

Classroom Interaction in Kenyan Primary Schools

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ABSTRACT *This article reports on a study of classroom interaction in Kenyan primary schools carried out as part of a national baseline study for the Ministry of Education and Human Resource Development in 1998. The baseline was designed to provide a comprehensive picture of the quality of primary education so as to allow the Kenyan Government to prioritise expenditure on resources to improve education in the republic and to assess the impact of any interventions. Video recordings of 102 lessons in English, mathematics and science were analysed using systematic observation, discourse analysis and a time-line analysis. The findings revealed the domination of transmissional forms of teaching, thereby providing little opportunity for pupils to question or explore ideas to help regulate their own thinking. The wider implications of the findings for improving the quality of classroom interaction in Kenyan primary schools are considered together with the training needs of teachers.*

Introduction

An important aspect of the recent discussion of the quality of primary education in developing countries has been an emphasis on process as much as input–output measures (see, for example, Lockheed & Verspoor, 1991; Commonwealth Secretariat, 1991; Shaeffer, 1992; Colclough with Lewis, 1993; Stephens, 1997). There has been a growing recognition that teachers and children are central in the effort to raise standards and attention is now turning to pedagogic issues and the need to analyse process factors as well as outcome measures. However, Stephens (1997) argues that within developing countries, one finds a paucity of research data into how teachers actually teach in the classroom. He therefore goes on to suggest that there is a need for much more field data on which to base decisions and formulate policies to bridge the gap between the rhetoric and reality of educational development. Similarly, within the Kenyan educational context, Sifuna (1997) and Abagi (1997) argue that the quality of primary education is increasingly becoming defined in relation to the nature of the education process. This is due to a growing recognition that effective teaching will play a crucial role in developing the quality of primary education.

In the last 15 years, school effectiveness research in developed countries has identified important factors at the school level which contribute to educational attainment, for example, effective school leadership (e.g. Mortimore *et al.*, 1988; Mortimore, 1993). They include positive leadership, monitoring pupil progress, joint planning and consist-

ency in approach, rewards and incentives, and pupil and parental involvement in the life of the school. The studies also began to be applied to data from developing countries and suggested that school effects might be even more important in these countries than developed countries (Heyneman & Loxley, 1983; Heynemann, 1984; Fuller, 1987; Fuller & Heyneman, 1989, Levin & Lockheed, 1993). In Kenya, the influence of the school effectiveness movement can be seen in a major programme to improve the standards of headship through the Primary School Management Improvement Project (PRISM, 1998).

Within the school effectiveness research, attention is now turning to teacher effectiveness because of the wide variation that has been found within schools, which is often greater than the variation between schools (Creemers, 1994; Fitz-Gibbon, 1997; Reynolds, 1998). This body of research identifies key factors of effective teaching such as lesson clarity, instructional variety, effective use of teacher time and high levels of pupil engagement (Borich, 1996). The quality of teacher–pupil classroom interaction is seen as being of central importance: the research suggests it is the single most important factor, accounting for wide differences in outcome measures using the same curriculum materials and purportedly the same teaching methods. Heneveld & Craig (1996) suggest that this level of research will also be crucial in developing countries and point to the gap in the research literature on teacher effectiveness in international education research generally, and in Sub-Saharan Africa specifically.

The Kenyan National Primary Baseline

In response to the aforementioned concerns, and in order to improve the database for the effective planning and management of resources, the Kenyan Ministry of Education and Human Resource Development (MoEHRD) designed and administered a large national baseline for the primary subsector. In its design, the National Primary Baseline (NPB, 1999) drew upon the sampling and data gathering methods used by the UNESCO-sponsored Southern African Consortium for Monitoring Educational Quality (SACMEQ), thereby allowing comparisons with other member states. It provides an analysis of pupil, physical resource, teacher, management, parental and community related factors. The data gathered from this exercise were designed to allow the Ministry to gauge the state of education in Kenyan primary schools in July 1998, the time that the data were collected. The main aim of the data analysis was to provide a clearer understanding of the key issues and problems affecting primary education, in order that strategies for improving education would be clearly focused and prioritised.

In addition to the main baseline study, four special studies were also commissioned covering (i) the inspectorate and advisory services, (ii) parental attitudes and the cost of schooling, (iii) teacher thinking, practice and motivation and (iv) classroom interaction analysis. All the studies were designed to be complementary to the main baseline as well as to each other. In general, the aim of the special studies was to provide qualitative data to help explain trends identified by the main quantitative data, which focused on input/output measures. The classroom interaction study was designed also to generate some useful quantitative data, albeit of qualitative processes, which will help serve as a baseline for future impact studies into teacher development.

