

'Re-zoning' proximal development¹ in a parallel e-learning course

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The action inquiry reported in this article focused on the way in which students engaged in, and what their views were on, a course that included two concurrent modes of delivery — a face-to-face version and its exact twin in online format, the former being complemented by the latter. This twinning course was introduced to expand learning opportunities in what we perceived to have become a compressed face-to-face curriculum with less scheduled teaching time than previously. Additionally, we wanted to engage students by exposing them to a constructivist educational landscape in the twin courses by challenging them to construct a multi-media metaphor as main learning artefact, integrating their ways of learning in this artefact. We believed that the two courses would reinforce each other in an educational symbiosis, and that the online version would compensate for less face-to-face learning and teaching time, due to logistical changes at the institution. In the first set of findings, in a research project that will continue for three years, the researchers found that it was initially very disturbing for the students to work in parallel mode within the same curriculum, but that they gradually became *au fait* with the processes and that the majority saw it as an opportunity to become more proficient learners. There were, however, a substantial number of students for whom the disturbance of their cognitive comfort zone of mostly reproductive 'learning' was an extremely negative experience. They appeared to be trapped in their educational comfort zones and had narrowed their zones of proximal development, probably because of fixed patterns of educational behaviour, which could include an epistemology that was not receptive to self-directed learning.

The genesis of the inquiry and of the course¹

This article presents both the background to a study and a report of the subsequent inquiry into students' learning in an online (e-learning) course that was designed as complement to a traditional classroom-based one. The inquiry originated in our concern about an issue, with which, we believe, many teachers in higher education are constantly grappling — how to get students to work independently, while nurturing their development as inquirers, and at the same time, stretching their ability to engage with higher levels of cognition and increased volumes of work.² We propose that many students in Education as a discipline are not afforded optimally challenging learning opportunities, possibly due to established habits of both staff and students and the inability to change epistemologies of reproduction and teacher centred lectures. We refer to this phenomenon, which is central to our argument, as students' 'zone of comfort'. We have selected this descriptor for what may also be termed their "petrified culture of learning" (Henning, 1992), meaning the fixed way in which they engage with and gain competence in the core activities of (higher) education. The reason we refer to this ingrained 'way of doing' higher learning as 'living in a zone of comfort' is because we have witnessed discomfort when the habits and conventions of this zone are disturbed (Daniels & Henning, 1998) and when it is viewed as a space for change where there is increased need for self-reliance and for discernment and inquiry. There is also a vast body of literature about changing pedagogies and the conflict between established ways and epistemologies and the constructivist environments that perturb those ways (Coye, 1997). Brown's (2001) description of the "the new student", who manages learning via many networks of information, knowledge and methodologies, encapsulates what we see as a way of perturbing petrified epistemologies and exposing students to wider ecologies of learning (Nardi, 2000; Weigel, 2002).

We argue that students may not identify with this 'new student', because of barriers to learning that obstruct the road to larger ecologies (Nardi, 2000), such as those created by learning via hypermedia and which have become known as e-learning. We begin by suggesting that these types of obstructions are caused by fossilised habits that constitute comfort and also control, with students responding to the lecturer who is 'in control' — planning the curriculum, assigning

learning and assessment tasks, and reminding students regularly of what they need to do and how to do it — implying therefore that students and lecturer share epistemological positions. Students, we propose, often appreciate this ostensibly well organised and managed enterprise of learning, because they mostly prefer having to respond to demands and requests, and to take little responsibility, except to execute the orders, usually with assessment and grading in mind. We have labelled this educational space the 'zone of comfort', juxtaposing it with the Vygotskian (Vygotsky, 1992) notion of the zone of proximal development. We have argued elsewhere that this comfort zone is probably a residue of the impact that behaviourist psychology had on education (Henning, 1998) and that it may have penetrated the South African higher educational psyche especially deeply in institutions where the Education curriculum focused on Fundamental Pedagogics as its main theoretical base. In this landscape the cognitive revolution (Gardner, 1987) in the pedagogy of higher education has not been as successfully completed as some of us may want to believe.

In our own practice, which is the setting for this narrative report, we have lived through countless numbers of academic induction processes with new groups of students, many of who hailed from institutions where Educational theory was narrowed down to the mentioned base. In most instances we have failed to inhibit reproductive learning. For example, when we expect of postgraduate students in Education to grapple with the very concept learning and with the concept knowledge, we still encounter definitions that hark back to a secure time when these could be memorised from prescribed texts as an insurance policy to a good 'pass' — giving rise to a process of both epistemological and methodological reproduction and eventual petrification.. Thus, when we introduce observation, problem identification and solution as some ways of doing knowledge production or generation, as opposed to drawing on memory for a collection of, often unrelated, stored facts and definitions we regularly witness conflict and discomfort. This is a rather bleak scenario in which students seem to engage in what we regard as immature learning habits (Pena-Shaff, Martin & Gay, 2001) in a fixed 'comfort zone'.

