LEARNER PROGRESS AND ACHIEVEMENT STUDY

RESEARCH REPORT 4

Submitted to:

The Anglogold Fund Educational Trust

CONTENTS

"IF I WANT ORDER I HAVE TO GO UP AND DOWN"
(Quotation from a school principal)

Executive Summary

This is a report of work done within the Learner Progress and Achievement Study during 1999 and 2000. The study was funded exclusively by the Anglogold Fund Educational Trust and would not have been completed had it not been for support from the Anglogold Fund Educational Trust which went beyond the normal commitments of a funder. The staff of the Learner Progress and Achievement Study are deeply grateful for this.

The report examines the use of time/ space and objects in school management and pedagogy. This research is based on a case study of two secondary and two primary schools situated in Khayelitsha within the greater Cape Town area.

In the first two sections, the report argues that each of these facets of school life is partly constituted by time/ space routines and – in the case of pedagogy - object related practices. In the final section, it argues that time/ space routines and object related practices articulate school management, organisation and pedagogy. Finally, the report suggests that this insight has substantial implications for school reform.

The data collection and analysis strategies are set out in the full report, below. Only the conclusions are given here.

Conclusions to Section A: School management and organisation

All four schools in this study were characterised by weak time/ space boundaries. The weakness of boundaries at each scale contributed to the weakness of boundaries at other scales.

The weaker the boundaries, the more management time and energy they absorbed, in the form of 'policing' of boundaries.

Associated with the need to police weak boundaries was a tendency to constitute activities in terms of their time/ space boundaries. i.e. with their space/ time frame, rather than their content.

The strong focus on the need to police boundaries was also associated with a tendency for management activities to be reactive and present oriented.

Where time/ space boundaries are weak, school management is subject not only to the need to police boundaries but also to tendencies to 'collude' with habitual and pervasive weak boundaries. This results in contradictory practices.

Conclusions to Section B : Pedagogy

Firstly, transmission practices are a response not only to discursive intentions (i.e. ideas) but also to space/ time routines within the school and by the availability of objects, or technology, whether it be chalk and blackboard, textbooks or computers.

Secondly, this study shows clearly that transmission practices are not designed afresh for each lesson. Instead, they are patterned, embodied and *habituated* practices which are institutionally and systemically pervasive, at least in so far as they cut across more than one institution. Habits embody a nexus of social, discursive, spatial and object related practices within a particular social space.

Thirdly, social practices are not only constituted but also *changed* at the practical, bodily, material and spatial levels as well as at the conceptual, linguistic and social levels

Fourthly, one of the implications of this study is that it suggests a different take on the notion of tacit knowledge. Castells links the notion of tacit *knowledge* to the notion of *habit* (1996 p. 160). This study would suggest that habits involve configurations of spatial, social, discursive and object related practices within a particular social space, or *context*. Any attempt to transfer tacit embodied, habituated practices into explicit knowledge, as Castells aims to do, would have to address the importance of context, understood in this multifaceted way.

Conclusions from both sections A and B

On the basis of this case study, the report makes the following general arguments about the ways in which time/ space practices operate in school management and pedagogy.

Routine time/space habits constitute a framing matrix which gives form to both management and pedagogy. In other words, time/space routines and habits articulate, or provide a connecting web, between management and pedagogic practices. This matrix defines the context of management and pedagogic practices.

Ideas about how to teach and how to manage which are not consistent with existing routine practices are constrained by time/ space practices which provide a pressure towards conformity. Where management and organisational time/ space boundaries are weak, pedagogic practices which are compatible with weak boundaries are privileged.

There is a 'scaling' of both time and space. For example, time is scaled in years, terms, weeks and days (and periods, in the case of secondary schools) while space is scaled at the levels of the environment, the school and the classroom. In the case of a particular school, the habituated time/ space practices may fall anywhere on a continuum from very strong to very weak. However, the strength or weakness of boundaries tends to carry through from one scale to the next.

The significance of the research

This research has both theoretical and practical implications.

Theoretically, the study offers one way of understanding the articulation of school organisation and management practices, on the one hand and pedagogy, on the other. This can be summarised as a tendency to adapt practices to context constituted by routine time/ space and object related practices. This articulation has been weakly understood in school reform literature, resulting in a tendency to focus on either school management or the classroom (Muller & Roberts 2000).

The study adds its voice to a literature which asks why teachers' transmission practices tend to conform to those which pervade the context in which they teach rather than those promulgated by their preservice courses (Ensor 1999). Teacher education tends to concern itself with the discursive and social dimensions of transmission practices in uncontextualised ways. On the other hand, teacher practices relating to the use of time ('time on task'), space ('absenteeism') and objects ('resources') are relegated to the domain of school management where they are conceived of as separate from transmission practices. This is a result of a conceptualisation that conceives time, space and objects as constituting an inert container for the dynamics of social and discursive pedagogic activities. The human and the nonhuman dimensions of transmission practices are pushed apart and relegated to different domains and the ways in which they are interrelated and fused in habituated transmission practices within particular social spaces are rendered invisible. It is not surprising that this kind of teacher education does not adequately prepare teachers to resist the patterning of practices inscribed in the rhythms of the institutions which they enter.

Practically, this study has implications for both management and teacher education. It suggests that such education as well as any attempt to change practices within schools must engage with the ways in which such practices articulate within a particular context.

"IF I WANT ORDER I HAVE TO GO UP AND DOWN"
(Quotation from a school principal)

H J Jacklin

INTRODUCTION

The Learner Progress and Achievement Study was started in August 1997. The pilot phase of the project was completed in March 1998. The second phase was completed in March 1999 and the third and last phase was completed in March 2000.

This report relates to the last phase of LPAS work, from April 1999 to April 2000. The study was funded exclusively by the Anglogold Fund Educational Trust and would not have been completed had it not been for support from the Anglogold Fund Educational Trust which went beyond the normal commitments of a funder. The staff of the Learner Progress and Achievement Study are deeply grateful for this.

This report examines the use of time/ space and objects in school management and pedagogy. In the first two sections, the report argues that each of these facets of school life is partly constituted by time/ space routines and object related practices. In the final section, it argues that time/ space routines and object related practices articulate school management, organisation and pedagogy. Finally, the report suggests that this insight has substantial implications for school reform.

