On the learning behaviours of English additional-language speakers entering Engineering Education in South Africa

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Abstract
This article reports the findings of an inductive study on the learning behaviours and language difficulties of a small group of English additional-language students entering a school of chemical and metallurgical engineering in South Africa. Students were interviewed in their home language. While they appeared to have had a reasonable grounding in the basics of effective studying and learning, a range of problematic features were also evident. These included rote learning, a dualistic conception of knowledge, and a problematic degree of dependence on teachers, texts and studying past examination papers. The interlinked nature of these features and the way they seem to derive from educational background suggest that the design of interventions should give particular attention to the 'learning practices' of students and be based on developing these practices as a whole rather than the more traditional approach of providing 'skills courses'.

INTRODUCTION AND BACKGROUND
School leavers entering higher education inevitably bring with them patterns of study that have been shaped by their school experience. As Dembo and Seli (2004) point out, ‘without realizing it, many students have probably automated their study habits through their repeated use during the 12 years of schooling prior to college’. Cognitive psychologists emphasize that learning which results from extended experience such as this leads to a relatively permanent change in behaviour or in behavioural potentiality (for example Hergenhahn 1982 and later editions). We will use the term ‘learning behaviours’ to refer to the patterns of studying and learning that have been developed in a learner through his/her prior educational experience.

In view of the adverse effects of the legacy of apartheid education in South Africa, and of the ongoing problematic nature of pre-tertiary education in the country (Muwanga-Zake 2005; Phurutse 2005; Scott, Yeld and Hendry 2007; Simpkins 2005; Yeld 2003), it would be surprising if the learning behaviours of
many South African school leavers did not include features that are problematic in a university context. The content of South African academic support programmes (for example see Pinto 2001) and anecdotal information (Grayson 1996; Meyer, Dunne and Sass 1992; Meyer, Parsons and Dunne 1990) suggest the occurrence of a range of problematic features. For example, Meyer, Sass and Dunne (1992, 314) provide a list of undesirable features such as rote learning and ‘an uncritical reliance on the words of the teacher or textbook’. The work of Meyer and colleagues demonstrated a negative impact of such features on the academic performance of students at university (Meyer 1991; Meyer, Cliff and Dunne 1994; Meyer, Parsons and Dunne 1990; Meyer and Sass 1993).

While these references suggest that a general consensus exists about the nature of these problematic features, the research-based evidence undergirding that consensus leaves much to be desired. For example, the extensive work by Meyer and associates just cited is dated (it was conducted towards the end of the apartheid era) and was based on deductive research using a priori categories of description of learning practices. Relevant inductive research in South Africa has focused narrowly on ‘approaches to learning’ (Case and Gunstone 2002; Rollnick et al. 2007; Case and Marshall 2004) or on ‘conceptions of learning’ (Marshall, Summers and Woolnough 1999). Zaaiman (1998) has reported on the learning behaviours of entrants to the University of the North but only from the perspective of university lecturers. It appears that a gap in the literature exists with regard to inductive research on the learning behaviours of South African university entrants whose pre-tertiary education was received entirely in the post-apartheid era. This gap motivated the study reported in this article.

The specific context of the study was an ongoing educational development project in the School of Chemical and Metallurgical Engineering at the University of the Witwatersrand. The study addressed the following questions:

1. What are the typical learning behaviours which a sample of English additional-language, first-year engineering students bring with them into the university environment?

2. How can these learning behaviours be classified in order to facilitate an understanding of the academic needs of these students and those with similar backgrounds.

**THE STUDY**

**Research design**

A case study format was used to establish a detailed picture of the experience and learning behaviours of a number of individual students by gathering data on their circumstances, experiences, perceptions and behaviour.

Data was collected from seven sources – personal background, psychometric results, an essay to gauge English proficiency, a questionnaire about learning behaviours, and academic performance data. Classroom observations were conducted.
during lectures and tutorials and during class activities that involved group work. 

Students participating in the study were interviewed twice – in July and September. 

These were guided, semi-structured interviews (Cohen, Manion and Morrison 2007) based on a schedule of questions derived from the research aims and the questionnaire on learning behaviours. Interviews were conducted in each student's home language so as to minimize the impact of language constraints. The interviews were recorded, transcribed and translated into English.

