Sociologist Basil Bernstein has given us a language that takes us some distance towards understanding how the structuring of pedagogic practices can lead to the acquisition of discourses, skills and values. However the modality of a pedagogic practice could take students beyond independent learning towards a zone of instability in learning. The data shows that at the zone of instability students are unable to read assessment messages from lecturers, experience cognitive discomfort where they are unsure about their content knowledge and experience shifts in how they view themselves in the process of learning. Despite this however some students are able to achieve success. Therefore the gap between what the curriculum offers versus the level at which students are expected to operate may allow agency. However it may also create a vacuum, floundering and confusion. The study is thus concerned with agency which could be experienced as either positive or negative.

Title: Student Agency in the teaching and learning of engineering design
Extended Abstract (1040 words)
In the acquisition of discourses, skills and values, Bernstein (2003) argues that the values of classification and framing within discourses tell us something about how the student to be pedagogised can infer recognition and realisation rules, thus putting him/her in a position to distinguish between contexts and produce legitimate text within certain contexts.

While the theory itself is powerful in allowing the pedagogic structures to be described, in terms of classification and framing values, the trajectory from exposure to such structures to the production of legitimate text is not made explicit in terms of the real work required by the pedagogised subject. This paper argues that there is some work done by the pedagogised subject in order to move from exposure to a modality of practice to producing a legitimate text. This work involves the enactment of agency. The paper further argues that in the work of enacting agency, the pedagogised has a certain view of the structure or experiences it in a particular way that shapes their efforts towards producing legitimate text. Margaret Archer’s (2003) theory of reflexive mediation takes into account structural properties which exist in the learning environment. This theory has been used in the study to investigate how students enact agency in the learning of a specific discourse of chemical engineering design.

The study focuses on senior chemical engineering students in a South African university enrolled in a chemical engineering design course. In this context students are expected to a) distinguish between the different subjects that constitute engineering sciences, b) be able to select from these aspects those that are relevant to the design they are given and c) to use these different aspects to produce a design that demonstrates their competence. Theoretical language used by Bernstein (2003) would phrase this as a) recognising or distinguishing between contexts (or categories), b) selecting relevant
meanings and c) producing appropriate text. Bernstein further notes that if a student is able to do a) they have recognition rules, whereas b) and c) entail possession of realisation rules. Notably if they can do all three they have active realisation but if they can only do a) and b) they have passive realisation. Bernstein argues however that the rules are defined by the values of classification and framing.

According to Bernstein (2003) classification is a concept used to define a relation between categories. These can be categories of courses, discourses or contexts. If the categories (of courses for example) are specialised, they have their own specific boundaries and identities i.e. are separate from each other. Framing is about forms of control that regulate and legitimatise communication in pedagogic contexts. If classification is about the relations between categories, framing is about the social relations within the categories (Hoadley, 2006). In other words, framing seeks to answer the question of where control is located within pedagogic practice. If it is located with the educator, then the framing is considered strong if not, it is weak. These four i.e. sequencing, pacing, selection and evaluation criteria are indicators of the modality of pedagogic practice.

Put simply this means that students’ success in acquiring the discourse is regulated by the modality of the pedagogic practice. To leave the matter there however would be to give primacy to one lens, that of structure. According to Archer (2003), it is only in light of actors’ personal projects that situations can prove to either be constraining or enabling. If for a particular student the context does not allow him/her to infer the rules, whether because of the pedagogic context or because of the context the student brings, the student has to deliberate over this on some level because otherwise they run the risk of producing inappropriate text. Alternatively if a student is able to infer rules despite the context, there is presumably some deliberation over this that also might happen. Therefore for this reason, the acquisition of the discourse has to be seen to also be regulated by students themselves. The point to be made is that the potentially ‘objective’ contexts do not ‘give’ the rules (of recognition and realisation) to the students but rather that students subjectively mediate the contextual particulars in regulating acquisition. This latter point is Margaret Archer’s language for giving due consideration to the role students play in mediating structural properties and powers.

The students were individually interviewed about their experience of the chemical engineering design course. The data shows that the modality of the pedagogic practice in this course potentially took students beyond independent learning towards a zone of instability in learning. As a result the students enacted agency in various ways. The problematic areas were a) the weakly framed sequencing of the related modules and b) the weakly framed evaluative criteria. The former meant students were expected to apply knowledge they didn’t yet have in a different context leading to cognitive discomfort. The ease with which students were able to do this was related to the contexts that students bring to the learning environment. Further, students were ‘forced’ to change their ways of working. This meant those students who had always viewed themselves as autonomous reflexives were ‘forced’ to be communicative reflexives with negative consequences for them and for the social relations in the class as a whole. The weakly framed evaluative criteria were such that feedback was poor i.e. it was not timeous, it was not comprehensive and it was not consistent. The timing issue exacerbated the sequencing issue such that mostly by the time the students received the feedback it
was too late for them to use it. Because it was not comprehensive, there were times when students perpetuated mistakes because these were not ‘picked-up’ by the lecturer in charge. Lastly it was inconsistent such that students who scored full marks on the modules had no idea about why they had scored full marks. As such the criteria for what counts as legitimate text production were not made explicit.

Bernstein’s theory would lead us to conclude that due to the above, the students have little chance of inferring realisation rules in chemical engineering design. However some students are achieving success and the paper gives more detail of the findings outlined. This is a PhD study and is a work in progress.

References