fillip to our teacher-researcher collaboration and the nature of student and teacher agency that was possible to realise within Lotta's classroom. Towards doing so, I first allude to Sarason's (1990) quote in the introduction of this paper urging schools to be for teachers too, with students' experiences also recognised as central within instruction. I next allude to points (1) and (2) above which reiterate how school cultures with their local rules, patterns and procedures define how people operate within their four walls. In our study the rector of Lotta's school gave her the freedom she needed, for me to visit her classroom and collaborate with her for research. There was little interference say in how Lotta managed her time and lessons. Lotta also wrote to parents of her students seeking consent for research, an aspect she followed up with gauging the interactions I had with her students. In taking such actions Lotta and me showed adequate regard for statutory rules,

following which enabled us to meet with project related goals. It taking such actions, we did not let systemic aspects mentioned by Sarason in points (4) and (5) above to hinder our work.

Before turning to methodological aspects of our work in the next section, I presently turn to the nature of agency that Sarason alludes to in points (3), (6) and (7) above. For example and in point (3) Sarason extends his earlier caution against neglecting students' interests within instruction and seeks students to learn more about themselves, their peers and the world. The exploratory talk based intervention which I discuss in this paper enabled Lotta's instruction to redress this very criticism, enabling her students to explore their understanding of everyday measures along with their peers. This they did by responding to a set of improbable questions that we had set like, Can Eva and Anton measure the length of Sweden on foot, Can Lars and Iris measure their age in decimetres. At first discussing such questions in pairs at their tables and then presenting their arguments in her plenary, Lotta's students used exploratory talk to hear how their ideas sounded when spoken out loud, besides also gauge what others thought of them (Barnes, 2008). Such manner of conduct had two advantages. First, in line with point (7) above, Lotta's conduct and subsequent analysis of data with me, enabled her to recognise the many ways in which she was able to guide her students' use of talk as teacher. She was able to identify which of her students, whom she knew as learners beyond the plenary, took part in her plenary and which did not. We were able to identify skeptics say, who were unwilling to explore their thoughts and those who were able to contribute scientific concepts way beyond what was expected of Grade four students (Gade & Blomqvist, submitted). Second and in line with point (6) above, our talk based intervention was able to redress the imbalance of power students can feel in classroom instruction, when by using presentational talk they merely present what they already know to those is power (Barnes, 2008). Inimical to students' learning this latter kind of instruction, Sarason (1982) would argue, carries the risk of students feeling powerless to contribute to change in classroom events via their own agency. If instruction were closed and not an open exercise, students' learning would be uninteresting for them, resulting in what Sarason termed encapsulated learning. In encapsulated schools by extension, teachers too could feel powerless in overcoming the many contextual aspects that are known to hinder meaningful instruction (Sewell, 1992; Somekh, 2009). It is against this background that Lotta's collaboration with me and utilisation of contemporary research within instruction, can be seen as a step in the right direction. In realising such collaboration we were able to also overcome what Sarason (1999) argued was the lonely manner in which teaching was conceptualized in wider society. Sarason pointed out that unlike in the performing arts, teaching was not conceived as a shared or public performance. Rarely did a teacher have a mentor to emulate and rarer still did teachers have any opportunity for sustained intellectual stimulation. In detailing how Lotta's plenary was able to address many an issue Sarason raised, it is methodological aspects of it's conduct that I turn to.

ENGESTRÖM'S ARGUMENTS

In developing Soviet theory of activity over the past thirty years Yrjö Engeström's writings are also extensive. While drawing upon arguments relevant to this paper, I find it appropriate to first mention that in contemporary times activity theory is not only developing in multiple