The sample

The sample was self-selected. A general invitation to participate in the study was made in 2006 to all first year, chemical and metallurgical engineering students at Wits who considered themselves to be struggling academically and whose home language was one of the Nguni group. Twelve students volunteered for the study but one withdrew early in the study. Details are given in Table 1. With regard to ethnicity and educational background, the eleven students in the study were representative of about 40 per cent of the entering cohort.

<table>
<thead>
<tr>
<th>Student</th>
<th>Gender</th>
<th>Home language</th>
<th>Type of high school attended</th>
<th>Oral medium of instruction</th>
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<tr>
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<td>English</td>
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<td>Township</td>
<td>IsiZulu</td>
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<tr>
<td>3</td>
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<td>Township</td>
<td>IsiZulu – English*</td>
</tr>
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<td>Southern Sotho</td>
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<td>English</td>
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<td>Township</td>
<td>IsiZulu – English*</td>
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<td>IsiZulu</td>
<td>Township</td>
<td>IsiZulu</td>
</tr>
</tbody>
</table>

* Instruction involved code switching between the two languages

Analysis of the data

The data gathered in the study was subjected to two analyses. The first was a thematic analysis that focused on the learning behaviours of the students and language issues and is reported in this article. The second looked more broadly at the first year experience of the students and will be reported in a subsequent article.

The thematic content analysis used the methodology of Terre Blanche and Durrheim (1999) as a means of investigating the students' learning behaviours in as
objective a manner as possible. The first step was familiarization with the transcripts and related information to decide how best to condense and interpret the data. A content analysis followed to identify significant features of the data and to provide a tentative basis for categorizing emerging themes. The data was then examined in more detail through a process of coding all words, phrases, or ideas that were associated with the learning behaviours of the students. The coded data was then examined to identify, classify, label and describe the themes evident in the data.

RESULTS OF THE THEMATIC ANALYSIS

The thematic categories fell into two broad groupings – learning behaviours derived from the schooling context and new behaviours that emerged at university. In the following descriptions we include the number and percentage of students who manifested each theme. While these statistics are only applicable to the students in the sample, the degree of consistency that is demonstrated suggests the findings are likely to be applicable to other students with similar backgrounds.

Learning behaviours derived from the schooling context

The first three themes involve aspects that are basic to effective studying and learning and require little elaboration. All students manifested these features as was evident from their descriptions of their experience, awareness and work ethic.

1. **Awareness of the importance of punctuality and attendance**: The student is aware of the need to attend class on time and to follow the timetable to ensure his/her presence in all lectures. The student is aware that homework needs to be completed by the due date and that it is necessary to plan ahead of time to prepare for tests.

2. **Active learning experience**: At school, the student was involved in his/her own learning experience; s/he had participated in class activities, had engaged with the teacher during lessons, and had initiated independent learning/studying strategies for self learning that exceeded what was covered in school.

3. **Cooperative learning experience**: The student has had experience of group work and has worked with groups or with a study partner to prepare for examinations, to conduct small research projects or to complete task based activities.

4. **Laboratory experience**: The student has clearly had experience working in a laboratory setting and has knowledge about how to conduct scientific experiments in a laboratory. The student shows an understanding of the use and care of laboratory equipment.

Eight of the students (82% of the sample) indicted that their school had had a science laboratory. Their laboratory experience appeared to be reasonable though one of the students remarked that they ‘had laboratories though the experiments were few and we worked in groups’.
5. **Examination awareness:** The student is aware of the importance of examinations in assessing his/her ability and makes use of past examination papers in preparing for examinations. From this activity the student is able to highlight probable and possible examination questions and studies according to what s/he considers will be required of him/her.

This was a very strong feature of the learning behaviours and awareness of all 11 students – particularly the practice of working through past examination papers. Some students reported that their schools’ strong emphasis on examinations and past papers was overly motivated by the pressure to attain high pass rates.

- My school did not prepare me for university; it was just interested in the pass rate. (Student 10).
- My school was very interested in the pass rate and so they spent a lot of time on the students work without really thinking about the type of learning students would need when they attended university. (Student 9).

