

Seeing epistemic order: construction and transmission of evaluative criteria

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This paper focuses on formative assessment in the field of higher education. It examines Bernstein's work on vertical discourses and knowledge structures with the view to deepening understanding of the concept of assessment *for* learning. The first part of the paper draws on Vygotsky's work on concept development and Bernstein's work on knowledge structures to explain why 'generalisation' and 'hierarchy' are central in knowledge acquisition. It then explores Bernstein's claim that, within the vertical discourse, different knowledge structures (hierarchical and horizontal) afford greater or lesser visibility of their epistemic structure, and thus of their evaluation criteria of what counts as a legitimate text. The second part of the paper investigates the ways epistemic expectations are signalled through the practice of evaluation to first-year university students in a professional education course and proposes that markers do not offer students sufficient access to recognition rules necessary for producing legitimate texts in the future. Drawing on Maton's distinction between semantic gravity and semantic density, the paper offers an example of how markers could recast what is present in students' work to offer students access to key ordering principles in vertical discourses.

Keywords: assessment for learning; Bernstein; vertical discourse; knowledge structures; semantic density; semantic gravity

Introduction

The democratic project of expansion of access to higher education has put teaching and learning firmly on the agenda of universities. There is increasing recognition in the field of higher education that if universities are committed to expanding access to higher education, they must take up the challenge of deepening students' epistemic access to academic practices. Research in South Africa has shown that many students that meet the formal requirements for access to university study may still face a steep learning curve at the level of

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the ‘form’ of academic knowledge (Craig 2001; Yeld 2003; Niven 2005; Scott, Yield, and Hendry 2007). The main challenge for universities, it is argued, is to bridge the gap between what is made available for acquisition and what is actually taken up by students. One approach to bridging this gap is broadly known as ‘Assessment for learning’ (Black et al 2003; Gipps and Cumming 2004; Shepard 2000). In this approach, assessment practices are used to both transmit criteria of knowledge being taught and to test students’ mastery of these criteria. Researchers who have looked at what assessment for learning would mean in the context of higher education emphasise the importance of evaluative feedback for helping students to recognise what counts as knowledge in different knowledge disciplines, and for helping students to develop the epistemic means to realise these evaluative criteria (Taras 2001; Shavelson et al. 2003; Rust, Price, and O’Donovan 2003; Boughey 2008). This work is premised on a socio-cultural theory of conceptual development as socially mediated and regulated (Vygotsky 1987). Feedback practices work with students’ responses to help students both to understand why they are not yet meeting privileged criteria and how they might begin to construct more appropriate responses. In this way, feedback can be used to promote what Vygotsky called a ‘Zone of Proximal Development’ by both recognising what the student produces and articulating it in line with more powerful forms of knowledge.

In previous work (Slonimsky and Shalem 2006) we analysed the epistemic means that academics use to impose a relational order on their objects of analysis. Using Wertsch’ (1991) work on ‘text-based practices’, we showed that the distinctive nature of academic practice lies in the ways linguistic, epistemic and social means are used by academics to consciously reflect on their objects of analysis. With these means academics create texts at a sufficient level of generality to, on the one hand, frame the object of analysis, and, on the other, make ideas publicly accessible to a universe of possible readers in other temporal/spatial settings. In this article, we draw on a second body of research, which is located within Bernstein’s sociological analysis, first, of pedagogic discourse (Bernstein 1990) and, more recently, of knowledge discourse (Bernstein 1996, 2000). This body of work put forwards two claims. First, from Bernstein’s work on pedagogic discourse, a strong claim emerges that by making evaluation criteria explicit, teachers give students ‘the possibility of learning the legitimate text’ and more specifically, ‘how to give a correct answer in the future’ (Morais 2002, 562; Morais, Neves, and Pires 2004; Hoadley 2008). This work develops Bernstein’s important distinction between ‘recognition and realisation rules’,¹ and shows, both conceptually and empirically, how, epistemic access can be opened to all students, by using a combination of framing rules, irrespective of students’ social ‘orientation to meaning’.² Second, from Bernstein’s work on knowledge discourse, a far more complicated and more equivocal claim is proposed that, within the vertical discourse, different knowledge structures (hierarchical and horizontal)

afford greater or lesser visibility of their epistemic structure, and thus of their evaluation criteria of what counts as a legitimate text (Muller 2006; Maton and Muller 2007). It is equivocal because two possible readings can be drawn from it: either that transmission of evaluative criteria is possible for the natural sciences (hierarchical knowledge structure) and much less so for the social sciences and the humanities (horizontal knowledge structure); or that the pedagogic discourse is relatively autonomous from the knowledge discourse, and so, depending on the type and modality in which evaluation criteria are transmitted, feedback will be more or less effective, *albeit* relative to the strength of the knowledge structure. This paper defends the second claim.

The first part of the paper offers a conceptual explanation for why ‘generalisation’ and ‘hierarchy’ are central in knowledge acquisition. This analysis draws on Vygotsky’s work on scientific concepts and on Bernstein’s work on knowledge discourse. The analysis also addresses the implication of the above quandary for assessment and offers a way forward. The second part of the paper investigates the ways epistemic expectations are signalled through the practice of evaluation to first-year university students in a professional education course. The analysis explicates its shortcomings and offers an example of what an evaluative feedback that explicates the order between propositions in students’ production could look like. The central claim we put forward is that for ‘assessment for learning’ to be of substantial value, it must be able to provide opportunities for students to recognise the ordering logic of their production.

