



A Construction for the Transmission of Growth: On Metaphors in Education

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Abstract

Metaphors are ubiquitous in education. In this paper an attempt is made to explore two questions that are thus pertinent: Why – and is this an unhappy state of affairs? Using the interaction-view of metaphor as analytical frame (Black 1954/55), a possible mechanism behind metaphor-generation in education is identified. According to the interaction view, metaphors function by a mechanism of inclusion/exclusion, i.e. by admitting certain associations whilst rejecting others. This mechanism, the paper argues, is vital in accounting for the prevalence of metaphor within the educational field. Three educational metaphors are then analyzed: construction, transmission, and growth, and an attempt is thereby made not only to demonstrate said mechanism, but also to consider some of the consequences that follow. Especially one result of the paper is notable: From the vantage point of the interaction view, conceptual formation in education presents itself in a new light.

Keywords: *Metaphor, constructivism, transmission, growth, education, educational science*

1. Introduction: Questions, Purpose, Structure

Metaphors are ubiquitous in education, as evidenced by for example “zone” and “growth”, by “construction”, and “scaffold”, and by “deep” and “surface”. I am in two minds whether this is an unhappy state of affairs; whether it represent something one should try to fix in the interest of precision. On the one hand, it seems the answer to this is “yes”, since scientific progress hardly is possible if not based on something solid, i.e. something literal, i.e. something precisely *not* a metaphor. On the other hand, perhaps the prevalence of metaphor in education testifies to a profound disciplinary feature, that it is therefore not easily eradicated, and that any attempt to do so would imply misrepresenting the very nature of the educational field.

This paper is an investigation into questions pertaining to the prevalence of educational metaphor. A particular interest is the question *why* metaphorical descriptions are so common in the field, and my aim is to explain this – something I do by identifying and discussing the mechanism behind metaphor-generation. Utilizing *the interaction-view* of metaphor (cf. Black 1954/55; 1977), the argument of the paper is that metaphor functions by triggering, in those who understand the metaphor, an alternative frame of reference – and that a metaphor is thereby *inclusive* as regards things the alternative frame affords. Consider for example the metaphor “Man is a wolf”. If he is, he is also “fierce, hungry, engaged in constant struggle, a scavenger” (things afforded by the new frame) (Black 1954/55, 288). At the same time, however, and by this very token, a metaphor also *excludes* certain features/properties, namely those that are inconsistent with/unfitting the frame the metaphor suggests. Consider again how man, if a wolf, is not at the same time brave – even if he might be cunning. A main argument of the paper is that the mechanism of inclusion/exclusion helps explain the prevalence of educational metaphor.

Three seminal educational metaphors are analysed in the paper – “learning is construction”, “teaching is transmission”, “education is growth”. By way of this analysis, I am positioned to discuss consequences and implications of the mechanism of inclusion/exclusion. In conclusion, and from the vantage-point of insight into how metaphor functions, I consider how conceptual formation in



education presents itself in a new light. The purpose of the paper is thus to describe and offer a perspective on a predominant feature of education – the ubiquity of metaphor within the field, and to discuss some highly interesting questions that arises in the extension of this perspective.

The paper is structured as follows. I start (sect. 2) by presenting a list of educational metaphors, and/or uses of such. The list serves to *demonstrate* (as opposed to merely *claim*) that metaphors are ubiquitous in education. Subsequently (sect. 3), I describe and develop the papers methodological approach, viz. the interaction-view of metaphor. Contrasting in this section the interaction-view to (i) *the substitution-view* of metaphor and (ii) the *comparison-view*, my aim is not to validate my methodological approach as much as presenting it. I then (sect. 4), analyse three educational metaphors using the interaction-view as an analytical lens: the construction-, transmission- and growth-metaphors. Lastly (sect. 5), I consider some implications and consequences of my analyses and offer a conclusion. In this last section I also answer the questions posed on the opening page.