6. **Teacher dependence:** Students enter the university expecting a similar relationship with the lecturer to what was experienced with their teachers at school. They expect their work to be guided and facilitated by a more ‘knowledgeable person’ who they can consult and question when they feel out of their depth or when they require additional explanation regarding the learning of concepts.

Ten students (91% of the sample) manifested this kind of teacher dependence. For example Student 7 attributed his success to what teachers had done: ‘At school I did well because the teachers did everything they could to make us understand’. The following quotation illustrates the kind of expectations some students had about what teachers, lecturers, or others do or should do for them.

- If they [lecturers] can give us more practice and make sure that they check each student’s attempt [at solving a problem] and assist us in whatever way. ... In other [university] courses, they teach us and force us to attend tutorials and mark registers and we pass those courses. (Student 9).

The extent of this teacher dependence is further demonstrated by the degree to which the teachers were involved in regulating the students’ learning at school: ‘At school my teachers ... made sure that we do our work properly. They assisted us in whatever way’ (Student 9). One student complained that teachers over-regulated student’s learning.

- The [university] lecturer’s responsibility seems to be to deliver the (subject) matter and then I had to work out what is going on by myself and enhance my own understanding of what has been taught. This is a big difference between school and university and I think it is not a good difference. We should have been forced to work on our own at school. (Student 8).
On the learning behaviours of English additional-language speakers entering Engineering

This contrasts with the experience of the one student who did not manifest teacher dependence as described here. Student 1 put it this way.

My school did prepare me for university. My school was so strict in a non-spoon feeding way. It is like they make sure you realize your potential at the same time they will not hold your hand – you have to do things on your own, so in that way it teaches you to think.

The following quotations demonstrate the level of relationship some students had had with teachers at school, the associated personal support which the students had received from them, and the expectation students had for a similar kind of relationship at university.

Lecturers do not pay that much attention to students like at school. (Student 6).

The lecturers too must not distance themselves from students. At school we were very close to the teachers – they were like our friends. (Student 10).

I liked the teachers at school because they were involved in our lives, not only academically, but also in our well-being. (Student 5).

7. **Text dependence:** The student appears to have good reading and comprehension skills and is used to working with multiple textual sources to obtain information pertinent to his/her success within the school environment. The student relies on the provision of notes from the teacher and supplements these notes by reading textbooks, study guides or other references related to the topic of study.

These features were common to all 11 students. The positive aspect of text dependence – consulting a variety of textual materials to expand one’s understanding of a topic – was evident in comments by students about their practice of using the library.

A strong feature of the students’ school experience was being given considerable textual support – handouts, information taken from the board, study guides, and past examination papers. The dominance of textbooks in the students’ experience is illustrated by the way students often used ‘chapter’ as a descriptor for an amount of work learned or to be learned.

At school we studied a chapter may be two or three weeks. Here at university you finish a chapter in one day. (Student 11).

For several students, textbooks were the primary source of instruction when the school had no maths or science teachers (Students 6 and 10) or no laboratories (Students 7 and 10). The following quotation – from a student who became frustrated with his teachers – emphasizes the extensive reliance on textbooks.
You know what, I stopped going to school in June [mid way through his final year]. For me going to school was a waste of time. The teachers at school were teaching the texts exactly as they are. So I decided to stay at home and read the textbooks and I passed very well. (Student 7).

For some students, the degree of reliance on texts appeared to be somewhat excessive. The following quotations illustrate this in several ways. The first quote complains that some lecture handouts were not ‘proper notes’. The second suggests that without handouts the student’s ability to understand and develop is significantly impaired. The third quote demonstrates both text and teacher dependence: the student is wanting the kind of notes and past examination papers that had assisted him at school and, in addition, looks to others – ‘they’ – to provide the means for enhancing his academic performance.

In [the engineering course] we do get notes but it is only a page. To tell the truth we are not given notes: I do not consider a page as notes and even the content on a page are not notes they are just extracts from the text ... I think if we can get proper notes it can enhance our performances. (Student 3).