The foundation of ‘conscious awareness’ is generalisation and hierarchy

In his work on how individuals develop concepts, Vygotsky (1987) argues that concept development is socially regulated through sign mediation. He distinguishes between spontaneous and true concepts. True concepts, he says, are made possible through formal education transmissions that strive to transmit systematised forms of knowledge available in the society (or what he called ‘scientific concepts’). Vygotsky argues that scientific concepts promote conceptual development because they impose new orders of meaning on existing concepts. They do this by pulling existing concepts into new relations of abstraction and generality. This claim is twofold. First, it proposes that the meaning of phenomena does not derive from a particular speech context, but from the relations between the concepts being presented. For Vygotsky, the development of theoretical thinking rests on the process of de-contextualisation of spontaneous concepts, or on what Wertsch calls ‘de-contextualised rationality’ (1991, 78). Concepts generalise phenomena; they extend them in time and space. Second, this claim proposes that in theoretical thinking the relations between propositions form a vertical order, whereby the more general concept frames the relations between the subordinate concepts. Vygotsky says: ‘only within a system can concepts arise, live, develop’ (1987,

224). The important point here is that the power of scientific concepts to signify and order meaning hierarchically allows one to make reality and one's own thoughts an object of 'conscious awareness'. For Vygotsky:

If conscious awareness means generalisation, it is obvious that generalisation, in turn, means nothing other than the formation of a higher concept in a system of generalisation that includes the given concept as a particular case. However, if a higher concept arises above the given concept, there must be several subordinate concepts that include it. Moreover the relationships of these other subordinate concepts to the given concept must be defined by the system created by the higher concept. If this were not so, the higher concept would not be higher than the given concept. This higher concept presupposes both a hierarchical system and concepts subordinate and systematically related to the given concept. Thus the generalisation of the concept leads to its localisation within a definite system of relationships of generality. ... Thus, at one and the same time, generalisation implies the conscious awareness and the systematisation of concepts. (1987, 192)

There is a key idea here about ordering principles, which lies at the very heart of theoretical thinking. Concepts can only regulate existing forms of understanding and transform them into new possible forms *if* they both represent existing ideas (symbolically mediate them) *and* transcend the here and now (Valsiner 2001, 87). If a concept is isomorphic with ideas that are deemed insufficiently developed, it would merely describe what is already present and would lose its regulatory function. In other words, it would lose its power to construct a semiotic system that can regulate relations between ideas in extended time and space.

Bernstein's work on formal knowledge discourse, which he calls 'the vertical discourse' (1996, 2000), can be shown to argue for a similar idea. Bernstein contrasts everyday knowledge, or what he calls 'horizontal discourse', with formal knowledge, which he refers to as 'vertical discourse'. Vertical discourse is characterised by a hierarchically linked sets of procedures that arrange meanings into 'specialised symbolic structures of explicit knowledge' (Bernstein 2000, 160).³ In line with his early distinction between elaborated and restricted codes, Bernstein's epistemological analysis of knowledge discourses shows that formal knowledge consist of a semantic structure, which can (to a greater or lesser extent) elaborate the relation between ideas and thus *control* the possible range of correlations between concepts and empirical phenomena. In contrast to this, the meaning potential of an informal body of knowledge is restricted because it is tied to a local context and, as result, its capacity to generalise in extended time and space is weak (Bernstein 2000, 207–208). So both Vygotsky and Bernstein distinguish between spontaneous and scientific concepts, and both emphasise the importance of generalisation and hierarchy for knowledge acquisition. Bernstein goes further. He develops the notions of generalisations and hierarchy by examining the relationship between propositions *within* the vertical discourse. This development has important ramifications for assessment, and so we turn to this analysis in the next section.

Knowledge structures, knowledge production and production of knowers

According to Bernstein, the vertical discourse is divided into two kinds of knowledge structures. Disciplines in the natural sciences, physics being a prime example, achieve high levels of integration of propositional knowledge and display strong semantic precision in correlating concepts with empirical phenomena.⁴ They form a hierarchical knowledge structure. Since the order of meanings in this structure is stable and the correlation between concepts and empirical phenomena is precise, it is possible to assume that the transmission of ‘the principles, procedures and texts to be acquired’ – can be made explicit (Bernstein 2000, 169). Assessment of content is likely to include assessment of form – the acquirer’s ability to order and structure taxonomies of concepts and her/his recognition and realisation of the modality of proof procedures.

The disciplines of social sciences and humanities, however, are characterised by weak semantic development and weak internal coherence. They form a horizontal knowledge structure, which consists of two types of disciplines: strong (mathematics and linguistics) and weak disciplines (sociology). A weak discipline is not capable of constructing precise explanations about empirical phenomena.⁵ The form of its development is fragmented – each of its theories (or ‘specialised languages’) exists as a discrete system. Each theory claims to have ‘its own criteria for legitimate texts, what counts as evidence and what counts as legitimate questions of legitimate problematic’ (Bernstein 2000, 162; our addition).⁶ Bernstein notes three complications. First, theories in the horizontal knowledge structures develop in opposition to existing ones, each develops as a discrete entity, and therefore its principles and procedures may not be transferable.⁷ Second, when the conceptual syntax of a theory is very weak, knowledge producers will struggle to convey recognition and realisation rules – what counts as a legitimate text and how to produce it. Recognition rules are reduced to the naming of the canonical proponent of the theory and showing how she/he explains the phenomenon (Bernstein 2000, 164). The theory’s procedures of investigation and instruments of observation are not transferable. To this extent the transmission of ideas within horizontal knowledge structures that display weak integration between propositions and weak precision is more tacit than explicit. Third, since these kinds of theories develop as discrete entities, and very often in opposition to other dominant ones, their selection and sequencing into a programme of learning is often the result of the transmitter’s ideological preference in relation to social and political struggles (Bernstein 2000).⁸ For Bernstein, academic achievement in horizontal knowledge structures, in particular of weak disciplines, is synonymous with the adoption of a particular position or ‘gaze’.⁹ Acquirers need, he says, to *experience* ideas by socially interacting with those who possess the gaze (Bernstein 2000).¹⁰ Taken together, these complications suggest a radically different idea of epistemic access to the core idea presented by assessment for learning. In particular,