2. Metaphors In Education – A Partial List

I wrote above that metaphors are ubiquitous in education. In this section, relatedly, I do two things. First, I demonstrate that this is in fact the case. A demonstration, as stated, is different from a claim in that it is explicitly based upon (empirical) evidence. This is part of the reasoning behind presenting the list below. After having presented the list, and second, I ask two pertinent questions.

Here is a list of metaphors currently in use in educational contexts:

Absorb, acquisition, agricultural, appropriation, assembly line, attainment, banking, basketball game, Bildung, billiard balls, boundaries, brain freeze, breadmaking, brick, budding minds, builder, business, candles being lit, care, catalyst, child-centred, clay, climate, clinician, cluster, coaching, collector, commodities, construction, container, cooking, cramming, creators, crossed, cultivating, cure, deep, deficits, delivery, depositor, depositories, diagnostic testing, diagnostician, director, discover, dissonance, doctors, echo, ecology, educational pearls, encoding, enlightenment, equilibrium, exchange, facilitator, factory, factory worker, falling bridge, family, fertilizer, filter, fire, flipped classroom, flowing waters, formation, friend, funnel, funnelling, gardener, gardening, goods, grow, growth, guide on the side, healing, housework, improvisational dance, institution, instruments, internalization, journeying, lamplighter, left behind, legitimate peripheral practitioner, lights, machines, manager of production line, map, market, mechanical, melting pot, member, mental meals, mentor, mid-wife, modelling, moulds, mortuary, narration, nurture, nurturing, objects of knowledge, orchestrating, oscillating, participation, particles in a box, parts-catalogue approach, path, peeling an onion, percolation, performer, persuasion, plants, portkey, pottery, pouring water, practitioner, prescription, production, products to be packaged, pulling, pushing, quilting bee, race, raw material, recapitulation, receiving, reception, recipe, recipients, regimens of treatment, regurgitation, resonances, respite, risk, sage on the stage, scaffolding, sculptor, seed, service, shaping, shepherding, shopping malls, showing, sick patient, sliding, solar system, sorting machine, spiral, social worker, sponge, spoon-feeding, sport, staircase, start fire, stir the pot, stock, storytelling, student-centred, surface, system, teacher-centred, team leader, technician, teeming crowd, texture, threshold, threshold concept, through the fog, tough bitter covering, tools, tour guide, trainer, transaction, transfer, transformation, transformative, translation, transmission, trouble-shooter, turbulence, umbrella, underlying, unified system, uphill battle, vessel, victims, vision, walk, war, wastelands, water, weakening, well-ordered machine workers, zone.

The list is supposed to, first, surprise the reader. – So many metaphors in education? Really? Yes, I haven't thought about it explicitly, but now that you mention it... Conversely, the list might be seen as mere hyperbole, especially after considering its genesis: it is derived from consulting just four papers, papers explicitly dealing with "metaphor" and "education", having these words, or slight derivations from them in their titles (refer to the papers in question in the bibliography, where they are marked with



a “*”). On this background, there is no wonder that a list like the one above is possible, but it represents an exaggeration, and it certainly does not demonstrate that metaphors are ubiquitous *in education*. I recognize this objection. At the same time I think it is hasty. Let me explain this. First, the list lays no claim to being representative, in which case there would be problems with it – both in terms of the sample being too narrow (lack of construct validity), and in terms of the absence of a recognized way to get from sample to universe (lack of external validity). If a demonstration that metaphors are ubiquitous in education were to be based upon four papers explicitly dealing with metaphor and education, with no indication of how to get *from the papers to education*, this, of course, would not do. But second, the list is not meant to achieve representation. But what is it meant to achieve then? It is meant to achieve *recognition*, to remind the reader what she already knows, even if only implicitly: that metaphors are everywhere in educational contexts. In so far, the list does not perhaps demonstrate as much as illustrate. Or rather, precisely because it illustrates, it also demonstrates the general claim: that educational metaphors are everywhere. This, in any case, is the reason for including the list, and the reason for considering it a demonstration.