strands of a collective called cultural historical activity theory or CHAT (Roth & Lee, 2007) but also in an interdisciplinary manner (Blunden, 2010). In addition Engeström (2001) himself outlines the many generations which he thinks mark the historical development of this theory, wherein he explains the structure and use of his widely recognised triangular model of an activity system. In consonance with Sarason (Fried, 2003) arguing that school cultures impact the way people act within them, Engeström (2001) identifies the problematic of a hidden curriculum whereby students learn to *be* students, please teachers, pass exams, belong to certain groups and so on. Engeström goes on to elaborate his notion of *expansive learning activity* which was the kind of activity that Lotta and me became engaged with, in our extended collaboration (Gade, 2015a). In simple terms such activity began with our observing each other as professionals in my pilot study with Lotta's Grade six students and evolved to new forms of work like analysing, theorising and coauthoring journal articles in reporting her plenary conduct with Grade four students. Addressing Sarason's (1990) concerns that schools be for teachers too, such expansive learning activity exemplified the kind of transformation that was possible to bring about when we collaborated as teacher and researcher. In line with Sarason's point (7) our extended collaboration enabled me to utilise contemporary research in joint pursuit of Lotta's project goals, besides understand the educational landscape of her classroom (Gade, 2015b). These actions prepared ground for the manner in which we realised Lotta's plenary conduct, wherein we drew on the theory of exploratory talk (Barnes, 2008). Despite conceptualisation of teaching as a lonely profession in wider society (Sarason, 1999) our collaboration made it possible for Lotta to have productive and implementable intellectual resources at hand, utilising which led to bringing about educational transformation and school change simultaneously. In line also with Sarason's point (2) such manner of agency resulted in creating new structures of work across institutional confines, even as we adhered to ethical norms which research demanded of us. In the kind of understanding that Lotta's plenary had opportunity to bring forward, her students were able to draw upon their own interests which Sarason (1990) argued was vital. Far from using presentational talk to placate the authority of Lotta as teacher, her students were able to draw upon their lived experiences, share the knowledge they personally had, besides explore their thoughts with regards to scientific concepts that underpinned everyday measures (Gade & Blomqvist, submitted).

Yet a central aspect of the manner in which Lotta and me were able to conduct and realise her plenary is methodological arguments which underpinned our collaborative intervention. It is to elaborate on these that I turn to Engeström's (2011) arguments. Primarily and as alluded to earlier on, the very design of Lotta's plenary was not an a priori decision made by me, one which she merely followed through as teacher within her instruction. While Lotta's project funding did provide financial incentive, it was her project goals of communication and mathematics that became the focus of teacher-researcher collaboration through the academic year. The extended dialogue we entered into for this purpose, besides field notes about narratives we exchanged on a daily basis related to the instructional world we shared. It was such manner of historical association which allowed us to decide on the timing of our talk based intervention. It is also relevant to note that by the time of plenary conduct, Lotta's students had made many a concrete measurement in their sports field and classroom. It was also the case that Lotta had only one forty minute slot in the timetable left to spare, before having to commence with the next chapter of the textbook. In my suggesting improbable questions for Lotta to use and her accepting this idea as plausible to implement, it is

appropriate to acknowledge our having collaborated on conducting action research by this time, with the same batch of Grade four students (Gade, 2012). Such conduct enabled Lotta and me to be reflexive besides develop mutual trust. Accepting my suggestion and conducting a plenary enabled Lotta's students to explore and articulate their theories of measure (Lehrer, Jaslow & Curtis, 2003). As outlined in the next section and as detailed elsewhere (Gade and Blomqvist, submitted) such conduct was supported also by Lotta's choice of an appropriate pedagogical category. Lotta's plenary was thus grounded in the realities of her classroom, with the realisation of it's conduct a result of dialectical interactions between her, her students and me as researcher (Sewell, 1992). Far from being conducted in an a priori and linear fashion, Lotta and her students' agency was very much part of collaborative decision making. My own agency as researcher lay in drawing upon extended understanding of this structure-agency dialectic, my ability to deploy relevant contemporary research, besides conceptualize a classroom intervention which was both timely and implementable.

In deliberating on his activity theoretic methodology called *Formative intervention*, Engeström (2011) lists four points which help distinguish his approach from those which have an a priori and linear focus, which I now discuss with respect to Lotta's plenary. The *starting point* of any intervention is the first point Engeström makes. Embedded in the life activity of participants the content of starting points Engeström argues, is not known before hand but evolves as a novel solution to a local problematic. As mentioned earlier, the idea for Lotta's plenary was very much grounded in Lotta's project goals and instructional routines within her classroom. The *process* of any intervention Engeström next argues is not for execution alone but subject to participant negotiation. I argue it was our adopting such a stance which made it possible for Lotta to agree to my suggestion of using exploratory talk and her using a pedagogical category which she thought was appropriate to the task at hand. Engeström's third point relates to the *outcome* of any Formative intervention. Not looking for predetermined or preconceived results, Engeström argues these to not only be new but locally appropriate, with participant agency itself notable outcome. Lotta's own actions in choosing a suitable pedagogical category, besides guiding her students' use of exploratory talk exemplified her agency. Herein, her students had opportunity to draw on personal experiences and examine their individual understanding of everyday measures. Both outcomes were appropriate to local conditions of her classroom and school. In this her students had opportunity to articulate and evolve their individual theory of measure, beyond making rote measurements in the concrete. The final point Engeström draws attention to is the kind of *researcher's role* that transpires within any intervention. As against the control of variables, Engeström seeks researchers to provoke and sustain the nature of change and transformation any intervention could bring about in the hands of participants, who could in turn avail of their individual agency. In Lotta's plenary it was her students' nascent theory of measure which emerged across her plenary conduct. I argue such realisation to have been a risky proposition, with it's outcomes uncertain and not tried out before hand. For example Lotta's students could have collectively abandoned their participation. Representative of their individual agency and in its conduct, we found a student Noel to interject Lotta's plenary by saying 'I don't understand anything!' while another student Nils to suggest to Lotta, that his classmates did not seem to identify her plenary as a space where anything improbable could happen. In exemplifying the breadth of responses and kind of agency that Lotta's students exhibited, I now turn to two extracts from within Lotta's plenary which relate to their emerging theory of measure.

