Truthfulness in science teachers’ corporeal performances

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Abstract
Relations between science teachers’ corporeal performances and their statements regarding these actions are discussed. Dispositions of truthfulness are applied to grasp the personal nuances in these relations. Three teachers’ corporeal performances and truthfulness are analysed. Diana shows effort, sincerity and trustworthiness in dealing with classroom management. Jane shows effort, fidelity and honesty in developing outdoor teaching. Simon shows transparency, objectivity and sincerity in his support of colleagues. By addressing the relations in the vocabulary of truthfulness the teachers in this study appear as professionals with personal dedication towards improvement of specific activities in a science teacher’s work and teaching.

KeyWords: Truthfulness, science teacher, corporeal performance, personal dedication.

Introduction
Teachers’ work consists mostly of teaching and communicating with pupils, students and colleagues. Speech, gestures and other corporeal performances are elements in their communicative activity (Hwang & Roth, 2011). This means that teachers’ speech, bodily and other communicative actions are fundamental in understanding teacher practice in their classrooms. Various educational researchers have begun to attend to the way that corporeal performance figures prominently in learning. Focusing on mathematical cognition Alibali and Nathan (2012) find that embodiment is 1) based on perception and action and 2) grounded in the physical environment of the present classroom. The teacher has to bridge between the known and the unknown of the pupils by means of vocal and gestural performances (Hwang & Roth, 2011). Within mathematics education research there is growing awareness of the significance of teachers’ use of gestures as one among many semiotic resources in a multimodal approach to mathematics teaching (Arzarello, Paolo, Robutti, & Sabena, 2009). Teachers’ gestures can support the phenomena or concepts they are explaining verbally but their gestures can also contradict the intended understanding in a lecture. The collective of communicative performances of teaching contribute significantly to the social world that pupils experience when they participate in lectures and instructions (Hwang & Roth, 2011). The pupils perceive the teacher’s vocal, gestural and positioned bodily performance, not the plan in the head of the teacher. The teacher’s basis for performing in the relation with the pupils in the classroom environment is themselves and their own bodily experience of teaching and the curriculum (Daugbjerg, in press). Other researchers add significance to the developmental aspects of “personal, embodied understandings of the lived terms of inquiry” into teacher education (Latta & Buck, 2008, p. 315). The teachers’ present corporeal performance is in accordance with their personal feelings and desires, meaning that the
relation between actor and environment can be addressed in terms of sincerity, authenticity and truthfulness (Wertsch, 1991). Including teachers more personal aspects of their communicative performance can bring forward truthfully his or her beliefs, intentions, feelings, desires and the like. These personal elements make it possible for a hearer to give credence to what is said and seen (Habermas, 1984). This opens for seeing teachers’ gestures and speech not only from the pupils’ learning perspective but also from the teachers’ teaching perspective. The latter perspective is formed by the teachers’ personal and embodied experiences from their work and life in general (Goodson, 1980; 2008). Despite the presented research interest in teachers’ gestures and in their personal embodied experience, the combination of these two research interests is rare. Teachers’ reflective perspectives on their communicative activities are seldom covered in detail in teacher research studies.

In the present study I will take up the corporeal performance approach presented by Hwang and Roth (2011) to investigate the relation between teachers’ different communicative activities and their reflective perspectives on these activities. I will combine their approach with the notion of truthfulness in order to come closer to the personal aspects of the observable communicative activity of teachers in their work. I will do this by combining observations of the teachers’ teaching and performing other work functions with their reflections on their professional choices and priorities. My intention is to add to the contemporary teacher profession debate the teachers’ more personal reasons for performing teaching as they observably do it.