Theory:

The study is informed by a theoretical interest in the relationship between context, on the one hand, and language, ideas and social relations, on the other. Context is understood here as involving the distribution, organisation and perception of space, time and objects as well as routine practices relating to space, time and objects. To this end it draws on the work of Lefebvre (1991) and Latour (1987, 1993). The basic theoretical premise is that there is a dialectic relationship between these domains. In other words, context influences ideas and social relations as well as vice versa. This contradicts a common assumption that ideas and relations invariably shape and lead context. These theoretical interests are backgrounded in this report but will be fore grounded in other articles related to this study.

Data collection

This research is based on a case study of two secondary and two primary schools situated in Khayelitsha within the greater Cape Town area. The study arose out of a concern about the quality of pedagogic transmission practices in the schools, the quantity of 'time on task', the limited use of material resources and a theoretical curiosity about the relationship between these aspects of practice.

The study was done during 1999, but formed part of a larger project which began in 1997. The organisation and management component of the report draws on data relating to all four schools

while the section relating to pedagogy draws on data relating to the two secondary schools.

The study is not intended to be representative of, and generalisable to, other schools. Rather, its purpose is to show how practices in schools are constituted and interrelated.

SECTION ONE

Section A of this report focuses on organisation and management practices in the schools. It sets out to map time/ space practices within school organisation and management. The purpose is to show how time/ space routines do not only follow from, but also constitute, the content and purposes of school organisation and management.

Data Collection

Data collection processes included
- the tracking and observation of one class in each school for at least three days
- the systematic observation of learners and teacher movements for one day in each school, before school, during break and at the end of the school day,
- the observation of learner registration and 'start up' practices in each school through visits on the first day of the year and, intermittently, during the following weeks.
- the tracking of two individual selected learners at break for one day in each school
- the tracking of each of the school principals for one day.
- questionnaires for staff relating to time/ space practices as well as the content of meetings

These data collection strategies were informed and validated by interviews with twelve learners in each school as well as less systematic observation during frequent visits to the schools over a three year period.

Three researchers worked in the schools throughout this period. Only one of the three researchers was fluent in Xhosa, a language frequently used in the schools. This researcher recorded and translated all the Xhosa 'talk' which formed part of the data. She also interviewed some learners in Xhosa.

Analysis

The data relating to the organisation and management of the school was analysed for:
- the strength or weakness of time/ space boundaries
- practices related to the securing and policing of time and space, including practices relating to learner and teacher presence and absence, i.e. practices aimed at strengthening time space boundaries.
- management practices which colluded with weak time/ space boundaries
- the constitution of management practices in terms of form (time/ space organisation) as opposed to content.

- the present or future orientation of management practices,
- whether practices are responsive or pro active.

DATA RELATING TO SCHOOL MANAGEMENT AND ORGANISATION

1. The strength of boundaries

Time/ space practices at both schools were characterised by weak boundaries on every scale.

1.1 The beginning of the year

At the beginning of the year, developments at the scale of the school were affected by weak boundaries within broader systemic organisation. At all four schools it took two to three weeks before tuition began at the beginning of the year. This was largely because enrolment numbers took some time to stabilise which in turn made it difficult for school management to organise classes. A number of factors contributed to this. Many learners started the year late because they arrived late from the Eastern Cape or because they were waiting for the month end in order to be able to pay school fees. Others were awaiting documents in order to change schools or spent time trying to gain access to higher achieving schools before settling for schools that were not full. Learners who had failed in the previous year were particularly keen to change to schools that had achieved a relatively high pass rate in the previous year.

At the beginning of 1999 enrolments at all four schools in this study were initially disturbingly low. Low numbers also affected teacher morale negatively, as posts were threatened. This led to a focus of management energies on recruitment activities rather than teaching activities. One of the primary schools sent busses to a neighbouring area to bus in learners while one high school sent a message to learners who had failed marginally offering them a pass if they returned. In general, there was considerable learner mobility in the environment which impacted on the schools' ability to commence with tuition.

1.2 *The beginning and end of a typical* day.

On a typical school day, the majority of learners had not arrived at school when the first bell rang; at one school this amounted to 91% on the day when learners were counted at the gates. Between five and sixteen teachers were also late at the four schools on the days when gates were observed.

During the school day there was considerable coming and going of teachers and learners in and out of the school gates. At the primary schools, most learners who left the grounds during class time had been sent on errands by teachers.

At all four schools the day also had no clear end. At the high schools 15 (out of 41) and 39 (out of 46) teachers left before three o'clock. At the primary schools 13 (out of 22) and 11 (out of 19) left early. At all four schools, at least some classes had either been dismissed early or left early of

their own accord because teachers were absent.

1.3   A Typical School Break

At both secondary schools, a majority of learners and a significant number of teachers left the school grounds at break on the days that observations took place. At secondary school A 76% of learners left the grounds at break and 4% did not return. At both primary schools a substantial minority of learners left the grounds at break. Learners who left the school would return home to collect objects, or buy food, or visit game halls or a public library.

At all four schools, both teachers and learners took some time to return to class after break on the days that schools were observed. At both secondary schools it was close on half an hour after the bell before all teachers had returned to their classrooms. At three of the schools, principals spent time prompting both teachers and learners to return to class at the end of breaks.

2. Policing of boundaries

One distinction between strong and weak space/ time boundaries relates to the extent to which they have been normalised. Weak boundaries have not been normalised; this means that substantial numbers of teachers and learners do not respond to bells promptly of their own accord. Consequently, the movement of learners and teachers to classrooms, and the routine presence of learners and teachers in classrooms require continual and overt policing in a school where space/ time boundaries are weak while the maintenance of strong boundaries which have been normalised absorbs relatively little management energy. This was starkly illustrated for me on a day in which I visited two different schools. At one, there were no bells, yet all learners and teachers moved to each class on time with no visible prompting. At the other, bells rang but were ignored by many teachers and learners until the principal appeared to chase both teachers and learners to class.