PLENARY OF EXPLORATORY TALK

After addressing students' curiosity about the improbable nature of questions we had set, as well as specifying the ground rules which students were expected to follow, Lotta asked each pair of students to stand beside her and present arguments they had explored in pair work. It was also the case that by design we addressed the students by name in the questions we gave each pair. Our analysis of talk across Lotta's conduct of such a plenary evidenced many an interesting aspect. For example in plenary discussion related to the question Can Eva and Anton measure Sweden's length with/on foot? we observed Eva to take paces in the space besides Lotta, her desk and the blackboard. With a student guessing Eva's pace to be a meter, we also observed Anton to walk with his feet end to end, in his exploration of how Sweden could be measured on foot. The ensuing plenary discussion was as follows:

- Liam You have to go straight ahead
- Ulla What if you go into a building
- [??] Then you go over the house
- Lotta Noel! Do you have anything good to say
- Noel And you can go through the house ... and you can go inside the house and jump off the balcony ...
- Leon And what if it is a high building
- Nils If you have a map, you can take that, you can look how much a foot is and use the scale of the map ...

The above extract evidences some features of the kind of agency Lotta's students displayed in her plenary. In the first Lotta's students drew on their acquaintance with body measures like a pace say and considered practical aspects relating to being able to measure Sweden both on foot and in the concrete. Their concerns of coming across high buildings and balconies was indicative of these concerns. In line with Engeström (2011) I argue such concerns to evidence how Lotta's students displayed ownership of the content of the question they were exploring. Next and as argued by Sarason (1990) in such manner of exploration, they were able to draw upon their personal experiences with measures in their everyday life.

My second extract evidences plenary discussion in relation to the question Can Lars and Iris measure their age in/with decimetres? whose analysis provides additional insight:

- Lars Can Lars and Iris measure their age in/with decimetres
- Lotta Can Lars and Iris measure their age in/with decimetres
- Many Noooo

- Lotta You should think about it for a while
- Nils Maybe
- [??] It works (Det går)
- Lotta Lars and Iris will answer, if it is possible to measure one's age in decimetres Lars and Iris will answer first
- Lars [Inaudible]
- Noel It doesn't work (Det går inte)
- Nils If you measure, just like Lars says or what Iris ... If you are ten decimetres long ... could't you say as Lars and Iris are suggesting that you are for example ten years old ...
- Lotta [Inaudible]
- Nils Ten decimetre years
- Leon Ten Dennis decimetre years!

To go along with students' talk Lotta gives examples of clothing sizes, yet is interrupted:

- Mark If you are thirty years old then you just count thirty decimetres. If you are ten years old then you reckon ten decimetres
- Leon Can one say one is thirty decimetres old
- Mark If you are thirty years old ... you say thirty decimetres. In that way you measure age
- Noel What! How are you thinking! I don't get it
- Lotta When we have thirty decimetres ... We must hear what Mark is saying and it is very difficult to hear what Mark is saying if all of you talk at the same time
- Noel You are insane! (Du är inte klok!)
- Lotta You mean that someone who is thirty years old is thirty decimetres tall?
- Leon This is just like Lena measuring time in kilograms!
- Noel I don't get it! (Jag fattar inte!)

After further exploration Nils ends collective responses to this question as follows:

- | | |
|-------|---|
| Nils | Nobody understands that ... I have said this throughout the lesson
[Addressing Lotta loudly] |
| Lotta | I haven't heard you Nils [Meaning she should have listened to him all
along] |

