TEACHERS' IDENTIFICATION OF EXCEPTIONAL CHILDREN AND A STUDY OF THE TEACHING STRATEGIES WHICH THEY ADOPT TO MEET THE NEEDS OF THESE GROUPS OF PUPILS

by

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ABSTRACT

This thesis sets out to examine how teachers cater for the bright pupils and slow learners in first year mixed ability classes in five comprehensive schools.

Teachers were asked to nominate bright pupils and slow learners in their classes using categories on a class profile instrument. The same teachers were observed teaching these classes. Observations covered most academic subjects on the timetable: RE, French, science, history, English, mathematics, geography, music and integrated studies. Over a period of a month the teachers' talk and questions, the pupils' responses, and the tasks set to pupils were each analysed for cognitive demand using specially adapted or newly devised instruments.

The study suggests that very little cognitive stimulation takes place in these first year mixed ability groups. Most verbal transactions have to do with class management, and of the remainder the majority are information-giving or information-seeking. Tasks, too, are mainly of a lower cognitive order.

In only two of the five schools did it appear that teachers made significantly higher cognitive demands on the perceived bright pupils than on other pupils. Though there is some evidence to suggest that bright pupils and slow learners may receive a disproportionately large amount of interaction with teachers, there was virtually no evidence to suggest that teachers tailor tasks or teaching strategies to cater specifically for the needs of these two groups in a mixed ability context. Most teaching is undifferentiated whole-class teaching aimed at all the pupils and not at individuals.

Some small-scale comparative studies were carried out in banded groups, and also in a primary school, a middle school, and in an accelerated set leading to GCE 'O' level examinations in the 4th year.

An important outcome of the thesis is the development of an Analysis of Classroom Tasks proforma for the secondary school. The size and scope of the main study, covering over 200 single periods by 36 teachers in 8 subject disciplines, suggests that the results may have some degree of generalizability.

PUBLICATIONS RESULTING FROM THIS THESIS

Sections of the data from this thesis have been subjected to peer-group criticism by appearing as articles in referred journals or in books as follows:

i) Articles

'Remedial education in the regular classroom', Remedial Education, vol. 13.3, 1978.

'Teaching bright pupils in mixed ability classes', Brit. Jnl. Educ. Res., vol. 4.2, 1978.

'RE: a suitable case for mixed ability treatment?', Brit. Jnl. RE, vol. 2.2, 1979.

'Provision for bright pupils: three years' progress?', Cambridge Jnl. of Educ., 1980.

'Thinking in science lessons', School Science Review, December 1981.

'Provision for slow learners: three years' progress', Forward Trends, vol. 8.4 1982.

'A question of stimulation', Gifted Education International, vol. 1.1, 1982.

ii) Contributions to books

'The demands by RE on pupils' thinking' in John Hull (ed.) New Directions in Religious Education, Falmer Press, 1982.

'Mixed ability teaching in the Humanities' AND

'The demands made on pupils' thinking in mixed ability' in M. K. Sands & T. Kerry (eds.) Mixed Ability Teaching, Croom Helm, 1982.

'Mixed Ability Teaching' in L. Cohen, J. Thomas and L. Manion, Handbook of Educational Research in Britain 1970-1980, NFER-Nelson, 1982.

'Demands made on pupils by classroom tasks' in E. C. Wragg (ed.), Research in Classrooms, Croom Helm (forthcoming).

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PREAMBLE: LIMITATIONS AND DEFINITIONS

Limitations

This thesis describes work which took place in a mixed ability context and across a range of subject areas. It is concerned with what happens to exceptional pupils, both bright and slow.

This is a wide brief; and it is inevitable that there should be differing degrees of emphasis on each of the various concerns. In proctice what this means is that:

... mixed ability teaching is used as the context within which to examine teachers' practice

... treatment of bright and slow pupils is set against the way in which teachers handle the 'middle band'

... the bright pupils receive more of the attention of this research report than do the slow learners

... among subject areas those singled out for more detailed treatment are RE and combined science.

These decisions about emphasis are essentially pragmatic. A thesis can cover only so much ground. The emphases reflect, in part, the personal interests of the researcher; but they were also considerations of special concern to the progress of the Teacher Education Project, under whose auspices the work was carried out.

Definitions

Definitions of terms such as 'mixed ability' and 'slow learner' are hammered out in the text. But the definition of what constitutes a 'bright pupil' is more emotive. In another context (ie the training materials which emanated from the research) I have advocated an inclusive definition. The bright pupil is one who has an IQ in the region of 130 or above, or who shows a special ability in any ONE field of academic work regardless of IQ. These youngsters were once found in the upper streams of grammar schools. Though selection has gone the pupils are still with us.

The word 'bright' and 'able' are used interchangeably in the text. This helps to make the work more readable and less repetitive.

In the Review of the Literature, however, it has to be remembered that other definitions and terms may be adopted by the authors reported, especially when the source is American. Words like 'gifted' and 'talented' predominate. The IQ cut-off point may be at the 140 level. Generally, in these sections, I have tried to use terms which represent the predilections of the authors concerned. This is not a wholly satisfactory state of affairs: but it represents the problem of semantics shared by all who work in this field.

I have not concerned myself withthose who might be rated at 'genius' level, but with that able portion of the school population which can be found in almost every school except the smallest and most deprived.

Acknowledgements

Though they are not repsonsible for its short-comings, I am conscious of the debts I owe to the many people who have been instrumental in seeing both this thesis and the Project work to its completion. Professor J F Eggleston has served bolth as my tutor and as Project evaluator. Sue Meakin and Evelyn Towlerton were invaluable research assistants to the Teacher Education Project. Many colleagues at the Nottingham University School of Education helped the Project unstintingly. My long-suffering wife suffered long.

CHAPTER 1: INTRODUCTION

THE SHERWOOD PROJECT: THE CONCEPT

The investigation discussed in this thesis had its genesis in the Teacher Education Project, a four-year research and development Project funded by the DES. This DES Project had as its terms of reference the generation of innovative materials and methods for teacher training both at the initial and in-service levels.

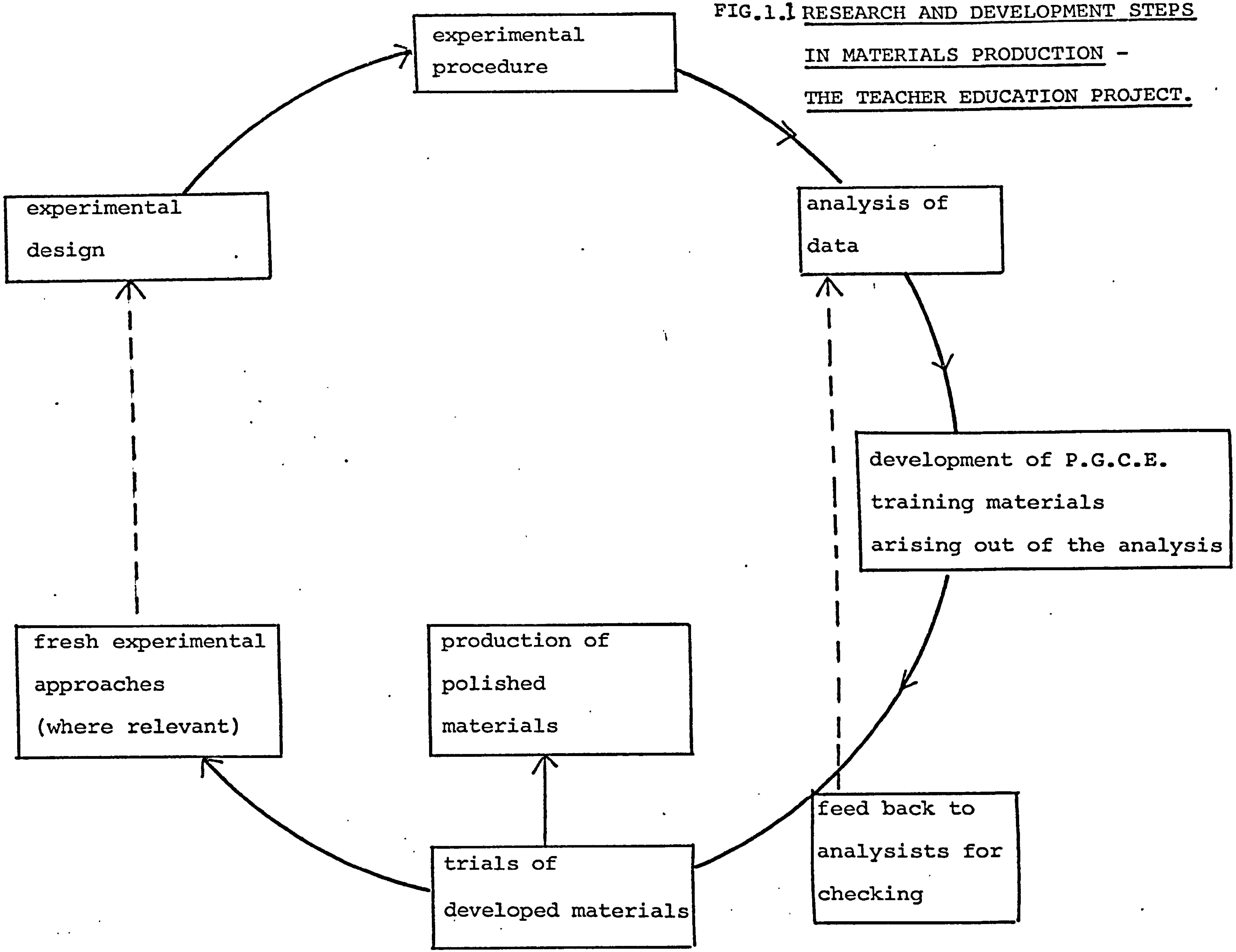
One of the earliest tasks of the Teacher Education Project was to decide those those areas into which its energies should be put. These numbered seven: class management, mixed ability teaching, the bright pupil, the slow learner, the teaching skills of questioning and of explaining, and language across the curriculum.

As the methodology for working the Project personnel decided that in each of the seven areas listed, there should be a period of research into issues of current concern. This research should be translated into appropriate training materials, which were in turn to be trialled, evaluated, and amended. Figure 1.1 is a model of the procedures adopted in each of the seven areas.

This thesis is an account of some of the investigations which served to underpin the materials development in the areas of mixed ability teaching, the teaching of bright pupils, and the teaching of slow learners. It reports research in first year mixed ability classes in five comprehensive schools. Though none of the schools was located in the present Sherwood Foreest area, the Nottingham base of the Teacher Education Project suggested it would be apt to code-name the present investigation The Sherwood Project.

It is this Sherwood Project which is now described in some detail. In chapter 2 the basic procedure for the investigation is outlined; and the specific research questions are listed in chapter 3. Along with some preliminary investigations in chapter 4 and a review of the literature in chapter 5, these form the backdrop to the study. The research methods and

FIG.1.1 RESEARCH AND DEVELOPMENT STEPS IN MATERIALS PRODUCTION - THE TEACHER EDUCATION PROJECT.



analysis procedures are reported in chapters 6 and 7. Chapters 8 and 9 look in some details at the study schools, their staff and pupils. Findings from the research form chapters 10 - 17 inclusive; while the implications of these are are discussed in chapter 18.

CHAPTER 2

The Sherwood Project: a brief outline of the underlying problems and methods of the research

As has been indicated in the first chapter, the starting point for this investigation was in the practical concern of a research and development project designed to improve teaching skills for both initial trainees and qualified teachers on in-service courses. As such it had three broad concerns:-

1. To investigate the nature of the learning which actually takes place in classrooms, with special reference to mixed ability contexts and what happens to exceptional (bright and slow) pupils within them.