For some of our subjects we have notes and information that you can download to pick up on the pieces you missed, but not in other courses. ... Without [such] notes it is difficult to change our logic or our methods, likewise our understanding. (Student 7).

My school did not prepare me for University. At school they gave us notes and we also used textbooks. I think even here if they can give us notes it can help us a lot. ... At school we also used past exam papers, and I think even here if they can give us past exam papers it can enhance our academic performance. (Student 4).

Several students went as far as stressing the importance not only of receiving past examination papers to study but also being provided ‘with solutions to guide us’ (Student 9). Student 8 expressed this opinion quite strongly:

When you study exam papers I do not think they will help if they do not have solutions. If the papers can come with solutions they can help a lot.

8. **Memorization and rote learning behaviour:** The student has ascertained that for a good pass mark at the level of schooling, memorization of key concepts and rote learning of facts are essential for success. For problem solving activities involving equations or calculations the student is dependent on learnt procedures that s/he has committed to memory and which can be applied when necessary.

It was evident that, for all 11 students, memorization and rote learning had played a part in their learning at school. Student 5 stated explicitly that ‘at school we were encouraged in memorization skills’. Other indications of rote
learning behaviour is evident in the following student comments with regard to learning problem solving procedures when studying for tests, and recognizing patterns in past examination papers.

It’s like we learned [at school] that every problem has a solution and now [at university] we discover that every problem could have many types of solutions and that all of them or none of them could be right. I don’t know how to study for tests like this. (Student 7).

In high school it is easy to turn to memorization because once you see a past paper you really have an idea of what the exam will look like because they don’t really make big changes to the exams from one year to the next. (Student 8).

A common feature of the student interviews was a conception of knowledge as being absolute and as something that is ‘received’ from authoritative sources such as written text and the words of the teacher or lecturer. This is illustrated in the following quotations from Students 8 and 7 where knowledge is clearly perceived as something that one ‘obtains’.

I am not getting the information that I need, the information that will make me understand the concept that is being learned. ... I must also ask help from other students, like there is one guy who is doing second year, but the problem is he also does not have the knowledge that I want.

I find that I am not getting the knowledge that I expected to get at University.

9. **Mother tongue reliance:** The student enters the University with the experience of having had key concepts explained in his/her mother tongue, either through the oral medium of instruction being an African language or having had teachers who have been able to use code switching techniques to provide mother tongue explanations. The student is therefore not used to English being the oral medium of instruction and finds it difficult at university to make or attach meaning to the concepts taught in English.

Throughout the interviews language emerged as a significant factor impacting the students’ learning and success in their first year of university study. Eight of the 11 students (73% of the sample) had been taught at school either partially or exclusively in a language other than English (Table 1). It is clear that, for these students, the oral mode of instruction was not the official mode of instruction which is English of Afrikaans for post grade 3 schooling. The following quotations illustrate the difficulties these students experienced as a result of receiving instruction at university in English.

[At school] we were taught everything in Zulu except when it was time for English ... at University it is very different. The lecturers speak differently
especially that they are all white. I love the course chemical engineering but I’m struggling with the language. Sometimes we also have discussion groups but they are not really helpful because everything is in English and we move so fast through the topics. (Student 5).

I think that the problem is that we are learning in our second language. Our job is to understand what is being taught but when the lecturers say some words in English we have to translate them in our minds to understand. When we do this we miss what the lecturer says next and end up confused as to what the lecture was about. (Student 3).

**Learning behaviours that emerged during the first year at university**

10. **Passive engagement:** The student concentrates hard on what is being said during lectures but appears to be using all his/her energy to understand what is going on and as a result engages little in note taking practices. More generally, students are not confident in their note taking ability. The student adopts a passive stance to learning particularly in regard to asking questions. The student answers questions when asked directly but does not engage with the lecturer by asking questions for clarification.

Ten students (91% of the sample) exhibited this set of behaviours. Most students found it hard to listen and write notes at the same time: ‘I find it very difficult to take notes during lectures because you miss some points’ (Student 6). In addition, the difficulties created by lack of English proficiency are well illustrated in the quotation from Student 3 just given. These difficulties are further exemplified by the next quotation which also illustrates how shyness and a lack of confidence in English make some students reticent to ask questions and engage with the lecturer in large group settings.