My second abstract from Lotta's plenary enables me to shed light on some other issues I have been drawing attention to in this paper. First and in line with research which argues that students need to articulate a theory of measure beyond taking concrete measurements alone (Lehrer et al., 2003) the above extract evidences the beginning of such attempts by Lotta's students. Asked if it was possible to measure their age in decimetres, the above extract shows her students beginning to differentiate the magnitude of any measure from the scale in which any measurement is made. Nils for example thought it possible to take a magnitude of length to indicate one's age, implicitly seeking a correspondence between magnitudes of age and length. Second and in the spirit of exploratory talk which Barnes (2008) pioneered, the above extract shows the manner in which Lotta's students explored their thoughts while drawing upon their understanding of everyday measures, even as they attempted to reconcile the improbable situations portrayed in their questions. Lotta's own guidance in this task remained crucial by repeating her students questions say, suggesting that students deliberate the task at hand or ensuring that they take turns while talking (Mercer & Dawes, 2008). Third and as mentioned earlier, Lotta's agency as teacher was extended in the expansive learning activity we were able to realise subsequently (Gade, 2015a). Lotta's taking part in analysis of plenary talk during subsequent reporting led us to identify students as different kinds of learners. Noel for example seemed a skeptical participant, often interjecting ongoing talk by saying he did not understand anything or even that everyone was insane. Nils on the other hand seemed to acknowledge the improbable game being played out, one his friends did not seem to recognise. It was these aspects combined with Lotta's choice of pedagogical category which contributed to our landscape study (Gade & Blomqvist, submitted). Taken together these arguments lead me to engage with two central issues raised by Sarason (1990) in my introduction. The first draws attention to his concern that schools are for teachers too. The above extracts show how Lotta was able to draw on contemporary research via teacher-researcher collaboration and conduct her plenary. The second was the fact that it was her students interests that was the starting point for both design and realisation of her plenary intervention. Bridging the perceived gulf between school and lived-in world and with interest and not content matter as principal focus, in Lotta's plenary her students had opportunity to explore the meaning they had made and participate with individual understanding.

SCHOOL CHANGE AND EDUCATIONAL REFORM

I draw my arguments to a close by first dwelling on the notion of educational reform. As drawn attention to by Sarason (1982) and as was possible to observe in my study, it was our ability to draw forward students meaning which made their participation in Lotta's plenary to be of interest to them, even if some were skeptical of ongoing discussion. It is fair to say that

those who eager to contribute, were not learning about measurement by rote alone (Lehrer et al., 2003) but had opportunity to examine their understanding of measures via an activity of knowing (Wells, 1999). I next dwell on the notion of school change, closely interwoven with educational reform. As again argued by Sarason (1999) and as was possible in Lotta's project, it was funding handed out by Swedish authorities which provided fillip to the kind of teacher-researcher collaboration we were able to realise and the changes we brought about in Lotta's classroom. Their financial support of a local school based project provided incentive for her sustained intellectual support, in turn enabling her to theorise as K-12 teacher. Such incidence is invaluable, since much theorising about K-12 instruction does not seem to factor contextual aspects which teachers like Lotta face and need to overcome, wherein theorising is done by expert researchers from outside (Cochran-Smith & Donnell, 2006).

Yet the point I wish to emphasise at the very end of this paper is the manner in which teacher-researcher collaboration between Lotta and me enabled us to intervene at multiple levels of teaching-learning, classroom instruction, Lotta's local school and wider society. Having possible lessons for conduct of interventions in local contexts elsewhere, I make two observations in line with Engeström (2011). The first alludes to expansive learning activity which Lotta and me were able to bring about (Gade, 2015a). Such extended collaboration involved our questioning as well as working with and around rules, norms and routines known to encapsulate learning in schools (Engeström 2001; Fried, 2003). In this we went on to display thoughtful agency as teacher and researcher, besides engage with newer professional practices across institutional confines, like jointly analyse intervention data and coauthor its scientific reporting. In Lotta's ability to conduct her plenary, her classroom instruction overcame the risk of being isolated besides her school an uninteresting place (Sarason, 1990). Towards achieving this Lotta and me worked with and around mid-level taken for granted phenomena at schools (Gade, 2015c). In the second, our realisation of participant agency of students, teacher and researcher was both vital and significant. In Lotta's plenary, her students were able to participate in individual and meaningful ways, overcoming the risk of students feeling powerless in contributing to change in everyday classrooms (Sarason, 1982). The manner in which teacher-researcher collaboration evolved historically provided Lotta with intellectual resources, utilisation of which contributed to her agency. This resulted in Lotta conducting her plenary by utilising a pedagogical category which agreed with her aims, interests, values and purposes (Somekh, 2009). My own agency as researcher lay beyond extended collaboration with Lotta and drew on intricate understanding and timely utilisation of the ongoing dialectic between students learning, Lotta's teaching and the mathematics curriculum being realised in her classroom (Sewell, 1992). Dialectically related to nationwide initiatives of empowering mathematics instruction, each of these agentic aspects contributed to the nature of school change and educational reform just portrayed. I argue it possible to bring these aspects to fruition in any classroom, by reconceptualising existing norms and routines besides prudently exercising participant agency.

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