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Using the Threshold Concepts Framework to explore
affective dimensions of students' learning**

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Recounting the role of emotions in learning economics: Using the Threshold Concepts Framework to explore affective dimensions of students' learning

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Abstract

Many students find economics difficult. Undergraduate courses often record high failure rates, and research in economics education reflects concerns about the quality of students' learning. Such concerns may be more acute in the South African context, where academic underpreparedness among students is one of many challenges facing higher education. Despite the emotional connotations of difficulty and challenge frequently associated with economics, affective aspects of learning are seldom considered explicitly in the design of pedagogy and curriculum. Likewise, emotions barely feature in research on teaching and learning in economics, which is dominated by quantitative investigations of performance and elaborations of innovative pedagogies. The Threshold Concepts Framework (TCF) offers a view of learning that encompasses both cognitive and affective elements. This approach is increasingly influential within and beyond the discipline in exploring qualitative dimensions of learning. However, this growing body of scholarship has yet to delve deeply into emotional aspects of learning in economics. This paper draws on a study that explored the processes and experiences of economics students' learning in a threshold concepts-infused tutorial programme that complemented a traditionally lectured Intermediate Microeconomics course at a South African university. The study used Interactive Qualitative Analysis (IQA), in which participants are entrusted with generating and analyzing data representing their experiences. Students were deeply involved in exploring their learning, in focus groups, individual interviews, and written reflections. These sources produced detailed representations, in the participants' voices, of their learning in economics. We offer an account of the range of emotional responses they described, foregrounding their own words. These descriptions depict learning in economics as a strongly affective process, coloured by a rich wash of emotions, both positive and painful. These responses stemmed from engaging with disciplinary content, from pedagogy and assessment practices, and from students' views of themselves as learners in the discipline. Emotions in turn affected students' motivation, learning behaviour and outcomes. We reflect on how these findings might inform teaching approaches that support and facilitate disciplinary learning. Deeper understanding of possible emotional responses, and of their sources and impacts, may be useful to economics educators and others in higher education facing similar teaching and learning contexts.

1. Introduction

Many students find economics difficult. This has been linked to the abstract nature of disciplinary ideas, the particular way of thinking that characterizes economics, and the traditional ways in which it is taught. Disciplinary difficulty manifests internationally in high failure and dropout rates, and concerns about the quality of learning and teaching in undergraduate economics (Colander and

McGoldrick, 2009; Dubas and Toledo, 2016). These concerns may be more acute in developing country contexts, such as that of South Africa, where academic underpreparedness among students is one of many challenges facing the higher education sector (Bokana and Tewari, 2014; CHE, 2016).

Despite the emotional connotations of difficulty and challenge, affective aspects of learning are seldom considered explicitly in the design of pedagogical approaches in economics. Likewise, emotions barely feature in research on teaching and learning in the discipline, which is dominated by quantitative investigations of performance and elaborations of innovative pedagogies (Hoyt and McGoldrick, 2012; Mixon and Upadhyaya, 2011).

Because emotions attached to learning exist at the intersection of discipline, context and biography, they are likely to be particularly important in the South African higher education context, where the impacts of a legacy of inequality reverberate through the university experiences of many students. In this paper, we argue that if we are to deepen understanding of students' learning in economics, and of ways in which it may be facilitated, we need to take account of the affective responses and influences pervading learning. This requires a broader framing than that inherent in most economics education research. The Threshold Concepts Framework (TCF) (Meyer and Land, 2003; Land, 2016) offers a view of learning that encompasses both cognitive and affective elements, and is entwined with learners' social and emotional contexts. The TCF is increasingly influential within and beyond the discipline in exploring the qualitative dimensions of learning; however, this growing body of scholarship has yet to delve deeply into emotional aspects of learning in economics.

In this paper, we draw on a broader study exploring the experiences and processes of economics students' learning in a threshold concepts-infused tutorial programme that complemented traditional lectures in Intermediate Microeconomics at a South African university, to offer an account of the emotions that may arise from and influence the course of learning. The following two sub-sections sketch the context of our study, in terms of the South African higher education setting and the discipline of economics. Section 2 considers how the TCF may inform an exploration of the emotional aspects of disciplinary learning. Section 3 describes the approach taken in the tutorial programme and the research methodology, Interactive Qualitative Analysis (IQA) (Northcutt and McCoy, 2004). Foregrounding participants' voices, in section 4 we recount the range of feelings that may be experienced as students encounter and learn economic concepts and develop a disciplinary way of thinking – emotions deriving from the content, the teaching and learning environment, and their views of themselves as learners. In section 5 we reflect on the significance of these findings and how they might inform teaching approaches that support and facilitate students' learning in the discipline.

1.1 Higher education in South Africa: rapid change and enduring inequality

The higher education landscape in this country has changed dramatically since the advent of constitutional democracy in 1994. The past two decades have seen the integration and overhaul of a fragmented and racially discriminatory system into a single national system (Waghid, 2015). The country is in the throes of expanding access to university study; enrolment at public universities has doubled since 1994 to reach almost a million students, and student demographics have changed dramatically with an increase in access for black students (CHE, 2016). Despite significant advances, higher education is still marked by profound inequality across and within universities. Historically black

institutions remain underdeveloped (Waghid, 2015); overall participation rates are still much lower for black than for white students, and success rates are skewed by race and prior education (CHE, 2016). Across the sector, academic staff numbers have not kept pace with the growth in enrolments, and student to staff ratios have worsened considerably (CHE, 2016). Moreover, the past few years have seen an escalation in disruptive and costly student protests — linked primarily to funding, but increasingly including broader political issues around institutional and curricular transformation — which are likely to intensify (CHE, 2016).