There is presently no ordering of the metaphors on the list – apart from them being organized alphabetically. It would be interesting to investigate into ways of systematizing educational metaphors, and several such ways have been suggested (e.g. Lakoff & Johnson 1980, 14ff; Ortony 1993, 4; Botha 2005, 433; Cook-Sather 2003, 26ff; Northcote & Featherstone 2006, 253). But since the task I have set myself is *to make use of* a particular view of metaphor, not to canvas different metaphor-taxonomies, I shall instead proceed by asking the following two questions: If the situation is as described, if metaphors are indeed everywhere in educational contexts, why is this so? Why the prevalence of metaphor when thinking, talking, and researching in and about education? The second question, and assuming the demonstration above successful, is the following: Is this an unhappy situation? Should we try to change it? As is evident, the latter question is different from the first in that it is of a normative nature. To answer *the why* and *the normative* question, respectively, it is necessary to get to better terms with what metaphors are and with how they function. It is to investigate this I now turn.

3. How Metaphors Mean – An Apparatus For Analysis

According to the *Oxford English Dictionary*, a metaphor is a “figure of speech in which a name or descriptive word or phrase is transferred to an object or action different from, but analogous to, that to which it is literally applicable” (OED, “metaphor”). Thus, when Leslie says, “Eating an orange is having the sun in one’s mouth”, the descriptive word “sun” is transferred to the action of eating an orange, to which it is not literally applicable. According to Leslie’s metaphor, however, eating an orange is analogous to experiencing the sun, one might say – in ways that might be further described.

John Searle asks how this is possible. “How is it possible for speakers to communicate to hearers when speaking metaphorically in as much as they do not mean what they say?” (1993, 83). This is a *deep* question, as I see it, and not easy to answer. Leslie does not, of course, mean that eating an orange is having a gaseous celestial body in one’s oral cavity. But if not, what is he communicating, and how is it possible (whatever *it is*)? The first step in Searle’s answer is to distinguish between *speaker utterance meaning* and *sentence meaning* and claim that metaphorical “meaning is always speaker’s utterance meaning” (84). Searle’s position is thus an instance of what Max Black calls *the substitution view* on metaphor, according to which using a metaphor is “saying one thing and meaning another ... [and under which u]nderstanding a metaphor is like deciphering a code” (1954/55, 280). A distinction between *source domain* and *target domain* might prove fruitful in explaining the substitution view. Leslie saying, “Eating an orange is having the sun in one’s mouth” is obviously saying one thing and meaning another, since it is, of course, impossible to eat the sun. Projecting “sun” from source-domain (astronomy) to target-domain (eating an orange), however, makes possible a new understanding of eating an orange (fresh, vital, healthy, invigorating – like experiencing the sun on you



face), and this, per speaker utterance meaning, might be what Leslie wants to convey. If so, the metaphor is decoded.

In addition to the substitution view on metaphor, there is *the comparison-view*. This is Aristotle's position, and it amounts to the claim that metaphor "is neither similar or analogous in meaning to its literal equivalent" (Black 1954/55, 282), that using metaphor rather consists in "giving the thing a name that belongs to something else; the transfer being either from genus to species, or from species to genus, or from species to species" (Aristotle 1959, 71f; 1457b, cf. Black 1954/55, 284n15). On this reading, and according to Black, a metaphor is a "condensed or elliptical simile ... [it is a] comparison" (283). Consider a remark from Wittgenstein's *On Certainty* in this connection: "I distinguish between movement of waters on the river-bed and the shift of the bed itself" (1969, 15^e; §97). Wittgenstein here compares a) the waters in the river, b) the riverbed at present, and c) possible shifts in the riverbed due to erosion by water, to a*) the constant flow of empirical propositions, b*) how some empirical propositions have hardened in the course of time, thus functioning c*) "as channels for such empirical propositions as were not hardened but [is still] fluid" (15^e; §96). Empirical propositions are not, of course, water in a river, but it is possible to compare them with the river's flux and oppose them to propositions that are not as ephemeral, but that rather stand fast (riverbed-propositions).