The Study

Most of the research into classroom interaction has focused on the industrial world of

TABLE I. Breakdown of observed lessons by subject at Standards 3 and 6

	English	Mathematics	Science
Standard 3			
Urban	8	10	7
Rural	8	10	10
Standard 6			
Urban	8	9	8
Rural	8	9	8

western Europe and the USA. However, small-scale studies of classroom interaction in developing countries (e.g. Rowell & Prophet, 1990; Rowell, 1995), and specifically in the Kenyan context (e.g. Maritim, 1983; Bunyi, 1997; Juma & Ngome, 1998), show the potential use of systematic observation schedules when modified to local conditions.

Systematic observation, discourse analysis and time-line analysis were chosen as the most appropriate methodologies for the study. Because they required the entire corpus of recorded talk to be systematically categorised, they provided a clear and systematic basis for analysing and quantifying the teacher–pupil interactions in the lessons filmed. The three approaches also allowed for methodological triangulation to achieve greater validity and reliability in the analysis of the video data.

The sample used for the video recording was selected to include a representative cross-section of schools from a range of provinces. The provinces included were: Eastern—Machakos; Rift Valley—Kajiado; Central—Kiambu; and Nairobi. Twenty schools out of a total random stratified sample of 187 primary schools following the national curriculum were included in the study. Of these, 10 were urban and 10 rural. A total of 102 lessons were video-recorded, covering English, mathematics and science at Standard 3 and 6, with the average lesson lasting for 30 minutes at Standard 3 and 35 minutes at Standard 6¹. The average class size for an urban primary class at Standard 3 was 38, and 58 for a rural school; for an urban primary school it was 39 at Standard 6 and 43 in rural areas. The national average class size for Kenyan primary schools is 29. Our sample, therefore, reflects the fact that no small schools were sampled and 50% of the schools were urban. Table I gives a breakdown of the number of lessons recorded in each of the three subjects (English, mathematics and science) at Standards 3 and 6 in urban and rural schools.

While most of the teachers in the sample had attended a 2-year pre-service training course, 31% of teachers at Standard 3 had received no initial training in comparison with 10% at Standard 6. Twenty-five percent of the sample was male, and most taught at Standard 6. The sample therefore broadly reflected the national figures for the primary teaching force.

Systematic Observation

In order to systematically analyse the video data, an observation instrument was designed and piloted which drew upon the research literature into effective teaching behaviours and classroom interaction (Galton *et al.*, 1980, 1999; Brophy & Good, 1986; Good &

Brophy, 1991; Borich, 1996). The instrument focused upon teacher question–answer–feedback sequences. It therefore reflected studies of classroom discourse from the developed and developing world which point to the ubiquity of the ‘three-part exchange structure’ (Edwards & Westgate, 1994). In its prototypical form, this discourse format consists of three moves: an *initiation*, usually in the form of a teacher question, a *response*, in which a pupil attempts to answer the question, and a *follow-up* move, or IRF, in which the teacher provides some form of feedback (very often in the form of an evaluation) to the pupil’s response.

The system also recognised the importance of recording how teachers provided feedback to pupil responses to questions. Different kinds of teacher questions were also recorded: that is, whether they were ‘open’ (i.e. defined in terms of the teacher’s reaction to the pupil’s’ answers: only if the teacher accepted more than one answer to the question would it be judged as open) or ‘closed’ (i.e. calling for a single response or offering facts), which research suggests can produce different levels of cognitive demand upon pupils (Galton *et al.*, 1999). The schedule also allowed for pupil initiations in the form of questions and included the use of pupil demonstration as a way of answering a teacher’s question. Pupil demonstration was included as a category together with choral responses as initial observations of local conditions suggested it was not uncommon in Kenyan primary classroom.

In order to achieve clarity in the classroom recordings, an audio-visual technician was employed using high quality video and sound equipment. The possibility of the teachers’ and pupils’ behaviour being affected to some extent by their perceived expectations of the research project and the intrusion of a video camera has to be acknowledged. It is recognised in classroom research, under the rubric of the *observer’s paradox* (Labov, 1994), that the very presence of the observer may alter what is being observed, especially the naturalness of speech and behaviour. Bearing these considerations in mind, the intrusion of the video camera and presence of the research associate appeared to be less of threat than it might otherwise have been once the lessons were in full flow, and this was reflected in conversations with the teachers after the lessons. This seemed to allow for the recording of lessons under conditions not far removed from the naturalistic situation in which the teachers and pupils would normally be working.

Discourse Analysis

In order to triangulate the systematic observation of the teacher question–answer–feedback sequences, a representative sample of 24 lessons, covering rural and urban schools at Standards 3 and 6, in each of the three subjects, was selected for transcription and coding using discourse analysis. The lessons were then analysed using a framework adapted from Sinclair & Coulthard’s (1992) system of discourse analysis.

The descriptive apparatus for spoken discourse developed by Sinclair & Coulthard proposes that lessons can be analysed as having five *ranks*: lesson, transaction, exchange, move, act. A lesson consists of one or more *transactions*, which consist of one or more *exchanges*, which consist of one or more *moves*, which consist of one or more *acts*. The study analysed the discourse at the rank of the teaching exchange, as it is here that Sinclair & Coulthard are confident that the system is most reliable in terms of its linguistic analysis.