In this setting, individual students' biography — particularly, their schooling experience — is a significant contributor to their affective responses to disciplinary learning at university. Students enter university in South Africa today “from positions of extreme inequality, most obviously in schooling, but also in terms of financial and other resources” (CHE, 2010, p. 6). Endemic underpreparedness is attributed to the “enduring unequal schooling system [which] creates multiple layers of disadvantage” (Bradbury and Miller, 2011, p. 1). Authoritarian, one-way delivery and an emphasis on rote-learning are still typical of much secondary schooling in South Africa. This may affect not only students' conceptions of knowledge and learning, but also their views of themselves as learners. Students from educationally disadvantaged backgrounds must breach a substantial gap between school and university; many continue to apply the “knowledge reproduction” approach, which has served them well at school, instead of seeing themselves as responsible for — and capable of — the “knowledge construction” required at university level (Bradbury and Miller, 2011). Negotiating the transition to university study thus makes particularly intense demands on the academic, social and psychic resources of students from educationally disadvantaged backgrounds (Cross et al., 2009).

In short, it seems likely that for many South African students, affective aspects of disciplinary learning would be felt particularly intensely. Awareness and understanding of the possible responses that could be evoked, and how they might influence learning, may assist economics educators in supporting and facilitating learning. (These may arguably also be relevant for non-traditional or minority students in developed country contexts.)

1.2 The disciplinary context: discounted emotions in economics education research

In undergraduate courses globally, learning in economics is focused on a universal conceptual core and characteristic methodology. Mastery requires that students develop the ability to “think like an economist” as they move through introductory and intermediate modules (Siegfried et al., 1991; Becker, 2004; Siegfried, 2009). Students often experience this progression or transformation as a difficult process, and many struggle to develop economic understanding and acquire the necessary “ways of thinking and practising” (WTP) that define the discipline (Entwistle, 2005). While this difficulty is widely acknowledged in economics education research, its sources, and the processes by which students reach conceptual mastery, are not as well understood or agreed upon (Becker, 2004; Davies and Mangan, 2008; Frank, 2005; Green, Bean and Peterson, 2013; Wilson and Dixon, 2009).

The role of feelings in this process of learning has not received much direct attention in research on teaching and learning in economics, or informed how and what we as educators choose to teach our students. Nonetheless, reading between the lines of existing work on teaching techniques, learning

concerns, and curriculum critiques, we can detect some intimations of the importance of affective aspects of learning.

Pedagogy, curricula and assessment in introductory and intermediate economics courses are similar the world over, and common problems, long known, still persist in the form of large classes and a reliance on lecturing and textbooks, rather than encouragement of wider engagement (Colander and McGoldrick, 2009; Goffe and Kauper, 2014; Siegfried et al., 1991). Concerns have been raised that this type of ‘theory-first’, lecture-based delivery fosters conceptions of knowledge as a quantity, and of learning as memorization (Bloemhof, 2012), promoting a surface approach to studying (Marton and Säljö, 1976). Numerous accounts of innovative teaching approaches, based on active learning and constructivist pedagogy and often entailing social processes, reflect a recognition of the benefits of cooperative learning (Hoyt and McGoldrick, 2012; Watts and Becker, 2008). It seems likely that the effectiveness of such approaches may be attributable in part to the emotional responses evoked by their empowering and socially interactive features, which in turn enhance student engagement (Zepke, 2013). However, relatively little attention has been paid to explaining the impact of these approaches on learning, and despite the evidence that such techniques are more effective, lecturing continues to be the dominant approach globally (Goffe and Kauper, 2014). The Intermediate Microeconomics course in which this study was set was in line with traditional practices, relying on lectured delivery to convey a standard syllabus, aligned with an international text, to a large and diverse class of several hundred students across three campuses.

Curriculum critiques in economics education scholarship may allude indirectly to the affective aspects of learning: as well as being overstuffed with theory, at first- and second-year level in particular, curricula have been characterized as overly narrow, abstract, and /or irrelevant. Calls for a deeper focus on a smaller set of critical concepts (Frank, 2005) coexist with suggestions that the lack of exciting and relevant new content is a more significant problem (Becker, 2004). The discipline also faces charges that it is not ideologically neutral, but is portrayed as such (Docherty, 2010; Heilbroner, 1987). Moreover, the questions focused on in most undergraduate courses are abstract and irrelevant to students’ areas of interest and concern (Colander and McGoldrick, 2009; CORE-Econ, 2016). The increasingly monist focus on neoclassical theory, to the exclusion of alternative viewpoints and historical and contemporary context, has been implicated in the discipline’s perceived irrelevance and the erosion of students’ motivation (Mendeloff, 2008; Van der Merwe, 2006) — a particularly pertinent critique in view of the Rethinking Economics movement globally, as well as debates around “decolonizing” curricula in South Africa (Muller, 2017).

While issues of relevance and motivation have affective resonance, little has been written about students’ emotional responses to curriculum and content in economics. With the exception of some mentions of anxiety – in test situations (Kader, 2014), or related to mathematical and graphical content (Benedict and Hoag, 2002; Cohn et al., 2004) – emotions remain largely disregarded and uncharted in research on economics education; indeed, it might be argued that we assume them away (as if both we and our students were *homo economicus*).

2. The Threshold Concepts Framework as a means of accounting for affective aspects of learning

In contrast to much economics education literature, the TCF offers a broader perspective on learning that not only accommodates emotions but acknowledges their centrality. The theory of threshold concepts emerged from the economics strand of a UK-wide research project (Enhancing Teaching and Learning Environments in Undergraduate Courses) (Meyer and Land, 2003), and formalizes and elaborates the shared understanding among economics educators that disciplinary learning requires mastery of particular transformative and troublesome ideas. The TCF has rapidly become established in the literature on economics pedagogy and in a range of other disciplines (Flanagan, 2017).