**Truthfulness and corporeal performance as a framework for understanding teachers’ work**

Truthfulness is a virtue, which acknowledge, that it is possible to understand statements of teachers as being based on their truly believed reasonable grounds even though these may later turn out to be false (Cooper, 2008, p. 82). Cooper builds his understanding of truthfulness on (Williams, 2002):

… truthfulness devolves into two dispositions, ‘Accuracy’ and ‘Sincerity’. These are the dispositions, roughly, to take due care that one’s beliefs are warranted, and ‘to come out with what one believes’ (Williams 2002, p. 45). The former requires honesty, objectivity and effort when forming one’s beliefs; the latter, a determination to communicate what one believes and, more generally, to be trustworthy communicators who do not mislead. (Cooper, 2008, p. 81)

Sincerity has to do with the trustworthiness in the speech acts, meaning a disposition to make sure that one’s assertions expresses what one actually believes. Accuracy is a more complex virtue, its basis is the effort we put into acquiring information about a certain subject matter. This informed accuracy will support a more authentic, objective and honest addressing of audiences (Williams, 2002). Cooper elaborates on William’s notion of truthfulness and adds fidelity that Cooper defines as “truthfulness in discussing some topic may require ‘Fidelity’ to the topic - an approach to it that does not belive what one takes to be the salient, important aspects of the topic”. Furthermore he adds transparency meaning that truthful communication “has no ‘agenda’ hidden from its audience” (Cooper, 2008, p.81). In order to make communication truthful it must be
Truthfulness in science teachers’ corporeal performances

accurate and transparent and furthermore demonstrate fidelity and sincerity in dealing with its topic. Truthfulness is a characteristic for communicative actions in the subjective world (Habermas, 1984). Wertsch (1991) accentuates the importance of an awareness of mental actions that, though they are carried out by individuals, are inherently social in certain respects especially in their use of language and other means of communication. I will apply such a sociocultural understanding of verbal and bodily actions in the present study as it helps me to contextualize my teachers’ corporeal performances.

Taking the lead from the above cited research I will in the present paper address science teachers’ bodily and verbal actions in science teaching as truthful corporeal performance. I will apply Cooper’s vocabulary of truthfulness to analyze teachers’ verbal and bodily actions. Wertsch (1991) also use human action as his central analytical element.

When action is given analytical priority, human beings are viewed as coming into contact with, and creating, their surroundings as well as themselves through the actions in which they engage. Thus action, rather than human beings or the environment considered in isolation, provides the entry point into the analysis. (Wertsch, 1991, p. 8)

In my approach I will add that it is important to keep in mind that actions here is to be understood as bodily as well as speech actions. Hwang and Roth (2011) use Vygotsky to stress the point that mental actions like language are copied from the social world. In reverse the way that we can learn about other persons’ mental actions and experience is through their narratives. (Clandinin & Connelly, 1994; 2000) Narratives present the personal idiosyncrasies of the individual teachers, which according to Goodson is essential in the teaching profession: “In understanding something so intensely personal as teaching it is critical we know about the person the teacher is. Our paucity of knowledge in this area is a manifest indictment of the range of our sociological imagination.” (Goodson,1980, italics in original). Interviews, observations and contextual data regarding the school and local area where a teacher live and work inform research about the teacher’s past and present personal life and work experiences (Goodson, 1992). Furthermore it is important to observe the teachers’ actual teaching, to saturate your understanding of the teachers’ narratives (Traianou, 2007).

Teachers’ corporeal performances are easily observed in the classroom, and can be analysed as means from a learning perspective of the pupils. Do we however want understand more about how the teacher ended performing the observed corporeal activity we must listen to the teacher telling about their teaching. In this process we must leave space for the teacher to bring forward nuances of their teaching activities. The language of truthfulness provides a vocabulary that can help us to retain the nuances of the individual teacher.