Bernstein's notion of the gaze suggests a form of immersion rather than of explicit transmission of evaluation criteria

Here is the nub of the problem – Vygotsky's theory of scientific concepts maintains that 'conscious awareness' depends on access to a hierarchically structured system of meanings. From the perspective of knowledge acquisition, assessment for learning emphasises the importance of transmission of evaluative criteria. Empirical studies that employ Bernstein's analysis of the pedagogic discourse confirm this, specifically in school's science and in mathematics (respectively: Morais, Neves, and Pires 2004; Hoadley 2008). From the perspective of assessment, Bernstein's knowledge discourse analysis is disquieting in that it foregrounds the fragmented form of knowledge development in horizontal knowledge structures, their weak structure, and their affinity to considerations other than epistemic. Put more strongly, if knowledge production in horizontal knowledge structure depends on loyalty to socially-based ideologies and if its weak grammar subjects the theory to constant contestations on meaning, how does one begin evaluating students' learning? Is it merely a play of ideology?

Recently, Maton and other sociologists of knowledge investigated the ramifications of the contrasting structuring of knowledge for teaching and assessment of knowledge in horizontal knowledge structures (Freeboy, Maton, and Martin 2008; Maton 2008, 2009). Maton's work focuses on how a course transmits to students 'what matters' – 'what makes someone or something different, special and worth of distinction' (Maton 2009, 45). This work (see also Muller 2007) insists that the current emphasis in professional education courses on 'learners' and 'processes of learning' has undermined the importance of knowledge, and, in turn, of students' capacity to 'transfer knowledge across contexts and through time' (Maton 2009, 45). Maton argues that students are able to transfer knowledge only when they are equipped with principles and procedures that teach them to 'demonstrably move between concrete cases and abstract ideas' (2009, 54). With the use of empirical evidence, he shows that when lecturers of weak disciplines within horizontal knowledge structures select evaluative criteria that focus on 'abstraction' and 'generalisation' rather than on 'reproductive' and 'summarizing descriptions',¹¹ students' achieve greater precision.

To better understand Maton's findings, it is useful to turn to another important conceptual distinction in his work. Maton (2008, 8–9) distinguishes between 'semantic gravity', or 'the degree to which meaning is dependent on its context', and 'semantic density', or 'the degree to which meaning is condensed within symbols (a term, concept, phrase, expression, gesture etc)'. In epistemological terms, this distinction can be shown to draw on Bernstein's restricted and elaborated distinction about orientations to meanings. In both, the classification refers to the kind of context (epistemic or empirical) to which a unit of meaning is attributable and to the degree of integration with other meanings it displays. From a perspective of pedagogy

of knowledge transmission, Maton goes further. Two steps in Maton's distinction are relevant for our task here. First, the distinction denotes what counts as a horizontal/vertical ordering in students' production: a lengthy description of empirical detail, substitution of examples for explanation, and the listing of specifics without a structure, demonstrates weak semantic density (ideas do not integrate relationally) and strong semantic gravity (ideas are context bound and not generalisable). When an idea 'has more meaning condensed within it' (Maton 2008, 8) – that is, the idea subsumes and integrates more propositions (strong semantic density, SD+) – it is de-contextualised or its semantic gravity is weaker (weak semantic gravity, SG–). Thus, a strong proposition is one that is integrated with other propositions (SD+) and can be shown to be connected to its empirical detail logically rather than contextually or ideologically. Second, Maton's distinction shows the kind of pedagogy necessary if one is to move an acquirer from a restricted to an elaborated code: pedagogical relations must oscillate between integration (high semantic density) and specificity (low semantic gravity). Students need to be taught to see the traces of a strong proposition in the empirical detail.

This oscillating movement between SD+/SG– and SD–/SG+ echoes Vygotsky's argument that the formation of 'true concepts' (1986, 149) rests on the upwards and downwards movement between spontaneous and scientific concepts (1986, 193). If Vygotsky's account of the upward and downward movement of spontaneous and scientific concepts in the formation of real concepts is valid, then pedagogy is concerned both with explicating to students the structure between ideas as well as teaching them to instantiate abstractions. On the basis of Maton's important intervention, we put forward the proposition that although the achievable level of precision differs between knowledge structures, in assessing academic knowledge of weak disciplines within horizontal knowledge structures, academics need to adopt a visible form of assessment that will help students to recognise in their productions the conceptual classification and the order between propositions. This includes identifying super-ordinate and sub-ordinate propositions, and the distinctions and relations between them.

The argument so far demonstrates a conceptual way of integrating the evidence that is available from the respective research on Bernstein's pedagogic and knowledge discourses. Through Maton's intervention and a return to Vygotsky one can see a possible disjunction between two practices – the practice of knowledge development, which builds knowledge vertically; and the practice of teaching, which oscillates cyclically between levels of abstraction.¹² We propose, therefore, that the rules that govern the practice of re-production of knowers (i.e. curriculum construction, teaching and assessment), are relatively autonomous from the rules that govern practices of production of new knowledge. With this in mind we turn to discuss a case study of evaluative feedback.

Structuring opportunities ‘to learn verticality’ in evaluative feedback

The practice of evaluative feedback enacts the meaning of formally instituted criteria; it conveys to students what lecturers, in fact, value. Notwithstanding this, modalities of evaluative feedback could be more or less visible depending on the extent that they convey recognition and realisation rules to students.