In this view of learning, which weaves together insights from several learning theories and other disciplines, certain concepts are seen to act as portals to transformed understandings that define disciplinary ways of thinking. Crossing these learning thresholds involves affective as well as cognitive processes; and because this knowledge is transformative, resulting in new ways of reading the world, it may also bring a shift in the learner's view of herself. While it foregrounds disciplinary content, the TCF also sees learning — and difficulty — as inseparable from the learner and her social and personal context.

The experience and processes of learning educationally critical but possibly troublesome content transcend disciplinary boundaries (Schwartzman, 2010), and reaching understanding of a threshold concept in any field is likely to be experienced as (Meyer and Land, 2003):

- transformative, precipitating conceptual and ontological shifts;
- probably irreversible;
- integrative (revealing interconnections among concepts);
- possibly bounded (serving to demarcate the discipline); and
- potentially (possibly inherently) troublesome, because of particular features of the knowledge to be gained (Perkins, 1999).

The TCF offers a way of conceptualizing and describing learning, and interrogating the reasons some students struggle to grasp particular content. The framework is not a proposed 'solution' to learning difficulties or a testable hypothesis, but a sensitizing concept that gives rise to some broad pedagogical principles and curriculum-design considerations (Davies and Mangan, 2007; Land, Cousin, Meyer and Davies, 2006).

Essential to this view of learning is the (anthropological) notion of liminality: coming to understand a threshold concept requires crossing a liminal space of uncertainty and incomplete understanding, making a recursive path from old to emergent understandings and views, which is likely to involve some discomfort, anxiety and perhaps a sense of loss. Students' responses to challenges of liminality are central to their learning. If students' responses to liminality are defensive, it is likely they will remain stuck at incomplete understanding, or withdraw, and not breach the necessary threshold. A reflective response enables them to reconstitute the meaning frames by which they make sense of the world, and ultimately to develop a new sense of themselves — which is closely tied to the internalization of disciplinary WTP, and identification with a disciplinary community.

Figure 1 summarises this view of disciplinary learning graphically:

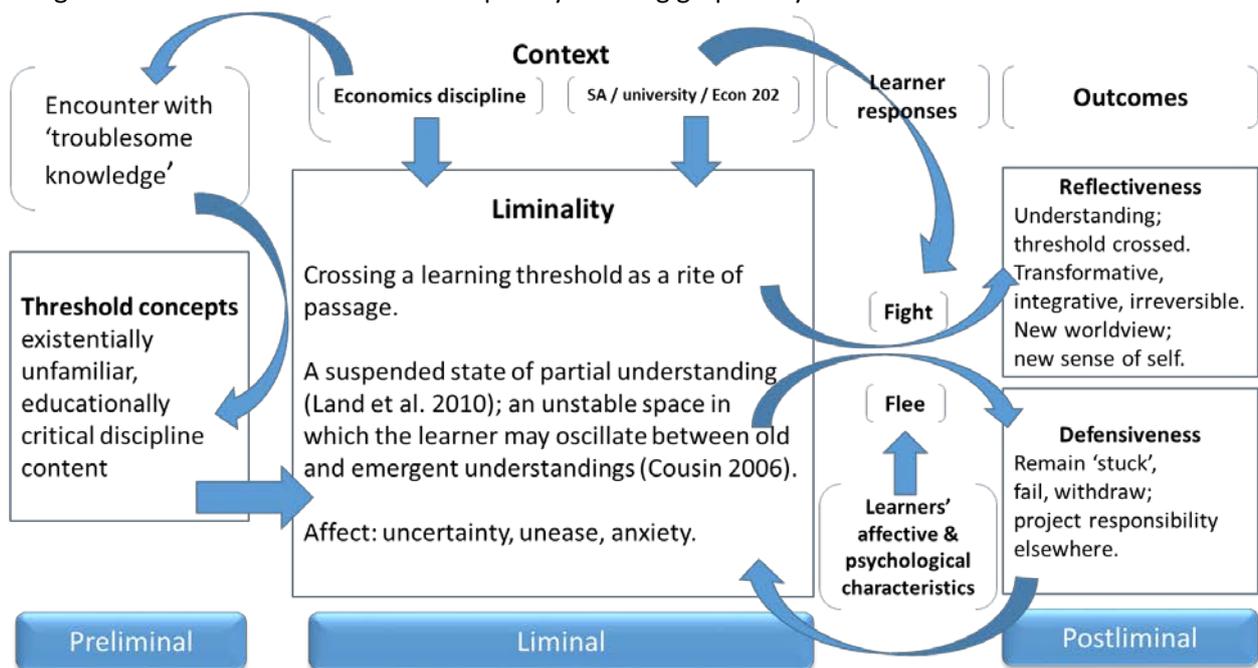


Figure 1. A threshold concepts view of learning (based on Schwartzman, 2010 and Land et al., 2010)

While liminality (together with its affective connotations) is central to TC learning, this is still the less well understood part of the transformation (Rattray, 2016). Descriptions of threshold characteristics and of liminality have tended to focus on the aftermath, rather than the experience, of students' learning of challenging concepts (Schwartzman, 2010). An emergent focal area within the TCF considers the psychological and affective characteristics that influence how learners cope with the demands of the learning transition (Berg et al., 2016; Rattray, 2016). There is clearly scope within the TCF for deepening understanding of this transition by filling in some detail around the emotions that may be attendant on learning.

Beyond a narrow disciplinary focus, "entering studenthood" constitutes a liminal process in itself (Berg et al., 2016; Cousin, 2014, p. 22). This transition requires drawing on reserves of "emotional capital" or experiential knowledge while mastering "rules of engagement" that are often tacit, and may be especially difficult for non-traditional students. For these students in particular, contextual factors significantly influence conceptual mastery, and a supportive learning environment is critical (Cousin, 2014). This view is relevant to the South African higher education context, where it aligns with work relating to underpreparedness and epistemological access (Cross et al., 2009; Jacobs, 2007).