Another thing that is a barrier is the English and the scientific terms. In our lectures it is not easy for me to ask questions, I am a shy person. In the big group, even if I do not understand, I do not ask the lecturer for help, but in the small group I do ask questions. (Student 2).

11. **Isolated learning:** The student does not actively participate in group discussions or group tasks in class but prefers to work alone. S/he is largely a passive observer in group activities and generally prefers to study alone.

These behaviours were exhibited by 9 students (82% of the sample) and have similar roots to those underlying passive engagement – shyness and difficulties with English.

In a group discussion I do not actively participate. Sometimes I am lazy even to raise a point. If what they are saying in a group is wrong I do not bother to
correct them – I just sit and listen. Sometimes I am scared that other people will laugh. (Student 11).

In addition to language and shyness, some students simply preferred to work alone while others found group discussions ‘destructive and unhelpful’ as the following quotations demonstrate.

I prefer to study individually. In a group I do not benefit a thing. In group study, no matter how focused the group is, there is a point where you totally lose a subject and end up talking about other things, or maybe debate on something that you individually know [but] the rest of the group may keep on twisting the point you are sure of and you end up getting the wrong idea. (Student 1).

I used to have a study group, but it did not work for me because we discussed what other people want, there was no fairness. Right now I am going to study alone and consult when I have a problem. (Student 5).

Contrasting these views, it was apparent that some students did find group discussions helpful and some were members of self-organized study groups as the following quotation illustrates.

What I think can help us students to improve academic performance is group discussions in the afternoons and evenings. I gained a lot from group discussions. We did not plan to have group discussions. I was working on a past exam paper and got stuck. Then I had to go for help to other students. Then we ended up discussing the paper together and that is how the group was formed. (Student 7).

OTHER RELEVANT FINDINGS

The stability of learning behaviours

We began the article by referring to statements about the relative stability of students’ learning behaviours and how this stability derived from repeated use over a long period of time in a schooling environment. Although our study did not probe this issue directly, some student comments gave indirect evidence of such stability. Student 5 stated that it was ‘hard to change’ her attitude and approach. The following quotations make the point more forcefully.

In your first year you do not pay much attention [to input on study methods] – you are so used to your own ways. (Student 1).

I thought I will catch up [on academic work] as I used to do at school until it was too late for me. (Student 10).
It is interesting to note that the interviews in the study were conducted at the beginning of the third and fourth quarters of the academic year and that, this far into their first year programme, none of the students reported a shift from their school-derived learning behaviours that they considered significant enough to mention.

**Academic performance of the students**

Table 2 summarizes the students’ academic performance at university and at school. It shows that six out of the eleven students failed their first year at university with one being allowed to repeat the year. In addition, with one exception, it shows that the university aggregate marks were all significantly lower than the school leaving aggregate mark.

**DISCUSSION**

We begin by noting the more positive aspects of the students’ learning behaviours. In particular, the first five behaviours identified in the thematic analysis – awareness about punctuality and attendance, active, cooperative and laboratory learning experience, and examination awareness – suggest that the students had had a satisfactory grounding and competency in the basic aspects of effective studying and learning. All the students appeared to have had a broad experience of having interacted with their teachers and having participated in group discussions and having studied with their peers. They appear to have developed a good work ethic, to be aware of the need to apply themselves diligently in order to perform well academically, and to have been actively engaged in their learning at school.

The findings of the study also identified features of the students’ learning behaviours that are considered problematic at a tertiary level. In this regard, rote learning and memorization stand out. The problematic nature of rote learning has been well documented. It is a ‘surface approach to learning’ that focuses more on the reproduction of information than on the gaining of understanding. It has been shown theoretically and empirically to be undesirable as the primary strategy when learning because it typically leads to poorer quality learning outcomes (Marton and Saljo 1976; Prosser and Trigwell 1999; Ramsden 2003; Biggs 2003). Our finding of the prevalence of rote learning and memorization among the students is consistent with both the literature cited earlier and with widely held perceptions about the characteristics of many university entrants in South Africa.