Evaluative criteria of students’ productions are not just told; they are usually transmitted in relation to a particular task – in the way in which lecturers construct task questions, in their explicit evaluation criteria and in their feedback. Depending on the epistemic form of the evaluation criteria selected for a particular task, the meanings that are transmitted display stronger or weaker semantic gravity and density. Evaluative criteria that foreground ‘precision of meaning’, ‘comparing’ and ‘proving’, direct students to ‘the epistemic relation’ (Maton 2008) between meanings, specifically between concepts and selected empirical phenomena. Their command (what they require students to do) draws students’ attention towards the practice of systematisation of units of meanings into a vertical order (+SD) and less so towards the student’s personal experiences or perception (–SG) or ‘the social relations’ between a claim and its context. When providing evaluating feedback, markers impose another level of order on students’ productions. Depending on the type of feedback and the modality in which it is conveyed, the message to students will be more or less visible and will enable or constrain opportunities to learn preferred principles and procedures associated with vertical discourse.

We now turn to the example. The question that occupies us in relation to this example is how lecturers transmit the preferred epistemic relation between ideas when marking the essays of first-year students. For their second assignment in the course, the students were asked to discuss the following topic: ‘Effective teaching does not only depend on a good teacher. For that to happen, the teacher requires tools and a better understanding of other factors’.¹³ The topic signals a relation between three content constructs: ‘effective teaching’, ‘tools’ and ‘factors’. The students were given the following sets of criteria to develop their essay:

Form:

a. Introduction:

Does the reader know how your essay will be developed?

Do you explain the key concepts of the topic?

b. Structure:

Writing is clear, use correct language and correct referencing

Structure of paragraph is correct

Ideas are elaborated and well supported by appropriate examples related to the topic

Structuring of ideas flow from the main idea into supporting ideas

Use of punctuation is correct. Spacing between words is correct
Using 1.5 spacing between lines and 12 font size
Avoid use of long winded sentences
Using a word count – to have estimation of length of essay
Evidence of understanding readings from the reading pack
References of course materials and extra reading that has been used

Content

Knowledge and comprehension

Explanation and understanding of the topic is shown. Shows understanding of key concepts raised in the question

Explain and give examples of tools and factors that a teacher would use to make teaching effective

Show understanding of readings by incorporating quotations and acknowledge appropriately

The criteria above display a preference of epistemic relation: the students are asked to engage with texts (prescribed course readings), distance themselves from a relatively familiar context, and engage with positions in the field about what makes a good teacher. The criteria appear to foreground epistemic ordering such as explanation of key concepts, elaboration of ideas, supporting ideas with examples. The content constructs of ‘tools’ and ‘factors’ are offered here as symbolic representations of empirical phenomena. They are intended to enable students to select from a variety of potential empirical correlates and order them into a semantic field.

In order to examine the feedback transmitted to the students, we developed two sets of external languages of description. With the first, by means of a quantitative analysis (Move One), we distinguish between the type of evaluative feedback the markers gave and the modality in which it was transmitted. With the second, by means of a qualitative analysis (Move Two), we demonstrate what kind of feedback can help students to shift from ‘strong gravity’ and ‘weak semantic condensation’ to ‘weak gravity’ and ‘strong semantic condensation’.

Move One: quantitative analysis of lecturers’ notations

In order to classify types of feedback we drew a distinction between ‘instructional regulative criteria’ and ‘academic literacy regulative criteria’ (see Appendices 1 and 2).

- ‘Instructional regulative criteria’ refer to the lecturer’s notation of the conceptual moves that students make in order to cover the relevant content in a preferred form. These are very important for student’s development in that they can explicate the meaning of criteria or the meta level of the form in which academic content is produced. We included:

- *Focus selection*: evaluative feedback in relation to students' coverage of the key content.
- *Elaboration of concepts*: evaluative feedback in relation to the level of detail provided by the student and de-personalisation when explaining a concept or an idea. This is when markers direct students' attention to semantic gravity, to types rather than tokens, to analysis rather than normative prescription.
- *Ordering of ideas*: evaluative feedback in relation to the level of coherence produced by the student within and between paragraphs. This is when markers direct students' attention to verticality, to sequence, relational integration and implications.
- 'Academic literacy regulative criteria' refer to the lecturer's notation on paragraph and sentence structure, punctuation, presentation, referencing, essay length, evidence of reading, spelling, and grammar.

Both of these types of feedback regulate students' production of academic texts but they do it at different levels of order. Feedback on 'instructional regulative criteria' regulates students' production conceptually. It alerts students to conceptual moves that constitute the making of vertical discourse. It supports students' epistemic access. Feedback on 'academic literacy regulative criteria' socialises students into conventions of academic literacy.

We coded all of the notations that five different lecturers made on 70 scripts, randomly selected from a class of 190 students. In order to distinguish the modality of the notation, we distinguished between two kinds of notations: 'discursive notations', or written comments next to a paragraph or at the end of the essay; and 'figurative notations', or notations that a lecturer makes by means of an abbreviated symbol. Figurative notations include ticking off next to a word, sentence or a paragraph, underlining a sentence, or putting an exclamation mark. In so doing, the lecturer explicitly indicates that she/he values or de-values something but does so in abbreviated form. We counted all of the notations and classified them into their types and modality.

Our findings suggest that although the total number of lecturers' notations on instructional regulative criteria is larger than on academic literacy regulative criteria (1009 and 716, respectively) when marking students' competence in aspects covered by the 'instructional regulative criteria', the lecturers offered far more figurative than discursive notations (771 and 238, respectively) (see Tables 1 and 2). When marking students' competence in aspects covered by the 'academic literacy regulative criteria' the lecturers offered far more discursive than figurative notations (516 and 200, respectively)

It is significant that within 'instructional regulative criteria' lecturers offered very little feedback on moves that are necessary for constructing epistemic relations; that is, on ordering moves (structuring of paragraphs, sequencing of ideas, development of ideas, integration between ideas, implications and

Table 1. Total number of instances of explicit discursive and explicit figurative notations for each sub-ordinate of the 'instructional regulative criteria'.