Work in economics has elaborated and supported the TCF. Davies and Mangan (2007, 2008) have offered refined categories of concepts, of which discipline thresholds and procedural or modelling thresholds have the transformative, integrative properties highlighted by the TCF. They suggest that these concepts work in a web of interconnections that together comprise a disciplinary ‘bigger picture’. Further important elaborations to the TCF within economics include the conjunction of understanding and ability to apply concepts, and the recognition that identity shifts arising from conceptual reframing are implicit in the development of students’ ability to think like an economist (Davies, 2012). In seeking forms of engagement — in terms of both pedagogy and content — which will foster the types of conceptual and ontological shifts that disciplinary learning calls for, the TCF also speaks directly to concerns around teaching, learning and curriculum in broader economics education research, some of which were noted in section 1.2 above.

In sum, because the TCF sees cognitive as entwined with affective and identity-related aspects of learning, the framework can accommodate and account for feelings. The main sources of emotion highlighted by the TCF seem to be the liminal nature of conceptual learning, and the potential implications of transformed understanding for learners’ sense of self (Meyer and Land 2006; Cousin 2006; Land 2016). In the context of economics, these have yet to be deeply explored. Even within TC-oriented scholarship, feelings as they are evoked by or impact on teaching and learning in economics remain largely undocumented.

Using the TCF to frame our study provided not only a holistic view of learning in terms of which we could deepen understanding, but also offered some guiding principles for the pedagogical approach used in the tutorial programme, which is described (together with the research methodology) in the following section.

3. Methods: the TC-infused programme and Interactive Qualitative Analysis

The range of feelings recounted here emerged from an exploration of students’ learning in a threshold concepts-infused tutorial programme that complemented a mainstream lectured module in Intermediate Microeconomics (Econ 202) at a South African university. A purposive sample of 20 students drawn from the mainstream class attended weekly double-period tutorial sessions over the course of the semester. The small class size and additional time afforded by the tutorial programme allowed us to depart from traditional lectured delivery and use active, cooperative learning pedagogies, described below. At the end of the programme, the students participated in focus group sessions and individual interviews.

In designing the tutorial tasks, we mapped the Econ 202 syllabus to relevant concepts from the ‘web’ of TCs proposed by Davies and Mangan (2007), and drew on and adapted relevant teaching and learning activities from the Embedding Threshold Concepts (ETC) project¹, as well as two classroom

¹ This project, hosted by Staffordshire University in collaboration with three other UK universities, ran from 2004-2008. The teaching materials are freely available for download from the project website at <http://www.staffs.ac.uk/schools/business/iepr/etc/index.htm>. The ETC activities are connected to the introductory level syllabus in the UK, but the ones we selected covered topics revisited in Econ 202.

games (Emerson and Hazlett, 2012). The ETC activities are guided by a TC orientation (Davies and Mangan, 2006, 2008); they embed economics threshold concepts in relatable, real-world examples, and break the analytical task down into component steps. In this tutorial programme, students worked on these activities predominantly in small-group discussion (four to six per group), which was followed in each session by class discussion, and oral or written reflection. The tutor deliberately remained in the background, aiming to facilitate rather than 'teach' the material, and strived to create an informal environment where students could interact comfortably to discuss the tasks and to share and develop their economic knowledge. In addition, participants wrote weekly reflections about their learning in economics. We expected that this activity would have intrinsic value for the students, in that it could enhance their self-understanding and sense of control over the learning process, or their metalearning (Ward and Meyer, 2010). These written reflections were an additional source of data (Creswell, 2013).

The larger part of the data was generated and initially analyzed using Interactive Qualitative Analysis (IQA) (Northcutt and McCoy, 2004). IQA² is a systematic, protocol-driven research procedure, in which participants analyze and interpret the data they generate. IQA thus aligns with social constructivist research, and its use here resonated strongly with the emphasis the TCF places on students' experiences, because participants were deeply involved in exploring their learning. Because the researcher plays a facilitative role in data generation and initial analysis, rather than being cast as the expert, IQA was also in harmony with the power relations that inhered in the tutorial programme: as the group had been entrusted with responsibility for their learning, so they were entrusted with generating and analyzing the data that represented their experience.

IQA has inherent features promoting rigour in data generation and analysis. A transparent audit trail of the steps required according to rigorous, reliable and replicable rules mitigates issues of researcher bias, reflexivity, or trustworthiness commonly associated with qualitative research, enhancing validity and reliability (Northcutt and McCoy, 2004).

IQA is initiated in a focus group, where participants generate affinities (themes) relating to the phenomenon: in this case, their learning in economics. Participants then identify relationships of influence among those affinities. In the second phase of IQA, the affinities and their interrelationships are elaborated in semi-structured individual interviews, adding richness and depth to the representations emerging from the focus group process (Northcutt and McCoy, 2004). In this study, the detailed individual data in participants' reflective journals formed an important addition to the standard IQA components.

The affinities provided the basis for coding the interview transcripts and the participants' reflective writing. From the data, we assembled quotes for each affinity - "specific examples of discourse that illustrate or allude to an affinity" (Northcutt and McCoy, 2004, p. 315) - and organized these into common or recurring themes to identify interpretive 'elements' of each affinity, and to describe the relationships between affinities. These sets of quotes form the source material for representation of the findings in IQA: rich, grounded descriptions, relying on participants' own words.

The quotes that make up the greater part of the descriptions that follow are thus composites - multiple quotes taken from many individual participants (lightly edited where necessary to remove verbal distractions or to standardize spelling), and woven together to sound like one voice. Each can

² Detailed explanation of IQA and its associated protocols is contained in Northcutt and McCoy (2004).

be seen as a tapestry made up of individual realities, at times revealing shades of variation within participants' shared understanding of their learning.