We also found that other features of the students’ learning behaviours were problematic. In the summary list which follows, it is evident that these features are problematic either because they are associated with a surface approach to learning, or because they are a manifestation of what Zimmerman (1998) terms ‘naïve self regulation’, or because they indicate a kind of expectation and experience of the teaching and learning environment that is significantly at variance with what pertains at university.
### Table 2: Summary of Academic Performance of the Students

Ordered according to level of overall academic achievement at university

(To maintain anonymity, the table gives only the range of marks students obtained)

<table>
<thead>
<tr>
<th>Student</th>
<th>Self-rated English proficiency (%)</th>
<th>School-leaving (Matric) results</th>
<th>Overall first year university results</th>
<th>Aggregate differential</th>
<th>Oral medium of instruction at school (type of school)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>90–100</td>
<td>74–76</td>
<td>54–91</td>
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<td>70–72</td>
<td>64–88</td>
<td>70–75</td>
<td>24–41</td>
</tr>
</tbody>
</table>

1. A self-estimate of the percentage of the English heard in lectures which a student understood.
2. The mark achieved falls in the range indicated
3. Aggregate differential = 1st year university % aggregate minus matric % aggregate
4. Zu-Eng = code-switching between isiZulu and English

Conceptions of knowledge: For many of the students, knowledge was viewed as absolute and something to be received. Perry (1970) describes this conception of knowledge as being ‘dualistic’ in that it is associated with ‘authorities and absolutes’ and does not appreciate the tentative and nuanced nature of knowledge and the need for commitment to a reasoned position (Booth and Ingerman 2002). Several
researchers have shown that this dualistic conception of knowledge is frequently associated with, and can even promote, a surface approach to learning (Norton and Crowley 1995; Saljo 1979; Perry 1970).

**Conceptions of learning:** Some of the students explicitly expressed the idea that learning is a matter of ‘getting knowledge’ and, by implication, that examinations will test whether or not such ‘received knowledge’ can be reproduced when required. Again the conception predisposes a learner to a surface approach to learning.

**Teacher dependence:** This is problematic not because it is intrinsically so but because of the extent of the dependence that was evident among some of the students. Many of them appear to have developed a reliance on their teachers to a degree that seems detrimental to the development of self-reliance and taking responsibility for the regulation of their own learning.

**Teacher and text dependence:** The kind of reliance on teachers and on textual resources found frequently among the students appeared to be the result of their school experience and their perception that knowledge is something you receive from authoritative sources – texts and teachers – and that the task of learners is to receive that knowledge and to reproduce it in order to pass examinations. In other words, it seems that the otherwise healthy behaviours of relying on teachers for guidance and instruction and using textual material appropriately have been somewhat ‘subverted’ by the orientation to ‘received’ knowledge and to rote learning.

**Examination awareness:** This appears to have been similarly ‘subverted’. For the majority of the students, the sensible practice of working through past papers to prepare for examinations appears to have developed into a practice of ‘studying past exam papers’ and solutions to them in order to rote learn.

There are good reasons to conclude that these problematic features derive from the students’ educational background and experience. Firstly, theorists (for example Sfard 1998; Lave and Wenger 1991) emphasize that when people participate in the regular activities of a community over a period of time they learn by ‘picking up’ the tacit knowledge, values, conceptions etc that underlie those activities. Accordingly, it would be expected that the long immersion of students in the secondary school environment would inculcate the conceptions of knowledge and the learning practices found and even intentionally promoted in that environment.

That this had occurred in the case of many of the students is attested to by remarks they made during the study. Some students reported that their school had intentionally ‘encouraged memorization skills’ (Student 5) and had explicitly organized for them to ‘study’ past exam papers (Student 9) in the classroom (Student 5). It seems that, at least in some cases, teachers had been very diligent to do ‘everything they could’ to ‘make the students understand’ (Student 7). This seems to have fostered among students the problematic level of teacher dependence we have described.