Sinclair & Coulthard (pp. 25–31) identify 11 subcategories of teaching exchanges with specific functions and unique structures. The four main functions of exchanges are:

informing, directing, eliciting and checking. The *teacher inform* exchange is used for passing on facts, opinions, ideas and new information to the pupils and usually there is no verbal response to the initiation. The *teacher direct* is designed to get the pupils to do but not say something, whereas the *teacher elicit* is designed to get a verbal contribution from the pupil. The elicit exchange which occurs inside the classroom has a different function from most occurring outside it because the teacher usually knows the answer to the question which is being asked. This accounts for the *feedback* move being an essential element in an eliciting exchange inside the classroom because the pupils, having given their answer, want to know if it was correct.

The 24 lessons were therefore transcribed and coded according to the system of analysis developed by Sinclair & Coulthard to compare the patterning of the teacher-pupil interactions at the central rank of the system: at the teaching exchange. It was thought that the quantification and subsequent patterning of the teaching exchanges would provide a useful means of comparing teaching styles across the three primary school subjects, and that the results could be triangulated with the systematic observation schedule and the time-line analysis of lesson content.

Time-line Analysis

In order to analyse the distribution of teaching and learning activities taking place in all 102 video-recorded lessons, a time-line framework was developed (Wragg, 1993). It was based on the content analysis of the sample of 24 lessons used for the discourse analysis. The instrument was designed to record five main categories of teaching and learning activity:

- *teacher-led recitation*: teacher-directed question-and-answer and teacher-presentation/demonstration;
- *seat work*: pupils work individually on exercises from the chalkboard or a textbook;
- *paired or group work*: pupils are given the opportunity for exploratory talk through problem-solving activities and sustained discussion of their own ideas;
- *pupil demonstration*: pupils are asked to demonstrate the answer to a question: for example, solving a mathematical problem on the chalkboard;
- *reading*: pupils are asked to read from a textbook or the chalkboard.

Time spent on each of the five teaching and learning activities was subsequently quantified in minutes and shown as proportions of the lesson time. The results of the analysis were then triangulated with the findings of the systematic observation and discourse analysis.

To check that the coding, using the three instruments, was consistent, a sampling procedure was carried out with three colleagues from the University of Newcastle-upon-Tyne, UK with extensive experience of classroom observation and discourse analysis. They were given samples of lessons to check against the coding systems. There were no consistent discrepancies arising from their checking of the codings. The use of the three research instruments within the Kenyan context was also validated by their trialling with Ministry inspectors and advisers.

Findings

Ninety lessons were analysed using the systematic observation instrument and 3180

TABLE II. Distribution of coding categories for teacher question–answer–feedback sequences

	Total	Percentage score
Question		
Open questions	66	2
Closed questions	3114	98
Answer		
Boys answering	1173	35
Girls answering	798	24
Choral response	1182	35
Teacher gives answer	87	3
Pupil demonstration	102	3
Feedback		
Praise	468	15
Affirm	2193	69
No reaction	522	16
Pupil questions	36	1

teacher question–answer–feedback sequences were coded, giving an average of 35 sequences per lesson, as shown in Table II. Having coded the lessons using the observation instrument, the coding categories for the question–answer–feedback sequences could be quantified and turned into percentage scores for comparison in order to analyse teacher questioning techniques and their response to pupils' answers.

The analysis shows that there was an overwhelming predominance of teacher-directed question–answer exchanges and that the vast majority of questions were 'closed' (i.e. calling for a single response or offering facts) questions as opposed to 'open' (i.e. calling for more than one answer) questions, which accounted for only 2% of the total. In other words, all 90 lessons, across all three subjects, were largely characterised by the teacher recitation mode where interrogation of the pupils' knowledge and understanding was the most common form of teacher–pupil interaction. In contrast to the domination of teacher questions, pupil generated questions were very rare (see Fig. 2), despite the evidence that such a strategy promotes higher order thinking and higher learning outcomes (Johnson

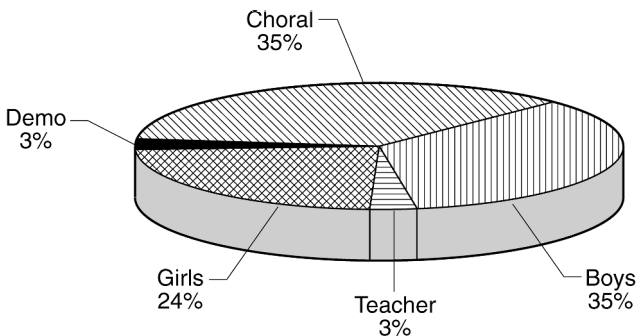


FIG. 1. Breakdown of pupil responses.