Criterion	Discursive notations	Figurative notations
Focus selection	75	410
Elaboration of concepts	104	300
Ordering of ideas	59	61
Total ($n = 1009$)	238	771

Table 2. Total number of instances of explicit discursive and explicit figurative notations for each sub-ordinate of the 'academic literacy regulative criteria'.

Criterion	Discursive notations	Figurative notations
Language aspects such as punctuation, spelling and grammar	327	94
Academic literacy conventions such as references and evidence of reading	189	106
Total ($n = 716$)	516	200

positioning). Within the academic literacy regulative criteria, lecturers' discursive notations are more frequently on basic language and literacy than on academic literacy (327 on language aspects such as punctuation, spelling and grammar; and 189 academic literacy conventions such as references and evidence of reading). Markers are focused on what is most observable but, in fact, less conducive for the new learning students need to access. In other words, students need access to the epistemic means that will help them to order ideas vertically.

We conclude that the lecturers did not offer recognition rules for a key ordering principle of the vertical discourse (sequence and progression). Their marking criteria and feedback have, in fact, a horizontal orientation.

Move Two: qualitative analysis

We now move to part two of our investigation, which we developed in view of the stark finding that lecturers offer very little evaluative feedback on ordering. This analysis is very important for the core conceptual claim of the paper that students must be offered opportunities to learn what counts as epistemic relation between ideas. From the perspective of assessment for learning, the analysis intends to show that there is always some order in a student's production, although an order may be more or less functional with respect to the development of a coherent and principled structure of ideas (generalisation and hierarchy). In other words, in order for assessment for learning to be formative, feedback needs to identify for students how functional what is present is, and use a notation form to move the student to those aspects that

are not yet present. Recapping Maton's distinction between semantic gravity and density, we define a functional text as one where the various meanings work together coherently to allow further integration and/or differentiation. More specifically, a functional proposition is (relatively) independent of a particular context,¹⁴ and constructs a relation between some/all the constitutive elements of the semantic field at stake in a way that enables further differentiation and integration, and thus an explicit, hierarchical order of meanings. In addition, when a proposition subscribes to a particular discursive/ideological view, the formulation of the relation between some/all of the constitutive elements is prescriptive (an 'ought' position).¹⁵ We use 'value' to distinguish whether a proposition displays prescriptive or descriptive evaluation. The three main elements of a functional proposition can be represented as follows:

Functional proposition = (SG-) ~ (SD+) ~ value (descriptive)¹⁶
 A non-functional proposition = (SG+) ~ (SD-) ~ value (appraisal)

Below we present a segment taken from one student's essay. We coded the segment in a form that explicates the kind of propositions the student offers and their order. The coding consists of two levels of analysis and six steps of evaluation; it focuses on the following questions:

- (1) What ordering tools can be identified in the segment?
- (2) What ordering can be imposed on the segment?

The segment

The tools required by the teacher are going to be used for helping learners in learning for example the pictures used for demonstrating air pollution will give learners an idea of what air pollution looks like, tools like teaching aids makes a lesson interesting it catches learners' attention. Having tools for teaching [sic]create learning environment to be inviting, challenging and motivating the teacher by using the tools the classroom atmosphere becomes positive... (C33)

Lecturer's comment: *What about talking about disadvantage of media the teacher needs to be aware of?*

By asking the student to think about 'disadvantages', the lecturer recognises that all the propositions in the above segment are similar; they all refer to the same process (helping learning by creating an inviting learning environment). The term 'disadvantages' implicitly refers to its antonym, 'advantages', and implicitly condenses all helping relations and classifies them into a group. This is what Bohm (2004, 8) refers to as 'similar differences' or 'similarity of the differences'; that is, a process in which differences are re-ordered in line with what is similar between them. In this way, the lecturer weakens the semantic gravity of the paragraph (foregrounding higher generality) and strengthens the conditions of possibility for semantic density. By

asking the student to think about the opposite (about disadvantages and not only about advantages), the lecturer directs the student's attention to potential differentiation of the object-tools in relation to the idea (in the topic) of 'effective teaching'. The lecturer points to what Bohm (2004, 8) calls 'different similarities'. This is when analysis produces differentiation in what appears to be similar.

The lecturer's comment creates a potential for further differentiation. The classification ('disadvantages') promotes a more differentiated sense of one parameter of analysis. Nevertheless, the comment leaves intact the existing level of structure of knowledge (i.e. in terms of the relation between SD, SG and value) in the segment. On the basis of this comment, the student could repeat exactly the same form of analysis but with different content (instead of listing advantages only, the student will add disadvantages). So, in effect, the lecturer's comment points to horizontal multiplication (further coverage in the same form) rather than to vertical development.

In the next paragraphs, we demonstrate how lecturers could work with the segment to create a 'zone of proximal development' (Vygotsky 1986) for verticality. We code the steps of re-ordering the above response to signal greater semantic density and weaker semantic gravity. We note that we do not offer model feedback here. We offer an example of how a student's production can be *read* for explication of present and absent order.

(1) First level of analysis (existing order): what ordering tools can be identified in the student's production?

Step one. We identified the semantic field of the segment. The semantic field re-presents the segment in terms of its coverage of the object of analysis (in this essay topic, the role of teaching tools in the act of teaching):

Unit of teaching – *lesson*¹⁷

Agents – *teachers and learners*

Object – (type) *tools, teaching aids*; (token) *pictures*

Knowledge – (type) *subject matter, concepts an idea* (token) *air pollution*

Processes – *demonstrating, creating learning environment, helping* (teacher); *catches learners' attention, active learning* (learner);

Setting – *environment, classroom, school, home, community*

Relations – *Teachers and learners, teachers and tools, learners and tools, teachers and classroom environment, learners and classroom environments.*

Conditions – *learning environment, atmosphere*

Appraisal – *interesting, inviting.*

Step two. We identified the constitutive semantic elements of the segment. This prepares the ground for later identifying the relation between the elements of the semantic field bounded in the segment or the propositional form in which the elements are ordered:

The tools [object-type]required by the teacher [agent] are going to be used for[Relation] helping [process-teacher] learners [agent] in learning[process-learner] for example the pictures [object-token]used for demonstrating [process-teacher] air pollution [knowledge] will give [process-tool] learners an idea of [relation]what air pollution [knowledge-token] looks like, tools like teaching aids makes a lesson [unit of teaching] interesting [appraisal] it catches learners [relation] attention. Having tools for teaching [process-teacher] [*sic*] create learning environment [condition] to be inviting, challenging and motivating [appraisal] the teacher [agent] by using [process-teacher] the tools [objects] the classroom atmosphere [conditions] becomes positive [appraisal], the learning [process-learner] becomes active [appraisal]. (C33)

Step three. We re-formulated the segment so that its propositional form is made explicit. In Bernstein's language, this step elaborates meanings that are present in the student's response, albeit in a restricted form:

Proposition 1 (explicitly stated): *The tools required by the teacher are going to be used for helping learners in learning.*

Question (implicit): How do tools fulfil this function?

Explanation (embedded) –

- *Give learners an idea of what a concept looks like, for example, a picture of air pollution*
- *Makes lesson interesting (i.e. catches learners attention)*
- *Makes learning environment [...] inviting, challenging and motivating*

Proposition 2 (explicitly stated): *[The tools] give learners an idea of what a concept looks like, for example, a picture of air pollution.*

Proposition 3 (explicitly stated): *By using the tools the classroom atmosphere becomes positive.*

(2) Second level of analysis (potential order): once the text is reformulated in a propositional form, the next set of notations imposes a preferred order so that hierarchy between the propositions can be made explicit. In this way the student is provided with recognition rules and realisation rules for what counts as a legitimate text.

Step Four. We fore-grounded embedded relations within and between the above propositions:

Explanation (embedded, functional purpose): *Tools [create] learning environment [...] inviting, challenging and motivating*

Proposition 4 (embedded conditioning): *[When a] classroom atmosphere [is] positive, [then] learning becomes active.*

Proposition 5 (relation between propositions) (embedded, causal) – *[When having the kinds of] tools [which] create [an] inviting, challenging and*

motivating environment [then] classroom atmosphere [could] become positive [and as a result] learning becomes active.

Step Five. We re-cast the constitutive elements in the above propositions at a higher level of generality and abstraction. The student is provided with ‘realisation rules’ for the text that is missing in the student’s production. The text is written in full:

Proposition 6 (potential ordering principle, constrained): Tools can work directly or indirectly on learners’ learning. Tools used by the teacher directly work on learners, and directly work on the classroom atmosphere. The tools that work on the classroom atmosphere indirectly work on learners.

Proposition 7 (potential ordering principle, fully elaborate): Tools work directly or indirectly on learners’ learning. They can enable and/or constrain the process of classroom learning. This depends on ... can be shown when ... (SG- ~ SD+ ~ value, descriptive).

Step six. The verticality (functionality) of each of the seven propositions is marked as relation between value, semantic gravity and semantic density (see Appendix 3). This table offers a systematic formulation of a logic of analysis that could be followed to read a student’ production both for what is present in the response, and for the forms of understanding that are not functional for further conceptual development.

In sum, the above kind of evaluative feedback points to the epistemic resources that could be used for both re-describing and scaffolding a student’s response to a new level of development. To use Vygotsky’s terms, this kind of evaluation offers conceptual resources for the creation of a zone of proximal development.

Discussion

The orientation of the grammar of vertical discourse is towards the future on the basis of an invisible past, and the invisible past is a whole re-contextualising apparatus ... So there is a vast invisibility behind any sentence in vertical discourse, vast invisibility. (Basil Bernstein, Cape Town, 1997)

The above quote points to the very kernel of our task – there is a vast invisibility behind any unit of meaning in the vertical discourse. Academic practices are constituted through de-contextualised knowledge and dis-embedded language. These features of all vertical discourses, coupled with the weak structure of the horizontal knowledge structure, compound students’ difficulties in acquiring the rules that structure academic knowledge. More so, students can only act and make sense of their experiences on the basis of their existing knowledge, and the recognition and realisation rules they developed

through their participation in previous social practices. One implication of this is that when students enter into any new social setting or practice they may think that they understand the criteria of the practice, but in fact this may not be the case.¹⁸ This is why it is often difficult for students to apprehend that they are not meeting desired criteria if they are merely told in words that they are not doing so. Evaluative feedback is potentially the prime activity that could narrow the gap, creating a relation between academic knowledge, which is general and de-contextualised, and an acquirer, who as an individual is specific and contextualised. Thus it is particularly important to find ways of transmitting criteria that do not simply tell students what is done in academia but also provide them with learning opportunities in the form of a joint activity with more experienced others that illuminate ‘how we do it’ and ‘why we do it’. This requires a detailed explication of the existing and the potential order in a student’s response, one such form of explication we demonstrated above. This kind of feedback makes explicit the propositional form that is present in the student’s work (in lesser or greater formality) and reconstructs the propositions and their preferred order in order to explicitly model to the student the recognition and the realisation rules of what counts as a legitimate text.