It also appears that some schools had intentionally promoted surface oriented learning practices as a way of achieving high pass rates and had marginalized or neglected giving attention to important aspects of the students’ development that were not directly related to attaining that objective. Teachers ‘did not bother ... about
On the learning behaviours of English additional-language speakers entering Engineering

the institution the students will be studying in’ (Student 10) so that students were taught ‘without really thinking about the type of learning ... [students] would need when they attended university’ (Student 9). This contrasts with comments from Student 1 – the student who leaned least towards rote learning. She reported that her school had been ‘so strict in a non-spoon feeding way’ and had explicitly maintained a learning environment that ‘teaches you how to think’.

With regard to the central concern motivating the study – the desire to identify and better understand the factors that contribute to the academic underperformance of the students – we argue as follows. The educational experience of the students has shaped and formed every aspect of how they perceive and respond to a formal learning environment – how they go about studying and learning, how they relate to and engage with teachers and resources, how they organize their time, how they regulate and monitor their own learning and study for examinations, and what they expect is required of them in that environment. The students emerge from their secondary education with learning practices that reflect their experience in that environment. With most of the students in our study, the ethos, perceptions and practices that were prevalent in their educational background had the problematic features we have discussed. These problematic features have become deeply ingrained in the students and are difficult to change and tend to persist well into their first year of university study.

Impact of language

Table 2 shows that all eleven students had obtained good marks in English in their school leaving examination. However, it is clear that these high marks did not necessarily translate into a level of English proficiency that enabled students to cope well with English instruction at a university level. Students who had attended schools where the oral mode of instruction was other than English displayed the mother tongue reliance described earlier and found it difficult to cope with an English medium of instruction at university. All indicated that they understood only between 50 and 60 per cent of the English they heard in lectures at university (Table 2). This contrasts with the experience of the three students from schools where English had been the oral mode of instruction: two indicated they understood between 90 and 100 per cent of the English in lectures and the third 60 per cent.

As Table 2 shows, six out of eight of those students who had not received instruction in English at school failed their first year at university, while all students who had received instruction in English at school passed. While many factors contribute to the underperformance noted, it does seem that a lack of familiarity with English as the oral medium of instruction is a major factor. Our findings therefore call into question the validity, uniformity, and efficacy of the current teaching practice in schools where science related subjects are not taught in English or are taught in a code switching mode of instruction.
Emergent learning behaviours
Nine to ten of the students in the study developed learning behaviours at university that are problematic – ‘passive engagement’ with limited note taking and ‘isolated learning’. These behaviours stand out in stark contrast to their reported behaviours at school (behaviours 1 to 5) which give an impression of a satisfactory grounding in effective learning practices. Consequently, it seems that passive engagement and isolated learning were emergent behaviours – behaviours the students did not seem to have displayed at school but emerged during their first year at university.

Reasons for this emergence were readily apparent from the interviews: students were self-conscious because of a perceived lack of proficiency in English on the one hand and, on the other, because of their state of uncertainty or confusion about concepts and basic issues that other students seemed to understand. In addition, the extra energy required to decode either verbal or written English appeared to be a distraction for some students that contributed to withdrawal or passive behaviours or limited note taking. We would add another possible reason for such behaviours. If students’ learning practices have the problematic features we have identified, the students would be likely to struggle to gain the understanding necessary to keep up and engage with new work particularly when the course content is delivered in an unfamiliar medium of instruction and at a pace greater than they had experienced at school. Difficulty in understanding the course material would be expected to add to the students’ level of stress and confusion and hence could contribute to withdrawal and passive engagement.

CONCLUSION AND IMPLICATIONS OF THE STUDY
The study makes a much needed contribution to the evidence-based understanding of two well-known problem areas in South African higher education – the English language proficiency and learning practices of university entrants. The contribution relates to each of the two areas individually and to the interplay between them. It also relates to the interplay between what happens at school and what happens at university.

The study was restricted to a small group of eleven Nguni-home-language students. Our conclusions need therefore to be substantiated with larger samples that include other language groups and a wider range of social and educational backgrounds. However, the findings of the study have major implications. The first and most obvious is that serious entry limitations in appropriate learning behaviours and proficiency in English that have been noted in the past are still prevalent for possibly a substantive proportion of students entering higher education in South Africa today. The second is that the effects of these limitations seem to last well into the first year of university study: the findings reported in this article were obtained from data obtained in the third semester of a first year programme that included modules designed to help students to transition successfully from school to university. The implication is that it is difficult for students to change problematic learning practices
and it is difficult for universities to design and deliver interventions that are effective in bringing about such change.