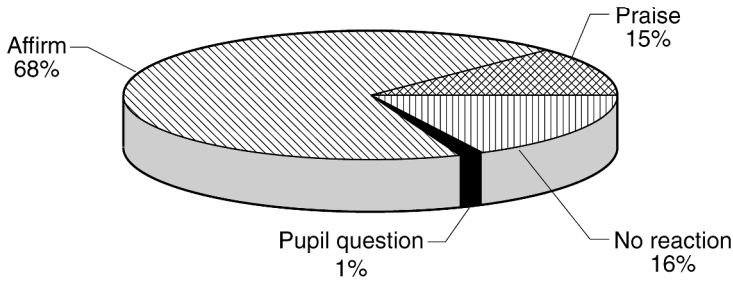


FIG. 2. Teacher feedback reaction.

& Johnson, 1990; King, 1991; King & Rosenshine, 1993; Barnes & Todd, 1995). The pupil responses were analysed by gender and choral response as shown in Fig. 1. Over a third were answered by boys or by choral response, with girls answering a quarter of the questions. Within the aggregation of the data, however, there was a great deal of individual variation between teachers. In a small percentage of cases, teachers would ask pupils to demonstrate an answer or answer the question themselves.

As Fig. 2 shows, the feedback teachers gave pupils was often in the form of an affirmation (i.e. the teacher simply affirms that the pupil's response is correct by nodding, repeating the answer, saying 'Yes', 'OK', etc.) or the teacher made no reaction to a pupil's response and went on to something else. Teacher praise of a pupil's responses either in words ('fine', 'good', 'wonderful', 'good thinking') or by expressing verbal affirmation in a notably warm, joyous or excited manner accounted for only 15% of the feedback, despite the importance that research into effective teaching places on such behaviour (Brophy & Good, 1986; Good & Brophy, 1991; Borich, 1996).

Discourse Analysis

A subsample of 24 lessons (covering the three subjects at Standards 3 and 6 from rural and urban schools) was analysed using the framework adapted from Sinclair & Coulthard's (1992) system of discourse analysis to triangulate the results of the systematic observation.

As with the systematic observation instrument, the discourse analysis framework provided a clear and systematic basis for analysing the classroom discourse in all 24 lessons because, for the majority of the time, whole-class interaction centred on the teacher was the main activity. Table III shows the aggregate of the distribution of teaching exchanges and percentage scores for all 24 lessons.

Fig. 3 shows the patterning of the teaching exchanges based on the percentage scores for all 24 teachers teaching across the three primary subjects (English, mathematics and science) at Standards 3 and 6. The graph shows that there was little overall variation in the patterning of the teacher exchanges used by the 24 teachers as they taught across the three subjects, and that teacher presentation (teacher informs) and teacher-directed question-and-answer (teacher elicits) dominated most of the classroom discourse, accounting for 82% of the total teaching exchanges.

The ubiquity of the three-part exchange structure (IRF) in all 24 lessons meant that they were all predominantly conducted within the teacher's frame of reference. Because of the teacher's claim to knowledge of the subject content, and right to control the pacing

TABLE III. Overall results of discourse analysis

Tch Exch.	Teacher inform	Teacher direct	Teacher elicit	Pupil elicit	Pupil inform	Check	Re-initiate	Listing	Reinforce	Repeat
Total exch.	282	76	768	10	38	52	26	4		24
% score	22	6	60	1	3	4	2	0.3		2

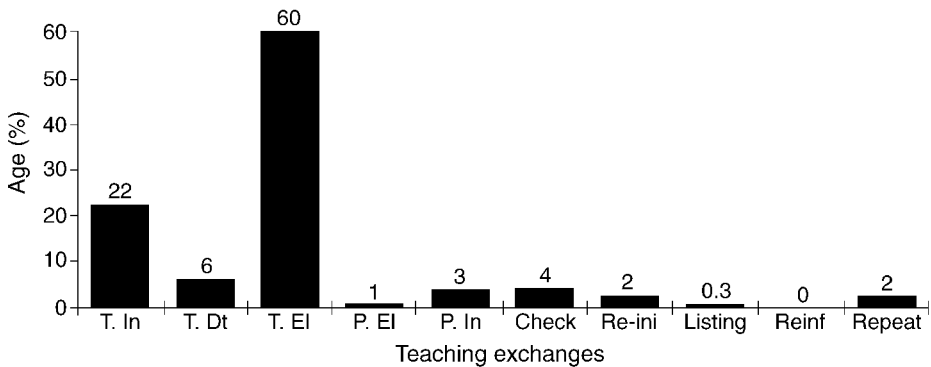


FIG. 3. Patterning of teaching exchanges for all 24 lessons.

Key: T. In. = teacher inform, T.Dt. = teacher direct, T.El. = teacher elicit, P.El. = pupil elicit, P. In. = pupil inform, Re-ini. = re-initiate, Listing = listing, Reinf. = reinforce, Repeat = repeat)

and sequencing of its transmission, pupils rarely managed to impose their own relevance outside the teacher's frame of reference. This is reflected in the type of moves they were usually restricted to within the classroom discourse, often being denied access to initiation and evaluation moves, resulting in the very low level of pupil questions. It also minimised the amount of responsibility that the pupils were able to take for their own learning in all three subject areas, as they were usually dependent on the teacher's sense of relevance.