4. Findings: students' accounts of emotions in learning economics

The focus group identified six affinities as components of their learning in economics. Although this paper focuses on the *Feelings* affinity, the essence of all six is outlined here because students at times referred to other affinities evoking or being influenced by their feelings:

Group Dynamics encompasses all the qualities and processes that defined students' interactions during the tutorial group sessions, and that they saw as impacting on their learning of economics.

The **Learning Journey** describes their progression in learning economics and comprises two sub-affinities: (metacognitive) *Learning about Learning*, and (conceptual) *Stumbling Blocks and Successes* encountered on the way to disciplinary understanding.

Economic Thinking refers to students' development of a distinct disciplinary perspective that they could use to analyze real-world events.

Goals represents future plans or aspirations, which ranged from performance-oriented goals centred on passing the module, to an intrinsic desire for understanding of economic phenomena, or conscious, long-term study or career aspirations.

Personal Outcomes embodies a range of academic and personal development benefits that students ascribed to their learning on the tutorial programme.

Feelings describes the range of emotions arising from and affecting participants' learning of economics.

These affinities, and their influences on each other, made up the participants' representations of their learning. Affective aspects were described primarily within the *Feelings* affinity, but were also discernible in the other affinities and their interrelationships. This section distils the range of emotions participants recounted, foregrounding their voices in the composite quotes capturing each feeling or its source.

The first three findings centre on learning in the tutorial groups as a source of positive emotions:

4.1 It was fun!

The tutorial group sessions were *enjoyable and engaging*, and participants were enthusiastic about attending and learning in that forum.

First of all I thought it was really fun. I enjoyed it. I found the tuts to be fun and engaging... I actually concentrated for the full two hours. When it came to

Wednesdays going to the tut it was fun, and interesting ... even though I felt guilty about [not] doing the work [written reflections], but then I wanted to go and attend. The tutorials are fantastic and I can't wait to learn more and better my knowledge. This thing will never get boring or unhelpful. It's been really fun just getting with other people and try to learn through them. And also the fact that I was thinking like an economist – it just made things easier, plus exciting. And it was just like adventures – you get to discover things!

Participants found the tutorial format conducive to learning, as they maintained concentration and were never bored; they felt motivated to attend the sessions each week. Being conscious of their own learning seemed to be an intrinsic part of the 'fun' element: collaborating with others, applying disciplinary ways of thinking and discovering new ideas felt "like adventures".

4.2 I had that happy feeling...

Participants conveyed a sense of *well-being, belonging and contentment* stemming from being part of the tutorial group.

There's this happiness that I was having – it felt like it's just like home in the TC groups... So I had that happy feeling inside me. It is enjoyable to work with other individuals and especially to share jokes and exchange ideas with other people. Being part of the TC group made me feel kind of important; valuable. [I] felt good 'cause people would listen when I speak in the tut. The group dynamics would cause feelings to arise such as self-awareness, sense of belonging and understanding as group dynamics created an environment of learning. Group discussions help through understanding and indirectly motivating each other. I loved the TC group, the way we learned. I'm going to miss these people, all of them.

Participants linked their interactions in the tutorial programme – summarized in the *Group Dynamics* affinity – to a range of positive feelings about their peers (the group) and themselves, as well as the discipline. Their learning in the tutorials was tied to the affective support offered by the group: a sense of belonging, feeling recognized and valued as a member of the group, and feeling attached to their peers.

4.3 It felt great learning and attaining economic knowledge

There is *joy in mastery* of disciplinary concepts, and positive emotions arise from students' awareness of their own progress in developing a disciplinary perspective.

A lot of it affected how I felt, because things like finally understanding something, that would make me feel like, ahh great, I'd feel more enthusiastic to get on to the next thing and to just go on. From the beginning and feeling anxious, and feeling like, uuuuh I really don't know anything at all or I don't know enough, to getting to a place where – oh, wow, I actually do understand some things, and I feel like I can actively engage with someone on these things. I was very happy when I finally understood about elasticity. It felt great learning and attaining economic knowledge. Once you get it, it's a sense of relief, a sense of accomplishment – that you didn't give up on the speedbump, just pushed through it. I am proud of myself for what I managed to get right already. Thinking like an economist makes you feel like an economist and feeling like an economist feels great.

Making progress in learning was an emotional process. The cognitive move through stuckness to conceptual understanding had its affective counterpart: finally understanding a concept brought feelings of relief, accomplishment and emerging self-efficacy, which motivated participants to continue learning in a positive cycle. Realizing that they had progressed in disciplinary ways of thinking had positive impacts on self-esteem, and for some students, on their sense of self with regard to the discipline.

On the other hand, the process of learning – and the prospect of assessment – could also be fraught, as described in the next three findings:

4.4 I was stressed about actually getting things

The process of learning could be accompanied by *fear and frustration as students tried to apprehend new ideas.*

During classes [lectures]... I used to be so scared because – it is better for me if I go to classes, then you teach us. Sometimes my mind will be not there, but then I'll always feel like scared, ok now I'm not concentrating! ... Yeah, so that feeling of fear, ok I'm going to fail, I don't know what [the lecturer] is talking about, ja, that fear... Because I was stressed about actually getting things instead of just trying to understand, so I easily got stuck on some things, because I'd try to understand it and it doesn't go in, try to understand - doesn't go in; then I'm saying argh, I guess, I don't know this stuff.

Anxiety was linked to trying to take in new content. This was heightened in the context of formal lectures, where students might feel that the lecturer was imparting disciplinary content that they had to take in as fully and quickly as possible. Participants feared not understanding in class, feeling

confused, and ultimately failing the module. Repeated, ineffectual attempts to get content to “go in” could detract from a focus on understanding, and lead to a negative spiral that undermined students’ beliefs in their disciplinary competence. Feeling confused and stuck while trying to learn new concepts was common, and could leave students feeling demotivated and frustrated.