At all four schools in this study, time/ space boundaries required continual policing. In most cases this policing was done by the principal. A significant portion of each principal's day was spent policing learner and teacher latecoming and absenteeism and dealing with the consequences thereof. (See appendix 1 for a full account of all the activities on the days that principals were shadowed.) The activities in which principals were involved on the days they were shadowed were counted. Seven out of twenty three activities in which primary school principals were involved on these days related to the policing of time/ space boundaries or securing the space of the school. 33 out of 84 activities in which secondary school principles were involved were related to policing time/ space boundaries or securing the space of the school

Policing teacher and learner absenteeism and late coming

On observation days, gates were locked at both secondary schools to exclude learners who were late in the morning and at the end of break, as a punishment. Teachers - one of whom carried a stick - also hurried learners along. On days when secondary school principals were shadowed,

they both spent time at the gates checking that learners returned speedily from break, chasing after learners who left early when the gates had been inadvertently left open and punishing learners who returned late from break.

At both primary schools, teachers waited at the gates to apprehend learners who were late. One of these teachers carried a stick and learners commented in interviews that they expected to be hit if they were late.

Both secondary and primary school principals spent time checking on the classes of teachers who were absent and punishing unruly learners in unattended classes, or talking to teachers and learners who had been absent on a previous day or who were asking for permission to be absent or to leave school early. The organisation of substitutes for absent teachers was a particularly time consuming activity.

Securing the space of the school also took up a considerable amount of the principals' time. At both secondary schools, high fences and gates had been erected while one of the primary schools were in the process of erecting a similar fence and gate. The purpose of these fences was both to keep learners in and to keep out troublesome visitors such as gangsters. In spite of this, the schools were frequently burgled. Three of the four schools were burgled during the same fortnight during the collection of data for this study.

On the days that principals of the schools were shadowed, principals spent time attending to doors that had been left unlocked overnight, broken windows, blocked toilets, the installation of security systems and blackboards and purchasing glass for broken windows.

The policing of time and space - specially attendance and punctuality of both teachers and staff - also tended to be a regular and time consuming topic at staff meetings at all four schools.

3. Present and future orientation of management activities

When principals were not policing time/ space boundaries or securing the space of the school, they were generally engaged in ad hoc, reactive rather than planned, pro active activities. Of 60 activities that did not relate to time and space, only 15 were pro-active, in the sense that they were not undertaken in response to an external catalyst. Of these only three related to relatively long term plans, viz. writing a letter relating to a new post, discussing a workshop and making telephone enquiries regarding the new curriculum. All other pro active activities of principals on all four days related to relatively short term objectives such as reading mail or planning an agenda for a meeting to be held on the same or the next day. (See Appendix 1)

4. Management collusion with weak time/space boundaries

While all four principals were concerned to police time/ space boundaries, three of them engaged in activities which colluded with these weak boundaries. One of the primary school principals left the school to attend to church matters while the other arrived late, called staff out of classes to a

meeting to resolve a dispute between staff for an hour and then left three hours early to take the school secretaries' to a secretaries' day lunch. One of the secondary school principals arrived late, left the premises to buy cigarettes and informed another staff member that he planned to leave early on the following Friday.

Some forms of official collusion with the deferment of tuition are routine within the schools such as early closing on the last day of the month to enable teachers to cash salary cheques, pay accounts and go shopping. Another routine activity at all four schools was the early ending of classes on Fridays to enable learners to clean classrooms once a week.

Some activities which displace tuition are not routine but are nevertheless frequent. One example relates to bereavement. During this study it became evident that bereavement related activities such as memorial services in the schools or early closing for memorial services in other schools is relatively frequent. Such activities occurred in one form or another in all three schools during the study. One of the schools has formally established a bereavement committee. While this is only speculation, It seems likely that the frequency of bereavement related activities is to the increasing occurrence of AIDS amongst learners and teachers, and that school managements are necessarily beginning to formalise their responses to this.

Another reason for the deferment of tuition at all four schools was early closing on days when there were teachers or other labour strikes. Early closing took place regardless of the level of teacher participation by teachers at the schools in the strikes.

Teachers' attendance of in-service courses during school hours also resulted in the interruption of tuition. Fourteen members of staff across the four schools said, in response to a question in a questionnaire, that they had attended courses during school hours during the year in which the study took place. It is not known in how many of these cases continued tuition was organised. However, where similar cases occurred during the classroom observation period classes were, at best, left with instructions to 'continue with their work' or to 'study'. On another occasion during the observation period at secondary school B as well as at primary school C, teachers who left early to attend courses simply dismissed learners in their classes early.

Another activity which displaced (rather than supplemented) tuition in one primary school during the study was associated with choir competitions. For at least two weeks during the year, tuition was virtually suspended while the majority of staff and a minority of learners practised for and attended competitions. Learners who were not in the choir were largely unattended during this time.

Teachers also reported in a questionnaire that they left their classrooms on occasion in order to attend to learner problems, parent visits and school meetings. At secondary school B subject meetings were called during class time during the observation period.

5. Constitution of activities in terms of form, not content

In the previous section it was shown that the policing of time/ space boundaries occupied much of the school principal's time and energy. This was also associated with a tendency to focus on the time space/ frame - rather than the content of general management and planning activities. For example, secondary school teachers reported in a questionnaire that the most frequent topic at subject meetings was the monitoring of the pace of syllabus coverage. References to the teaching *process and content* were much less frequent.

Staff questionnaires were completed in October when examinations came up at secondary school staff meetings. This topic - i.e. examinations - was also constituted in terms of its space/ time frame, with the emphasis on scheduling.

6. Strong boundaries for non-teaching activities

Although all teaching activities were weakly bounded, non-teaching activities were strongly bounded. There were a number of indications that it was understood that teaching related activities could not intrude upon break or after school time. This was evident in a number of comments made by staff at the four schools during the observation period such as the following exchange between a deputy principal and a staff member during break at a secondary school:

> Deputy : Mr M can I see you quickly please, I just need to ask you something quickly
> Teacher: Oh yes, but it is break time (starts to leave)
> Deputy : I know, I'm sorry, but just quickly

In this exchange the deputy principal was clearly apologetic for raising a work related matter during break time, and the teacher felt it was within his rights to refuse to allow the deputy to intrude on this time with work related matters. Consequently events such as meetings, commemoration services and choir practices were held during class time or after school but before three o'clock, rather than at break. At only one of the schools - secondary school A - did staff express the view that meetings should necessarily take place after school and that it was inappropriate to call meetings during class time.

This is not to suggest that no work was done by any teachers during break. A significant minority of teachers did do various administrative or preparation tasks during the observed break times. However, it was clear that this was completely voluntary and exceptional, and could not be expected or required by management. Generally even the talk in the staff rooms seldom related to work matters.