2. To examine dimensions of teaching style or strategy in that context, and to assess their appropriateness and effectiveness.

3. To translate the findings of the investigation into effective training materials.

The context of the research, then, tended to centre around the younger pupil in the comprehensive school. It will emerge in future chapters that mixed ability work is most widespread in the first and second years of comprehensive schools, so it is precisely in this context that one is able most effectively to explore the first concern outlined above. The fundamental question here was clearly:

> What kinds of teaching and learning take place in mixed ability classes?

But as soon as one finds oneself in a mixed ability context one has to ask one's self:

> How do the kinds of teaching and learning which take place in mixed ability classes affect those pupils whom teachers regard as the bright pupils and slow learners in their groups?

The exploration of pupils' learning and the analysis of teaching style and strategies depend upon quite sophisticated techniques. During the early period of the research little or nothing of any consequence was known about much more fundamental questions concerning mixed ability teaching than these (this theme is taken up in the Review of the Literature). Consequently it seemed appropriate to gather some immediate information about the way in which schools organized for and taught mixed ability classes.(1) To this end a set of case-study documents was compiled to explore teachers' and schools' practice.

These case-study instruments were compiled by the author, and scrutinized and amended by two experienced research assistants and a Visiting Fellow seconded to the Project. In this way the instruments were refined so that questions were economical in form, clear and unambiguous. The case study instruments were piloted by several volunteer teachers. Only minor amendments were needed.

In their final form the instruments consisted of

1) A Headteacher Questionnaire.

2) A Teacher Interview Guide.

3. A Head of Department Interview Guide.

4. A Lesson Observation Guide.

Copies of these documents are included in the Appendix to the thesis.

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1. Our localized investigation was conducted simultaneously with the NFER's recently published national survey. The findings were remarkably similar. (Reid 1982).

These four documents adopted a semi-structured approach.

The Headteacher Questionnaire concentrated on school organization for mixed ability, using mainly open-ended questions. This was mailed to 70 schools in the East Midlands which were used by Nottingham University for the placement of student teachers on practice.

At the same time tutors in the School of Education were asked to select a teacher who was, in their opinion and experience, a good practitioner of mixed ability teaching. This teacher was to be observed at work using the Lesson Observation Guide and then interviewed using the Teacher Interview Guide. The teacher's head of department was also to be interviewed, using the Head of Department Interview Guide. These documents were semi-structured, i.e. they provided a framework of questions that allowed for an open-ended exploration of the theory and practice of mixed ability teaching in the department and classroom selected.

Using the findings from these four documents it was possible to piece together an accurate picture of how mixed ability classes were organized at a school level and taught at a classroom level in the immediate East Midlands area. Some of the findings from these studies have been written up elsewhere [e.g. Dooley, Kerry and Smith (1977); Bastiani (1978)]. In the 4th chapter, however, there is a review of the findings which are most pertinent to the Sherwood Project itself.

These early investigations, then, provided the springboard from which it was possible to conceive of the more detailed and sophisticated study which is reported here. In fact, these early investigations tended to confirm a number of misgivings about mixed ability teaching, notably

... that it may fail to cater in any appropriate specific ways for bright pupils or slow learners,

... that the 'flexibility' which teachers claim is part of the skill in handling a mixed ability class does not in practice include sympathetic handling of the three teaching modes (whole class teaching, groupwork and individualized learning), and

... that cognitively, demands made on pupils are relatively slight.

With these concerns in mind it was decided that what was needed was to use new, adapted or existing research techniques in order to explore as accurately as possible the "thinking demands" made by teachers upon pupils in mixed ability classes in the early years of the comprehensive school.

Thinking can be measured; not directly, but through the evidence of spoken and written words. This case is argued in some depth on page 218f. Therefore, a basic research design emerged as follows:

1. Adopt a number of first year secondary mixed ability classes.

2. Observe lessons across eight academic subjects - viz. RE, French, Science, History, English, Mathematics, Geography and Music.

3. Follow each class in these subject areas for approximately one month.

4. Record all teacher-pupil verbal transactions, i.e. teacher talk, teachers' questions and pupils responses or initiations.

5. Record all tasks set to pupils in the lessons observed and, where possible, examples of their responses to them.

A variety of recording methods were adopted or devised to enable this data collection to take place. These are described more fully in Chapter 6 and examples are included among the Appendices. At this stage it is sufficient to say that, once recorded, each segment of the data (teacher talk, teachers' questions, pupil responses and initiations, tasks set by teachers and pupils' responses to tasks) could be coded for level of cognitive demand. Methods for carrying out this coding are also discussed later, in Chapters 6 and 7.

Potentially, therefore, it was possible to extract from the recorded data information concerning cognitive demand from eight subject areas taught by eight different teachers in each of five schools to about 150 pupils. In practice two of the schools taught RE, history and geography as Integrated Studies, so that only six teachers were involved across the eight academic areas studied. In practice, therefore, information covered

5 schools
9 subject groupings
36 different teachers
135 pupils

In addition, small-scale comparative studies were carried out, using the same subject groupings, in a fourth year middle school class, a primary school class and an 'O' GCE accelerated set. Some studies were made, too, of the teaching of RE and science in a comprehensive school using broad banding techniques.

Overall, this represented in the five schools of the main sample alone:

230 lessons covering
213 hours of teaching and learning, involving
15,068 teacher talk transactions,
6,928 teacher questions
18,961 pupil responses and initiations, and
640 tasks set by teachers.

These figures indicate the very sizeable sample of classroom life analysed, including almost 41,000 verbal transactions between teachers and pupils. In the main sample below, given that the schools, teachers and pupils are representative of comprehensives as a genre (and the case for this will be argued in due course), then any emergent findings from the Sherwood Project must be taken seriously as important pointers to the needs of initial and in-service training of teachers - and to underpin training materials was, it will be recalled, the purpose of this investigation.

Of course, the cognitive data described so far paints the picture of the mixed ability context in which the teaching and learning with which we are concerned had its being. How can it be discovered whether bright pupils or slow learners are given special attention or are the object of specific strategies by our sample of teachers?

In practice, three elements were built into the research methodology which between them ensured that the fate of the bright and slow learners could be tracked in some detail.

First, before observations in classrooms began, the teachers were asked to identify those pupils who, in their opinion, fell into these two categories. The use of the teachers own perceptions and identification is discussed in Chapter 9.

Secondly, the observer got to know the names of all pupils in the class before beginning to record information about verbal transactions. Thus it was possible to indicate, where applicable, which pupils responded to the teacher and were thus involved in cognitive transactions.

Thirdly, a careful note was taken of the teaching modes employed during observed lessons. Whole class teaching was obviously aimed at all pupils, and its suitability and effectiveness in terms of cognitive demand could be assessed, therefore. Groupwork and individualized learning could likewise be studied in specific relation to the pupils at whom these modes were directed.

The purpose of this research was to paint the fullest picture possible of cognitive demand in lessons and to try to deduce whether and how teachers stimulated cognition in pupils of high, average and low abilities. Though some of the research techniques were relatively well-tried, others were specially developed for the purpose. The uniqueness of the investigation, however, consists as much as anything in the multi-faceted image of cognitive demand which it enables one to create.

Before examining the detail of the individual measures and cognitive demand it is appropriate to lay out the broad canvas. This will be done in three stages. First the research questions implicit in this chapter will be elaborated. This will be followed by an analysis of the findings from the preliminary investigations mentioned earlier. Thirdly, the literature of the various areas of concern will be reviewed.

CHAPTER 3

The Research Questions

Emergent from the practical concerns of teacher training emanating from the Teacher Education Project were a number of more specific questions about mixed ability teaching and its effect upon exceptional pupils at each end of the ability spectrum. These questions included the following:

> What proportion of the schools used by Nottingham University's School of Education for initial training have mixed ability classes?
>
> How do these schools organize for mixed ability teaching?
>
> Which subject departments are most likely to favour a mixed ability approach? And why?
>
> Which subject departments are most likely to reject a mixed ability approach? And why?
>
> How are pupils allocated to mixed ability classes?
>
> How is the progress of pupils recorded in mixed ability classes?
>
> What do heads and teachers see as the benefits of mixed ability teaching?
>
> What do heads and teachers see as the problems of mixed ability teaching?
>
> Is mixed ability as a form of school organization likely to increase, decrease or remain stable in popularity?
>
> How are bright pupils identified on entry?
>
> How are slow learners identified on entry to the mixed ability comprehensive school?
>
> What special provisions are made for bright pupils in schools where mixed ability classes operate?
>
> What special provisions are made for slow learners in schools where mixed ability classes operate?

How do heads and teachers view the education of bright pupils in a mixed ability context?

How do heads and teachers view the education of slow learners in a mixed ability context?

What kinds of teaching occur in mixed ability lessons?

Within these lessons how do teachers cater for the special needs of exceptional pupils?

More specifically, what proportion of time is spent by teachers in each of the three main teaching modes:

whole class teaching
groupwork
individualized learning?

What signals do teachers give pupils in their classes about the kinds of thinking they require in lessons?

What cognitive demand is made on pupils by teachers' talk?

What cognitive demand is made on pupils by teachers' questions?

At what cognitive level do the pupils respond to these questions?

What cognitive demand is made on pupils by tasks set by the teacher?

Do bright pupils, slow learners or average pupils respond to teachers' verbal stimuli or tasks at different cognitive levels from one another?

Do bright pupils make more demands on teacher attention than average pupils?

Do slow learners make more demands on teacher attention than average pupils?

What proportion of teacher attention has to be given to managing or administering the mixed ability class as opposed to teaching it?

What implications do the answers to the foregoing questions have for

handling bright pupils in mixed ability classes?
handling slow learners in mixed ability classes?
the training of teachers in the skills of mixed ability teaching?

Because of the applied nature of this enquiry it seemed most appropriate to summarize the ground to be covered by the research as a series of questions to be investigated, rather than as hypotheses to be tested. This had advantages of open-endedness which suited both the methods of investigation described, and the use to which the findings would be put.

CHAPTER 4

Some preliminary investigations described

It was not possible to pursue all of the questions listed in the previous chapter in equal depth. Nor was it possible within the context of a limited-life regional project such as the Teacher Education Project to do a national survey (the NFER was engaged simultaneously on such a survey but its results were not expected for some years). For our purposes we needed accurate information and we had to collect it quickly. The longer term emphasis and resources were therefore put into the questions bearing directly on cognitive demand. Meanwhile, the four-part research package already described would give working answers to the more general questions of procedures and problems in mixed ability classes. A number of studies were undertaken based on the data generated by the research package, and the most pertinent of these are now described in the sections which follow.

1. Heads' views of the procedures and problems of mixed ability teaching

The Headteacher Questionnaire, mentioned above and described in the Appendix was mailed to 72 East Midlands schools used by the Nottingham University School of Education for teaching practice placement. The first 40 replies, i.e. those received by the agreed deadline, were subjected to analysis. This number represents a response rate of 55.5%. The paragraphs which follow give a general breakdown of the findings about the nature and extent of mixed ability, and of some of the problems and advantages of this form of organization.

'Mixed Ability' as a descriptive term

'Mixed Ability' may be used as a generic term to describe any class which is not based on streaming by ability. Four definitions of mixed ability can be detected in the answers of the Headteachers to the questionnaire:

(a) Classes which represent the full ability range of the school intake.