4.5 My fear of economics assessments

Anticipatory, *assessment-related anxiety* was experienced by many students.

Yoh, economics makes me very anxious. I think it's because I failed it a couple of times so I'm always scared I might do it again. I really wish I knew how to overcome my fear of economics assessments. When I heard there were written questions – because we hadn't done written questions, we weren't sure what to expect. At first, before I wrote it, I was scared, 'cause you don't know what to expect and you don't know what you should be reading, whether it's enough or it's inadequate... Often, especially in multiple choice, I feel like I'm being tricked; that puts me on edge.

Participants’ fear was linked to the possibility of failing, particularly for students who had had to repeat economics modules. While anxiety often arose from being unsure of how to prepare for a written test format, the more familiar multiple choice questions could also be experienced as treacherous.

4.6 So when I saw the results...

Test *performance evoked a variety of strong emotions*, which were closely related to students’ self-belief and motivation.

So when I saw the results I was quite shocked. My first test... I was not happy at all about it. When I write I'm so slow, so it ends up making me sad and angry at myself, because you know you're trying to say, this time let me push myself, and then at the end of the day you fail. And then when I got the result I was like, oufff, oh my gosh what happened? How am I supposed to learn this thing, economics...? The successes came in my test 2 result. I got 68 – that's when I knew I've got to keep going. So when I saw that I had passed, I was really surprised (and VERY happy!) For me, firstly I actually performed very well in test 1, and then what surprised me is that you... acknowledged my performance and my effort. So with my test 2 it was more like, I just don't want to disappoint!

Poor performance in assessments could cause disappointment and frustration that led participants to identify possible reasons for their performance, or to question their own abilities with regard to the discipline. By the same token, doing well in tests bolstered participants' self-belief and motivated them to maintain their efforts. This might be linked to a desire to live up to expectations (their own, or those of the tutor and/or their peers).

Beyond issues of pedagogy and assessment, disciplinary content and perspectives could in themselves elicit some emotional responses:

4.7 Economic Thinking affected me...

Developing a disciplinary perspective, encapsulated in the *Economic Thinking* affinity, could produce negative emotions. Some students expressed a sense of *sadness or loss* linked to the new way of thinking, specifically tied to the idea of opportunity cost:

Economic thinking affected me to the extent that by economic thinking I as an individual should maximize my gains, which I felt differently about in the past: now I feel I must, if not I am sad. The issue of scarcity and trade-offs, opportunity costs hinders us from maximizing our happiness; and more is better, it is sad how one has to choose. Opportunity cost: it's irritating how opportunity cost affects every decision I make. Thinking about what all my opportunity costs are made me sad, realising what was being given up.

This mild feeling of sadness had little to do with their own performance, and could be characterized as an existential sadness arising from the disciplinary view of reality: reaching the understanding that any choice they made in life would require them to give something up.

A few students expressed possible tensions between *Economic Thinking* and *Feelings* that centred on a *clash with their personal values*:

Before economics – the part about maximizing my happiness or utility – well, I have to say that in a way it does seem as though if you're maximizing your personal happiness or utility, you're selfish. So before learning it, I didn't do things selfishly. Whatever maximizes the utility of the majority, I used to say that. It's not about personal gains. I can't think like that, my feelings get in the way... You can't walk around thinking 'I want to maximize my benefits, I don't care what happens to someone else!' You can't do that as a person, it's not really doable. You consider other people most of the time.

Narrowly defined self-interest or utility maximization, underpinning the economic approach to decision-making, could be dissonant with students' feelings of altruism if interpreted as a code to live by.

4.8 I became more enthusiastic about economics

Nonetheless, students expressed *more positive feelings and attitudes towards their economics studies* in general.

I think I love it more now 'cause I understand it more. I like it more now since I know more or less when I can use it. I learned how to use it better, and as I use it I love it more. I loved this, what we're doing, microeconomics. I really enjoy it. It's just a different way of thinking. I like it. I became more enthusiastic about economics. It became so fascinating... I actually went to ask [student counsellors] to find out whether I can have three majors. I loved economics because of the TC group. Group discussion - that's when you realize that you actually love eco's and you want to pursue it.

Participants linked these positive feelings to having acquired greater understanding of the discipline, and knowing how — and when — to apply it. For many, these responses to economics resulted directly from the group interactions and processes in the tutorials.

4.9 I feel good about my growth and development in economics

With an enhanced sense of disciplinary self-efficacy came newfound confidence, interpersonal skills and changed perspectives: *Personal Outcomes that led to positive emotions.*

Positive personal outcomes has led to positive feelings about everything from economics as a field and my life in general. When my mind was opened I felt happy and excited because I became confident. The more confident you are about your economic knowledge the less anxious and sad about economics you are. I got more self-confidence, I learned to listen... and I feel I have grown from this. Working in groups makes me feel confident, because now I can express myself with no fear. The TC group showed me I shouldn't be closed off or afraid to voice out my emotions and be confident when talking about eco's. I feel good about my growth and development in economics.

Participants' anxiety and sadness diminished as their self-confidence – in social situations, and in their economic understanding – grew. Participants linked feelings of happiness and excitement to becoming aware of their own learning progress and personal growth. These positive feelings extended to a range of objects: themselves as individuals, the group, economics as a field of study, and life in general.

Importantly, all of these emotional responses were not mere side-effects – they could in turn exert a significant influence on the course of learning for students, as the final finding reveals:

4.10 The way I felt about the module affected my goals

Feelings arising from learning experiences, and from their beliefs about themselves in relation to learning, affected students' goals.