As with the systematic observation, the discourse analysis of the teaching exchanges suggests that all 24 lessons were conducted through teacher-led recitation, where interrogations of the pupils' knowledge and understanding was the most common form of classroom interaction. The following extract, taken from a Standard 6 English lesson in a rural school looking at possessive nouns, is typical of the IRF discourse style used by all 24 teachers across the three subject areas (the *moves*, Initiation [I], Response [R], Feedback [F], make up the three-part teaching exchange, which in turn is made up of *acts*: acc = accept; ack = acknowledge; ch = check; cl = clue; com = comment; con = conclusion; d = direct; e = evaluation; el = elicitation; i = inform; l = loop; m = marker; ms = metastatement; n = nomination; p = a prompt; rea = react; rep = reply; s = starter; z = aside).

Exchanges		Moves	Acts
Teaching	T Complete these sentences (<i>reads</i>) 'Is this your coat Stephen, I feel sure it must be yours' I'm doing the first one for you then I'm asking a question (<i>repeats sentence</i>) what is that what do you do in these sentences you have written (<i>reads</i>) 'See I've told you, I feel it must be yours' what is this word yours to you according to the grammar it is called as	I	s el el
2	P A person thing	R	rep
3	T Yes more than that	F	e
4	T One more thing I will give you the coat belongs to Stephen isn't it (<i>reads</i>) 'Is this your coat Stephen, I feel sure it must be yours' so the personal thing what the coat belongs to Stephen so it is called as girls' dresses boys' hats miners' lamps do you remember standard 5 junior English	I	s el cl el
5	P (chorus) Yes	R	rep
6	T Give me the part of speech	I	el
7	p Apostrophe	R	rep
8	T Apostrophe is what apostrophe is the punctuation mark to show possession isn't it then we use the apostrophe which is the punctuation mark to show the possession then we learnt these words under possessive nouns do you remember possessive nouns possessive nouns do you remember now	I	s el
9	P (chorus) Yes	R	rep
10	T Ladies' handbags miners' lamps boys' shoes where you put the apostrophe to show possession so here we're dealing with possessive nouns	F	com

This section illustrates clearly the teacher's pervasive use of the three-part, IRF, exchange and the elaborate nature of many of her sequences of elicits, which are chained together to form a lengthy transaction. The extract also illustrates how the teacher often uses *starter* acts (Turns 1, 4 and 8) as a matter of routine in opening moves. These are similar in function to what Edwards & Mercer (1987) call 'cued elicitations' where she provides advance warning that a question is imminent and provides some clues as to how to answer it.

We also see her 'reformulate' her questions throughout the sequence in an attempt to arrive at the answer she desires, by simplifying and building into its restatement some of the information needed for the acceptable answer and where the ingredients of an appropriate answer might lie. The transcript reveals the way in which teacher-directed talk of this kind creates the impression of knowledge and understanding being elicited

TABLE IV. Percentage scores of the distribution of teaching and learning activities at primary Standard 3

	English	Mathematics	Science
Teacher-led recitation	67	57	58
Seat work	30	37	35
Paired or group work	5	0	5
Pupil demonstration	3	6	0
Reading	0	0	2

TABLE V. Percentage scores of the distribution of teaching and learning activities at primary Standard 6

	English	Mathematics	Science
Teacher-led recitation	66	55	73
Seat work	23	41	19
Paired or group work	6	0	5
Pupil demonstration	0	3	2
Reading	5	1	1

from the pupils, rather than being imposed by the teacher. The extract also reveals the rapid pace of the teacher's questioning and the predictable sequence of recitation. There is a large amount of teacher elaboration through the use of *starters* and the rephrasing of questions, in contrast to the brief responses expected from the pupil, which show a high incidence of simple recall. The pupils' responses are evaluated and commented on by the teacher, who has the right to determine what is relevant within her pedagogic agenda. The extract also reflects the common use of choral responses to teachers' questions as revealed in the analysis of teacher question-answer-feedback sequences.

Generally, in all three subjects, teacher questioning was dominated by recall questions, as revealed in the systematic observation, making up over 90% of the questions. The discourse analysis of the 24 lessons therefore supports the findings of the systematic observation schedule, which also revealed the pervasive use of teacher-led recitation which left little room for pupil initiations.

Time-line Analysis

The time-line analysis system proved effective in analysing the distribution of teaching and learning activities in the whole corpus of 102 video lessons. The total amount of time spent on the five teaching and learning categories (teacher-led recitation, seat work, paired or group work, pupil demonstration, reading) in each lesson was systematically recorded in minutes and calculated as a proportion of the overall lesson time. The distribution of each of the five teaching and learning activities could then be calculated within each lesson, aggregated and turned into percentage scores for comparison across subjects and teaching stages. Tables IV and V show the overall percentage scores of the time-line analysis.