(b) The upper classes of newly formed comprehensive schools where the pupils are mainly those from the original secondary modern or grammar school.

(c) Classes in the upper school where pupils have opted for a certain subject, often on the basis of a 'guided choice'. Thus the class serves as a mixed ability base but individual subjects are to some extent setted by pupil/teacher choice.

(d) Unstreamed classes in selective schools.

Where possible all but (a) have been excluded for the purpose of describing the extent of mixed ability teaching by subject (section (i)).

A further qualification must be noted. Although the comprehensive schools all make provision for remedial work, there is little uniformity of practice. All but two schools expressly mention withdrawal of pupils from classes, but this refers both to total withdrawal into Remedial Classes and partial withdrawal from a varied range of subjects (see Section 4). For some pupils basic remedial work replaces classes in specific subjects e.g. French. Occasionally Headteachers draw a further distinction between groups for remedial pupils and special groups for slow learners - though the basis for the distinction is not made clear. It would therefore appear that some schools - and some subjects - have a wider range of ability in their classes than others. The picture may change rapidly; teachers (especially those of maths , science and modern languages) may be given the option of setting or banding during the school year, if this is felt to be beneficial.

The term 'Mixed Ability' apparently means different things to different people and in different contexts. Yet even when differences of interpretation are masked there is a striking similarity in what Headteachers have to say about mixed ability teaching in general.

(i) The Extent of Mixed Ability Teaching

(a) Replies were received from 30 comprehensive schools, 6 independent/ direct grant schools, 2 grammar schools and 2 sixth form colleges. Since comprehensive schools make up the greater part of the sample and are dealing with a wider range of ability than selective schools, their answers form the basis of this and the following account of mixed ability teaching.

Of the 30 comprehensive schools which replied, only 2 were purpose-built. Eight had developed from former secondary modern schools, 9 had developed from former grammar schools, and 11 had developed from an amalgamation of grammar and secondary.

Five schools (all former grammar schools) were not teaching any mixed ability classes. Two taught mixed ability classes but did not indicate in which years or subjects. The remainder (23) all taught mixed ability classes in year 1, but the extent of mixed ability teaching then decreased gradually (Fig. 4.1).

Fig. 4.1. Extent of Mixed Ability Teaching by School Year*

	1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.	6th yr.
Number of schools teaching mixed ability classes.	23	21	17	15	15	*

*In view of the variety of provision at this level it was decided to omit the 6th year from this section of the analysis.

Two schools which taught mixed ability classes in year 1 only were both newly reorganised grammar schools with their first year of comprehensive intake.

The most obvious decline in mixed ability teaching occurs after pupils have made their choice of subjects at either the end of the 2nd or 3rd year of comprehensive schooling. This can be seen more clearly from a study of mixed ability teaching by subject (Fig. 4.2).

Figure 4.2

Analysis of mixed ability teaching by subject in thirty comprehensive schools in the Nottingham ATO as at June 1977

	1st year	2nd year	3rd year	4th year	5th year
Mathematics	18	8	4		
Physics	3	2	5	2	2
Chemistry	3	2	5	2	2
Biology	1	2	5	2	2
Combined Science	19	16	4	2	2
English	19	16	9	5	4
French	18	9	3	1	
German	2	1	1	1	
History	8	8	11	1	1
Geography	9	9	11	2	2
Humanities	10	9	5	6	6
Classics	1	1			
Religious Studies	12	10	11	9	9
Arts, Crafts, Metal/Woodwork, Creative Arts	17	16	12	4	4
Drama, Sound and Movement	4	4	3	2	2
Music	16	14	11	3	3
P.E.	12	9	7	6	6
Technical Studies	5	5	3		
Design	3	3	3	3	3
Home Economics	4	4	3		
I.D.E.	2	2			
Environmental Studies				1	1
Social Education				2	2
Computer Studies				1	1
Careers				1	1
Total number of schools in the sample using Mixed Ability teaching in the year indicated (see Fig. 1)	23	21	17	15	15

(b) The analysis by subjects revealed certain common patterns:-

Years 1-3

Maths and French - Mixed ability classes were most common in the first year. There was a noticeable decline in the extent of mixed ability teaching in the second year, and very little mixed ability teaching after that.

Combined Science - Taught by most schools to mixed ability classes in years 1 and 2 but partly replaced by mixed ability classes in Physics, Chemistry and Biology in year 3.

Humanities/History-/Geography - All 3 taught by ⅓ of the schools (or more) to mixed ability classes in the first 3 years, but with a shift of emphasis towards the separate subjects in year 3.

Music, Art, Crafts, Religious Studies - Each taught by more than half the schools in mixed ability classes in years 1 to 3.

English - Taught in mixed ability classes by the majority of schools in years 1 and 2 but with a noticeable decline in year 3.

Years 4-5

15 schools continued to teach pupils in mixed ability classes in years 4-5 but the number of subjects involved in each school was generally small. 6 taught only one subject to mixed ability classes. (Fig. 4.3.)

Fig. 4.3. Number of subjects taught to mixed ability classes in years 4-5

Number of Subjects	1	2	3	4	5	6	7	8	9	10	11	12
Number of Schools	6	0	3	2	1	0	2	0	0	0	0	1

Of the subjects taught in mixed ability classes, the most popular was R.E. (in 9 schools), followed in descending order by Humanities (6) and P.E. (6); English (5); Art/Craft (4); Design (3) and Music (3). Other subjects were taught in mixed ability groups by one or two schools only. Only 3 schools taught more than three academic subjects to mixed ability classes in years 4-5. Two of these were the purpose-built comprehensive schools which both taught all the science subjects in mixed ability classes. One of them also taught German and Computer Studies. The third school taught French to mixed ability classes in the 4th year and History, Geography and Humanities in years 4 and 5.

(c) Teachers benefited from contact with a wider ability range. They realised the need to treat their pupils more as individuals with different strengths and weaknesses. This necessitated rethinking teaching methods and course content. It encouraged teachers to co-operate with colleagues in team teaching and it helped to engender enthusiasm.

(d) A minority of Heads mentioned standards of academic achievement and claimed that they improved either for some of the pupils or for all.

(ii) The Problems of Mixed Ability Teaching

The problems of mixed ability teaching centred around slow and fast learners, teacher qualities, teaching techniques and resources.

(a) Over half the Heads mentioned the problem of coping with the whole ability range in one class. Several felt that the extremes of the ability range - especially the bright children - were not being fully catered for. A few mentioned that the problem of range of ability was particularly acute in certain subjects, e.g. modern languages, maths and science.

(b) Over half commented either on the qualities needed in a teacher of mixed ability classes or on the need to adopt a new attitude to teaching and different teaching techniques. Several felt that older teachers especially might feel at a disadvantage. They had more status to lose by replacing proven traditional methods with uncertain new ones. Vision, determination, hard work and good organisation were required. The weak teacher was likely to do a worse job in a mixed ability class than in a traditional teaching situation. Teachers needed to develop, or to be trained in, specific techniques such as record keeping, group teaching, individualized learning and preparation of learning units.

(c) Approximately a third mentioned the difficulties of providing suitable facilities, adequate resources and the necessary ancillary staff.

(d) Several Heads commented on the amount of time and effort demanded of teachers of mixed ability classes, both in the classroom and in preparing work and keeping records.

(e) Other areas described as 'problematic' were timetabling, the size of class, the need for improved methods of assessment, and the existence of pockets of resistance among teachers or parents.

(iii) The Likely Development of Mixed Ability

No Headteacher envisaged an appreciable increase in mixed ability teaching in the near future. Two said they wished to extend it into the third year and 2 saw it as likely to decrease. The majority thought it would stay at the same level. Several described the position as unsettled with some subject areas wishing to develop, and some to cut back, on mixed ability teaching. Subject departments seemed to be allowed a fair degree of discretion about adopting or not adopting mixed ability teaching. Only three Heads expressly mentioned the demands made by the external examination system, though there were some indications that this pressure lay behind much of the policy making on mixed ability.

2. Some lessons taught to mixed ability classes

In order to examine more closely the mixed ability context outlined by the Heads it was arranged to observe a number of lessons taught by teachers who had been nominated as effective teachers of mixed ability classes. These nominations had been made by experienced teacher trainers and their help was enlisted to observe and give specialist comment on some of the lessons. The observers used the Lesson Observation Schedule to record their comments. A selection of these case-studied lessons is described in the paragraphs which follow and some attempt is made to utilize the observer's comments in each case as pointers to the criteria of effectiveness used. In each case the observer interviewed the teachers after the lesson using the Teacher Interview Schedule. Malcolm Rees' exposition of his own work is quoted in full as one of the best examples of these interviews.

The findings reported in the next few sections of this chapter are based upon 21 detailed case-studies in which the teachers nominated by tutors as effective at handling mixed ability classes were observed and interviewed using the Lesson Observation and Teacher Interview Schedules. In all but two cases their Heads of Department were also interviewed (two nominated teachers were the heads of their own departments).

From the samples quoted here, and others like them, and from the related interviews with teachers, it was possible to construct a list of criteria of effectiveness in mixed ability teaching as seen by teachers. This section ends with a glance at these criteria and more detailed analysis emerges throughout this chapter.

An English Lesson

This was a double lesson of seventy minutes duration for first-year secondary pupils on the theme of story-telling about how animals got their present shapes.

The class (1u) takes place in the drama studio, and the lesson begins with the pupils sitting in a circle on the studio floor. Mr. Black explains that he is going to depart from his usual practice of using friendship groups. Instead he is going to assign individuals to special working groups within which each child is going to tell a story written last week. The stories are to be told not read. The groups are carefully assigned, though the pupils are not made aware of it, to include more and less able pupils as well as some average youngsters. The rest of the first session of this double lesson is now taken up with the groupwork described.

At the halfway stage in the lesson the pupils are recalled into the whole-class situation. Mr. Black says that a couple of weeks ago he visited a class in a local primary school. Mr. Black had told the primary pupils about 1u's story-writing. The primary pupils had each written a request for a story about an animal of their choice. Now Mr. Black is going to hand these requests to individuals in class 1u. The secondary pupils will then write about how the named animal got its shape. Completed stories will be taken back to, and used in, the primary school. A typical request reads: 'My name is Sarah, aged 9½. I would like a story about how the dog became like that'.

Mr. Black, having set up the task, splits 1u into groups again, the groups discussing the kinds of stories they might write. Some of the groups are not apparently motivated, and some individuals race around and play boisterous kicking games. After about ten minutes of this the whole class is told to sit down. Mr. Black shows the pupils a set of

Young Puffin books called 'How the Whale Became' and other stories by Ted Hughes. These stories are to serve as exemplars for the children's writing, he explains.

The class now settles to write, and continues in a task-orientated fashion until another twenty minutes have passed and the bell goes for the lesson to end.

A Social Studies Lesson

This double lesson, using the 'Man: a course of study' materials, is for a first-year group and held in the social studies base, with many resource materials to hand.

The pupils sit singly, in pairs or in groups according to their own choice, with the exception of two girls who are separated because of a long-standing feud.

Starter materials for the lesson consist of worksheets of information and questions. Several concepts, notably adaptation, co-operation, life-cycle, communication and structure, are being studied with particular reference to animals of the African savanna.

The lesson begins, however, with internal matters such as notices, for which total silence is required against threat of punishment. Then pupils begin work on the materials, with the teacher occupied initially explaining the task and resources to pupils who were absent last lesson.