We have tried numerous ways in which to challenge students to become *bona fide* learners instead of knowledge managers and clerks, storing and retrieving mostly memorised and non-problematised information. Through many years of experimenting with different ways of instilling deep learning habits (see Weigel's summary of the tenets of "deep learning", 2002, Chapter 1) and after continuous epistemological conflict we experience with many students who hold firmly on to the belief that a 'neatly structured (organised)' course content is the road to learning, we realised that the only way such deeply held beliefs

1 The reference here is to the Vygotskian notion of the "Zone of proximal development, or ZOPED".

2 The opportunity for the research came about when we introduced a dual mode course, which will be described later.

could be challenged is by a radical change. We were looking for the opportunity to challenge the students with a course in which they would have to structure their learning — their knowledge making — themselves. There would thus be a firm distinction between course organisation, the planning, management and execution of the course, and knowledge structure, the way students organise the knowledge in their own minds. Students who wish to reproduce both content and format of the knowledge introduced in a course often use these two concepts interchangeably.

With the country's need in terms of successful higher learning in mind, and heeding the call for more and better equipped we contemplated different routes.

More students, more graduates, less interaction and a compressed curriculum?

We were thinking that the expectation for increased graduates at South African universities could never be realised unless the university programmes and courses, at classroom level, were not educating competent, but also critically aware citizens who continually adapt their learning habits. For us this also meant that we would have to challenge what we believed to be petrified epistemologies and concomitant learning styles. We argued that policy and legislation to change higher education and education generally will mean little if the micro activities of students and their university teachers do not organically meet the challenges. They need to do this as technologies (and thus distributed cognitions — Nardi, 2000; Brown, 2000; Brown, 2001) change along with the needs of a global society and its New Economy. Some of the issues we contemplated were related to something as basic as the scheduling of learning experiences — of using teaching time in different ways. As student numbers are expected to increase, along with the need for more advanced and sophisticated academic development opportunities, teaching time seems to be diminishing in the context where we work and whence we tell our story. Institutions, such as ours, where a single language of learning and teaching has been complemented with an additional language medium and where there are part-time as well as full-time students in most programmes, struggle to keep its promise of a quality education for its students. In practice two languages of learning and teaching and also two groups of students (part-time as well as full-time) have meant that the schedule or timetable at some institutions has had to accommodate four parallel deliveries of programmes. The impact of this emergency plan in the case of the institution where we are employed has been serious in terms of quality and staff input. We have found that not only has the scheduled time for meeting with students in lecture, tutorial or lab mode been cut drastically, but the frequency has also been reduced from three or four periods per week to one or two a week in some instances. The effect has also been that curricula have either 'shrunk' in both content and methodology, or that they have been compressed drastically, expecting of students to work independently and to enter the academic community without sufficient induction and socialisation into the ways of the academy (Lea & Street, 1999; Henning, Mamiane & PHEME, 2001). Academic members of staff have had to engage in at least four repetitions of a topic with four different groups of students, without additional teaching assistants being appointed in most cases. While contemplating this rather daunting scenario, we became involved in a venture, which we believed, may make a contribution to students' ability to relearn how to learn and to enter the community of the university in the apprenticeship model (Brown, Duguid & Collins, 1989; Brown, 2000). We were thinking that by entering the virtual classroom, adjacent to the face-to-face classroom, students would have a dual opportunity to engage with their course, thereby becoming e-learners.

An opportunity for epistemological re-zoning in an e-learning twinning programme

When we were at a point of serious concern for our programmes in Education generally, we were assigned an opportunity in which we

could address our concern. We could create a brand new curriculum for a semester course in "Learning and Cognition" for 2001. We had a free hand to explore ways of engaging Education students in learning about learning, while they themselves were challenged to learn in multiple ways. We were looking forward to this opportunity where we could plan a course that would embody many of the epistemological and methodological notions we hold dear and for which learning via electronic mode would be a suitable additional medium. One of these notions is the forming "energising (cognitive) networks" (Godsell, 1999) for peer learning and monitoring and thereby creating a powerful learning environment where students will experientially come to face issues of "adaptation and viability" (Henning, 1997) in a true constructivist sense. These central and evergreen concepts in the theory of learning of Jean Piaget would be both a pedagogical and epistemological concern for us in the design of procedural knowledge construction in the course.³ We would furthermore have the opportunity to let students explore intense peer mediation and support (Salomon & Perkins, 1989; Salomon, 1993; Salomon, 1999; Rogoff, 1990; Brown, 2000) in the way that we had interpreted Vygotskian theory. They would thereby also learn experientially about his notion of the zone of proximal development (Vygotsky, 1992; Kozulin, 1990) as they are challenged by the course and its human and technological mediators to optimise their use of scaffolding and mediation tools. We also believed that this could be an opportunity to capture a number of problematic issues of pedagogy under the same umbrella: the course theme itself would allow us to let the pedagogy demonstrate and embody the curriculum content. The students would experience independence, responsibility for their own learning (and materials) ample discussion and teasing out of contentious or difficult issues; they would use hypertext responsibly and creatively and they would not be able to be recipients of knowledge or its artefacts. What they wanted to gain they would have to build and navigate and thereby learn to direct their own learning. At the same time they could share their learning path, with its obstacles, with their peers in both online and face-to-face communication. These were the assumptions on which we based the curriculum and the concurrent action research.