The applied method

Danish primary and lower secondary school science teachers participated in the present study. The study was focused on the relation between life and work of science teachers. The 8 participating teachers and I made introductory semi-structured life history interviews followed by observations of each teacher for 2-4 workdays at their schools or during field trips to saturate and enable a thick description (Denzin, 2001). The observa-
tions were documented through handwritten logbook notes. Along this interaction with the teachers some of their own produced teaching material was collected such as pupil worksheets, curricula, etc. A second interview was based on themes and questions that appeared from the preliminary analysis of the first interview, the observations and the collected material. Such a methodological approach has been tried out by Norrie and Goodson (2011) and Brickhouse and Bodner (1992). All data was collected from February 2009 to November 2011. The coding was performed solely by the author using the Nvivo8 qualitative analysis software. The coding framework is constructed in accordance with the recommendations by Saldaña (2009) and Richards (2008) using a mixture of free nodes and tree nodes in Nvivo8. The structure of tree nodes was developed from a pilot study (Daugbjerg, 2010) and was based on larger international studies on teacher professional development (Day, Sammons, Stobart, Kington, & Gu, 2007; Lindblad & Goodson, 2011). The tree nodes were primarily covering professional aspects like relation to colleagues and pupils, view on natural science, professional development and the like. The free nodes appeared during the analysis when a theme presented itself in the interviews or observations. The free nodes were covering more personal aspects like spare time interests, choice of teaching subject matter, own children, employment prior to teaching and the like. It is in the juxtaposition of observation and interview data from e.g. the node on relations with pupils that brings forward personal as well as professional aspects of this element in teaching. This study on truthfulness and corporeal performance is based on the work in my PhD thesis on the entanglement of science teachers’ lives and work (Daugbjerg, 2013). The overall design of the empirical and analytical work behind this study is as such supervised by my PhD supervisor and approved by my assessment committee. The detailed analysis and presentation of data in this paper is however exclusively my own work including the theoretical staging of the analysis and the drawn conclusions.

In my research I have the teachers’ speech – verbal actions - in their classroom dialogue and in the life history narratives. I have their bodily actions in their bodily communications in the classrooms, in the school corridors, in the staff room and during field trips with their pupils. I have selected three cases for presentation in this paper that illustrate how the relation between verbal and bodily communication can be read as signs of truthfulness. In my analysis of signs of truthfulness I have put emphasis on clear relations between the observed corporeal performance and how the teacher talks about this performance. I have been regarding it as a sign of accuracy if the teacher express and show effort, authenticity or honesty in their verbal and bodily communications in accordance with the above description developed by Cooper (2008). Likewise I have been regarding it as sign of sincerity if the teacher express and show trustworthiness in their verbal and bodily communication. I have been regarding it as a sign of fidelity if the teacher expresses a full account in their verbal and bodily communication. I have been regarding it as a sign of transparency if the teacher shows no signs of hidden agendas. I have to stress here that I’m not judging the teachers general personal character I’m specifically analysing the corporeal performance in the presented cases and how they can be regarded as signs of truthfulness. For this reason each case is presented as a teacher and his or her handling of a school activity to stress the point from Wertsch above that actions are the entry point of the analysis.
The resulting cases

I present the results of my observations and interviews as three selected cases, where I have condensed the observations and relevant interview excerpts into coherent narratives. Their personal dealing with the specific school activities is present in the observation, but has it clearest voice in the interview excerpts. The last case doesn’t directly involve pupils, it is about a teacher providing pedagogical and subject matter support to colleagues.

Diana dealing with classroom management

Diana instructs the pupils using the blackboard to present the agenda for the lesson and for structuring the classroom dialogue, besides that she uses the interactive whiteboard for presenting exercises and worksheets that the pupils can download from the school intranet to their own laptops or borrowed school-laptops. She instructs the pupils that if they have problems, they first read the worksheets once again if that doesn’t clarify their problem, then they ask their classmates. Only if their classmates can’t help them, then they ask Diana. Telling the pupils to use their classmates forces the pupils to explicate their problem and to relate to their classmates as potential sources of learning. This also diminishes Diana’s number of pupil interactions giving her more time to talk to pupils with significant problems learning the subject matter at hand.