The view on metaphor that Black espouses, which will be utilized below, is *the interaction-view* on metaphor. The view derives from I.A. Richards (1893-1979), who according to Black claims that metaphor is "fundamentally a borrowing between and intercourses of *thoughts*, a transaction between contexts ... Metaphor ... requires two ideas 'which co-operate in an inclusive meaning'" (1954/55, 285). To understand a metaphor, consequently, is to be "forced to connect two ideas" (286) as the ideas "interact to produce a meaning that is a resultant of that interaction" (285). Black distinguishes between the principal and the subsidiary subject in metaphor (cf. the difference between "source domain" and "target domain" considered above). In the sentence "Eating an orange is having the sun in one's mouth", "orange" is the principal subject whilst "sun" is the subsidiary. Taken together, however, the two subjects evoke in the reader a "system of associated commonplaces" (287). This system is "a system of ideas, not sharply delineated and yet sufficiently definite to admit of detailed enumeration" (288). In our example, and as indicated, the commonplaces associated with "sun" is that it is "fresh, vital, healthy, and invigorating". The interaction of ideas, it is argued, between "orange" and "sun" produces new meaning so that the meaning of neither of the two words remains the same.

The important thing according to Black is not that the associated commonplaces are true about (in this instance) the sun. What is important is rather that the commonplaces "should be readily and freely evoked" (287) in the reader. It is when the principal subject of the metaphor and its subsidiary subject *interact* that metaphorical meaning is generated, the new framing of sun "imposes extension of meaning" (286). Donald Schön calls metaphors able to extend meanings in the way described by Black *generative metaphors* and defines it as a linguistic item able to carry over "frames or perspectives from one domain of experience to another" (1993, 137). Uses of generative metaphor might according to Schön imply perception-switches as regard foreground and background, which in turn leads to a "restructuring of the perception of the phenomena" (141). Further it might lead to a generation of "new perceptions, explanations and inventions" (142). Let me illustrate this by extending the above example: If eating an orange is having the sun in one's mouth, might not eating ice-cream be to swallow the moon? Or perhaps eating an ice-cream is rather like chewing Uranus, "the coldest planet in the solar system" (space.com 2024)? The point is not whether these suggestions represent good/apt metaphors – perhaps they do not. Rather, the point is that considering eating an orange is having the sun in one's mouth, opens the possibility of considering also other foods planets, how a system of associated commonplaces is evoked, which carry frames of understanding from one domain to the next. In this way, and to return to Black, metaphor "suppresses some detail, emphasizes others ... [and thus] organizes our view" (1954/55, 288). As stated in the Introduction, metaphors are both inclusive and exclusive. If foods are planets (inclusion), they are not at the same time seasons



(exclusion). They might be, but only later – and if so, opening an alternative set of associated commonplaces. (“Eating an orange is being kissed by spring”.)

Let me sum up. After having in section 2 demonstrated (reminded you?) that metaphors are a central feature of the educational field, I have in this section considered different perspectives upon how metaphors function: the substitution-view, the comparison-view, and the interaction-view. As written above, my interest in this section has been to present my analytical apparatus, namely the interaction-view, not to validate it. It is worth briefly pointing out, however, that the reason the interaction-view is preferred is that it seems to me to be the one best aligned with the nature of the case – the case being metaphor. A metaphor is not a substitution, as I see it, no code to be deciphered. Why? Since it would then lose its power when deciphered, and it does not. Neither is a metaphor a comparison. Why? Since it should then be possible to substitute it for what it is compared to – which is not possible without considerable loss in meaning.

4. Construction, Transmission, Growth: An Analysis

Learning is construction, teaching is transmission, education is growth. These are the metaphors that will be analysed in this section. Even if the metaphors differ along several dimensions (for example, whilst one is about educational output, the others are about educational input and overall educational purpose, respectively), they also have at least three things in common. First, and substantially, they are all seminal in educational contexts – to the extent that they orient major learning theories (cognitive, material, and pragmatic theories, respectively) and by two of them having been considered expressions of educational paradigms (cf. Öelkers 1994). Second, also substantially, the metaphors are all *generative* (cf. Schön 1993) in that they transfer frames of understanding (associated commonplaces) from one experiential domain to another. Third, and more pragmatically, the metaphors have easily identifiable principal and subsidiary subjects. This is fruitful for present purposes as it facilitates perspicuous analysis.