For the purpose of embodying the course content in the methodology we assigned as main learning artefact the construction of a multimedia metaphor for the concept (or the students' conceptions of) learning, based on their studying of at least 20 academic texts, 14 of which were hypertexts, and some field research. Composing, or constructing a complex metaphor would not be possible if the students worked, in what has become for many of them, a default mode, namely, representation, reproduction and memorisation of information, without much generativity, problem-solving and critical awareness. The students would thus not be expected to 'remember' anything for the sole purposes of retrieval, recall and representation in a written paper, assignment, exam or test. They needed mostly to be involved in creating a complex metaphor for their understanding of learning, based on what they had learned from the texts and from their observations and interactions, both at the interface with hypertext, their online discussions and face-to-face contact with peers and lecturers.⁴

The community of learners that we hoped would emerge from this course would appropriate the multi-textured virtual classroom and see it as a valuable complement to the fragmented on-campus community. This type of twinning programme is not unusual. The Massachusetts Institute of Technology is in the process of placing full versions of 2 000 of its face-to-face courses on the web (Newman & Scurrie, 2001). Brown (2001) also affirms that this is undoubtedly the way forward in higher education. Newman & Scurrie (2001) also report

3 Procedural knowledge (skills), declarative and conceptual knowledge, along with conditional knowledge are four main types of knowledge that are generally distinguished in educational theory.

4 In another article, we will discuss the research on the development and the presentation of the students' metaphors (Henning & Van Rensburg, in progress).

that 1 100 of the approximately 3 000 colleges and universities in the U.S.A. are engaged in online education of some sort and Weigel (2002) makes innovative and feasible suggestions about hybrids of online learning and face-to-face courses. The advantage these authors see in such hybrids is that students can now be connected to their course (and its people) whenever they wish to and from wherever they are able to — and likewise for the teachers.

At our institution we felt that they needed this extra connection more than they needed the navigation skills themselves. We reasoned that one cannot form a community of learners if you meet once per week and do not share anything in between. The connection would therefore have to be made virtually as well and the community of learners (Brown, 1994; Pena-Shaff, Martin & Gay, 2001), we proposed, would be established electronically, with some offshoots in the real classroom, creating a dynamic ecology of learning (Nardi, 2000). We also argued that to eventually become competent members of a community of practice (Lave & Wenger, 1991; Wenger, 1998; Wenger, McDermott & Snyder, 2002) the students would need to practise the discourse needed for such engagement.

The course management

Students received a paper copy of their detailed study guide upon registering for the course, which simultaneously entered them onto the commercial, software facilitated online course. Their learning activities included:

- Once weekly face-to-face teacher facilitated discussions for 110 minutes for full-time students and 55 minutes for part-time students;
- Twice weekly (for 11 weeks) online discussions with peers and feedback from teachers (and the tutors/teaching assistants in the team);
- A field observation report of a learner in action;
- A self-designed and administered test in which they assessed their understanding of the main themes of the course;
- Tutoring assistance from two course tutors that added up to 30 hours per week in some weeks;
- A summary journal in which the integration of themes across the course were indicated; and
- A complex multimedia metaphor, in innovative multimedia format, presented orally and explained to an audience of teachers and peers, and accompanied by an essay in which the metaphor is explained and theory is invoked at the end of the semester course.

The course design logic was that students would engage optimally with the texts and also in discussion, and would thereby create a new learning ecology and a community — affording them another opportunity to develop an academic identity by having to articulate their understanding and their problems in written mode (Ivanic, 1999). Rote learning was not only discouraged, but any direct copying of course text was severely penalised. The online discussions, for example, were assessed according to a set of matrixed grading criteria, which distinguished levels of engagement and depth of discussion, and which were presented explicitly at the outset. Students were encouraged to apply these rigorously (see suggestions of Pena-Shaff, Martin & Gray, 2001: 50; 56, for a custom-designed coding schema of online educational communication).

Conceptual framework — ecologies of learning

The grounding of the research was in the specific concepts of contemporary theory of learning that pertain to constructivist epistemologies and related notions that had the goodness of fit with the ecology we were trying to establish. We agree with Phillips's (2000:1) view that, " 'Constructivism' is a currently fashionable magic word in the Western intellectual firmament, one that has beguiled a great many educational researchers, curriculum developers, trainers of teachers and teachers themselves ...". Aletta Zietsman (1996), herself educated at the feet of the great proponent of radical constructivism, Ernst Von

Glaserfeld (Von Glaserfeld, 1999; Phillips, 2000:17), wrote at the time that constructivism had become "a flavour of the month" notion that was regarded by many as "a cure for all educational ills". Taking cognisance of the abuse of the term for whatever reasons and also of the fact that there are many contested issues in the debate, as succinctly presented in the edited volume by Phillips (2000), we argue from the position that as an epistemology and as a heuristic, constructivism does provide a useful analytical tool for reflecting on human learning. It is also from this position that we would like to look at the manner in which the students appropriated the course that we are researching, and which, itself, espouses to have constructivist leanings. Consequently we looked at the data and tried to find evidence of students making knowledge, constructing meaning, and invoking their prior knowledge and cognitive templates (or realising the lack thereof) in the procedures they were to follow.