Figs 4, 5 and 6 compare the percentage distribution of each of the five activities in English, mathematics and science lessons at Standards 3 and 6.

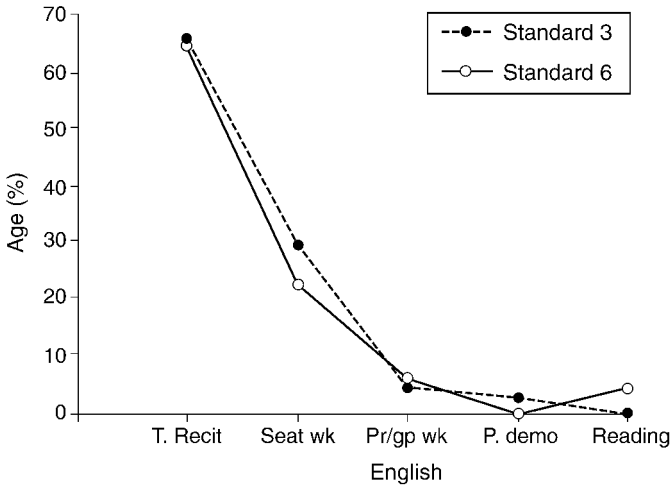


FIG. 4. Distribution of teaching and learning activities for English.

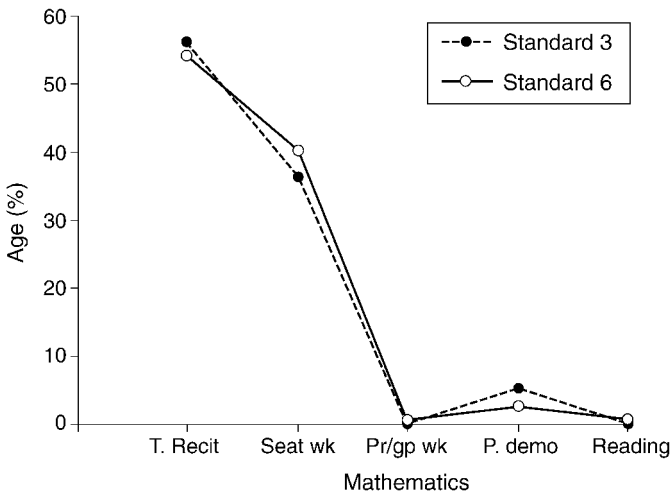


FIG. 5. Distribution of teaching and learning activities for mathematics.

The time-line analysis therefore shows little variation in teaching styles across all three subjects at both stages of the primary curriculum. The results also show the domination of teacher-led recitation, occupying over half of the lesson time, where interrogations of the pupils' knowledge and understanding was the most common form of teacher-pupil interaction, thus validating the findings of the systematic observation schedule and discourse analysis. The findings also support an earlier, smaller scale study by Montero-Sieburth (1989) on the use of instructional time in Kenyan primary schools. Montero-Sieburth found that 70% of class time was taken up with the teacher presenting information through lectures, asking closed questions, writing notes on the board while pupils copy them down and checking homework. Overall, the results of both studies

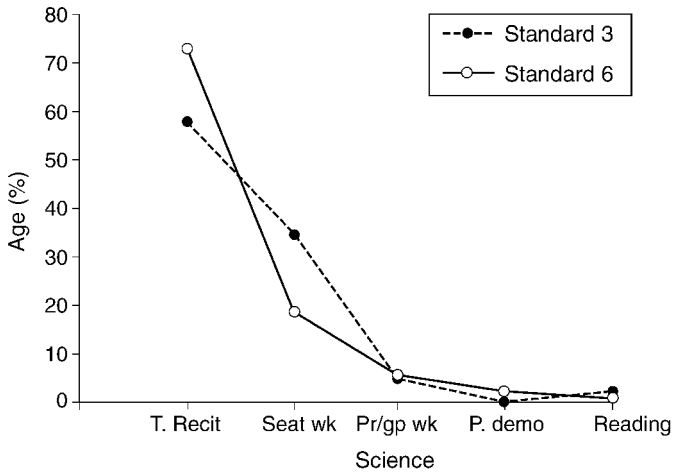


FIG. 6. Distribution of teaching and learning activities for science.

suggest that there was little opportunity for the pupils to engage in active forms of learning through paired or group work, or pupil demonstration, and that there was little sustained reading, mainly due to the lack of textbooks, particularly in the rural areas.

Summary of Findings

In summary, the findings of the systematic observation, discourse analysis and time-line analysis reveal that the prevailing pedagogy in Kenyan primary schools, in English, mathematics and science at Standards 3 and 6, is dominated by the transmission of facts. While there were some examples where this was done more effectively than others, most lessons were dull and repetitive. The teachers themselves sometimes appeared bored and uninterested. Classes were overwhelmingly quiet and passive but with a strong apparent focus on the teacher. Pupils strove to be chosen to answer, but there was little attempt to vary the style and purpose of the questioning strategy, or to progress from the stylised repetition of memorised information.