The way I felt about the module affected my goals. Ultimately... I like doing good in the world. So if I feel that economic thinking, which has led me to my goals, will affect others positively, then I will feel better about what I'm doing... it's like a butterfly effect – it will just make me want to learn more, and do more, and affect more people. My love for economics has grown that I even want to become an economist. But I'm afraid...! It's quite a [lot] of work, and I heard that third year includes stats, and I really suck at stats... Economics is tough but I will major in it. I always feel like a person who can always achieve his goals. It has been a struggle that has not yet ended but I will not give up on my studying toward economics.

Participants' goals with regard to economics — particularly, the desire to pursue further study or even a career in the discipline — were shaped by their feelings. Positive feelings towards their learning experiences and their own abilities informed and reinforced these goals. In a similar vein, if disciplinary thinking could serve uses that accorded with students' own values, they might feel more motivated to learn. For some, these feelings might be tempered by apprehension about the demands of further study and doubts about their abilities to meet those demands. Others expressed determination and confidence that they could reach their goals and surmount any difficulties they might meet.

Some students recognized the need to manage their emotions in order to advance in learning:

I have set goals, but I think my feelings get in the way - negative towards things I don't understand. I feel like when I reach my goal I'm happy, but now it's important to feel the same when you're trying to reach your goal. If I didn't do well, I just thought, better luck next time, I didn't dwell on failing. [When] one talks about feelings, it's not only good things. Sometimes you learn something when you get a

bad situation. You learn more and then you know what to do, now I need to change my techniques. And then that makes us to grow, to learn and to change stuff.

Negative feelings towards content they did not understand could hinder their attainment of learning goals; modulating the impact of emotions and maintaining a positive attitude through the learning process could help them reach those goals. However, negative feelings were also recognized as potentially constructive, in that they could provide the impetus for a necessary change in approach that would enable greater learning and growth.

5. Reflection: taking account of feelings in teaching economics

These descriptions reveal that students' learning of economics is coloured by a spectrum of emotions, both positive and negative, that affect learning behaviours and outcomes. By filling in some detail in their own voices of how students experience learning, the findings may deepen our understanding of the learning concerns and challenges faced in undergraduate economics. Here, we offer some reflections on how this understanding might inform approaches that support and facilitate learning.

Students' positive responses to the tutorial programme remind us not to lose sight of the possibility for fun, discovery, and greater intrinsic motivation, or the potential of engaging, empowering approaches for fostering self-development as well as conceptual learning. Their descriptions throw a light of contrast on the shortfalls of traditional lectured delivery, which may inadvertently produce the passivity, invisibility, anonymity, and lack of accountability that can hinder learning in higher education (Shulman, 2005). Unearthing the emotional responses that large-class, fast-paced lectured delivery might evoke adds a dimension to our understanding of why this may reinforce reliance on a surface approach to learning in undergraduate economics. It seems that learning may also be hindered by self-doubt and anxiety, linked to the pressure of having to internalize (and store for subsequent retrieval) the volume of 'truth' dispensed at a rapid pace in lectures. By contrast, deep learning is more likely to be fostered by approaches that help students to conceive of themselves as capable and in control of their own learning.

This confirms concerns about the continuing dominance of lectured delivery, and substantiates calls in the economics education literature for greater use of more active and cooperative learning. Consideration of students' feelings around peer group processes reveals how cooperative approaches may foster learning by providing affective support. The sense of affirmation, belonging and contentment that stemmed from being part of the tutorial group countered the invisibility and anonymity of lectures; the group could be seen to provide a supportive liminal environment, the importance of which is emphasized by the TCF (Land et al., 2006). In a context of increasing demands on limited staff resources, group learning may be leveraged to provide affective support that staff cannot feasibly offer in large classes. Indeed, with increasing access to university study and growing numbers of first generation students, the peer group might be especially well-placed to foster a sense of belonging and identity, and to support the broader transition to studenthood, as well as more immediate disciplinary learning.

Anxiety characterized many students' experiences. Anxiety linked to an initial sense of not knowing enough matches liminal anxiety as anticipated by the TCF; it arises from the uncertainty or unease of incomplete understanding, on the way to disciplinary mastery (Meyer and Land, 2006). This is developmental and healthy – adaptive anxiety that reflects the emotional investment needed for intellectual growth (Shulman, 2005). We need not seek to spare students this type of anxiety, but should help them to tolerate it and ensure that it is not debilitating by providing emotionally supportive learning experiences and relationships (Taylor 2006; Land et al. 2006). Also important is letting students know that some anxiety is common and necessary, that not knowing is part of coming to know (Cousin, 2006). The peer group can provide affective support as noted above – and can help students to see that their experience is shared.

Many students reported intense assessment-related anxiety. Much of this seems to derive from unclear expectations; it is not conducive to learning, and could be mitigated in class by making the disciplinary 'rules of the game' explicit (Land et al., 2006). Reviewing our assessment practices might offer further opportunities for facilitating learning: assessments are part of being 'seen', especially in the context of large, anonymous classes, and feedback on performance is a channel through which we affect students' sense of self-efficacy and motivation, for better or worse.

Generalized, unconstructive anxiety might have deeper roots in past emotions and relationships around learning and assessment contexts (Crossman, 2007). For underprepared students in South African higher education, learner biography is implicated in the pervasive low-grade anxiety and self-doubt many participants conveyed. Greater understanding of the intersection of learner biography, including school history, and threshold concept learning might point to ways in which the obstructive impacts of this type of anxiety might be dispelled.