7. Visual Coding of staff rooms

At all schools - and particularly the secondary schools - the visual coding of the staff rooms reflected a construction of teachers' work almost exclusively in terms of time/ space forms. The walls and notice boards of all four staff rooms were covered with timetables for examinations, subject meetings, staff meetings, as well as calendars and lists of events or fixtures. At secondary

school A the most prominent notice in the staff room was a large list of teachers' latecoming records indicating how many times each teacher had been late each month.

Two other types of notices appeared on notice boards in large numbers. Firstly, there were large numbers of official notices from the provincial and national education departments and SADTU, many of which related to conditions of work. Secondly, there were large numbers of advertisements for credit schemes, bank loans, home improvement schemes, car schemes, cell phone services and medical aid schemes at all four schools.

Much smaller numbers of a miscellany of other notices appeared on notice boards. These included motivational poems, specially at the primary schools, cartoons and articles relating to education cut from newspapers, advertisements for staff development courses and occasional photo's taken at school events or, in one case, paintings done by school students.

The paintings done by learners were exceptional in that they were the only component of visual display in staff rooms that related to the content or process rather than the official monitoring and time/ space framing of teachers' work.

CONCLUSIONS TO SECTION A

All four schools in this study were characterised by weak time/ space boundaries. The weakness of boundaries at each scale contributed to the weakness of boundaries at other scales.

The weaker the boundaries, the more management time and energy they absorbed, in the form of 'policing' of boundaries.

Associated with the need to police weak boundaries was a tendency to constitute activities in terms of their time/ space boundaries. i.e. with their space/ time form, rather than their content. This is also reflected in the visual displays, or coding, of staff rooms.

The strong focus on the need to police boundaries was also associated with a tendency for management activities to be reactive and present oriented.

Where time/ space boundaries are weak, school management is subject not only to the need to police boundaries but also to tendencies to 'collude' with habitual and pervasive weak boundaries. This results in contradictory practices.

SECTION TWO: PEDAGOGIC PRACTICES

This section of the report focuses on the ways in which pedagogic practices are constituted by time/ space routines and object related practices.

DATA COLLECTION

Data collection for this section took the form of observation of three grade nine classes in two schools over six days. The classes were observed for three days, two days and one day respectively. The transcripts of three lessons were abandoned as they were insufficiently detailed. This left 33 lessons, or just over 25 hours of observation for analysis.

The observations were conducted in October, three weeks before the end of year examinations. Only three of the lessons watched were explicitly set up as revision lessons, but the timing may well have influenced the approach to other lessons.

DATA ANALYSIS

An initial reading of the data sought to identify and distinguish between social, discursive, spatial and object related dimensions of transmission practices. This process led to the empirical identification of one set of salient practices in each dimension.

Salient features of pedagogy

In terms of *material practices* the study draws a distinction between practices which are materialised through the distribution or production of a material record of the text of the lesson and those that do not. The notion of materialisation is drawn from Latour and Woolgar (1979) who follow Bachelard in describing apparatus as 'reified theory and practices' (P 68). In this study the blackboard, the notebook, the textbook, the pen and the worksheet are similarly regarded as reified pedagogy.

In terms of *space/time practices*, the study draws a distinction between teacher presence and teacher absence in the classroom. Conceptually, the notion of space/time practices is drawn from Lefebvre. For Lefebvre,

> time is known and actualised in space, becoming a social reality by virtue of a spatial practice. Similarly, space is known only in and through time (p 219).

In terms of Lefebvre's theory, three kinds of practices are implicated in the production of social space: spatial practices, referred to here as space/time practices (use of, movement in, perception of space); representations of space (codification or conceptions of space) and representational space (lived, imagined or subjectively experienced space). Thus a focus on teacher absence and presence foregrounds a particular spatial practice which is located within a much more complex process of the social production of social space.

In terms of *social practices*, the paper draws a distinction between teacher/whole class interaction, teacher/individual interaction and teacher non-interaction. The focus here is on the social practices *of the teacher*, rather than on the setting up of the social practices of the learners by the teacher, i.e. regulative discourse.

In terms of *pedagogic discourse* (incorporating both instructional and regulative discourse), the paper draws a distinction between pedagogic transmission practices which are suggestive of the acquisition of rich knowledge and those which are suggestive of the acquisition of inert, or rote knowledge. The distinction between rich knowledge and rote knowledge is elaborated below.

Rich Knowledge and Rote Knowledge

For purposes of this study a distinction was drawn between transmission practices which overtly provided the discursive conditions for the acquisition of rich knowledge (RiK) and those which provided the discursive conditions for the acquisition of rote, procedural or inert knowledge (RoK). Davis (1995) argues that the acquisition of RiK is characterised by the process of making connections between new knowledge (or 'beliefs'), and existing 'networks of information, knowledge and beliefs' (p. 6). For Davis, "the justified believer must discern links between his justified beliefs and many others which can support it." Therefor RiK is different from rote knowledge which the learner possesses "largely as a result of relying on the expertise of others" (p. 6).

This study was not concerned with the *nature of the belief sets,* or knowledge, to which connections are made, for example everyday knowledge such as shopping or specialised knowledge such as mathematics. It is possible that this study could be deepened to take these distinctions into account. However, that would require a further level of analysis which is beyond the scope of the present paper.

The study was also not concerned with the *nature of the discursive connections* suggested by transmission practices, for example whether they could be characterised as relational or instrumental (Davis 1995 p.8). Nor did the study attempt to establish whether connections were actually made, at the level of acquisition. The concern here was simply to establish whether the transmission practices of the lesson overtly set up an opportunity for learners to make connections between the text of the lesson and *any other* appropriate text, or, in Davis' terms, set of beliefs embedded in the prior knowledge of the learner.

At the level of discourse, the distinction between transmission practices which facilitated the acquisition of RiK or those associated the acquisition of RoK was signalled in both the regulative discourse (through instructions such as 'copy' or 'explain') and the instructional discourse (through the introduction of a broader frame of reference - or absence thereof).

The analysis then correlated time spent on activities conducive to the acquisition of rich knowledge with teacher presence and interaction with the whole class, and with recording of the lesson text.

DATA RELATING TO PEDAGOGIC PRACTICES

Teacher presence and absence

In the observed lessons, teachers were absent from class for 37% of observed time, either for the whole lesson or for part of the lesson. It is likely that teachers would have been absent for a greater proportion of time had the observers not been present as at least two teachers indicated that they had decided to come into class because the observers were present. Teachers who were absent from class were not necessarily absent from the school.