Discipline in classrooms was very good. Despite large class sizes, teachers were not spending time on control and command and there seemed to be an unspoken respect for the teacher. Sifuna (1997) traces the tradition of strict discipline within Kenyan primary schools back to British colonial days. He suggests that the passivity and self-discipline of the pupils is both a strength and a challenge to the Kenyan education system in trying to get the pupils to take some responsibility for their own learning, and to think and work independently.

There were few examples of interaction between teacher and pupils that extended or even encouraged higher order thinking because of the domination of the recitation mode, where typically the teacher asks a series of pre-planned questions, initiates all the topics, and rarely interacts with the substance of the pupils' answers except to evaluate them. As a result, 'real' discussion, in which there was the exploration of a topic and interchange of ideas to enable higher order thinking, seemed to be rarely practised. There was virtually no pupil-to-pupil interaction or evidence of pupil self-reliance, or of pupils being encouraged to generate their own questions or form some tentative hypotheses. The quality of the verbal feedback by teachers also seemed to discourage pupil contributions as it was generally lacking in genuine praise.

Discussion and Conclusions

In conclusion, the findings of the systematic observation, discourse analysis and time-line analysis reveal that teaching in Kenyan primary schools, in English, mathematics and science at Standards 3 and 6, is dominated by transmissional forms of teaching; these findings are also replicated in other developing countries (Rowell, 1995).

It is also apparent from the video evidence that the quality of the classroom interaction is hampered by a lack of teaching resources and the poor physical condition of classrooms. In addition to the need for teacher development in Kenyan primary schools, there is also a need for more teaching aids and classroom resources to promote active forms of learning. In many classrooms, particularly in the rural schools, the chalkboard was often the main teaching aid. Generally, the chalkboard was effectively used: almost all the teachers filmed organised and divided up their boards in a manner that made it possible for the observer to follow the progress of the lesson and for the pupils to copy illustrations and answer written questions. The general lack of instructional materials was particularly acute in the science teaching during practical work as none of the public schools had laboratories (the exception being a private school in Nairobi).

The evident lack of textbooks in many of the classes filmed, particularly in the rural schools, was a major concern. This often resulted in the teacher writing notes and assignments on the chalkboard, which meant more time was taken in accomplishing the task at hand and less in teacher–pupil interaction. It also limited the amount of homework that could be given. No information and communication technologies (ICT), such as tape-recorders, radios or computers, were used in the 102 recorded lessons; again, probably reflecting the lack of availability, despite the valuable contribution they can make to the teaching and learning process (Moseley *et al.*, 1999).

The classroom conditions captured in many of the videos also seemed to hamper the quality of the classroom interaction. While most of the classes had a traditional seating arrangement with all desks facing the chalkboard, many of the classrooms were small, resulting in overcrowding. Many of the classrooms also had a distinctive ‘action zone’ where a group of actively participating pupils were seated. The teacher talked to them more and asked them questions most of the time. Those at the back of the room hardly participated in the classroom learning and this was exacerbated in large classes. Clearly, such poor facilities need to be tackled to promote comfortable and conducive learning conditions and facilitate greater interactivity in the classroom, in addition to the need for more teaching materials and the development of teachers’ pedagogic skills.

The findings of the current study are also supported by another of the baseline studies into classroom practice and teacher motivation in Kenyan primary schools (Juma & Ngome, 1998). This study looked at a sample of 38 lessons across English, mathematics and science at Standards 3 and 6 and found that the most prevalent methods of teaching were: lecturing punctuated by a question and answer approach; chorus class recitation; pupils copying from the chalkboard; written exercises and teachers marking pupils’ work. They also found gender variations in the amount of interactions teachers had with boys and girls. Overall, varied classroom activities across the three subjects and two stages were hardly observed.

Juma & Ngome (1998) attribute such findings to poor teacher training and motivation, poor school management, a lack of textbook and related teaching and learning materials, overcrowded classrooms, and the fact that teachers are constrained towards didacticism by examinations for the Kenyan Certificate of Primary Education (KCPE), which are narrow in what they test. In other words, the pressures to get through the syllabuses and

cover the required material often meant that teachers overemployed teacher-directed methods at the expense of creating opportunities for pupils to take more responsibility for their own learning. Sifuna (1997) and Abagi (1997), in their observations of primary education in Kenya, reach similar conclusions and place their discussion within the wider political context of educational policy which encourages passivity on the part of policy-makers and educators.

In looking for other explanations for the apparent lack of differences in the way teachers teach across the three primary subjects, it could be that teachers are inherently conservative in their approach as change risks failure in the eyes of their pupils, parents, headteachers and inspectors, and this is not something most teachers take lightly. Tharp & Gallimore (1988, p. 191) suggest that because innovation and change always cost time, anxiety, and uncertainty, it is essential that teachers have supportive interactions with peers through modelling and feedback if the 'recitation script', as uncovered in the present study, is to be changed to 'new repertoires of complex social behaviour necessary from responsive teaching'.