Emotions attaching to disciplinary content in itself are surprising against the backdrop of most economics education research, from which they are absent, but they are anticipated by the TCF. Particularly, grasping the opportunity cost concept evoked an existential sadness, as it transformed students' views on their own choices, while also serving as a tool to analyze choices made by others (Shanahan and Meyer, 2006). This type of sadness is developmental rather than debilitating; it is not a problem to be addressed, but an example of how content that can seem devoid of emotion (and is usually taught as such) may not be so for students. Teaching and learning could be enhanced if we acknowledge and make use of, rather than ignore, affective responses to disciplinary ideas.

Similarly, we should not discount the dissonance students may experience if their personal values clash with narrowly defined self-interest or utility maximization as an underlying disciplinary principle. Some may interpret that perspective as a normative code to live by, instead of an analytical model approximating human behaviour, to make use of in appropriate circumstances (Siegfried, 2009) – and educators should be wary of inadvertently fostering the former view through the narrow neoclassical content and lectured delivery typical of (at least) level 1 and 2 economics. It is also possible that students may have reached a level of metacognitive awareness that enables critique of neoclassical economics – they have understood the theoretical canon, and are able to reflect on why it may not appeal to them. These issues recall the concern noted in section 1.2: that economics is not value-free, yet this is not usually made explicit (particularly not at undergraduate level). The possibility that some of the discomfort associated with learning economic theory might be a chafing at students' moral and community regard places a responsibility on teachers to include in the curriculum consideration of the limitations and flaws of, and alternative views to, neoclassical theory.

On a related note, increased enthusiasm for their economics studies was tied to students' perceptions of the use of their growing understanding; the discipline as they experienced it was personally relevant. This adds weight to arguments for including (more) issues students care about and can relate to in undergraduate courses, and making the use and relevance of what we teach explicit whenever we can. Creating time and opportunities within our courses for students to reflect on their disciplinary learning – and how it relates to real-world events and their personal contexts – may help to highlight its relevance.

Intertwined questions around emotional responses, values, and relevance point to opportunities to review curriculum and content choices, to account for and harness affective aspects of students' learning in economics. For instance, educators can encourage 'bigger' and more critical thinking (Colander and McGoldrick, 2009; McGoldrick and Garnett, 2013), or guide students to explore alternative ethical theories to the neoclassical (Wight, 2012); we can structure activities that use emotion and empathy as pedagogical tools (Menzies, 2009) especially when teaching more emotive, overtly value-laden topics. There is a case to be made for introducing questions of policy and moral philosophy, and real-world issues about which students care, into mainstream undergraduate economics³. This becomes all the more pertinent in view of the lasting impact of the global financial crisis on the status of the discipline (Colander, 2013), the South African context of inequality and widespread economic disempowerment, and the calls for decolonizing the curriculum in South African higher education (Muller, 2017).

Intense feelings were associated with students' views of themselves as learners, ranging from self-doubt and anxiety to growing disciplinary self-efficacy, newfound confidence and happiness arising from personal development. These emotions are inextricably linked to students' sense of self, and remind us that we are teaching more than conceptual content. Strong emotional reactions to assessment outcomes similarly suggest self-investment that we should be careful not to underestimate. As educators, we might consider how we could amend learning environments and pedagogies so as to engender in our students a sense of themselves as capable learners in the discipline. This is especially true in a South African context, where we are dealing with a legacy of inequality that requires many students entering higher education to undertake some "unlearning" (Bradbury and Miller, 2011) or even undoing of "cognitive damage" (Amin et al., 2017). To contribute in this way, we need to understand more deeply who our students are; awareness of their emotional responses is a starting point.

The feelings students expressed around their learning in economics – whether with regard to the pedagogical approach, their being part of the tutorial group, the disciplinary content, or how they felt about themselves as learners – suggest that the discipline as they experience it is intensely personal. This substantiates a premise of the TCF: that disciplinary learning cannot be separated from the individual, or her social and personal context. Despite the uniformity of syllabus and approach in undergraduate modules the world over, we are not teaching neutral content to neutral vessels.

Emotions exert an important influence on learning behaviours and outcomes. Feelings about self and discipline are instrumental in determining whether students will embrace performance or mastery

³ Typically, such topics are addressed only at level 3 or beyond. An exception here is the curriculum embodied in CORE (2016) - see www.core-econ.org - an alternative approach to teaching introductory economics which is gaining traction through pilot programmes at several universities in a range of countries.

learning goals, and accordingly take surface or deep approaches to study (Dweck and Master, 2008). Their goals and motivation affect how they respond to liminality – the extent to which they will persist and engage with difficult disciplinary content, or whether they are likely to ‘fight’ or ‘flee’ when faced with learning challenges. Goals and motivation can be usefully mapped on to the TCF, serving to structure and fuel students’ traverse through troublesome learning thresholds. Recognizing the potential impact of students’ feelings on learning, we should also be aware that progress often requires that students manage their emotions. We might explore how our teaching approaches and learning environments could support the development of greater self-efficacy, resilience, and other components of psychological capital (Rattray, 2016) with which our students face liminal learning challenges.

6. Conclusion

Emotions arise at the intersection of discipline, context and biography, and pervade every aspect of learning, influencing students’ goals and motivation, learning behaviour and outcomes. Our findings based on students’ descriptions of their learning in economics align with and add detail to the view of learning inherent in the TCF, as a transformative, liminal process, comprising intertwined cognitive and affective elements. Content, pedagogy and assessment are not emotionally neutral for students, and awareness of the spectrum of emotions they may evoke leads us as economics educators to consider how we might account for, support and harness these responses, in curricular as well as pedagogical choices, to enhance teaching and learning. We are called on to understand more deeply who our students are; to consider what they may not know in the broadest sense, and to make it more explicit; to engage them with content that is personally relevant and meaningful; to offer supportive learning environments and relationships that can foster a sense of belonging and personal growth; and to empower them through teaching approaches that allow them to see themselves as capable learners in the discipline rather than inadvertently doing the opposite.

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