With regard to how the country’s secondary education system is preparing students for university, the findings of the study have significant ramifications. If the myth of English instruction in the majority of public high schools is substantiated by further research undertakings and the practice of vernacular and code switching instruction is as widespread as the trend in the sample indicates, then it is possible that a substantial number of students could be facing severe discourse disadvantage on entry to English-medium higher education institutions. It seems that the language and oral mode of instruction at many schools develops in their students ‘mother tongue reliance’ as described earlier and that this is detrimental to the attainment of discipline-specific discourses such as science discourse, and also constitutes a problematic feature of many students’ learning practices. While this reliance may be helpful in the short term for the understanding of concepts, the findings of the study suggest that, in the long term, it impedes the development of proficiency in English to an extent that exacerbates transitional difficulties on entry to university.

A further implication of the study findings is that the root of the difficulties with English proficiency at university seems to derive more from the language and oral mode of instruction at school than it does from the kind of English course students take at school. Some research has suggested that, in the South African context, ‘English as a primary language’ develops critical thinking skills more effectively than does ‘English as an additional language’ (Gibbon 2003; Gibbon, Nixon and Nixon 2006). Whatever other impact the choice between alternative English courses may have, high marks in the English course taken do not appear to correspond with high proficiency in English.

With regard to how the country’s secondary education system is developing the learning practices of students who enter university, the findings of the study again have major ramifications. The findings give validity to the often voiced and anecdotal references to the rote learning and memorizing strategies employed by many South African learners. However, the study suggests that this is a manifestation of a deeper problem – ingrained learning practices that have a wide range of problematic features. The learning practices of the majority of the students in the study were pervasively informed by a conception of knowledge and of learning that predisposes students to surface approaches to learning. They were also characterized by a naïve dependence on teachers, texts and past examination papers, and by unrealistic expectations of what a tertiary learning environment would be like and what was required of them there.

The study provides evidence that these problematic features and the roots of problems with English proficiency derive particularly from the oral mode of instruction and the teaching practice at school. The ramifications of this are extensive: interventions are needed to change instructional and teaching practice in South African secondary schools and to make teachers more aware of the impact which their teaching practices and oral modes of instruction have on those among their
students who are likely to progress to university. In addition, it seems that secondary students who intend to enter university would advantage themselves if they attended a school where the oral medium of instruction is the same as that of the university they would like to attend.

The findings of the study have much to say to South African universities with regard to how they prepare themselves and respond to entrants who display some of the problematic features we have described. In the first place, awareness is needed of how features of learning practices and proficiency in English that are problematic can combine to generate emergent learning behaviours – such as passive engagement and isolated learning – that are detrimental to a successful transition into university. Secondly, with regard to language interventions, the findings emphasize the point that problems with proficiency in the university’s medium of instruction are not the only factors that impact negatively on the academic performance of entrants: they may not even be the most important issue to address given the high prevalence of the problematic features which the study has identified in the learning practices of some entrants. A clear implication emerging from the study is that a holistic intervention is needed – one that addresses all problematic features together (including, for example, the issue of critical thinking skills alluded to in the work of Gibbon et al. mentioned earlier). It seems likely that any intervention will have disappointing results if it overlooks or under-addresses any one factor that is significant.

The emphasis on a holistic intervention seems even more relevant when it comes to addressing the issue of learning practices. A significant recommendation that emerges from the study is that it is important to conceptualize the observed problematic features of the students learning behaviours as manifestations of their ‘learning practices’ rather than as isolated features that require individual attention. The implication of this is that interventions that address these features should target the development of learning practices as a whole rather than focusing on isolated skills or learning behaviours. Failure to take such an integrated approach may very well be a reason why ‘skills courses’ and related developmental measures have a poor record of success (Wingate 2006).

ACKNOWLEDGEMENT

The work reported in this article was made possible by a grant from the South African National Research Foundation (NRF).

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On the learning behaviours of English additional-language speakers entering Engineering