Diana present reflections on her approach to dealing with a former problem of classroom management in her Physics/Chemistry teaching:

During the last years I have read a lot on classroom management (.) I think I exactly got some specific tools for what you do, and what works, and what does not work in relation to quieten things down; or in relation to conflicts, how can I de-escalate rather than escalate it. Because I felt that I kept running into, and couldn’t understand, there was no experience that could solve that problem.

…

The most important thing for me is that the pupils function. (.) Like socially in relation to each other and function in relation to the conditions we have here, they can relate well with one another; but when I give some conditions or other [adults] does it, then they suddenly don’t function (...) and that I think it is the biggest task to make them function here and make them function with the other pupils. (Diana is 39 years old and has been a Physics/Chemistry teacher for 13 years)

Diana’s follow up on acknowledging this problem is that she puts effort into gathering knowledge through literature on how a classroom dialogue can be managed. Her next action is to implement what she has read in her own classroom dialogue i.e. the observed structuring of the classroom dialogue.

Diana’s actions shows signs of accuracy as she honestly puts effort into acquiring knowledge on how to handle classroom management but she is also authentic as she addresses the problem in a way that communicates well with the pupils. She signals a
very sincere and trustworthy follow up on her recognition of a problem instead of believing it.

**Jane restoring a local nature area and teaching outdoor**

Jane has participated in an in-service professional development programme. She took a primary science teaching module from the pre-service teacher education (equivalent to 36 ects at bachelor level). As her exam project she investigated a pond and a forest near her school and made plans how to restore them and improve the educational value of them. She followed up on these plans and persuaded the municipality to restore the lake and the forest. The lake has been restored; the bottom mud has been dug up. The forest has been thinned, so that the remaining trees have a better chance for growing into healthy natural looking trees and form a natural forest.

The in-service training has (re-)affirmed Jane that her approach to teaching about science and nature is constructive and beneficial for the children. Jane’s actions in the classroom - and other educational settings - reflects a continued relation between her 32 years of experience of teaching, and her devotion to communicating nature and natural phenomena to children, and her recent in-service education. She is and has constantly been involved in local nature conservation projects; Jane is - in spite of her seniority - still developing her own teaching. She is still engaged in social activities with the pupils such as spending the night under open air.

It is such a beautiful little place if only more would use it more. It is so full of opportunities. I even stayed overnight up there with a group of pupils once. We had wonderful evening, a clear sky and lots of stars. Children nowadays don’t see stars; they don’t sleep in the wild. It is a shame. (Jane is 56 years old, and has been a primary science teacher for 32 years).

Jane’s commitment to outdoor teaching shows signs of accuracy as she puts a lot of effort into activating her new competencies from her primary science teaching education into her own primary science teaching. Jane’s long-lasting and continued emotional relation to natural settings such as forest and ponds was founded when she was young:

We went swimming in the creek near my uncle’s farm when I was girl. I remember one evening we were going home and the sun was setting, this red evening sun and there came a bumblebee very quiet (.) and the smell of bugs, these leaf bugs, who were hanging up in the trees, this sharp smell, no really (...) such an experience stands very strong for me (...).

The way that Jane gives this type of experiences voice in her life story narratives adds a lot of authenticity to her commitment to teaching enthusiasm for nature to the children. An enthusiasm that is visible through her use of a series of bodily communicative actions and experiences. I followed Jane on a field trip, where the pupils collected insect
galls from oak trees; she enthusiastically praised the pupils when one of them found a new type of galls.

In all, there are signs of accuracy in Jane’s effort in restoring the pond and signs of sincerity in her trustworthy use of the pond in her primary science teaching. Furthermore she shows signs of fidelity and honesty based on the fact that Jane refers to her own emotional childhood experience, when she applies an experience-based approach in her teaching of nature and natural phenomenon to children.