Linked to this foundation, and broadening our envisaged ecology, we also invoked the theory of distributed cognition; a theory of mediation and cognitive networking that drives much of the scholarship on tool utilisation in education (Salomon & Perkins, 1989; Brown, 2000; Nardi, 2000; DiSessa, 2000). DiSessa (2000:116) makes the point clearly: "Making progress in an episode of materially mediated thinking — reasoning or coming up with a new idea — happens jointly in the mind and in the medium at every stage". In making their own knowledge in this networked and parallel fashion, we asked ourselves, how students made use of navigational skills to access and also activate and elicit available knowledge? Here we struggled with the narrowness of the radical constructivist view, which seems to presuppose individuals living in a world of their own making only.

We, rather, opted for a social constructivist view, in which we see individuals gain knowledge in a culture (such as a culture of higher education), which is expressed in a language (and here we included a discourse, such as that of the higher education pedagogy of Education) that already exists and that came into being to capture and to develop and communicate that culture (Geertz, 1973; McCarthy & Swandt, 2000; Phillips, 2000). Thus, we argue, the way in which students will engage with socially distributed cognition facilities will also resonate with their culture of learning and the way they use language in learning as cultural tool. For example, if they regard educational language and its discourses as a fixed set of terms and sentences that communicate or convey knowledge in predetermined patterns (viewing the tool as fixed and meaning as pre-determined), they will find it difficult to adapt to using language to generate personal understandings and to explore their own constructions — a methodology of constructivism that Howe and Berv (2000:23) explain by referring to the philosopher Wittgenstein:

Individuals are born or "thrown" into linguistic communities. The resources and practices available, which they have no choice about whether or not to learn, are saturated with cultural, historical and social dimensions Wittgenstein coined the term "language game" as a way of pointing to the rule-governed nature of linguistic practices and to the manner in which people catch on to these rules by actively engaging in such practices. Analogous to Kant's categories, language games are presupposed by the experiences individuals have, not the results of them"

Elsewhere we have discussed the "unravelling of grand narratives" of pedagogy (Daniels & Henning, 1998) and the fossilised use of language as mental, cultural tool (and concomitant educational discourse and culture), which had become a cognitive prison for the students who reverted to memorised clichés in communication about the content they were studying. Many students got "thrown" into a pedagogy in which the power of the textbook and the lecturer was so pervasive that the rules of the language game implied subservient non-critical reproduction and as near to perfect replication as possible, without developing a critical awareness.

Linked to the theory of distributed mental actions, we also invoke the view of The New Literacies and the Multiliteracies movement (Cope & Kalantzis, 2000), in which critical language awareness may

over time penetrate the fixed rules of a language game, played, in many cases, over a student's entire education career. Proponents of this movement say that, for example, academic skills and competence pertain to far more than observable skills and products of learning. "Academic literacies" (Lea & Street, 1999; Street, 2000) indicate an interwoven collage of skills, socialisation and the development of a critical academic identity (Ivanic, 1999), which presupposes reflexivity (Henning, Mamiane & PHEME, 2001). From this view constructivism as epistemology means that students are not only able to construct knowledge in a disciplinary domain, but that they also co-construct their academic identity and their enculturation into the ways of doing of the academy, including being critically aware of the academy itself. In researching student participation, we would see as a prerequisite to engaging in the course a willingness to cultivate an academic disposition and an own persona of inquiry.

We furthermore argued that the ability to form communities of learners (online and on-campus), in the way that Ann Brown (1994) first conceptualised it in her work with schools, and the acceptance of an academic apprenticeship role (Brown, Duguid & Collins, 1989; Rogoff, 1996; Brown, 2000) would contribute to the development of academic literacies, an academic identity and to the construction of knowledge.

The inquiry

The research design logic needed to capture some of the characteristics of student learning as reflected in the theories that we invoked in our inquiry as well as their experiences in and of the course. We faced a stumbling block that is not unusual in action inquiry (Greenwood & Levin, 1998), and that is that the planning of the intervention needs to also incorporate the research into the intervention, even though the exact plan of the research can only be determined by the way the intervention is developing. At the time that the course was launched, we opted for the conventional qualitative modes of data gathering and analysis and also for establishing trustworthiness of evidence (Flick, 1998; Silverman 2000; Merriam, 1999; Denzin & Lincoln, 2001; Morse, 2001), and slowly adapted these as the course and the inquiry progressed.

For the purposes of this article we focus on those methods in the inquiry (which is on-going and will be for at least three years until the course is refined and running smoothly) that have harnessed the data pertinent to the question we asked, namely, how the students verbalised their reaction to the methodology and the content of the course and what the nature of their engagement was. This means that we would elicit students' feelings about their participation in the course, their views on the course and analyse the way in which they participated. We wanted to see whether what they say about, and what they do in, the course were in some way related. We also planned to include our own experience as course presenter participants, not only to overtly express our bias, but also to present a more complete picture.