The pupils progress at their own pace and are at different points in the material. The talk which goes on quietly is thus sometimes task-orientated, but is more often just conversation between friends about mutual interests outside the class. A careful study of individuals shows that a minority work consistently hard, most concentrate spasmodically, while a small minority does very little. On the other hand, pupils do help one another, for example with work missed on a previous occasion, and they are encouraged in this by the teacher.

During the lesson the feud between the two separated girls continues silently and in sign language across the classroom. At one point the teacher is interrupted to hand out fluoride mouthwashes, a present from the school dentist.

The atmosphere of the class is relaxed. Casual comments and even jokes pass between pupils and teacher as the lesson proceeds. Not all of these are relevant to the task. Two boys are not working at all, still. They finally attract attention, and are given detention. This seems to have little effect on work output.

The children continue in this vein until the lesson nears its close. It is the last lesson of the day - and draws the comment from the teacher that behaviour and effort could have been better. The lesson ends with a formal whole-class session of clearing away and checking the return of equipment.

The two miscreant boys stay behind for detention: a three-minute stint of clearing up waste paper and tidying the resource cupboard.

A Geography Lesson

The theme of this fifty-five minute lesson is Egypt, and the setting is a traditional box classroom. It forms a part of a series of lessons, and some work has been done already using colour slides taken during a school cruise.

Fifteen minutes at the beginning of the lesson are used to finish off pieces of leftover work. The main purpose of this is to while away a little time until the textbooks required for the lesson can be returned from another classroom. However, the pupils need varying lengths of time to tidy up these loose ends, and the noise of those who have finished further inhibits the progress of those who have not.

When a suitable moment presents itself, and pupils have done this catching up, Mrs. James gives a talk on the Nile to the whole class, emphasising the need for irrigation and the alluvial problems. She draws attention to various important points in the textbook, while the children follow their usual practice in this class of making notes in the backs of their exercise books.

When this talk is over (and it is essentially a revision of information supplied in a previous lesson) the teacher sets the following task to be completed in these pupils' exercise books: 'Imagine you are an Egyptian farmer. Try and explain your way of life to a foreign visitor.' The children are instructed to include, as part of their reply, information about crops, weather, irrigation, the size of fields and clothes. In addition, the children are to illustrate their answers. All the relevant background information to answer the question is available from the textbook. The remainder of this lesson is spent on the task set.

A French Lesson

This lesson to second-year pupils takes place in a classroom space which is open to a corridor, and lasts forty minutes.

At the beginning the teacher insists on silence and calls the register. This administrative task is followed by a set of clear instructions about the pattern of the lesson and the immediate task.

In a whole-class session the teacher revises the French numerals, conversation in shops ('Je voudrais un kilo de ...', 'Ça fait combien?'), and some common or useful expressions ('Où va-t-il?', 'Il va à l'école'). The sense of these is illustrated and reinforced by use of the blackboard and of a flannelgraph with figurines.

The class divides into prearranged groups, each led by a pupil nominated by the teacher. Appropriate realia are given to each group, and around these everyday objects each group invents conversations involving counting, number games, simulated shopping transactions, and question and answer sequences.

The transition from classwork to group work proceeds without a hitch. Once groups are formed the teacher monitors each, passing quickly from one to another. Participation within groups is high; but most of the tasks are consolidation or revision. During the lesson only one or two new words emerge. Pronunciation is passable; but keenness and fluency are noteworthy.

For the final few minutes of the lesson the groups are called back together and a whole-class question and answer session precedes the bell.

A Religious Education Lesson

Malcolm Rees is the teacher nominated as a 'good' teacher of mixed ability R.E. classes. He is teaching year two; the theme is Poverty. Venue is a traditional box classroom, the desks arranged to group pupils into units of about four. This room is part of a suite of three religious education rooms continuous one with another and housing between them an extensive resources collection to service the school's own topic-based syllabus and assignment sheet system. Throughout the lesson pupils come and go between rooms, locating resources discovered from the classroom catalogues.

Malcolm Rees spends part of his break setting up the classroom for a group of nine pupils to see a filmstrip, while the remaining pupils will work independently in pairs or fours. The first two minutes of the lesson is a general address to the class: 'Work on, on your own. Don't make too much noise. At first, I shall be teaching the filmstrip group'. The nine pupils were self-selected, having decided that they had reached an appropriate stage in the topic to tackle the filmstrip. To devote his attention to commentating on the filmstrip Malcolm Rees has to be quite determined in ignoring spasmodic requests for help from pupils at other stages of work. Most, however, are self-motivated:

looking up resource catalogues, reading found materials, writing and drawing in their books, hunting for and sticking in illustrations.

Malcolm Rees' session with the 'population' filmstrip group involves not merely putting words to pictures, but throwing out hints about lines of enquiry (work out how many people there will be in twenty years' time), introducing technical terms and raising moral and social issues.

Most pupils work steadily, know the system and get on willingly. There is a small amount of noise not related to the task and Malcolm Rees is aware of this. He finishes the filmstrip, sends off the nine with new ideas, and homes in on the less motivated. He uses questions to expose their inadequacies in the work they claim to have covered and informally but firmly lets them know the microsleep is over. Circulating now, he urges pupils to use materials not copy them and discusses variables in predicting population sizes.

Two minutes before the end of the lesson he organises the return of resources.

Comments on the Case-study Lessons

During the research into effective mixed ability teaching 21 teachers and their departments were studied. Most were observed at work using a lesson observation guide. Of the nine lessons in the humanities recorded using this research instrument five have been reported here, one from each clearly defined subject area represented in the humanities sample. The lessons comprise, it is suggested, a fair cross-section of the work of more able practitioners who teach mixed ability classes.

Of course, the sample is too small for the purposes of generalisation. However, some basic patterns do emerge from these case-study lessons.

Whole-class teaching may be used throughout a mixed ability lesson. Even where it is combined with other teaching modes it is commonly used to enable a teacher to begin and end lessons tidily and with the attention of the whole class. Much that passes for individualised learning in fact consists of identical tasks set to all pupils but carried out with some concession to variations in pupils' work rate. (Whether these are appropriate strategies is discussed elsewhere in this book.)

There are no obvious provisions in the case-study lessons for the more able pupils nor even, more surprisingly, for the less able.

Discipline can go astray even for effective practitioners. Good class management (having equipment ready as in the R.E. lesson or prearranging groups as in French) may overcome the main problems. There may still be some pupils who talk too much, about the wrong things. Some time-wasting is evident through this excess of chatter, and with the tacit approval of the teacher. The ten-minute interlude in mid-lesson in English and the wait for geography textbooks exemplify the last point.

Some of the tasks set are rather traditional, though others have potential for imaginative response. The proportion of time spent on consolidation and reinforcement in some lessons suggests a view of education dominated by factual knowledge; and this view is explored elsewhere in this thesis.

Noteworthy Features of the Case-studied Lessons

Observers of the lessons collected in this study were asked to record noteworthy events or impressions from the lessons described. The following is a selection of their comments.

The English Lesson

'Most noteworthy was the skill of the teacher in structuring different language activities at different times: in first having the pupils talk about something previously written; in having groups allocated by ability so (hopefully) different kinds of talk would be heard by each child; in having introduced a real audience for their writing; in having introduced a set of exemplar and stimulus books; and in allowing time for talk, listening, reading and writing within the lesson.

'The teacher was not concerned to control "messing about" during the lesson because (he said) things worth saying are said in such moments. From an observer's point of view many children were simply uninterested at these times and did nothing.'

The Social Studies Lesson

'The most noteworthy feature was the relaxed atmosphere and good humour. Second was the absence of deviant behaviour; though the long-running feud between the two girls went deeper than the lesson itself.

'The teacher frequently threw things (rather than passing them) - booklets, pens, scrap paper. This seemed to be a sign of the relaxed atmosphere and of the treatment of pupils as mature and responsible ... He rarely raised his voice, and did not need to ... He spoke openly of the distinction between sexual urges and sexual technique in humans as being examples of things which were respectively innate and learned. Though one girl listener was embarrassed the others were not.'

The Geography Lesson

'The teacher has an essentially sympathetic attitude which encourages and elicits responses on every lead. Deviant pupils are brought into the lesson rather than disciplined.'

The French Lesson

'The efficient organisation and the teacher's personality, which was calm, authoratitive and easily accepted by the class, stood out.'

The Religious Education Lesson

> 'With this system of teaching in topics there is no beginning and no end to each lesson in a conventional sense. The pupils have to be largely self-motivated. Quality of teaching was high - and many individual pupils had problems dealt with. Nevertheless, some pupils had no teacher contact during the lesson.'

Summary of the Observers' Comments

Clearly there is the implication in these comments of a classroom atmosphere which is open, facilitating and child-centred. With the most able practitioners this can be combined with high standards of classroom organisation and with the absence of serious deviant behaviour in pupils. Sometimes a price, in the form of minor deviance or time-wasting, must be paid for this gain in the affective domain. No doubt it is partly this atmosphere which is so often referred to in ill-defined ways in the literature of mixed ability teaching as 'the social gain' of this form of organisation.

A Teacher Articulates his Philosophy

Something of the flavour of the observers' comments is taken up in the following reconstructed rationale of his work recorded by Malcolm Rees, the teacher of the R.E. lesson reported in this chapter. How does Malcolm Rees view his own teaching?

> "I try to treat all pupils as individuals, especially when I mark work. I want my classroom to have a relaxed atmosphere free from conventional labelling. Flexibility of teaching method is the keynote in mixed ability classes like these; but all the time one's aim is to increase understanding by all the pupils of the main ideas that underlie the syllabus. They're important, that's why we, as a department, have adopted them; and they're interesting too. Conventional objectives in mixed ability teaching are all very well, but social education is central to all teaching methods. Encouragement of independent thought is probably the most crucial issue in education, mixed ability or streamed.

In a mixed ability class one can't teach from the front. The pupils must work in groups, and I never talk to everyone at once for more than about ten minutes. A teacher needs humour, and a bit of action (drama for example) makes a lesson come to life. Most of the groups I use are small: I put four pupils together for written work, maybe six for discussion. The groups are self-selected, and friendship is the criterion. Mind you, boys tend to stay with boys and bright pupils with bright pupils. The work in this department is largely based on topics. Our resources are extensive, and the worksheet is a basic tool for each topic. They're not rigid. Pupils don't work through the questions in order and won't necessarily answer all the questions. I use every kind of audiovisual hardware and software. The blackboard is mainly a notebook, it's been superseded by the overhead projector. My biggest problem is finding reading material for slow learners.

We've been using a topic system for four or five years now in this school so we know what works and what doesn't and pupils are quick to show signs of boredom if we pick one that isn't good or use it too long.

Assessment of pupils is undertaken using a variety of measures, and results are recorded in literal grading on a workcard. We use tests, class written work, and ability, attitude and attainment as criteria for judgement. Assessment is continuous, but we don't have any kind of objective standard in mind against which we measure pupils. The range of ability is wide, from non-readers to potential A-level candidates. All this means mixed ability teaching is very demanding on time, preparation time mostly and seeing pupils individually. We use the school technician a lot but there's little other help or advice available, though the local advisory service runs a resource collection.

I like mixed ability teaching, and have grown to like it more. Students in training should be told firmly that all pupils are individuals. One must not be dominant, must use pupil feedback; above all, take risks and admit mistakes. Maybe the case for mixed ability teaching in religious education is clearer than it would be in maths or even English. I suspect my attitude would be different if the subject were a linear one with a lot of examination pressures. As it is, religious education is about changing people's behaviour not scoring x per cent."