**Simon supporting his colleagues**

Simon has taken a one year education as science education guide (equivalent to 60 ects at bachelor level). Today he functions as such and he heads the science teacher team at his school. He furthermore has been attached to a nature school where he also functions as a guide. Simon has taken his new competencies and used them for the development of a local primary science curriculum. Simon’s interest is to empower his colleagues in their work with and teaching of primary science. Simon uses his newly acquired competencies to guide his colleagues in their joint work with establishing a resource bank and database on teaching materials for primary science. Simon has presented the database to me and shown me the teaching materials in it. Simon was able to get his colleagues involved, as his talk of “we” and “team” below illustrates but also as the joint ownership to the database of materials that supplement the curriculum illustrates.

... last year we said in our science teacher team that Natur/teknik [primary science] was our focus, there was to be something related to the curriculum aims and that was really it, and then people should help collect teaching materials. I had taught something about it - that is me and a colleague - it was on how we used some teaching material in our teaching. And this year we thought that it would be Physics/chemistry that needed a boost. (Simon is 39 years old, and has been a science teacher 9 years).

Simon shows signs of sincerity in the way that he wants the colleagues to take ownership to the joint development of the local primary science teaching material database. Simon signals transparency as he openly communicates the agenda of the database and the way the science team work in general. Simon bases his colleague including approach on his science teaching guide education, where he was educated to work systematically with including his colleagues to secure their ownership of the development of primary science teaching. A choice that signals the he objectively finds this a fruitful way to include his colleagues.

**Concluding reflections on truthfulness in science teachers’ corporeal performances**

I set out to investigate the relation between science teachers’ bodily actions and speech acts concerning their communicative activity. I applied the vocabulary of truthfulness to analyse and describe the verbal and bodily actions of the participating teachers. The above cases present how it is possible to find coherence between what teachers do and
what they say about what they do. Furthermore the cases illustrate how this coherence can be described with truthful dispositions of accuracy, sincerity, transparency and fidelity in their relations to their work and pupils as suggested by Cooper (2008). The presented cases relate to diverse school activities such as teacher pupil relations, outdoor teaching, and colleague support. The latter case doesn’t involve much physical activity in the corporeal performance, however despite the low level of physical activity there is still significant signs of truthfulness in the actions performed and the reflections presented by Simon. In the presented cases it is especially sincerity, effort, authenticity, accuracy and trustworthiness that stand out as visible signs of truthfulness. The limited number of teachers in this study and the fact that I conducted the analysis alone calls for awareness regarding large-scale generalizations of any conclusions from the study.

However the study does indicate that the vocabulary of truthfulness contributes to the description of science teachers’ more personal aspects of verbal and bodily actions in their teaching science and work with science teaching—e.g. classroom management, outdoor teaching, and colleague guidance. If science teacher research wants to understand the person in the professional science teacher it could be beneficial to address the truthfulness of science teachers’ speech, gestures and other bodily actions. Within science learning research there seems to be a movement to broaden the understanding of conditions for learning science:

A recognition now emerges that being human means being in the flesh, acting in the world with feelings, emotion and corporeal forms of knowing. The classical theory of reason, which explains learning as the product of the conscious (rational) mind configuring itself, does not fully explain how real people learn by means of sense experiences, affect, and uncertainties. (Hwang & Roth, 2011)

Departing from this perspective of pupils learning it could be said that corporeal forms of knowing also apply to teachers teaching. Teachers knowing about teaching are part of their bodily experiences inside classrooms as in the case of Diana and outside classrooms as in the case of Jane. In the presented interviews the participating teachers state their reflections on the observable corporeal performances. The application of the vocabulary of truthfulness offers means to describe how corporeal and speech performances of the participating teachers relate. By addressing this relation as sincerity, effort, authenticity, accuracy and trustworthiness the teachers in this study appear as professionals with personal dedication towards improvement of specific activities in a teacher’s life and work.
References


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