The methods of data gathering that we deemed most suitable to capture data that would address this bifocal question were:

- focus-group interviews with 10 purposively selected students from a population of 123 (we selected them on a scale of 1–10 for their satisfaction with the course, which we ascertained by means of a brief survey questionnaire), whereby we intended to harness a variety of views of and experiences in the course;
- a personal written sketch in which the whole population ($n = 85$ responded) expressed their views on what were the best and the worst characteristics of the course, both in content and in process;
- the generic online course evaluation questionnaire of the University, in which we aimed to capture student views ($n = 79$ responded);
- an analysis of students' ($n = 123$) online discussions, that would reflect the nature of their engagement; and
- the two course presenters' observations and experiences in their

personal journals, which would include the view from our side as researchers-practitioners.

What we were looking for was, firstly, evidence of students' ability to change their learning (working) habits and their utilisation of the language tool from what is generally expected in the courses in Educational theory as we experienced it at the institution. Secondly, we were hoping to find evidence that their developing conceptions of learning showed some signs of the discourse of the course and its methodology, as well as an emerging critical awareness of learning (and teaching) and matters epistemological. Thus, we would approach the data with the explicit intention to capture students' understanding of constructivist epistemologies, views on their learning and how it may have changed since they entered the course, with perhaps also some indication, in the discourse, that they were in the process of nurturing language as tool of inquiry and the development of an academic identity, that they were developing communities of learners, and that they were apprenticed academically, learning to perform academic tasks in the way the course proposed them.

The way we engaged with or analysed the data varied within methods. The sketches and interview data were analysed for content, and constantly comparing units of meaning (Flick, 1998; Merriam, 1999; Silverman, 2000) to extract the most pertinent themes. In some of the ongoing analyses (not reported in this article) we also do discourse and conversation analysis and other sequential analyses like narrative analysis, and of course, artefact analysis of the multi-media metaphors that the students had composed (see footnote 4). We also tried to see the data from a critical perspective, aiming to go beyond "what appears self-evident, natural and unproblematic (and to search for) what can be interpreted as the freezing of social life" (Alvesson & Skoldberg, 2000:145). We opted for this interpretation route because as our research progressed we became increasingly conscious of the fact that a group of the students⁵ was viewing us as 'saboteurs' initially — "plotting to deprive them of an assured and easy pass" (student comment). We were wondering, more and more, about the subtexts, the camouflaged meaning and the "frozen" educational way of life that led students to accuse the lecturers of educational malpractice. In the words of one student:

I don't see why we have to do all this frilly stuff and why we can't go on learning the way we did before and will forever after. These lecturers think they have something fancy going but all they are doing is jeopardising our chances to get good marks. Many of us were assured a distinction and now I think I am down to an "F". I also don't like the way they run things. They get paid to make announcements in class and to give us reading sets and things and to mark our assignments. I hate this. It is not making me independent; it is making me very cross. I am angry and I don't like their style at all. Especially ... she really irritates me with the way she carries on about learning.

The findings

Data from the evaluation questionnaire

After analysis we summarised the findings of this part of the inquiry according to the sets of data per method of gathering, starting with the evaluation questionnaire, which consisted of 27 questions and one open question, the only one relevant for this article. These data were analysed by the Centre for Higher Education Studies at the university and the following are examples of what the students had said:

"was forced to do active learning and to apply knowledge";
 "interesting discussion, like to listen to others' ideas and critique";
 "the subject is confusing"; "the subject needs more structure";
 "It's chaotic and I'm lost"; "I'm going to complain, you never know what to do"; "There are no notices or class announcements" and "I am very angry, I heard this course is easy memorising stuff".

5 Through e-mail, online discussions and in personal contact with us, 44 students had shown this stance.

Eighty-five students reacted on the request to write one paragraph each on what they experienced as the best part of the course as well as on what they have experienced as the worst part of the course. From these paragraphs, the following ideas concerning the best part of the course are worth mentioning:

"a continuous challenge"; "flexibility and demand to understand, not just regurgitate"; "stimulating"; "it rules out rote learning"; "I could work on my own pace"; "facilitating your own learning is awesome"; "imaginative and innovative course"; "interesting new experience".

Equally important are the ideas concerning the worst part of the course, such as:

"extremely labour intensive"; "access to computers caused problems"; "extremely time consuming"; "the diversity of the topics in class discussions was too much to absorb all at once"; "highly perturbed and irritated"; "extremely demanding"; "working students were not taken into consideration"; "anxiety of something new"; "felt intimidated and confused"; "I found it difficult to adapt".

One of the students captured the overall feelings by writing:

The best part of Education 2A — The hurdle that was ultimately conquered! Defeating one's own perturbation receiving around a new medium of learning. I overcome my procrastination concerning the concept of online learning by becoming an actively involved learner and learnt how to participate and interact with online peers to establish a relationship of shared learning to reach my own interpretation of a learning experience. Freedom to explore and interpret academic theories and construct them in a way that made the theory practical in my life and within the actual Education 2A course. Computers can be problematic and at times, the links that were provided on the website could not be opened. These problems were, however, solved through online communication. I also found it difficult to communicate with certain people in my 'virtual group' who introduced concepts or meaning for the sake of posting a discussion.