Time spent teaching

Of the total observed time, teachers interacted with, or taught, the whole class group 22% of the time and interacted with learners individually a further 16% of the time. Time spent interacting with individuals was mostly spent moving from desk to desk checking work in learners' notebooks. This means that for 62% of observed time teachers were either absent, or present but not teaching. This present but not teaching time was most often spent marking work not related to the current lesson but teachers also read newspapers or simply waited.

Lessons with designated texts

Of the 33 lessons observed, there were designated texts, or learning content, for 24. In two of these lessons, learners were informed of the text of the lesson in the absence of the teacher. In the remaining nine lessons the teacher was either absent or was present but did not introduce a lesson text in any way.

Rich knowledge and rote knowledge

Each of the lessons with designated texts conformed to one of the following descriptions, categorised as either rich knowledge (RiK) or rote knowledge (RoK):

TABLE ONE

	Rote Knowledge: Practices suggestive of RoK involved the teacher making the text available or requiring learners to recall portions of the text, or deal with the text in an entirely self referential way which involved no explicit reference to any other text for purposes of elaboration, interpretation, application or explanation and no reference to the principles governing such an exercise or the supportive reasoning of the learner.	Lesson No's
1	Copy new text.	7,12,15,18
2	Copy corrections for previous exercise without reference to reasons for errors.	10, 19, 29
3	Answer questions; recall from memory or general knowledge only. No new text.	2,3,23,26
4	Practice or review procedures e.g. 'divide' or grammatical transformations. Slot filling. No new content or reference to principles, explanations or reasoning.	21, 22, 24 25, 31
5	Discuss: express opinions. No new text	28
	Rich Knowledge: Typical 'connecting' activities associated with RiK included teachers or learners explaining the reasons for a mathematical procedure or identifying links between historical events and learners' own experiences or even simply rephrasing terminology in the learners' own words.	
1	Discuss. Relate new text to own experience.	14, 32
2	Answer questions requiring application of knowledge to new problem, or explanation and application of principles.	8, 15, 16, 27.
3	Elaboration of concepts in text; restate in own words	30

Use of objects

Eighteen of the 33 lessons observed for this study involved the recording of the designated text of the lesson, i.e. of that which was presented to be learned. The dominant pattern - thirteen lessons - involved the teacher placing a text on the blackboard (or asking a learner to do so); learners then either copied the text or did the required exercise in their notebooks. In these thirteen lessons no other materials, such as textbooks or photocopied sheets, were used. In a further four lessons, photocopied worksheets were handed out; again, they were not supplemented by any other material. Finally, in one lesson, learners were referred to their textbooks to do an exercise after a collective discussion of work done on the blackboard.

Correlations

The analysis then correlated time spent on activities conducive to the acquisition of rich knowledge with teacher presence and interaction with the whole class, and with recording of the lesson text.

Table 2 shows the incidence of all salient features of pedagogic discourse and practices in the observed lessons.

TABLE TWO

Day & lesson	Lesson Time	Teacher present	Col.Tr Time	Indiv. Tr.Tm	RiK Tm	RoK tm	Rec Y/N	Subject:
S1D1 L1	25	P.28m						Guid
2	28	P.25m	5m	20m		22m	y	So
3	40	P.40m	2m	15m		24m	y	Geog
4	22	A						Eng
S1D2 L5	20	A						Agri
6	28	A						Geog
7	52	A				21m	y	Xhos
8	22	P.22m	22m		22m		n	So
9	22	P.20m						Eng
10	25	P.25m		10m		10m	y	Afr
S1D3 L11	45	A						Agr
12	50	A				28m	y	Xho
13	55	A						Geog
14	50	P.50m	50m		50m		n	His
15	55	P.27m	17m		20m	17m	y	So
16	60	P.60m	60m		60m		y	Math
S2D4 L17	50	A						Eng
18	50	P.50m		25m		46m	y	Geog
19	60	P.48m				25m	y	Xhos
20	50	A						So
21	50	P.47m		24m		20m	y	Afr
S2D5 L22	47	P.46m	5m	28m		17m	y	Afr
23	47	P.44m	20m			20m	n	Eng
24	40	P.40m	12m	26m		25m	y	His
25	42	P.42m		7m		42m	y	Math
26	63	P.50m	17m	10m		25m	y	ReEo
27	40	P.40m	15m	8m	28m		y	So
S2D6 L28	52	P.40m	40m			20m	n	Guid
29	55	P.55m	5m	15m		25m	y	Afr
30	50	P.27	27m		27m		n	Geog
31	55	P.55	8m	20m		20m	y	Eng
32	45	P.45	22m	12m	22m		n	His
33	50	A						Xhos
Tot	1518 25h18	967 16h07	338 5h38	251 4h11	240 4h00	476m 7h56	17Y 6 N	

Abbreviations: Col. Tr. Tm - Collective Transmission Time (Teacher interacting with whole class).

       Indiv. Tr Tm - Individual Transmission Time (Teacher interacting with individuals)

       RiK Tm - Time spent on rich knowledge activities.

RoK Tm - Time spent on rote knowledge activities.
Rec. - Recording (written work).
Y - Yes
N - No
Guid - Guidance
Sc. - Science
Geog. - Geography
Eng. - English
Agric. - Agriculture
Xhos. - Xhosa
Afrik. - Afrikaans
His. - History
Math. - Mathematics
BusEc - Business Science

Analysis revealed that RiK related transmission activities were generally associated with teacher interaction with the class as a whole while RoK activities were not. In lessons in which 240 minutes were spent on RiK activities, 224 minutes were spent on teacher transmission activities involving interaction with the class as a whole. In contrast, of 476 minutes spent on rote learning associated activities, only 159 minutes were spent on teacher transmission activities involving interaction with the class as a whole.

It is not inevitable that RiK activities involve teacher interaction with the class as a whole, as instructions for RiK activities can be inscribed in printed texts or placed on the blackboard. This occurred in only two lessons, however (15 and 27).