3. A note on methods of analysing the case-study data

In the previous section some sample lessons were described, the comments of some observers recorded and self-analysis of one teacher quoted from the Teacher Interview Guide. The general method of analysing the data from the 21 case-studies was, however, as follows:

The present writer had overall responsibility for interpreting all the findings, but to eliminate (as far as possible) any bias in his perceptions he got together pairs of experienced teachers and/or tutors. The individual sections of the enquiry were given to these pairs of analysts who worked over the material on the three Guides. Finally, the two analysts and the author agreed an account of the findings based on their independent analyses. These negotiated accounts are used as the basis for the rest of this chapter.

4. SLOW LEARNERS AND BRIGHT CHILDREN THE TEACHER'S VIEW

As part of the Teacher Education Project's co-ordinated case studies 21 teachers and 20 heads of department responded (using the Teacher Interview Guide and Head of Department Interview Guide) to questions relating to teaching slow learners and bright children in mixed ability situations.

(a) What yardsticks do TEACHERS employ in order to measure the range of attainment of pupils within taeir mixed ability classes? (19 responses)

(i) SLOW LEARNERS. No teacher mentioned the use of specific testing procedures but a wide variety of 'rules of thumb' were produced. Most common was Intelligence Quotient, with IQ scores of 70, 70-75, 75, 80 and 85 being mentioned as critical points below which pupils need special educational treatment. Reading appeared as a critical indicator of ability six times: 'non-readers' 4 times; 'poor reading ability' and 'pupils with reading age of 7 years' once each. Two teachers used writing as a yardstick, one feeling that a slow learner was one who was 'hardly able to write at 13 years', the other a pupil 'unable to write at all' /the exact implication of the word 'write' in these contexts was not possible to discern/. A few teachers thought in terms of a particular proportion of the school population as slow learners and spoke of 'D pupils', the '80th percentile' and 'the bottom 25%'. Many of the measurement devices were rather more crude and some teachers defined their slow learners as 'the upper ESN', 'just above remedial level', 'remedial pupils' or 'those who shouldn't be here in the first place'.

(ii) BRIGHT CHILDREN. Again, no specific testing procedures were mentioned though teachers often had a clear 'objective measurement' in their heads when measuring the brightness of their pupils: this was the ability to pass the O and A level public examinations. For these teachers bright pupils were those who were 'S level candidates', 'potential A level candidates', or 'likely to get O level without trying'. A natural comparison to this measuring device was the one which spoke of bright pupils as potential university entrants, and three teachers were emphatic that brightness indicated potential to gain Oxbridge entry. Intelligence Quotient featured again, with figures of 125 plus, 135 and 140 plus as possible levels of significance. Two teachers used reading ability as a guide, one suggesting a reading age of 13-14 years on entry to secondary education as a guideline. Two teachers talked in proportional terms, bright pupils being 'A' pupils or the top 25%. Again, there was a cluster of very vague diagnostic guidelines: bright children are 'the highly articulate', the 'very able', the 'very intelligent', the 'very bright'.

(iii) SUMMARY. The twenty-one teachers exhibited a considerable range of yardsticks but showed little agreement with each other over their methods of diagnosing slow learners and bright pupils in mixed ability classes. Two teachers did not answer the question relating to the range of attainment within their classes, one saying that he couldn't and the other side-stepping the issues. Generally teachers were more concerned to measure ability than attainment, the exception being the pre-occupation with examination success referred to above.

(b) <u>How many TEACHERS report themselves as having problems in mixed ability classes caused by the presence of pupils of widely different levels of ability.</u>
(21 responses)

(i) <u>POSITIVE RESPONSES</u>. Nine teachers reported positively, usually with a simple affirmative followed by a list of problems (see sub-sections c and d). Of the few who elaborated briefly one said 'Of course' (ie who could avoid such problems in mixed ability classes?), one mentioned emphatically the hard work involved in preparing lessons for mixed ability classes and the third emphasised the large amount of his attention that was absorbed by the pupils at the two ends of the ability range.

Ten more teachers' responses were not recorded by the interviewers, but problems were listed (see next sub-sections), so these teachers can be counted as positive respondents.

(ii) <u>NEGATIVE RESPONSES</u>. One teacher responded with a categorical 'NO' when asked if he had problems in mixed ability classes caused by the spread of ability. One other replied tentatively 'No, not at first form level', but went on to list some problems.

(iii) <u>SUMMARY</u>. Clearly even the effective teachers we chose to interview do, typically, have problems in mixed ability classes resulting from the widespread ability of the pupils within them. The next two sub-sections deal with these reported problems in some detail.

(c) <u>TEACHERS' reported problems in dealing with slow learners in mixed ability classes, and their reported solutions to these problems.</u>
(19 responses)

Teachers identified a considerable number of problems and reported their solutions to them. Problems and solutions are summarized below in parallel columns.

	Reported Problem	Reported Solution
1.	Slow pace at which these pupils work.	Remedial cards - but the pupils still need attention and this is NOT a fully effective solution.
2.	'Dragging their feet'	More teacher attention.
3.	Lack of time eg to give practice in reading skills.	-
4.	Poor reading ability (6 occurrences)	Reading with the pupils, to the pupils. Putting slow pupils with a pupil who can read better. Intensive individual attention where possible (and it often isn't). Putting instructions etc on tape.
5.	Inability to read instructions	-
6.	Inability to follow instructions	Press pupils individually to re-read and explain to the teacher.
7.	Inability to understand instructions and worksheets	Teacher must devote more time to explanations.

	Reported Problem	Reported Solution
8.	Understanding and starting set work.	Individual attention to pupils in early stages.
9.	Short memories	Give extra revision (French teacher).
10.	Short attention span.	Provision of extra materials helps.
11.	Short concentration span and problems in understanding complex explanations directed at whole class.	'Suppress the slow' or 'speak to the bright pupils separately'.
12.	Difficulty in writing	Encourage pupils to write précis from worksheets.
13.	Pupils' written work - knowing what to say and how to say it.	Individual attention and help from teacher.
14.	Lack of books and resources suitable for both age and ability.	Make up deficiency with teacher attention (not a satisfactory solution).
15.	Level of classwork too high for least able.	Special work at slow learners' level and plenty of teacher attention.
16.	Pupils have difficulty in choosing work units.	Teacher must give help to them to choose within their own capabilities.
17.	Sustaining motivation	Jump to new work to sustain interest.
18.	Maintaining progress and interest.	Use a lot of apparatus.
19.	Keeping morale high because this group is slowest and least successful always.	-
20.	Behavioural problems caused by boredom.	Use a lot of apparatus.
21.	Giving individual attention to pupils whenever possible.	'I try. Not always successful but I'm working on it'.
22.	Need for continual attention from the teacher to	
	assist with practical work	-
	" " reading	-
	answer questions	-

(d) TEACHERS' reported problems in dealing with bright children in mixed ability classes, and their reported solutions to the problems. (16 responses)

Although 20/21 teachers indicated that pupils at the extremes of the ability range produced problems for them in mixed ability classes, only sixteen mentioned problems specifically caused by the presence of bright pupils in their classes.

	Reported Problem	Reported Solution
1.	Fast pace of working compared with rest of class. (6 occurrences)	Provision of new, valid and challenging work (once). Additional work (once; teacher adds 'an easy problem to cope with'). Extra material to work through (eg worksheets, problems, experiments (once)). Extra material (once; teacher adds 'not to serious a problem'). Extension work (once). No solution offered (once).
2.	Bright held back by slower pupils	No solution offered (teacher adds 'not serious problem at first form level').
3.	Failure to reach potential because they easily look good in mixed ability classes.	Individual contact with teacher to extract best from each child.
4.	Failure to stretch them because slow pupils demand teacher's time.	No solution offered.
5.	Boredom.	Having enough material available to stretch the brighter pupils.
6.	Frustration at being held up by rest of class.	No solution offered.
7.	Provision of occasional extension work or extra work (twice).	Set additional homework and let pupils demonstrate their achievements to rest of class. (One teacher comments 'this is not a successful solution'.)
8.	Need to extend bright pupils.	More thought has to be put into worksheet to occupy the ablest.
9.	Provision of extra reading.	No solution offered.
10.	Maintaining progress.	Use of lots of apparatus and additional work.
11.	Need teacher's help too frequently.	No solution offered.

(e) A comment on the reported problems and solutions in sub-sections (c) and (d)

Almost without exception the teachers are obviously honest in reporting that they have problems with pupils at the extremes of ability range in mixed ability classes and sincere in their attempts to deal with these problems. Some interesting contrasts emerge between problems caused by slow learners and those caused by bright pupils.

Teachers are obviously able to analyse the problems they face from slow learners: they can isolate 22 individual problems, find solutions to all but 4 of them and agree to some extent with each other about the core problems: poor reading and comprehension ability.

With bright pupils teachers are far less able to discern problems: our respondents found just 11 between them, almost exclusively part of the syndrome 'fast working - failure to reach potential - boredom and frustration'. To five problems no solution was offered; and to a sixth one teacher had found no solution. Only seven of the case studies analysed made any attempt to set out the needs and problems of bright pupils and the solutions offered to meet these. There is a general feeling that, since bright children can cope, it is not 'too serious' to fail to cater for their special needs. It is questionable how far teachers are even aware of these special needs. In one case study the teacher seems to imply a criticism of bright pupils to the effect that their problems are self-manufactured: 'they work too fast'.

In both sub-sections teachers failed to indicate how successful their reported solutions were when applied to the problems, except for a few rather pessimistic comments (which have been included above ad loc).

Although some teachers in our sample were obviously quite experienced at, and well informed about, teaching slow learners in only one case did we find a teacher applying a systematic policy of diagnosis and assistance to bright pupils in the class.

One aspect of our findings about teachers and slow learners was, however, rather disturbing. Many of the teachers' reported solutions to problems were reduceable to the advice 'give more individual time and attention to the pupils'. But the evidence of the responses was that when the teachers followed their own advice, they discovered that they did not have the time to give frequent individual attention to one section of the class. So the wheel has turned full circle and the solution has become a problem.

(f) What do HEADS OF DEPARTMENTS see to be the benefits and problems to have accrued to both slow learners and bright pupils placed in mixed ability classes?
(19 responses)

The Head of Department Interview Guide asks about both the benefits and the problems to have accrued to all pupils from the move from streaming to mixed ability teaching. From their responses it was possible also to deduce the benefits and problems attaching to the two groups of pupils of current interest. The respondents were Heads of Departments in the schools from which are 20 experienced teachers of mixed ability classes were drawn. They were both practising mixed ability teaching themselves and sympathetic to it as a method of organization. To set the context it is preferable to look at the Heads of Departments responses as they refer to <u>all</u> pupils before looking at our two specialized groups.

(i) <u>Benefits of mixed ability teaching for ALL pupils</u>

A simple list will suffice; figures in brackets indicate frequency of reporting. Mixed ability organization means:-

Social benefits: no children feel inferior, superior; no labelling (10).
Pupils may work at own pace (2).
Improved class atmosphere (2).
Improved discipline (2) results.
Better chances for late developers (2).
Pupils may work at own level.
More teacher-pupil contact results.
Levelling up of attainment occurs.
More co-operative work is done.
Social benefits result from teacher-pupil contacts.
There is improved language development.
Pupils' decision-taking about specialisms is delayed.
There is more time given to individuals.
All pupils are more confident.
Psychological benefits (unspecified) accrue.
A longer time is available in secondary education to assess pupils' abilities.