Learning is construction. “Learning” is the principal subject of this metaphor while “construction” is the subsidiary. Projecting the subsidiary subject onto the principal one, is to understand the metaphor, and on the interaction-view this means that the two subjects, from different contexts as they are, start to co-operate or transact to produce an inclusive meaning. A reader of the metaphor connects the two subjects – *in their interaction*, something which evokes in the reader a system of associated commonplaces. What is this system? What are the commonplaces “contained” in the associated frame – which are carried over to produce an inclusive meaning? I shall now suggest an enumeration; commonplaces italicized. There are, of course, *builders* and *foremen* associated with construction, and a *construction-site*; and there are *bricks* and *containers* and different kinds of *tools*. Also associated are *scaffolds* and *blue-prints* – and *machines*, and *pillars*, and *slabs* and *beams*. The latter items need to be manageable; if not, building becomes hard or even impossible. The metaphor suggests that this is learning – that learning be conceived along the lines indicated. And so, students construct (= are builders of knowledge), something which happens under the guidance of a foreman or guide (= teacher) on a construction-site (= classroom), where the students use different kinds of tools (= skills and competences). The teacher needs to scaffold (= to be didactically alert) and to follow her blueprint (= teaching-plan), and pillars and slabs and beams (= content, stuff, material) need to be suitably chunked (= expressed in learning objectives). The interesting question now is not a substantial one – “Is learning really construction?”. Rather the interesting question is the following: does it make sense to assume that, based on the metaphor, one starts understanding (seeing) in terms of what the frame affords – that one’s perspective upon learning is formed by the interaction between learning and the commonplaces associated with construction to the extent that this is how learning is henceforth experienced? The interaction-view on metaphor answers this question “yes”.

Teaching is transmission. Teaching is the principal subject of this metaphor whilst transmission is the subsidiary. Again, the borrowing from one form of thought (“transmission”) to another (“teaching”) is

what makes the metaphor and, again, this means that the two subjects start to cooperate – producing in a reader a system of associated commonplaces. What are the commonplaces associated with transmission? According to Michael Reddy, “English has a preferred framework for conceptualizing communication” (1993, 165). Lakoff & Johnson (1980) argue that this framework amounts to the following “complex metaphor: IDEAS (OR MEANINGS) ARE OBJECTS. LINGUISTIC EXPRESSIONS ARE CONTAINERS. COMMUNICATION IS SENDING” (10). The commonplaces associated with transmission, consequently, are along the following lines (again I italicize the commonplaces): There are *messages* and *senders* and *receivers*, as there are *media* and *interference*, and, sometimes, even *white noise*. There are problems with *bandwidth*, even if there are, sometimes, conditions for *transfer* that is more optimal. The metaphor suggests that this is teaching: that teachers are providers of information, sending information-bits for the students to decode. The students are the recipient of the information being delivered and their job is to decipher it. The classroom functions as a funnel for the sending of said information, subjects to the problems of disturbances. The teacher needs to be didactically alert, but the better description of this is not scaffolding, as above, but being precise – delivering an uncluttered message for the students to receive. Is it reasonable to propose that based on this metaphor and the perspective it imparts, one starts seeing teaching as transmission? According to the interaction-view, this is precisely what happens. The subsidiary subject (“transmission”) interacts with the primary subject (“teaching”) to produce an inclusive meaning through the system of commonplaces that the second subject imparts. The inclusive meaning amounts to seeing teaching in terms of the commonplaces: sending, receiving, messages – teachers as providers of information and students as receivers.