RoK activities did not necessarily require the teacher to be present; in two cases teachers sent messages for one of the learners to place the lesson text on the blackboard to be copied by learners in her absence. In five more lessons texts were placed on the blackboard before learners entered the class or written up at the beginning of the lesson by a teacher or learner and learners were expected to proceed with copying the text or doing the exercise without further discussion. In three of these lessons the teacher did not even instruct learners verbally to proceed with the work on the board; learners simply responded to the work set out on the board. In these cases there was very little interaction between teachers and the class as a whole. The interaction that did take place was almost entirely regulative, relating mostly to control of noise. In other cases, learners commented that they expected teachers to be absent because the teachers had completed coverage of the syllabus, i.e. transmission of the subject text designated for the year had been completed. The text had been 'transferred' to learners and no further elaboration, or RiK activities were required.

Activities associated with RoK were more likely to be recorded than were activities associated with RiK. While fifteen out of seventeen of the RoK associated activities were not only followed by, but constituted as, written activities, only three of the seven RiK activities involved any written recording of the learning that took place.

With only one exception (lesson 16), discussion and written activities did not take place in the same lesson nor were students required to do written homework following discussion type lessons. Designated texts were *either* discussed *or* written activities were set.

Patterns

It emerges very clearly from this study that there were very definite patterns and rhythms which structure transmission practices in the observed lessons. These patterns, which cut across different teachers, subjects and the two schools, were constituted by particular configurations of time/space practices, uses of objects, social practices and discursive practices.

The dominant pattern was for the teacher to set up the relay of a text, via the blackboard, to the learners' notebooks. This pattern did not necessarily require the teacher's presence for instructional purposes. Teachers were frequently absent. When they were present they either limited their interaction to a regulative role (keeping the class quiet) or they moved from learner to learner ticking and signing learners' work, generally without comment. By far the majority of these lessons involved activities suggestive of RoK. In a few cases the texts were provided in the form of photocopied materials and in two cases the texts took the form of exercises which required some reasoning on the part of learners, suggestive of RiK. These lessons were future oriented to the extent that learners were expected to record them in written form for future reference. This form of future orientation may be regarded as a form of privileging of the text.

A subordinate, less frequent pattern was for teachers to initiate some form of interaction with the class incorporating discussion, explanation or questions and answers, thus teachers were not only present but interacting with the class as a whole. The transmission discourse was both instructional and regulative. These lessons were more likely to involve activities suggestive of RiK. However, with only one exception, they did not lead to written activities and, in this sense, were present oriented and not privileged as a reference for future learning.

A comparison of the two schools shows considerable similarities in the patterning of transmission practices. One significant difference is that teachers were absent for a much greater proportion of time in one school (School A: 51%) than in the other (School B: 25%). This bears testimony to a stronger managerial discipline in school B and, possibly, a stronger sensitivity by school management to the presence of observers. This led to a similar ratio in actual teaching time, i.e. 30% of observed time in School A and 44% in School B. However, the difference between time spent on the lesson text by learners was much less, i.e. 43% in School A and 49% in School B. In other words, there was very little difference in the ways in which teachers structured learner time. This would suggest that external pressures which required teachers to spend more time in class - possibly to some extent short term pressures arising from the presence of observers - did not translate into substantially different rhythms within the learning activities set up for learners by teachers. The external manipulation of one component of the configuration of social, discursive, spatial and object related practices was not sufficient to impact substantially on deeply embedded habitual multifaceted transmission practices.

CONCLUSIONS FOR SECTION TWO

A privileging of the discursive might tempt one to conclude from this study that a concept of knowledge which privileged transmission practices suggestive of RoK rather than RiK led teachers to particular social, spatial and material related transmission practices. Consequently teachers' transmission discourse was dominated by the regulative, involved limited social interaction and did not necessarily require teacher presence.

However, this conclusion is brought into question when the use of textbooks is considered. Teachers in both schools developed their practices in contexts in which learners did not generally all have textbooks. Recently textbooks have been made available to learners, although not in all subjects. Furthermore textbooks tend to be delivered to schools some time after the beginning of the year. Learners in these schools are only given textbooks once they have paid their school fees. Consequently teachers can still not assume that all learners have textbooks for most if not all of the year. This would begin to explain why it was assumed by the teacher in only one of the lessons that learners actually had their textbooks in class (lesson 16). In only one other lesson were textbooks used, and in that instance the teacher photocopied the relevant page from the textbook for distribution to learners on the assumption that not all learners would have their textbooks in class.

In this context the absence of a particular object - the textbook - is arguably as important in constituting transmission practices as is the teacher's concept of knowledge acquisition. Thus the first conclusion arising from this study is that transmission practices are a response not only to discursive but also to the form and availability of particular objects.

Secondly, this study shows clearly that transmission practices are not designed afresh for each lesson. Instead, they are patterned, embodied and *habituated* practices which are institutionally and systemically pervasive, at least in so far as they cut across more than one institution. Habits embody a nexus of social, discursive, spatial and object related practices within a particular social space:

> Habits are particular practices that reflect a history or repeated action. Habits are not just signs, Connerton argues, but bodily practices. Knowledge (of practices, in other words, habits) is, therefore, bodily as well as cognitive. Our social space is made up partly through habitual action, as is a bodily space as well as a cognitive one. Connerton then opens a way of understanding the sense of technological agency by not falling back into notions of a rational individual (agency as conscious action) as the explanation for the social or for action or for agency. Connerton writes: "we remember...through knowledge bred of familiarity in our lived space" [p. 95] (Macgregor Wise 1997 p 72).

Thirdly, social practices are not only constituted but also *changed* at the practical, bodily, material and spatial levels as well as at the conceptual, linguistic and social levels. This was evidenced in this study in the case of lesson 16, in which the teacher structured his lesson in a way which did not conform to the institutional patterns. His resistance to the weak classification of time and space in the school became overt when he refused to allow learners who knocked at the classroom door to interrupt the lesson. For Macgregor Wise, both conformity and resistence

to the rhythms of social space derive from habit:

> ...the hegemonic codings of technology and language, the character of social space, are internal as well as external. Resistance is not the struggle of a pure interior against a domineering external space ...; it is not simply the rebuilding or rejection of tools and machinery; it is not simply the recoding of language; it is not simply thinking radical thoughts. Resistance must take into account our own habits. Habits are not simply repeated action, not simply a repetition or the endless recurrence of the status quo because each iteration, each action, is unique: "Habit *draws* something new from repetition, namely difference" [Deleuze, 1994, p.73]. Within habit lies repetition and difference. The difference of habit (a *positive* difference) is our foothold; it is the margin of manoeuvre. p. 76.