(ii) <u>Problems of mixed ability teaching for ALL pupils</u>

Mixed ability teaching suffers problems of

Committed teachers: mixed ability staff must be committed to the general philosophy.
Explanation: teachers must take into account varying abilities when giving whole-class instruction.
Inadequate resources.
Constant need to produce resources.
Lack of appropriate teaching materials.
Lack of educational (as opposed to social) benefits.
Getting teaching 'level' quite right.
Checking all pupils are gaining from a course.
Cliques which develop among pupils.
Inheritance of mixed ability organisation by those who have to to it without believing in it.

(iii) <u>Benefits of mixed ability teaching for SLOW LEARNERS</u>

There are no sink groups (4).
There are no ghetto classes in the school.
There is improved discipline (2).
More teacher attention is spent on slow learners.
The pupils maintain higher expectations of themselves.
Bottom third of pupils are helped by interaction with the rest.
The able pupils articulate to less able what they learn and help to teach them.
Less able pupils are more involved [? in what].

(iv) Problems of mixed ability teaching for SLOW LEARNERS

Teacher-time is disproportionately consumed on them.
It is hard to make them feel they can achieve satisfactorily when all other pupils achieve more.
Teachers are not doing their best for slow learners in mixed ability classes.
These children always fail.
Slow learners need pushing harder.

(v) Benefits of mixed ability teaching for BRIGHT PUPILS

Teachers can spot bright pupils more quickly.
Bright pupils can articulate what they know to the slower pupils.
Bright pupils with poor home backgrounds can realize there is more to life than what they see at home.

(NB. There were 13 nil responses on this section.)

(vi) Problems of mixed ability teaching for BRIGHT PUPILS

Teachers spend too much time with the slow learners.
Good pupils can get away with not working at appropriately fast pace.
It is hard to cater for the very bright in a mixed situation.
Bright pupils fail to cover enough subject content for their needs.
Teachers are not doing their best for the top pupils - work is aimed at the middle band.
The top third of pupils are not stretched (the respondent reports this is 'not a terrible problem').
Bright pupils are MORE difficult to teach than other pupils.

(g) Spontaneous comments about SLOW LEARNERS and BRIGHT PUPILS contributed by HEADS OF DEPARTMENT and TEACHERS during their responses to the Head of Department Interview Guide and Teacher Interview Guide

In addition to the specific information collected by the Project a number of comments were made by the Heads of Departments and Teachers about slow and bright pupils. These and their contexts are reported here for any extra light they may shed on teacher thinking about these 2 groups of pupils.

In talking about the kind of teacher who succeeds best at mixed ability teaching it was suggested that desirable qualities should include the skill of stretching all pupils to the best of their abilities, awareness of individual differences in ability and potential, and reticence to under-rate slow pupils. A balance needed to be kept between the different needs of different pupils so that all had a fair, but not necessarily equal, share of teacher attention. Conventional labelling should be avoided but the least able should be given individual attention and more thorough training should be given to teachers to cope with this difficult group. Students in training ought to be able to describe the peculiar characteristics of slow learners and bright pupils in their classes. There was a tendency in the case studies for the respondents to group slow and bright children together and to deal not with the respective problems of the two groups of pupils but with the teacher-centred problem of teaching a central core of pupils alongside two parallel deviant groups.

Under the general heading 'Organization of Learning' some interesting views were expressed by individual teachers. One characterized mixed ability lessons as a series of steps:-

i) introduction for 4-5 minutes
ii) set extra work for 'middle' of class
iii) set extra work still for 'fliers'
iv) repeat the beginning for slow learners.

Another said he NEVER used individualized learning: 'sadly some could never read the card'. However, a third teacher claimed to set both slow and bright to work on their own so that he could cope with 'middle'; and one language teacher stated categorically that able pupils work best in homogeneous groups - a view probably shared by many linguists.

Attitudes to slow and bright pupils which were critical of their education in mixed ability classes were not peculiar to teachers who were unconvinced by the philosophy of mixed ability teaching. One teacher, who reported himself as 'favourable, becoming more favourable' to mixed ability teaching said that what he liked least about it was having very bright pupils and not being able to extend them. Another teacher (neutral, becoming less favourable) put it more strongly: 'what I like least is the frustration and emotional upset experienced by the very bright and the very limited in mixed ability classes'. However, these views were balanced by two teachers, both very favourable to mixed ability teaching, who liked most 'teaching the whole ability range' and claimed: 'It works - the able are NOT handicapped in the first two years'.

There was some feeling of vulnerability among teachers of mixed ability classes who pointed out the need for remedial specialists to help them and the inadequacy of existing resources as well as their own lack of training in mixed ability teaching methods.

The social benefits of mixed ability teaching were emphasized again and some teachers claimed improved discipline resulted from splitting up slow learners out of homogeneous classes. Some again indicated the use of bright pupils as pupil teachers. There was a plea for new evaluation of record keeping systems to measure things other than academic attainment and to eliminate competition within classes. Apart from the obvious 'grade for effort' there were no positive suggestions on this front.

While some teachers pointed out that slow learners in fact finish set work very quickly (because they do only a limited amount of it) the emphasis on 'extra' work for the more able was just that: ie the bright were not enriched nor accelerated, simply given more of the same. This practice emerged as common in the Project's research with Headteachers.

5. Drawing together more threads

In the foregoing sections of this chapter an attempt has been made to extract information from the Headteacher Questionnaire and the case-studies of effective teachers of mixed ability classes, with special reference to how this information relates to procedures for dealing with pupils at the extremes of the ability range. This remaining section of the chapter returns to summarize information about mixed ability teaching in general.

Case-study methods and open-ended interviews of the kind used in these preliminary investigations are valuable in that they allow the respondents to 'speak for themselves'. This teacher sums up the flavour of much of the mixed ability teaching observed in these words:

> "A teacher is not 'a god of knowledge'. There are not always clear-cut answers so uncertainty is sometimes inevitable. He must create in students a tolerance for uncertainty - their own and his."

> "The teacher will have to encourage in the children a tolerance of 'double standards' - of flexibility and complexity in his assessment of their work so that they do not continuously measure themselves against an overall ranking system."

> "The teacher should not have a single 'lesson unit' in mind - a certain piece of work to be completed in a certain way in a certain period of time. This means using a lot of project work, allowing further exploration of areas that have stimulated interest. Lesson activity should allow for variety - graphics/discussion/writing. Discussion is very important. The children are now prepared to discuss more spontaneously, but the teacher must keep a check on this and make sure discussion is occurring and is a fruitful experience for all. This may mean intervening and suggesting discussion groups where this is not happening. Serious treatment of <u>all</u> contributions is essential - never to ridicule or disapprove - to encourage the same reaction in students."

"Individualised learning is important. The children will not march in step anyway. One must allow for spontaneous direction and take tangential interests seriously. Yet the teacher must assess the value of what a student proposes and why, e.g. if work is sketchy and poor and the pupil simply wants to 'move on' to 'move away', or if the proposal involves merely copying out long sections of information, these activities must be questioned and the student required to justify his proposals. Any pupil should be able to pace themselves and move on to another topic if certain criteria are considered:-

1) a minimum level of work has been done

2) if the need to move on sustains a sense of impetus

3) if there is a serious initiative to undertake work which has some value

4) if the work done could be fed back into the class."

"Group work is especially effective in encouraging social skills and in stretching ability by requiring those who have grasped something to articulate it to those who have not - it also frees the teacher by giving him more time for each pupil. Collective and co-operative attitudes are encouraged; sharing of ideas gives respect for each other and creates a perception of other ways of looking at things."

"The quantity of resources creates difficulties and there is the problem of simply coping with unexpected demands. This is why the school has organised a resources room for each departmental floor. The double unit for each lesson (1 hour 10 mins.) is vital to give time for organisation and for children to settle into and explore the possibilities in what they are doing. Places for things to happen are vital - there must be an element of self-service if the children are doing different things and initiating action - places for papers, knowing where plugs are for equipment, being able to use it themselves. Media resources are necessary (MACOS has a special projector for student use)."

"A classroom base for the teacher is important; to pin up past work as evidence of achievement and for reference by teacher/pupils when desired; also to create a familiar and conducive atmosphere for work. A socially defined space in which the children can recognise themselves as engaged, in some sense, on a collective activity is important."

With this summary comment in mind we can now return to the main theme of our enquiry, to see how far this ideal is reflected in the literature and later in practice.

CHAPTER 5. A REVIEW OF THE LITERATURE

A. THE MIXED ABILITY TEACHING CONTEXT

A.1. Nature and extent of mixed ability teaching

In the area of mixed ability teaching it is perhaps fair to say that the decade 1970–1980 began with a myth and ended with an enigma.

The myth suggested that most secondary schools in England and Wales had adopted mixed ability classes and like most myths there was a factual base. A majority of secondary schools had become, or were becoming, comprehensive; and the comprehensive ideal seemed to demand as a corollary that the obliteration of discrimination be taken a stage further to embrace not just what happened at neighbourhood school level, but in the classroom too. It was common in the early '70s to read definitive statements (never apparently corroborated by evidence) that "most" schools had a mixed ability organization or that proportions as high as 75% of schools were now using this form of organization. Some scrutiny of definitions and a harder look at how to collect evidence for these estimates should have exploded the myths.

Bridges (1976) isolated five distinct patterns of classroom organization which teachers labelled mixed ability. These were children of a full ability range working in one class on appropriately graded individual assignments; children working in mixed ability pairs, the able usually helping the less able; children of mixed ability working on a common project but with tasks devised according to their individual abilities; children of mixed ability working on a common and undifferentiated task such as discussion; and 'hidden grouping' within a mixed ability class.

At a classroom level this picture was sometimes complicated by the withdrawal of remedial pupils, occasionally of the most able, so that the remaining mixed ability groups were drawn from a wide spectrum of ability but not the whole of it (Pain, 1976).

At a school level Dooley et al (1977) found that school policies differed about the ways in which children were assigned to mixed ability classes. Some allocated on a random basis, while others tried to bring about a mix based upon criteria of pupils' social background, measured abilities or achievements, primary school of origin, primary school reports or friendship choice.

There was also the important distinction between mixed ability <u>organization</u> and mixed ability <u>teaching</u>. Some schools apparently divided pupils into mixed ability classes, but the form of organization did not affect the teaching which the child experienced. This point will be elaborated later.

With such a wide variety of practice it is hardly surprising that many schools acknowledged mixed ability teaching as part of their structure. Often (and this has not always been overt in the research) it was a very minor part. Thus in the 1977 study by Dooley, Kerry and Smith only a handful of East Midlands schools in a sample of 40 continued mixed ability beyond year 2, and few adopted this form of organization across the whole curriculum for all pupils.

In North Wales, Jones (1972) found the incidence of mixed ability classes dependent on geographical area. Flintshire had progressed further with the comprehensivization process and mixed ability organization than other counties, but in North Wales as a whole streaming was common in small schools, banding in larger ones. Jones is right to point to a growing sophistication in school timetabling to enable teachers to use appropriate blends of these and other grouping methods.

The decade's largest study of mixed ability teaching was undertaken by the NFER, beginning in about 1975. Regrettably, no results† have been published for public scrutiny; though in a private communication the project leader indicated that initial findings confirmed the small-scale findings of Dooley et al.

An overview by HM Inspectorate (1978) found that 11/12-16/18 comprehensive schools where mixed ability covered most* subject areas but was confined to year one formed some 12% of the total in England. Those with mixed ability up to year 2 (or in year one only if age of entry was 12 years) formed another 12%. Schools with mixed ability in most subjects up to year 3 comprised 9% of comprehensives. Those with mixed ability up to year five made up just 2%. Clearly, in 1978 a wholly mixed ability organization to age 16 was rare; and in only 33% of English schools was even a partial mixed ability organization in operation.