Thus feedback is an essential part of learning what it means to participate in a social practice. In terms of assessment for learning, feedback does not always have to form part of the marking process; it could be developed on the basis of reflection on students’ work during the marking process, and be used as a teaching activity. This claim is consistent with Maton’s argument that for students to learn ‘the mindful abstraction of meaning from one context and its application within another context’ they need to have access to ‘principles for re-contextualizing knowledge so that meaning can overcome the gravity well of specific contexts’ (2009, 54–55). Stated more specifically, Muller argues that students must be taken systematically through ‘the knowledge steps to be traversed’:

... Insofar as the idea of theory integration means anything at all, it does, qua hierarchy, specify the formal, minimal steps to be acquired in order for sense to be made at all. (2007, 82)

Conclusion

The first part of the paper showed why generalisation and hierarchy are central for building ‘conscious awareness’ in students. The analysis of Bernstein’s knowledge discourse showed that the knowledge structure dichotomy has serious epistemological consequences for knowledge development. Based on Maton’s work, the empirical study analysis shows a way in which lecturers can conduct evaluative feedback that will orient students towards construction of propositional knowledge of strong semantic density and weak semantic gravity, even when within horizontal knowledge structures. The argument which

supports this is that since both knowledge structures (hierarchical or horizontal) are members, albeit of unequal status, of the vertical discourse; and since the vertical discourse has the power to organise ideas systematically, similar epistemic means (abstraction, generalisation or reproductive or summarising descriptions) are available to be recruited for the field of reproduction of knowers, although their epistemic power to classify empirical phenomena differs, depending on the knowledge structure being taught.

Any newcomer to any knowledge structure must learn how to order meaning in order to be able to construct strong propositions. Evaluative criteria and evaluative feedback that explicitly convey the strongest form of grammar available for a discipline enhance epistemic access. Starting from the point that in any student's production there is an order and in any marking form there is a preference for some or other type and modality of criteria, the point of the empirical study is to show that in order to move students beyond their actual order to their potential order, one would need to formalise what is present in the student's response and then show them how to transform it. The language of description developed here is intended to contribute to the creation of a grammar for making visible the re-contextualising apparatus of evaluation. The finding that markers do not pay sufficient attention to ordering, and the process we have demonstrated that makes it possible to explicate for students the propositional form of their construction and thus give the students evaluative feedback that can shift them from the present to the potential, together make a case for a shift in lens on what counts as a truly *formative* assessment.

Notes

1. Bernstein (2000) distinguishes between 'recognition rules' that refer to the student's ability to classify legitimate meanings – that is, to know what meanings fall outside a theoretical model and what may/may not be put together – and 'realisation rules' that refer to the acquirer's ability to produce/enact what counts a legitimate text (2000, 16 and 209).
2. This notion was developed by Bernstein (1990, 18) to code the form (elaborated and restricted) accessible to children of different social class, its origin in the social division of labour and its affect on acquisition of school knowledge.
3. In first edition of *Pedagogy, Symbolic Control and Identify*, Bernstein provides a fascinating analysis of Bourdieu's limited use of the symbolic to convey the arbitrary (socially constructed) base of knowledge. He argues that sociologists need to investigate the structuring significance of the internal structure of symbolic systems (1996, 170).
4. Muller defines these characteristic of knowledge as 'verticality' and 'grammaticality', respectively (2006, 13). 'Verticality' refers to the elaborated structure of integration and subsumption of propositions into high-order ones. This is similar to Vygotsky's 'system of generalisation'. 'Grammaticality' refers to the strength of the conceptual syntax of a language in relation to the empirical world. The stronger it is (Bernstein uses the notion of 'rigorous restriction'; 2000, 163), the more stable are its referents.

5. In the field of the social sciences and the humanities (horizontal knowledge structure), intellectuals dispute not only each other's assumptions about what concepts (such as 'learning', 'class', 'liberal economy', etc.) mean, but also the epistemic means that generate claims about how are these related to specific empirical phenomena.
6. In sociology it refers to different sociological approaches – functionalism, symbolic interactionism, and so forth, constitute different languages. See Bernstein (1996, 181 n4). Other examples are the feminist, postcolonial, Marxist, post-structuralist, and so on, approaches that form the field of 'cultural studies'.
7. This, ironically, is experienced more by the senior holders of the language. Senior speakers of a language, Bernstein argues, 'may be cut off from acquiring the new language because of trained incapacity arising out of previous language acquisition ...' (2000, 162).
8. Maton and Muller explain this complication: 'alternative theories are in a war of hearts and minds, and choices between competing claims to insight are based more on a "knower code", that is to say, on who is making knowledge claims rather than on what is being claimed and how' (2007, 27).
9. Bernstein explains: 'The acquirer rarely has access to the transmitter(s) recontextualizing principle but this principle is tacitly transmitted and is invisibly active in the acquirer as his/her "gaze" which enables the acquirer metaphorically to look at (recognise) and regard, and evaluate (realise) the phenomena of legitimate concern' (2000, 173 10n).
10. Bernstein summarises: ... The recognition and construction of legitimate text in a Hierarchical Knowledge Structure is much less problematic, much less a tacit process than is the case of a Horizontal Knowledge Structure, particularly those with weak grammars. In the latter case what counts in the end is the specialised language, its position, its perspective, the acquirer's "gaze", rather than any one exemplary theory ...' (2000, 165)
11. In 'summarising descriptions, the locus of evaluation is a particular discursive text or an authentic experience and perception.
12. Bernstein argues that pedagogical modes are influenced by social facts and are not intrinsic to the discourse of knowledge (2000, 34). In other words, there is no guarantee that practitioners in the fields of hierarchical knowledge structure will use visible pedagogy and evaluation, because the epistemic means of their knowledge form are capable of integration and subsumption. The use of problem-based learning in medical education is evidence of that.
13. Questions may be raised about the quality of the question. This is beyond the scope of the present paper.
14. Context could be a specific material context or a particular ideological view.
15. 'Value' is particularly important for evaluative feedback in horizontal knowledge structures, which are rift apart by ideological revolutions (Maton and Muller 2007).
16. ~ signifies 'relation between'.
17. Words taken from the segment are italicised.
18. This problem is compounded in higher education. Unlike schooling in which evaluative criteria can be transmitted on an ongoing basis during classroom interaction through classroom exercises and tests, practitioners in academic contexts normally foreground the practice of knowledge production over and above the practice of knowledge transmission evaluation. Lecture halls are big and impersonal, evaluation is far less frequent, and opportunities for ongoing feedback are radically curtailed.