Data from the focus group interview

In the focus-group interview with 10 students the main theme constructed from the data was the foreignness of both the computer as medium of personal knowledge management and navigation and the complex nature and the volume of the course. Students emphasised that they would have battled with the course, even if it was not online and if they had to read the texts in the library or get them in a reading pack. Another student commented that she found the "content easy", it was the "process of understanding it that was difficult". Like so many of the students, this person had not made the connection that understanding was the route to knowing. The main issue that they kept referring to was the fact that they had to "structure" (we would say organise or manage) their learning and they did not know how. When they eventually did learn to do it, the course had already advanced and they felt that they needed more time. They also focused on the notion of continuous engagement, which, for most of them, was a strange idea. In addition, they found it difficult to work on something as 'unusual' as a metaphor in multi-media and had been very scared at the outset. Furthermore, they found the lack of hard copy administrative documents difficult to deal with and took time to adjust to e-announcements and administration of the course. It would appear that time-management and organisation of learning were the main issues, after they had become used to the course. The unsatisfied students insisted that this type of learning environment only suited some people — "others like structure and order".

The online discussions as data

In their online discussions (there were more than 2 000 postings over four months) it was evident that only about 15% of the students had successfully read the texts and had made inter-textual connections. Many students did not realise that they had not integrated the texts, but

were summarising and reproducing the content, some by translating it into Afrikaans. This was also substantiated by the course journals that they later submitted. Many were clearly at a major disadvantage with regard to academic reading.

I find it too time consuming to read all these texts and there are too many new concepts. I know why, because I used to read and memorise without worrying too much about what it means, Now I have to know what I read. I can't even make proper summaries — it all takes too much time. Like this stuff on distributed cognition. I am not even going to try it, The Salomon and Perkins bit is not my scene. I don't know why they did not just give us a textbook and some notes and a proper test. Not this thing where you have to set the test yourself. I mean: who wants to test who here?

The level of the discussions was mostly superficial, with those students who had clearly grappled with the texts speaking mostly in monologues to themselves and complaining about the lack of interaction. Nine students discussed the themes extensively and showed inter-textual understanding. Those who did not clearly tried to convert the course into a linearly organised electronic textbook-cum-study guide and found that it did not work, because they could not memorise the content and were in any case assessed from a multimedia representation of their understanding, which ruled out rote learning.

Narratives of the course presenters

The lecturers' narratives, our last tool for data gathering and interpretation, echo throughout this article. We had to rely on our experience and our knowledge of higher education and student learning to continue to work, because we felt somewhat embattled at some point when some colleagues also 'reprimanded' us for what we were trying to do.

Discussion

In a synthesis of the findings, we generated a number of main themes, and then tried to trace a pattern of meaning from these. Our generation or construction of themes and of the pattern in this inquiry will include our fully subjective experiences and views as well — which we argue — are our interpretations, our acts of *verstehen* and in some instances also *erklären*. Alvesson & Skoldberg (2000:246) propose:

The process of construction thus demands something to construct (out there, so long as we are not talking about pure objects of fantasy), a constructing subject (the researcher) and a social context that constructs the researcher (society, language, paradigms, the local research community). To put it simply: reflexivity, in the research context, means paying attention to these aspects without letting any one of them dominate. In other words, it is a question of avoiding empiricism, narcissism and different varieties of social and linguistic reductionism.

As "constructing subjects" we approached the interface of the empirical information that we had gathered, and the preliminary meanings we had attached to them with some caution, not wanting to put ourselves in a data driven straitjacket, as is often the case with those grounded theory analysts who do not go beyond a first (of many more) level(s) of categorising and who leave a trail of conceptual poverty in their wake (Morse, 2001:203-221). We also did not want to study ourselves in a mirror (committing research narcissism as referred to above) or reduce the data to generalities and blanket statements. We wanted to seriously reflect, along with a group of student participants whom we invited to assist us, on the meaning of the data. From this interaction we constructed a number of main themes, which we eventually clustered into the following:

- The educational culture in which many of the students had been raised made a shift to a constructivist course a traumatic experience for some (the majority of undergraduate students in the course). For others, who had presumably been exposed to a constructivist landscape before, it was a challenge that they embraced (a minority of undergraduate students, with a majority of postgraduate and part-time students). These students fulfilled

the requirements for apprenticeship and for learning in distributed ecologies. The appropriated and in some cases embraced the networked learning and directing and managing their own learning in a powerful way.

- The electronic technology posed less of a problem than students' ability to organise and manage their learning and especially also their use of time.
- All the participating students said that they had never worked in a course where memorisation of content was not the main focus. This included students from other Faculties, such as Arts and Humanities and Economic and Business Sciences.
- Students had trouble reading text and relating it inter-textually.
- There was some evidence of emerging micro-communities in the discussion groups of the virtual classroom, some of which were extended to face-to-face groups.
- The students who engaged with the course and who appropriated the extended learning opportunities of the virtual classroom expressed self-confidence in and critical awareness of the course, which we interpret as building blocks of an academic identity.