Nevertheless, the phenomenon of mixed ability classes was widespread enough to merit a good deal of attention by teachers and teacher trainers throughout the decade. Their concern was both about the underlying philosophy of the movement and for its implications for practical classroom skills.

A 2. The underlying philosophy

The philosophy underlying the moves towards mixed ability teaching was bound up, as already suggested, with the comprehensive ideal. A would-be student of this topic has to tread a minefield of covert political prejudices, although some writers attempt an objective rationale for unstreaming. Simon (1978) lists five bases.

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* i.e. Where not more than two subjects in any year group were in streamed, setted or banded classes.

† This work (Reid 1982) was published late in the compilation of this thesis, and is referred to elsewhere in the text.

Classes roughly homogeneous in intelligence become heterogeneous when other kinds of classroom skill are called into play. If intelligence in pupils can be developed, then streaming on the basis of immediately existing intelligence is questionable. The validity of intelligence tests themselves is open to question. There is a certain amount of evidence for the self-fulfilling prophecy, which gives streaming an accuracy which is more spurious than real. Low stream children tend to become socially alienated.

Simon's last point is taken up strongly by Bridges (1976), and is often the lynch-pin of the case made by individual schools and teachers for advocating mixed ability teaching. This argument may polarize the two organizational forms of rigid streaming and universal unstreaming in language which is emotive, even eschatological: the educational "sheep and goats" have somehow to be reconciled before the advent of some otherwise inevitable but ill-defined Orwellian crisis of Animal Farm proportions. Kelly's books (1975, 1978) typify the genre.

The argument in its less emotive forms runs as follows: pupils of higher socio-economic and ethnic status do better on culturally-biased intelligence tests than other pupils. These pupils, already advantaged in the educational rat-race, have their motivation and opportunities enhanced by streaming on the basis of these tests and thus complete the self-fulfilling prophecy. Therefore, equal opportunities for all in an unbiased context should be the prime objective of educational provision. At the level of the individual classroom, the mixed ability class 'itself exhibits and promotes the development of desirable social attitudes, dispositions, skills, or values' (Bridges, 1976) through groupwork or individualised learning.

Elliott (1976) looks more systematically at the issue of equality as the basis for mixed ability teaching. The underlying principles here are that human beings have a right to equality of respect because of their common humanity; that they have equal right to opportunities for self-development; and that they have equal right to opportunities of achieving certain social goods. In fact, practical constraints produce conflicts and dilemmas for the teacher as decision-maker. Thus "the teacher who has to prepare as many pupils as possible for the examinations will find it extremely difficult to protect and foster the self-directed learning of the necessary abilities. It is far more efficient for him to develop these abilities by fostering dependency on his authority position".

The kinds of decisions and compromises to which Elliott refers are described at school level by Seckington (1978) who advocated a 'mixed economy' which employs mixed ability groups alongside appropriate setting and banding strategies. This response has become normative, and leads us to reflect on the decision-making process when a school "goes mixed ability".

A 3. The process of change and prerequisites of success

HM Inspectorate (1978) found the motivation for change to mixed ability to be both social and educational. In a summary of the educational arguments one would expect references to reduction of competitiveness, improved attitudes to learning, less type-casting of pupils by ability or aptitude, the move towards a common curriculum, the avoidance of assigning the ablest teachers predominantly to the ablest pupils, the facility of assessing pupils against their own performance, and the avoidance of under-achievement. The social arguments have been dealt with already, except for the pragmatic corollary whereby teachers advocate mixed ability as a way of disposing of behavioural 'sinks' or 'ghetto classes' (their words, Dooley, 1977) by spreading the disaffected poor achievers throughout several classes.

The process of change however, is a cause of some concern. Sands and Kerry (1981) and HM Inspectorate draw attention to the differing levels of staff consultation in individual schools, which vary from democratic decisions of policy and procedure made by all staff on a one-man-one-vote system to autocratic decision by the head. Bell et al (1979) in a study of 'Pond Street Comprehensive' isolated 3 stages in the process of change: a planning phase, a phase of initial implementation and an operational phase. They identified a number of lessons which could be learned in advance by schools planning to go mixed ability. Staff needed a commitment, not just to a change of teaching tactics, but to the specific change (in this case mixed ability teaching). Adequate preparatory in-service training was vital. A person to act as co-ordinator of change gave a sense of identity. Continuous monitoring, recording, evaluation and feedback was essential. Conversations about proposed or on-going innovation needed to occur on an inter-departmental basis not just between subject colleagues.

According to the Schools Council (1977) successful change to mixed ability is facilitated by ten factors. These are that there should be relatively small classes which have few disruptive pupils, housed in reasonable accommodation, with access to float teachers and with remedial pupils catered for separately; the school should be well-established, with a supportive head, a highly competent head of department, excellent reprographic facilities and no apparent shortage of money. Ingleson (in Sands and Kerry, 1982) draws attention to the need for involved teachers not only to work co-operatively as a team but to learn the skills of team teaching, and the availability of ancillary help may be of critical importance in some subject areas.

A 4. Teaching methods and their appropriateness

This section looks at three areas: the changing teaching methods required by a move to mixed ability organization; the debate about the suitability of some school subjects for a mixed ability approach; and experiments with mixed ability teaching methods in specific subjects. To complicate matters, the issues inter-relate.

Organizational change to mixed ability may not be accompanied by appropriate teaching methodology. However, the statement begs a question: What teaching methods are appropriate? There are 3 main teaching modes, i.e. whole class teaching, group work and individualized learning and these form the contexts within which teaching strategies (such as the use of discussion, worksheets or resource-based learning) function. Most writers emphasize the need for whole class teaching to give way to group work or individualized learning in mixed ability contexts and mixed ability lessons are often divided between all three modes and involve the strategies mentioned. Kerry (1978) described such a lesson. Bailey (1976) is distinctive in arguing that individualized learning is the only logical way to teach a mixed ability class since the underlying philosophy of mixed ability grouping stresses the individuality of each child's learning need. He finds teaching strategies such as discussion invalid because "beyond a certain point of differential ability or information the exchange of talk within the group ceases to be a discussion".

In a study of learning by small groups involving 99 children Tann (1979) found advantages and disadvantages. Low achieving boys responded well to this mode, reticent children found the context psychologically safe, and the bright child was challenged or questioned about his or her contribution. The presence of shy, slow or belligerent pupils was a hindrance; and pupils needed to learn in advance key strategies of listening, monitoring, and challenging. Warwick (1971) suggests that pupils work more successfully if each class group is carefully structured by the teacher to include pupils with a range of skills. These groups become, in effect, working teams. Sands (Sands and Kerry, 1982) found that teachers used 'groups' to describe four different phenomena: pupils sitting together but working on individually assigned tasks; pupils sitting together working simultaneously on similar tasks; pupils working together on a common task in which individual contributions were separable and distinct; and pupils working together on a common task where individual contributions were not clearly identifiable.

Truly individualized learning, as opposed to pupils working individually on tasks common to the class, is ill-documented. The commonest manifestation in schools is with schemes such as the Schools Mathematics Project, where all children experience the same course but at least the pace of progress is determined by each pupil in the class.

Certain teaching modes and strategies may be more appropriate to some subject areas than others. Mathematicians and modern linguists sometimes argue that in their linear subjects a mixed ability approach is difficult. Hayes (1976), in a small case-study, discovered that linguists and mathematicians saw as problems for mixed ability classes the fact that not all pupils were able to handle complex abstract ideas, that only a limited number had the intuitive aptitude required in the subject, and therefore to cope with the mixed ability group an individualized approach to learning was required which was unrealistically demanding on material and human resources.

Despite this view mixed ability classes in modern languages and maths are fairly widespread in the early years of the secondary school, and many science and humanities faculties also opt for a mixed ability approach. The following paragraphs give a subject-by-subject review of attitudes to and procedures for mixed ability teaching.

The variety of approaches to mixed ability teaching in any given subject area is well illustrated in the case of mathematics. Digby (1976) described a small-scale experiment for teaching mathematics in mixed ability pairs. He suggested that pupils could help each other to learn on occasions when the teacher was not readily available, that averagely intelligent pupils could be efficient teachers of others, and that average pupils could learn new material as proficiently as the above average. Collins (1978) formed two remedial and two high fliers' groups from an annual intake of pupils, and divided the remainder into mixed ability groups. All sets covered the same ground, though at the extremes the pace and depth would be different for certain topics. In a primary context Sherwood (1978) encouraged children to work at their own level, with many topics progressing simultaneously in the same classroom; but he mentions a secondary school where all pupils worked on a single topic, though at three levels according to their aptitude. The Schools Council (1977) visited twenty-six maths departments and found whole class teaching in use exclusively in twelve of them, though a widespread alternative model for the maths teacher in a mixed ability context was that of consultant.

In mixed ability science Sturges (1973) advocated a review of curriculum content in the light of Piagetian theory in order to make sure that work was tailored to individual pupils' needs (compare Shayer, 1970). For this purpose he found whole class teaching ineffective and looked to the use of graded worksheets and a circus of experiments as the solution, with pupils working both in groups and pairs as required. In a suitable setting a group of about 90 pupils was allocated to five teachers. Three teachers each took a third to begin a core topic, while two 'floaters' eased administration and picked up problems. Later, the float teachers collected the fast finishers for extension work. Ross (1976) experimented with the design of worksheets and found that the basic structure was more effective when it included: a title and introductory statement or questions; a clear description about the practical experimental work and how to carry it out; a conclusion stating the learning outcomes; and a set of graded questions to be tackled by the pupil to test learning. A five-minute lesson introduction to the whole class opened the way for the worksheet, and thereafter pupils worked at their own pace. Flecknoe (Sands and Kerry, 1981) described a mixed ability science department in which the teacher played the roles of organiser, facilitator, provider and stimulator. But in a study of 120 pupils in Wigan, Frost (1978) concluded that even using the 'best available' mixed ability teaching methods streamed classes performed significantly better than unstreamed ones.

As an English specialist Torbe (1979) put forward three criteria of successful teaching and illustrated them in action with brief case studies. The criteria were that the teaching should embrace the emotional, personal and private aspects of learning as well as the public; that it should "recognise the power of language by finding ways of building on the inevitable human function of language, that innate capacity for learning that is in everyone", and thirdly, the teaching was political in the sense that learning is about knowledge and understanding of material, about the other members of the learning group, and about one's self. In a case-study in English the teacher read a contemporary poem and asked the class to talk about it in groups using a tape-recorder. The tapes were played back and discussed with the teacher's comments, and some pupils transcribed a tape. In the process they learned that they could understand a complex poem without teacher intervention; that their combined analysis was detailed and extensive; that their learning activities included the process of anecdote, analysis, asking questions and thinking aloud.

RE teachers may be more open to mixed ability approaches than some other humanities staff (Kerry, 1979). Even so Wiggs (1976), using an observer to case-study his own teaching, found that some children had difficulties in oral work, and that his discussions of controversial issues were not as open-ended as he had imagined. Mixed ability RE is heavily dependent upon the availability of plentiful and suitable resources. Nevertheless, many RE teachers seem to favour mixed ability organization because the underlying notions of equality and human work apparently blend with the philosophy of the subject area. Syllabuses are often based on themes or topics, which lend themselves more readily to mixed ability groups where individuals can absorb each discrete topic area at his own pace and to his own level. A similar observation may apply to history, geography and social studies lessons, and to minority subjects such as classical studies or European studies.