Teachers' conservatism in teaching styles, of the kind found in the current and Juma & Ngome's (1998) study, may result from the images of teaching which are culturally transmitted and deeply internalised (Calderhead & Robson, 1991; Sifuna, 1997). Teachers may therefore find it difficult to imagine that knowledge, information and skills could possibly be transmitted in any other way than through teacher-led recitation. Lortie (1975), in exploring the socialisation of teachers, highlighted 'apprenticeship by observation', a process in which experiences of being taught for thousands of hours as a pupil internalises a model of teaching. Sifuna (1997) argues that these socialising factors have a greater influence in the Kenyan primary school context, where over 30% of teachers are untrained. Given these powerful cultural influences, it is therefore not surprising that Kenyan primary teachers, particularly those with little training, should draw upon such implicit knowledge, especially when faced with the problem of managing large numbers of pupils in the classroom.

Such research and commentary suggests the need for more powerful teacher education programmes which get novice and experienced teachers to challenge their beliefs and practices through classroom observation and critical reflection to make this invisible pedagogy more visible (cf. Bramald *et al.* [1995] for further discussion). Research suggests that such programmes must involve the exploration of alternative teaching and learning strategies which will help to raise the quality of teachers' interactions with their pupils, and which will promote wider communicative (and hence more cognitively demanding) options to those in which pupils are often mere listeners or respondents. One such example of this is peer-coaching (Tharp & Gallimore, 1988; Joyce & Showers, 1995) where in-service education is followed by extensive practice and coaching in the classroom in which observation and feedback focuses on specific features of teacher behaviour such as the recitation script.

To improve the quality of teachers' interactions with their pupils, research suggests that there is a range of alternative strategies which teachers can incorporate into their classroom practice. For example, Nystrand *et al.* (1997) advocate that teachers pay more attention to the way in which they evaluate pupil responses so that there is more 'high-level evaluation' whereby teachers incorporate pupils' answers into subsequent questions. In this process, which they term *uptake*, they suggest that teachers' questions should be shaped by what immediately precedes them so that they are genuine questions. This is in contrast to recitation, where there is usually a prepared list of *test* questions with pre-specified answers from a list of 'essential' information against which a pupil's

knowledge can be checked. Through this process, teachers can engage pupils in a probing and extended discussion in which they signal to them their interest in what they think and not just whether they know and can report what someone else thinks or has said. Therefore when high-level evaluation occurs, the teacher ratifies the importance of a pupil's response and allows it to modify or affect the course of the discussion in some way, weaving it into the fabric of an unfolding exchange. They therefore chain together teacher questions and pupil responses so that the discourse gradually takes on a conversation-like quality, with teacher and pupils taking turns in speaking, thereby encouraging more pupil-initiated ideas and responses and consequently promoting higher-order thinking.

Similarly, Dillon (1994) and Wood (1992) suggest that in order for pupils to take the initiative, the balance of control needs to be shifted in their direction, the achievement of which demands teachers paying attention to their use of questions and alternative conversational tactics to recitation. Their alternative discourse strategies involve 'low control' moves from teachers whereby instead of asking frequent questions, they give their own thoughts and ideas in the form of statements in which they speculate, surmise, interpret, illustrate, or simply listen and acknowledge what pupils have to say. These alternatives to teacher questions, which include telling, suggesting, negotiating and listening, are designed to free pupils to give their own views, to reveal their knowledge and areas of uncertainty, and to seek information and explanation through questions of their own. Once the pupils have helped to shape the verbal agenda, teacher questions are more likely to involve a genuine attempt to explore their knowledge and to promote 'real' discussion. This would involve the exploration of a topic, an interchange of ideas and questioning by pupils, with pupils and the teacher following up on each other's statements. Teachers also need to build in opportunities for paired and group work. This will provide pupils with the opportunity to interact with their peers on problem-solving activities in which they can ask as well as answer questions.

Overall, therefore, the findings of this study suggest the need for more powerful school-based teacher development programmes incorporating classroom observation, coaching and feedback in the use of effective teaching behaviours, alongside improved classroom conditions and teaching resources. They also suggest the need for more longitudinal studies to investigate the effects of such interventions on teachers' thinking, classroom practice and the attainment and motivational levels of pupils. The dissemination of such findings will have implications not only for developing countries in sub-Saharan Africa and beyond, but also for teacher development programmes throughout the developed world aimed at improving the quality of classroom interaction.

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NOTE

- [1] It should be noted that the theoretical age of a Standard 3 pupil is 8. However, the NPB shows that while less than 50% of pupils complete primary school, 68% of Standard 6 pupils have repeated their year once and 30% have repeated it twice or more. The average age of a Standard 8 pupil is therefore 17, not 11.

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