Fourthly, one of the implications of this study is that it suggests a different take on the notion of tacit knowledge. Castells links the notion of tacit *knowledge* to the notion of *habit* (1996 p. 160). This study would suggest that habits involve configurations of spatial, social, discursive and object related practices within a particular social space, or *context*. Any attempt to transfer tacit embodied, habituated practices into explicit knowledge, as Castells aims to do, would have to address the importance of context, understood in this multifaceted way.

Finally, this paper was motivated by an interest in the constitution of the transmission practices of teachers. It adds its voice to a literature which asks why teachers' transmission practices tend to conform to those which pervade the context in which they teach rather than those promulgated by their preservice courses (Ensor 1999). Teacher education tends to concern itself with the discursive and social dimensions of transmission practices in uncontextualised ways. On the other hand, teacher practices relating to the use of time ('time on task'), space ('absenteeism') and objects ('resources') are relegated to the domain of school management where they are conceived of as separate from transmission practices. This is a result of a conceptualisation that conceives time, space and objects as constituting an inert container for the dynamics of social and discursive pedagogic activities. The human and the nonhuman dimensions of transmission practices are pushed apart and relegated to different domains and the ways in which they are interrelated and fused in habituated transmission practices within particular social spaces are rendered invisible. It is not surprising that this kind of teacher education does not adequately prepare teachers to resist the patterning of practices inscribed in the rhythms of the institutions which they enter.

CONCLUSIONS FROM BOTH SECTION ONE AND SECTION TWO

On the basis of this case study, the report makes the following general arguments about the ways in which time/ space practices operate in school management and pedagogy.

Routine time/space habits constitute a framing matrix which gives form to both management and pedagogy. In other words, time/space routines and habits articulate, or provide a connecting web, between management and pedagogic practices. This matrix defines the context of management and pedagogic practices.

Ideas about how to teach and how to manage which are not consistent with existing routine practices are constrained by time/ space practices which provide a pressure towards conformity. Where management and organisational time/ space are weak, pedagogic practices which are compatible with weak boundaries are privileged.

In the case of pedagogy, habitual routine practices are also constituted partly by the availability of objects, or technology, whether it be chalk and blackboard, textbooks or computers.

There is a 'scaling' of both time and space. For example, time is scaled in years, terms, weeks and days (and periods, in the case of secondary schools) while space is scaled at the levels of the environment, the school and the classroom. In the case of a particular school, the habituated time/ space practices may fall anywhere on a continuum from very strong to very weak. However, the strength or weakness of boundaries tends to carry through from one scale to the next.

The significance of the research

This research has both theoretical and practical implications.

Theoretically, the study offers one way of understanding the articulation of school organisation and management practices, on the one hand and pedagogy, on the other. This can be summarised as a tendency to adapt practices to context constituted by routine time/ space and object related practices. This articulation has been weakly understood in school reform literature, resulting in a tendency to focus on either school management or the classroom (Muller 2000).

Practically, this study has implications for both management and teacher education. It suggests that such education as well as any attempt to change practices within schools must engage with the way in which such practices articulate within a particular context.

Section Three:
Student mathematical writing, pedagogic practice and quality learning: a comparative analysis of student productions at two schools: based on a dissertation presented in partial fulfillment of the requirements for the degree of master of education by Heather Collins (March 2001)

This study was prompted by a larger study, the Learner Progress and Achievement Study (LPAS)

> The main objective of the Learner Progress and Achievement Study (LPAS) is to compare the circumstances and experiences of learners who negotiate the school system successfully with those who struggle, in order to identify factors which impact on progress through and achievement within the system. (LPAS Report 1, 1998: 6)

In this study the mathematics notebooks of Standard 10 /Grade 12 students' from two schools (pre-selected as the study schools by the LPAS project) were compared and contrasted. The aim of this part of the study is to address the question: What can students notes tell us about the quality of learning?

The study schools have many similarities: they were both previously administered by the Department of Education and Training; they are in close proximity to each other; their student populations, for the most part, speak the same home language (Xhosa), and the same medium of instruction, English, is used at both schools; and the students at both schools are predominantly working class. The most obvious difference between the two schools is the success rates of students in their final school leaving examinations. If the schools selected had been in different areas and the student populations spoken different home languages, it might have been easy to suggest that the most important differences in the cultures of teaching and learning were due to the differences in race and class that were exacerbated by Apartheid legislation. By examining schools that have experienced the impact of Apartheid in broadly similar ways one is able to look beyond these macro differences and examine micro differences in the structuring of teaching and learning. It allows one to analyse the more fine grained differences in the dominant culture of teaching and learning that developed at each school under grossly similar conditions. This allows one to develop a better understanding of the potential for different forms of education within broadly similar conditions, which is useful in any examination of quality in education.

The concept of quality

The initial part of this study focused on defining the concept of quality in education. The aim was to be able to state the parameters of the problem behind the question more clearly. It became clear that this term is used differently by different people both in relation to education and more broadly, in ways that masked considerable differences. This prompted us to ask why and how the notion of "quality" has become an important concept in education.

The study examined how the notion of quality became embedded in educational knowledge and practices. It traced historically how the notion of quality was transferred from economic

practices. When terms or concepts are transferred from one context or body of knowledge to another there is likely to be a shift in the way the term is conceived. However, there may well be strong continuities between the concept in the former and the latter contexts or practices. In much policy development and research internationally, schooling in general, and concerns around quality schooling, in particular, have been delinked from their social contexts and assessed in terms of managerial or organisational models. This has served to shift a reading of schooling away from a linkage with social development to a more decontextualised reading of schooling that relied on the identification of a ubiquitously applicable set of indicators of quality. However, what counts as quality depends not only on the social context but also upon the values of the evaluator. This indicates that quality can be understood as that which is valued. This, in turn, led to a discussion on the most commonly accepted views on what is currently valued in education. Various contemporary views on the quality of mathematics teaching and learning were outlined. The conclusion reached was that the quality of mathematics teaching and learning depends on the extent to which students are inducted into the knowledge and practices of school mathematics and that forms of teaching and learning are always influenced by macro and micro social features. Any assessment of the culture of teaching and learning needs to take account of both the macro and micro social contexts. Basil Bernstein's (1990, 1996) sociological model of cultural transmission was used as the primary model upon which to base the analysis of the culture of teaching and learning at each school. Bernstein argues that teaching and learning are a form of cultural communication. This allowed for a redescription of the notion of quality in education to an analysis of the differences in the teaching and learning practices at the two schools.