Education is growth. Education is the principal subject of this metaphor whilst “growth” is the subsidiary. Borrowing from one frame of thought (growth) and projecting it onto another (education) is what makes the metaphor: two forms of thought interacting. What are the commonplaces associated with growth? There are *seeds* and *soil* and *sun* and *rain*; as there are *gardener*, *gardening*, and *weeding*. Seeds have *potential* for growth, *blossoming* and *fruition* – if the *environment* is *fertile* and if there is enough *nutrients* and *water* present, and if a knowledgeable gardener is in charge. Then the seeds *mature*. The metaphor suggests that that this is education: that a student (= seed) develops (= grows) her potential if under the auspices of an expert teacher (= gardener). A classroom is more or less fertile, more or less nutritious and has a better or worse educational climate; it is, in short, a whole ecological system. The teacher, again, needs to be didactical acute, but now this means weeding, and moreover operating in a manner conducive, not detrimental, to growth both in the short and long term. In *Democracy & Education*, Dewey (1944) argues that “the educational process is one of continual reorganizing, reconstructing, transforming” (50). This is the idea of “Education as growth” (41) which Dewey defines as the capacity “to readjust activity to meet new conditions” (52). Growth is habit formation in terms of both “executive skill ... motor [skill] ... [and as regards both] intellectual and emotional dispositions” (46ff). Instruction, according to Dewey, is not “a method of supplying this lack [of desired traits] by pouring knowledge into a mental and moral hole which awaits filling ... [rather it is] the enterprise of supplying the conditions which ensure growth” (51). Is it (not) reasonable to assume that based on the metaphor of growth, one starts seeing education in terms of the interaction of forms of thought that the metaphor affords? According to the interaction-view, transposing the second subject (“growth”) onto the primary (“education”) – one starts seeing education in growth-terms, like Dewey does, thereby gaining a new perspective.

As stated in the Introduction, and according to the interaction-view, a metaphor functions by evoking in those who understand the metaphor an alternative frame of reference, and by the interaction between this and the principal subject. A metaphor is thereby inclusive. How? In terms of the commonplaces afforded by the frame. However, the same metaphor is thereby, and at the same time, also exclusive. How? As regards features/properties not associated with the frame in question. I will end this section by considering the inclusion/exclusion-point in a little more detail, before answering *the why* and *the normative* questions (cf. sect. 2) in the next section.



As is evident, the three metaphors considered have widely different associated commonplaces. The associated commonplace is a property of the subsidiary subject of the metaphor, which is transposed onto the primary subject. This results in an interaction that produces a change in perspective, and this, concisely, is what makes the metaphor. The associated commonplace of the subsidiary subject thereby functions inclusive. On the construction-metaphor, for example, the commonplaces associated with construction provides, which is to say includes, notions not just about students (the ones who construct), but also about teacher-role (foreman/guide), place of learning (construction-site), the material supposed to be learnt (tools), and so on. According to Black, the associated commonplace provides a frame for understanding – and what falls within this frame is included in the metaphor. But, by the very same token, metaphors do not only include, but they also exclude – all the things that fall outside of the frame. On the transmission-metaphor, for example, there is no room for *fertile soil* (= student background?) since the commonplaces associated with transmission does not relate to *organic growth* but to *messages*, *senders*, and *receivers*. Conversely, it is possible to say that minimizing *white noise* (= clamour in the classroom?) is not a main concern on the growth-metaphor all the while the commonplaces then relate to *care* and *flourishing*. One sees different things dependent upon which metaphor is assumed – since the metaphor both includes but also, thereby, excludes.

5. In Conclusion: Questions Answered and Implications

Why the prevalence of metaphor in education? Are we now, based on the above pages, positioned to answer this question?

It might be suggested that young and/or immature sciences are dependent upon metaphor. To begin, to get off the ground in terms of the genesis of science, it should be accepted that first attempts at scientific systematization entails non-literality, imprecision, metaphor. Assuming the educational sciences young in this sense, it might be that the prevalence of metaphor in education is because disciplinary key-terms are not (yet) defined, and that metaphorical descriptions are ways of starting to grapple with the subject matter. Given time, the situation will change – and there are indeed signs that it already has, the so-called science of learning being a case in point (cf. the works of for example Richard Mayer [2011]). The problem with this argument is that even if education is young in scientific terms, questions pertaining to *how and why to educate* are as old as western civilization itself. One of the foundational texts of the western world, *The Republic* by Plato (1991), discusses educational questions over tens, if not hundreds, of pages. And the main question? How to envisage a just educational system, one that assures the *construction* of adequate virtues, that the correct curriculum is *transmitted* to the inhabitants of the polis (even if, alas, only to a minor fraction) – so that *growth*, both in individual and aggregated terms, might result. How strange that we have not, in the more two millennia since Plato, managed to make progress in terms of precision – how strange that our key-terms are still nor defined.