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Appendix 1. Instructional regulative criteria

Criteria	Discursive
TF (Topic focus) <i>Focus selection</i>	Marker puts general comment at the end of the essay: <i>Please focus more on [...]. Stick to the question</i> (E58); Marker makes comments next to paragraph requesting: <i>link this to the question</i> (E61)
KEY (Selection of key content)	Marker writes the actual concept she is looking for: <i>Criterion referenced assessment instead of just 'assessment'</i> (B20); Marker comments at the end of the essay: <i>You have dealt with some tools quite efficiently and left out other important ones such as [...]</i> <i>You have also not considered other factors such as [...]</i> (D47)
EXP (Explanation/elaboration: 'Explain and give examples of tools and factors')	Marker comments next to a paragraph: <i>Explain with supporting facts</i> (B19) <i>You need to talk on other factors more- discuss them in more detail!</i> (C33)
PARA structures of paragraphs	Marker notes: <i>Poor structure between sentences and ending</i> (B17); Marker delineates a paragraph and tells student to make it part of previous paragraph (C31)
SEQ Sequence (structure)	Usually given as end comment: <i>You did not use the checklist to help you improve your essay structure</i> (C37); <i>Your assignment is a bit like a jigsaw puzzle</i> (D53)
DEV Development: 'How your essay will be developed'	Markers refer to the introductory paragraph and comment: <i>Clear introduction</i> (E73) or: <i>Plan your essay in the introduction</i> (B22)
RELINT Relational Integration	Marker asks the student to link one idea: <i>teacher will listen to learners' ideas to another effective teaching</i> (E60)
IMP Implications	None
POS Positioning thinking critically	Marker asks the student to be critical: <i>What about talking about disadvantages of media the teachers need to be aware of</i> (C33)

Appendix 2. Academic literacy regulative criteria

Criteria	Discursive
PUNC punctuation	Marker punctuates student’s text
SP Spelling	Marker’s correct student’s spelling
GRAM Grammar	Marker inserts or changes full word, appropriate expression, tenses, apostrophe, plural/singular. Marker writes sentence instead of the existing one
SS Sentence structure: use of long winded sentences	Markers write: <i>Sentence too long</i> (B 21).
REF Correct referencing	Marker writes <i>complete the reference</i> (E62) or marker corrects the form: <i>Don’t underline and also italicize</i> (D56)
REA Evidence of Reading	Marker asks for the source (in view of plagiarism) <i>acknowledges or reference</i> . ^a
PRES Presentation	Marker writes: <i>Please take care in the presentation of your essay</i> – as an end comment (E70)
LENG Essay length: word count	Students were required to enter word count. Marker writes: <i>not enough</i> next to word count 955 (C43)

^aThis is different from REF where the marker corrects the form in which a student wrote the reference. If marker only ticks the brackets, it is abbreviated. When marker asks for a source, it is explicit.

Appendix 3. Present and potential propositional order in the student's production

Proposition Number	Proposition content	Semantic Gravity	Semantic Density	Functional/not functional
Proposition 1 (explicitly stated):	<i>The tools required by the teacher are going to be used for helping learners in learning (objects, agents, processes, appraisal, relation)</i>	Weak The proposition could be further developed. A horizontal development will stop at appraisal (see below). Vertical development will construct differentiation using some/all of the constitutive elements of the semantic field.	Weak Value is prescriptive (tools will be helping). Weak potential for differentiation	Functional (-)
Question (implicit)	How do tools fulfill this function?	Weak	Strong	Functional (+)
Proposition 2 (explicitly stated):	<i>[The tools] give learners an idea of what a concept looks like, for example, a picture of air pollution (object-tokens, process, knowledge)</i>	Strong Constrained by ideological presupposition that learning of concepts happens through demonstration of concrete particulars i.e. by appraisal.	Weak - Strong potential for multiplication of other tokens that demonstrate the concrete, and thus weak potential for further differentiation.	Functional (-)
Proposition 3 (explicitly stated):	<i>by using the tools, the classroom atmosphere becomes positive (process, object, conditions, appraisal, relation)</i>	Strong (constrained by ideological presupposition that positive atmosphere is <i>the</i> condition for learning i.e. by appraisal)	Weak Value is prescriptive (tools make environment positive) Weak potential for differentiation	Functional (-)
Proposition 4 (embedded)	<i>[When] the classroom atmosphere [is] positive [then] learning becomes active (conditions, appraisal, process, relation)</i>	Strong constrained by appraisal	Strong Value is descriptive (when...is...then) Enables further differentiation	Functional (-/+)

Appendix 3. (Continued)

Proposition Number	Proposition content	Semantic Gravity	Semantic Density	Functional/not functional
Proposition 5 (embedded causal)	[When having the kinds of] <i>tools</i> [which] <i>create</i> [an] <i>inviting, challenging and motivating environment</i> [then] <i>classroom atmosphere</i> [could] <i>become positive</i> [and as a result] <i>learning becomes active</i> . Object, process, appraisal, setting, condition, relation	Weak Although constrained by an ideological presupposition, the proposition integrates propositions 2&3, expanding the semantic field.	Strong Value is descriptive (when... which... could... as a result). Relational integration enables further differentiation between various constitutive elements	Functional (+)
Proposition 6 Potential ordering principle (vertical constrained)	Tools can work directly or indirectly on learners' learning. Tools used by the teacher directly work on learners, and directly work on the classroom atmosphere. The tools that work on the classroom atmosphere indirectly work on learners.	Weak (-)	Strong (+)	Functional (+)
Proposition 7 Potential ordering principle	Tools work directly or indirectly on learners' learning. They can enable and/or constrain the process of classroom learning. This depends on... can be shown when...	Weak (- -)	Strong (++)	Functional (++)