Questions for the study

Once a definition of quality had been established, various sub-questions were posed in an attempt to probe ways in which the students' notes might give clues to the culture of teaching and learning at the two schools and potentially some ways in which quality of learning may be inferred from them. These sub-questions are grouped below.

Linking patterns in student productions to the form of teaching and learning privileged at each school:
- Are there similarities between the student patterns in students' notebooks within each school? If so, what, if anything, can be inferred from these patterns about the culture of teaching and pedagogy privileged within the mathematics classes within each school?
- Are there differences between the student productions at each school? If so, what, if anything, can be inferred from these differences about the culture of teaching and learning that dominates at each school? How, if at all, can these differences be related to the different levels of achievement of students from the two schools in the final matriculation examination?
- To what extent do the patterns in the students' mathematics notebooks resonate with information gleaned from other sources about the form of pedagogy privileged in the Standard 10/Grade 12 classes at each school?

Linking student productions, pedagogic form and quality:

- Do the student productions captured in the mathematics notebooks provide enough of a record of the teaching approaches of the two teachers to enable one to assess the extent to which students are inducted into mathematical knowledge and practices? If not, what other forms or records (for example other student records, observations of forms of interactions in the classrooms) are needed or would be useful before describing and evaluating culture of teaching and learning in each school?
- What, if anything, do the student mathematics notebooks display of the extent and forms of evaluation in the different classrooms? How might these forms of evaluation be related to other forms of evaluation that are not displayed in the notebooks, both in form and extent? What is the relationship between evaluation in general and the induction of students into mathematical knowledge and practices? Is the proportion of evaluation that is captured in the notebooks sufficient to use as a basis to discuss the differential potential for students at each school to be inducted into mathematical knowledge and practices?

Linking patterns in the student productions within each school to student achievement and the form of privileged pedagogy:

- Are there differences between the productions of the more successful and less successful students within each of the schools? If so, are there any patterns in these differences and how might these patterns relate to the dominant culture of learning at each school?
- What, if anything, is the relationship between student achievement and quality of education; or in student success in examinations and the extent to which they are inducted into mathematical knowledge and practices?

Data collection and analysis

Student's notebooks were considered to be a record of the teaching and learning practices at each school. Mathematical notebooks of two "achieving" and "non-achieving" Standard 10/ Grade 12 students were collected in each school, in other words a total sample of eight notebooks of male and female students were analysed. The mathematics notebooks were read as records of the patterns of educational communication at each school, which in turn was conceived of as one aspect of Bernstein's model of cultural transmission.

Daniels (1989: 124) writes,

> [i]n different schools (or cultures) actions and objects signify different meanings. Indeed at a general level it is possible to conceive as cultures or schools as worlds of signs and signs about signs (Hawkes, 1977) ... That which is taken to signify competence in one culture may signify incompetence in another or irrelevance in a third.

It was argued that the student productions are part of the system of signs of the school: they provide visual evidence of the selection and combination of cultural elements that are privileged at each school. Further visual evidence of the dominant culture of teaching and learning was gleaned from and provided by brief descriptions of each school. From these descriptions and from interviews with the matric mathematics teachers, inferences are draw about the dominant patterns of communication, dominant trends in teaching and learning, the dominant educational vision and how staff and students aimed to achieve these visions within

the constraints they operated under. The differences in orientation of the schools were related to patterns in the teaching approaches, which were, in turn, inferred from the patterns of differences in the students' mathematics notes. Differences in these patterns of teaching and learning at each school were related to the potential to position students favourably both in terms of the final examination and more generally to the body of mathematical knowledge and practices. The teaching and learning practices at each school were positioned differently in terms of the form of mathematics privileged by the syllabus and that privileged by the final examination and its potential to induct students into mathematical knowledge and practices.

Findings

There were stark difference in the patterns of teaching and learning at the two schools. At the one school students spent most of their time doing practice examples; towards the end of each section of work general rules and formulae were provided as a summary of the topic. At the other school, students spent most of their time writing out expository notes that served as description of each topic: these students spent little time doing calculations. In the mathematics classes at the former school, learning occurred largely in the form of practicing examples, whereas at the latter school the intention appeared to be for students to understand the topic before doing any practice work. Students at the former school were more successful in their external examinations.

Direct and indirect evidence of formal and informal evaluation in the student's written work was related to the form of teaching and learning dominant at each school. Evaluation was also related to the student's ability to interpret and understand the rules that underlie the production of mathematical writing. The student's notes were related to their individual success rates and to the potential for the school to prepare them for the final examination and induct them into mathematical knowledge and practices. Being inducted into any form of knowledge or activity takes time. Much evaluation of education happens through snap shot testing or evaluation of single lessons. Evaluation of students' mathematical writing allows one to assess how students are inducted the body of mathematical knowledge and practices over time, in a relatively cost effective way.

In conclusion, it was argued that student productions are a partial record of teaching and learning practices. They provide much evidence of the dominant elements of the culture of learning at any particular institution at a particular time. However, unless these are read in conjunction with other records of teaching and learning, such as transcripts of lessons, one cannot with any surety comment on the quality of learning.

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EXPENDITURE: DECEMBER 1999 to FEBRUARY 2 000

Part One: December shortfall:

Two researchers' salaries plus bonuses R26 334 - benefits, UIF, retrenchment costs = 4% R 1 054	R27 388
Travel costs (fieldwork mileage)	R 1 360
Telephone rental x 2	R 145
Phone calls (estimate)	R 500
Purchase of learner notebooks as data	R 800
Printing and photocopying (estimate)	R 400
Total (Part one)	R30 593

Part Two: January to February: Project completion

One senior researcher's salary @R7 337 pm + 4% (benefits, UIF, retrenchment contribution)	R 15 260
One phone rent @R80 pm	R 160
Calls (2 months)	R 450
Printing, photocopying, Postage	R 630
Stationery & computer costs	R 300
Travel (workshops and visits to schools)	R 2 780
Four report back workshops to schools (materials, eats)	R 1 000
Total (Part two)	R 20 580

Total expenditure

Part A	R30 593
Part B	R20 580
Total	R51 173