An alternative answer to “the why question” is to propose that metaphor is indispensable for intra-disciplinarity. Since the educational sciences are irreducibly intra-disciplinary, one can argue that central aspects of education and educational theory are not in principle susceptible to precise, literal language. Translations between different disciplines necessitates common terminology, and since this is lacking, metaphor is the next best thing. For this reason, we must settle for metaphor if we are to get anything done. Jon Elster has an alternative answer to the question why. He argues that “It is an open secret that this [educational science] is a very weak discipline” (2005, 298; translation mine). Elster’s accusation is that the educational sciences lack the rigor traditionally accorded the scientific enterprise and that, hence, it is hard on the verge of impossible, to ascertain both what are the objects investigated and what results/findings in educational studies represent. Accordingly, there is a prevalence of metaphor in education and educational science because the discipline is weak, and talking in metaphors is a way to get away with non-rigour. In the Introduction I asked whether the



prevalence of metaphor in education represents something one should try to fix in the interest of precision. On Elster's account it seems the answer to this is "yes".

The three suggestions above amount to different answers to the question why metaphors are ubiquitous in education. One suggestion is that it is because the field is immature in scientific terms, another that it is because of the irreducible intra-disciplinarity of the field; Elster, by arguing that the educational sciences are scientifically weak, suggests that the prevalence of metaphor within the field is due to lack of rigor. All three suggestions, consequently, might be taken to imply that the state of affairs is unhappy in education – thereby also answering the normative question (cf. sect. 2). Should we attempt a remedy? If yes, which possibilities are there? Here are three suggestions – even if they are immediately met with further questions. We could try to mature the field – but how? One possibility is to increase quantification in educational contexts, as suggested by for example John Hattie (2011) and Carl Wieman (2019). Doing this might seem promising, but it would still have to answer a point made by David Berliner (2001): how the enormous number of interactions in educational contexts make quantification difficult – to the extent that one does not know which variables are independent (cf. Rømer 2017). We could try to make education and educational studies less intra-disciplinary – but what would that mean, and is it even possible without reducing the educational object beyond all recognition? We could up the rigour by making our terminology more precise – but what would that look like? I would like to end by developing this last point by tying it to the main concern of the paper: the ubiquity of metaphor in education. There is, quite simply, no way to talk about human learning, teaching, and education, about our knowledge-attainment, development, and flourishing without using metaphor – as indicated by this very sentence. There are no non-metaphorical words in the lexicon that might suffice in this regard; and *katacrexis* would just imply more/new metaphor. Consequently, there is a reason why the educational field is imprecise – it is because this reflects the nature of the case. And the nature of the case looks something like this: in physics there are an enormous number of factors, but each factor has only two variables: it is either on or off. In education, contrary, there are not that many factors really: students, teachers, stuff; place exams and frames – but the number of variables tied to any of them is astounding (cf. Sæverot & Torgersen 2012). This might be a reason why precise, literal language is often missing in education – because to (try to) capture the manifold in precise, scientific language, will not do. Systematization presupposes reduction, but it seems that reduction in education might be out of place.

If the line of thought indicated above is accepted, conceptual formation in education presents itself in an interesting light. If conceptual formation is ordinarily a matter of categorizing, that is: suggesting boundaries for the inclusion of phenomena, conceptual formation in education is not like that. Since the phenomena that interest us in education are ambiguous, multivariable – admitting of several denotations (a promising student and a poor one, an excellent teacher and one that is mediocre), conceptual formation in education is not really conceptual formation. Rather it is the process of identifying and developing the commonplaces associated with a generative metaphor.

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