The question that we posed after we had worked through the data was: "Why were a large number of students dependent on packaged knowledge presented for purposes of reproduction of information; why were they unaccustomed to continuous engagement and self-direction, and why were they not able to demonstrate competence in academic reading and critical reflection?" In trying to come to grips with these issues, which we had now defined as the main components of the pattern in the findings, we opted to formalise our interpretation and the drawing of conclusions from this part of the inquiry, starting with what Alvesson & Sköldböck (2000:250) refer to as the data constructing level interpretation, after which we continued with a search for underlying meanings, then a critical interpretation and lastly, a reflection on our own research artefact and the language we used, plus the representation of different voices in our text. We had kept notes of the initial 'raw' interpretations during the running of the course and the data gathering in informal diaries (an act of intuition more than of method). In these we had also recorded our own feelings and experiences.⁶

In the first phase of interpretation, coinciding with the creating data artefacts phase we fully expected to hear the different voices and the tone of voice of the students as we had come to distinguish them in the course. The majority of the students were not used to working independently and had great trouble managing, directing and navigating their 'learning lives' in this course with its strong logic of distributed cognition, self-directed learning and cognitive apprenticeship (with concomitant nurturing of an academic identity and of ownership and responsibility). To our minds many still lacked an academic identity and the autonomy that goes with it (Lea & Street, 1999; Ivanic, 1999). They were particularly perturbed about the fact that they had to read more than usual and that they had to participate in the online discussions. Many revealed underdeveloped academic reading (and writing) competence. Some voices sang praises for "learning to learn for the first time" in their lives. Others wailed that they "did not register at a residential institution for distance education" courses. The latter seemed to be the students who had participated in less than 25% (we ascertained this from the online participation and the campus class attendance) of the activities and were upset when they realised that continuous engagement is the only guarantee for completing the course successfully. They had to be fully engaged academic apprentices to learn to inquire, to critically assess and to manage their learning. We continually reminded them that reproduction of information does not constitute apprenticeship learning and their socialisation into the academy would remain incomplete without optimal participation.

At some point we felt we were standing with our backs against

the wall, because we were getting only isolated support from our colleagues and some positive feedback from the students who had engaged with the course from the very beginning. We revisited our design and our purpose with this course on many occasions, starting to doubt the design logic. It was at that point, about halfway through the course, when we heard both more harmonious and more contrapuntal voices — pieces of a bigger puzzle were starting to fall into place.

We had upset the curriculum equilibrium — we were re-zoning the learning space. In the words of one student, "I registered for this course to get a quick 'A' and learn some definitions and write a neat assignment with some references". Another one said, "I was not expecting to work so hard and to have no guarantee in terms of plain rote learning. I also did not expect to think so much and to search the Internet for my survival." We had, inadvertently, disturbed a comfortable way of working, but one, which we argue, that does not facilitate academic identity development and emancipation. We were beginning to think that the academic literacies that we were striving to get established ran counter to what we saw as the pragmatic, functionalist and utilitarian view of Education that appeared to have developed in the Faculty. There was clearly something different about the course, and it was not just the fact that it was also online. At the time there were a number of similar hybrid courses online as well. The comfort zones of most of the students (and dare we postulate of some their lecturers?) who had been (mutually?) enculturated into a system of functionalist and pragmatic ways of doing had been dislocated. This, we propose, would have happened in a constructivist campus-only course as well — the online character most probably just exacerbated it. Many of them had clearly not been socialised into the way of life of a university as academic institution. These students were seniors and many of them were not able to perform essential and basic academic tasks — reading and integration of knowledge across texts being a prime example. In order to learn more, with the help of these mediational devices, they had to change their epistemology, or verbalise an existing epistemology for reflective purposes at least. This discomfort was probably the greatest of all. The comfort zone had been redefined as a stretched zone of proximal development that required some reflection such as proposed by Iran-Nehad and Gregg (2001). It required the development of academic skills, customs and literacies, the most important of which was critical awareness of own learning. This awareness seemed to scare many students.

In the next level of analysis we tried to understand the larger narrative behind the lack of academic apprenticeship. We had to address the question of what knowledge and what education were being perpetuated in a system of education where a surprisingly large number of students (18 of them, all postgraduate) say that they have never really needed to read any text comprehensively, have never been to the library, and that writing of papers and assignments were mostly a matter of "cutting and pasting" from unprocessed sources. Fourteen students said that they selected this course as an easy "A" in what is regarded as a faculty with a "low standard". Students from other faculties were especially appalled with the direction the course had taken, because for them Education as a major was a sure guarantee for an easy distinction, which meant that they could spend time on their other major. One student even remarked in an interview that one Education course reminded her "of a church service where one hears the Truth of living from the pulpit" and then she retracted her statement and said, "No, it's like Sunday school. You learn the verses and you sing the song".

Those of our colleagues who complained about the course confirmed this by saying that the course was disturbing the equilibrium in Education, because it is "far too difficult for our students" and it is not "fair to our students to expect them to use computers so much". One person said the course was on the level of a master's course in Education (sic). It would seem as if most stakeholders in Education 2A are working on the assumption that "Education should be easy", probably because students are admitted into the programmes with lower school achievement than most other faculties. We were perturbed about this.

6 An entire article devoted to this is forthcoming in *Education as Change*, 6, using an auto ethnographic design type and including poetry and impressionistic vignettes.

We work on a resource principle of education and not a deficiency one, thus we subscribe to the notion of the zone of proximal development as a space that cannot simultaneously be a zone of comfort. Hence, we argue, that university lecturers in Education have a golden opportunity to stretch this zone to its furthest possible limits in their preparation of the country's educators and educationists.

The condition for this is, however, labour intensity. Students need mediation, feedback, attention and empathy. The single meeting per week and the compressed curriculum cannot deliver academic apprenticeships with competence in the required literacies, or future teachers and other professionals as reflective practitioners. The on-campus students are in our view, neglected in what is now only a shadow of the previously rich curriculum, the concomitant tutorials, the lab sessions and the workshops. Thus, when we introduced a really work intensive course, it seemed to upset not only the students. There is some lack of justice in such a system, and we believe it to not be unique to this single institution. The quick fix, compressed curriculum, with minimal assessment and meaningful feedback, plus the pragmatic need to redeem an epistemology of content in order to maintain such a system, cannot be aligned with the type of curriculum we introduced and which the teacher education policy in South Africa presumes. This curriculum, in which two lecturers have to spend at least 10 hours per week in online discussion and mediation, plus six hours in campus classes, and then many hours in assessing and feedback of student work, does not allow much time for the other courses, which we continue to teach at postgraduate level, for student supervision and research, not to mention administrative duties.

In the last component of the interpretation we had to reflect on our bias towards the stretching of the students' zone of proximal development and how it may have coloured the text. We realise that our view has been anything but multi-focal, and that we did not consider the context of the course sufficiently. There are many factors that come into play in the design of a manageable and viable curriculum at university and we focused rather narrowly on the students' views and their performance in one course only. For the purposes of the action inquiry our bias played a role. We believe in this type of learning environment and the students have indicated that they are mostly able to join the apprenticeship and the learning community, on condition that they learn to manage their learning time more efficiently and that they practise academic reading more skilfully. This article demonstrates our bias clearly, but we trust that readers can make meaning beyond the limitations of our views.

In summary, then, we came to the conclusion that in this first investigation into a new course we captured sufficient evidence to the effect that a shift to a constructivist curriculum, with many networks of distributed cognition, including electronic networks, creates enhanced learning opportunities for those students who embrace the academic apprenticeship format, but that it becomes a cause for great turmoil and a sense of failure for those students who are not willing (or able) to relinquish the comfort zones of a petrified pedagogy with a functionalist, pragmatic curriculum, compressed to fit into the tightened university schedule.

In the end 25% of the students were not able to complete the course successfully, mostly because they did not enter the apprenticeship. There were many success stories, some of which are true 'Cinderella' tales. We cannot relate them here, except to say that there were a number of students who had not touched a computer when they arrived in the course and who admitted to thinking that learning was information storing and recall, with some overtly stated skills added, and who had never been challenged to form personal views of learning. The mentioned students came for tutoring every Saturday and left the course, having created complex multi-media metaphors for learning in which radical and social constructivist epistemologies were captured and critiqued. We believe that these students are the ones for who custom designed learning opportunities for the stretching of the zone of proximal development is needed. They engage in what OJ Sessa (2000) refers to as "committed learning". We salute these stu-

dents for leaving their epistemological zones of comfort and for embracing an academic apprenticeship with its distributed cognition. And we propose to the University that the educational logistical advantages of this dual learning and course delivery mode be further explored and that it be introduced on a larger scale.

We conclude by supporting King & Kitchener's view on epistemological maturity of students (Pena-Shaff, Martin & Gray, 2001 :43): Students who are at a stage in which they believe knowledge is certain and held by authorities need a forum in which they can explore their own ideas and those of their peers in order to understand they are participants in the construction of knowledge. Once they have reached this stage they then need to recognize that ideas should be supported by experience and shaped through a 'process of reasonable inquiry' (p. 31). To support students in this transition educators must expose them to evaluate and develop sound arguments.

Academic discourse proficiency requires skills of inquiry, argumentation and critique, and an interactive online course may assist in nurturing these if it is designed and implemented in a constructivist epistemological landscape, in which students can construct knowledge (and with that an extended reality). There are many courses on the web that are no more than downloaded hard copies. We, of course, argue strongly against these.

Conclusion

This has been at best a tentative inquiry, giving us a small glimpse of how students engage with and react to a parallel on-campus, online course that requires them to construct and generate knowledge and not to reproduce information, and to do so by constant engagement. It resonates with findings in similar inquiries as reported by Haseman (1999) and also in a review by Hofer & Pintrich (1997). The findings will serve the action research project well, because they will impact the next cycle of the course, in which the problems that the students voiced and the ideas they expressed will be implemented judiciously. We will also address the way the course was received at other levels in the Faculty. We have heard only some of the voices and the tones of voices of participants, and at this stage our own voices echo loudly, but as time passes, we may present more voices — especially the disparate ones. We are concluding, however, that the students who did not enter the apprenticeship in the twin programme were daunted more by their petrified epistemology than by the electronic medium and the broadened ecology. That this is explainable as epistemological trauma, due to the nature of the difference between e-learning, with its networked landscape and conventional modes of more linearly mapped and defined knowledge packages remains a question at this stage. Lemke (1995) proposes that the type of reality e-learners create via their knowledge construction processes is sufficiently different to cause some epistemological pain.

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