Taylor (1978) argued, against the mainstream of opinion, that modern languages could be taught successfully in mixed ability classes subject to certain provisions. These were that teaching groups were 'small enough to allow of high individual levels of participation but large enough to give internal flexibility'; that there was a secure climate; that there was the motivation of social activity. The reinstatement of primary school French teaching was also advocated.

More detailed studies of classroom approaches in individualized subjects can be found in Kelly (1975) and Wragg (1976).

A5. The effectiveness of mixed ability teaching

Few of the curriculum experiments reported so far have attempted to measure the effectiveness of mixed ability teaching in terms of learning gains by pupils. In the following paragraphs some consideration will be given to the evidence for pupil learning.

The largest and most detailed investigation is the Banbury enquiry (Newbold, 1977; Postlethwaite and Denton, 1978). Banbury School was so organized that 11+ intakes could be divided into four houses. Two of these had a mixed ability organization and two were streamed. Some 2000 pupils were studied and objective measures, case-studies and attainment test results were used to track pupils' progress. Newbold concluded that the research showed 'significant differences between groups, but these groups have not usually been the systems of organization, not always the separate Halls, but often the individual form teaching units'. This is another way of saying that it is the quality of teaching rather than its organizational context which is important. Additionally, he demonstrated that primary school of origin was important in the progress of 11 and 12-year olds; that in mixed ability groups bright pupils tended to choose others as friends, but less so than in a streamed system; that low ability pupils gained in attitude and academic performance in mixed ability groups; that bright pupils did not suffer academically in these groups; and that mixed ability groups broke down some socio-economic class barriers to friendship.

In a closely argued statistical analysis Postlethwaite and Denton examined the Banbury pupils up to 4th year level. They found that the system of grouping used on entry to the school did have long term effects on the pupils' education. In particular, the findings concerned with friendship attitudes and attainment could be traced as affecting the pupils later in their school careers. Differences in pupils' subject choices at fourth form level between the former streamed and mixed ability cohorts were 'very distinct', and were still detectable at sixth form level. The evidence also suggests that teachers found it harder to make judgements about the abilities from the mixed ability cohorts, and counsellors found it harder to guide them towards subject choice, although pupils were satisfied with their options and examination results did not suffer.

The Banbury research must repay detailed scrutiny as a bastion against those who would detract from mixed ability out of preconceived prejudice. There are a number of possible objections to its design or the validity of the findings. Little account is taken of the Hawthorne effect on the halls chosen to go mixed ability; the finding that able pupils do not suffer is altogether too neutral and unambitious; there was at least some remedial withdrawal for reading; the improved discipline and attitude of pupils may be related to the general process of change rather than the specific innovation of mixed ability grouping; most of the pupils in the streamed cohorts at Banbury had experienced mixed ability grouping at the primary stage, so that the differences between the two systems may be masked. Perhaps the most important finding is the confirmation of the role of the individual teacher as the most significant determinant of pupils' learning.

In the Sherwood Project Kerry (Sands and Kerry, 1982) studied first year mixed ability classes in five comprehensive schools in order to measure the cognitive demand evidenced in classrooms by an analysis of all verbal transactions and of the tasks set to pupils. Using a shorthand coding system the cognitive demand of teacher talk, teachers' questions, and pupils' responses and initiatives was recorded. Tasks were analysed as 'high' demand (dealing with concepts or abstractions) or 'low' demand (requiring data level responses only). From the verbal transactions he concluded that teaching could be divided into three basic activities: managing, informing and stimulating. When the percentage scores for these three activities were calculated from the shorthand codes managing consumed 53.7% of all classroom verbal transactions, informing comprised 42.2%, while only 4.1% of transactions were in the category stimulation. Similarly in an analysis of classroom tasks he found 87% at a low level and 13% at a high level. He argued that teaching of this kind was unlikely to bring out the best in bright pupils, and might fail to realize the potential or capture the interest of even the least able. This argument is extended in this study.

During the Teacher Education Project study of groupwork in mixed ability science classes Sands (1981) used a classroom observation schedule and pre- and post-lesson interviews to assess the learning effectiveness of this mode of teaching. Groups were most typically long-lasting self-selected friendship pairs of similar ability. In practical lessons all groups or parts within the class normally worked at an identical task. No opportunity was given to groups to design experiments or interpret results: the task was to carry out a specific experiment and observe what happened. Verbal interactions were at 'a low cognitive level'. The finding supports the work of Kempa (1979). Sands concluded that 'the use of groups had more to do with the economy of providing fewer sets of apparatus than with the desire to involve the children in a different kind of learning activity'. There was a 'dissonance between teacher expectations and reality'.

These studies suggest that, like most innovations in education, mixed ability teaching is just one strategy in the armoury of the teacher. Its success depends upon the teaching skills of its individual exponents.

6. Training for mixed ability teaching

If teaching skill is a crucial issue, then it is fair to say that too little work has been done on how to improve it. Wragg (1978) identified ten sets of skills necessary for the initial training level. Four were preparatory skills: understanding individual differences among children in the class; understanding the issues about language in the classroom; learning to be a team member; and knowing how to devise and prepare appropriate curricula. Four were teaching strategies: using whole class teaching effectively; learning to handle small groups; interaction with individual pupils; and developing flexible teaching approaches. Two had to do with evaluation. They were the skills of record keeping and the tracking of pupils' progress, and the ability to evaluate one's own teaching and undertake professional self-development.

Kerry and Sands (1982) emphasized that mixed ability teaching is an <u>advanced</u> teaching skill, and they used the insights developed from the Teacher Education Project to develop a profile of the successful teacher of mixed ability classes and to encourage teachers to use self-analysis to practise the skills implicit in it. Such a teacher prepares lessons thoroughly, accepts each pupil as an individual, is competent in subject matters, is not too dominant but asks demanding questions, can use pupil feedback, organizes well and prepares stimulating resources and workcards, knows what standards to expect from pupils and can cope with extremes of ability. He or she will experiment with teaching method and learn from any mistakes.

A7. Conclusion

At the beginning it was suggested that this decade of mixed ability teaching ended with an enigma. Mixed ability was designed above all to cope with the middle band majority of children. Yet in a piece of unpublished research Kerry found that the archetypal pupil of this kind was described by teachers only in negative terms: not articulate, not disruptive etc. Or as Adelman put it: 'a child of no particular specifications, 'entwined in the political undergrowth of education'.

Clearly some specific attention needs to be paid to the needs of pupils towards the two extremes of the ability range in mixed ability classes. To these pupils, in sections B and D of this chapter, we now turn.

B. THE BRIGHT, ABLE OR GIFTED PUPIL

B.1 IDENTIFICATION THROUGH MEASURED INTELLIGENCE

For decades it has been the dream of some cognitive psychologists to produce a wholly reliable and definitive test of intelligence. The problems are legion, but centre around three main areas. First, there is no single agreed definition of intelligence. Secondly, many tests are alleged to have some kind of inherent bias, e.g. a cultural one. Finally, the administration of many tests is a skilled operation; and ineffective administration may affect the testee's performance.

There is no single persuasive theory about the nature of intelligence. A common approach (Spearman 1927; Vernon 1961) is to accept that there is a general intelligence factor (g) which is basic to any intellectual operation, and that this differentiates more obviously into major group factors (verbal, spatial-mechanical) and probably into more specific minor group factors, perhaps with increasing age during childhood.

Guilford (1959) suggested that ability could be grouped on a three dimensional model. The dimensions consist of operations, contents and products. Thus any intellectual activity could be plotted to one cell out of 120 on the three dimensional model.

Operations consisted of cognition, memory, divergent thinking, convergent thinking and evaluation. The contents were four-fold: figural (non-verbal), symbolic, semantic (verbal), behavioural. There were six kinds of products: units, classes, relations, systems, transformations, implications.

Guilford's model has been criticized (Vernon, 1977) for its elaborateness; and certainly it is true that no single test could cover all 120 cells of the model. Nor has it been successful in differentiating kinds of talent: Mills (1955) failed in an attempt to correlate the abilities of able mathematicians with a specific profile from Guilford's model.

Piaget (1977) lists five theories of intelligence. These, with his definitions, are as follows:

1. Associationist Empiricism - in which 'one can attribute progress to the pressure of the external environment whose characteristics (conceived as being constituted independently of the subject's activity) would impress themselves little by little on the child's mind)'.

2. Vitalistic Intellectualism - this presupposes 'an activity structured since its beginnings by merely applying itself to increasingly rich and complex contents'.

3. Apriority and Psychology of Form - in which 'progress of intelligence (is) due not only to a faculty in a completed state but to the manifestation of a series of structures which are imposed from within on perception and intelligence in proportion to the needs aroused by contact with the environment'.

4. The Theory of Groping - in this pragmatic interpretation intelligence is seen as 'attempts or gropings, inspired by needs and the implications that result from them, but selected by the external environment (as in biology the mutations are endogenous but their adaptation is due to selection after the event)'.

The final theory is Piaget's own.

5. The Theory of Assimilation - here intelligence is seen as 'development of an assimilatory activity whose functional laws are laid down as early as organic life and whose successive structures serving it as organs are elaborated by interaction between itself and the external environment.

Piaget's version of intellectual development is not so much a rejection of the other four theories as a synthesis of them in the light of his now famous experiments to discover the processes of intellectual development. The theory fits well with the evolutionary concept in biology; and goes a long way towards marrying the intuitive and instinctive elements in human behaviour with those of cold rationality and reflective judgement.

Some other commonly quoted definitions of intelligence are as follows:

> '... the ability to think in terms of abstract ideas' (Terman, 1916)

> '... the capacity to judge well, to reason well, and to comprehend well' (Binet and Simon, 1916)

> '... the ability to undertake activities that are characterized by difficulty, complexity, abstractness, economy, adaptiveness to a goal, social value, emergence of originals, and to maintain such activities under conditions that demand a concentration of energy and a resistance to emotional forces.' (Stoddard, 1943)

> '... the aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment'. (Wechsler, 1944)

> '... the ability to learn acts or to perform new acts that are functionally useful'. (Getzels, 1954).

Without doubt the most poetic (though the least useful!) is that of Hersey (1959):

> 'Intelligence of a high order is mysterious, manifold, fast-moving, luminous, tantalizing, and incredibly beautiful, like aurora borealis on a cool September night.'

Whatever one's theoretical position on the nature of intelligence, the problem of measurement remains the same: to devise a valid and reliable test which will produce an 'objective' result capable of discriminating reasonably accurately between the ability of one individual and that of another. Because of the differing views held about the nature of intelligence kinds of tests differ widely, some purporting to measure 'g' and others more specific verbal or non-verbal abilities.

The confused state of psychological theory about the nature and definition of intelligence does little or nothing for the problem of constructing intelligence tests. Tests are an emotive subject (for other reasons, too, that will be probed more deeply in later paragraphs). Thus Mehrens and Lehmann (1973) can sum up the situation as follows:

> 'Practical psychologists are still very inclined to use tests of general intelligence because these tend to be well developed and predictive of future scholastic success'

While Kamin (1977) postulates:

> '... the IQ test has served as an instrument of oppression against the poor-dressed in the trappings of science ...'

The first IQ test was devised by Binet in 1905, consisted of 30 tasks to test higher mental processes, and was designed to identify mentally deficient children. Revised in 1908, the tasks were grouped by age level. A further revision in 1911 was followed by the Stanford (1916) revision. This Stanford-Binet test was itself revised in 1937, and a new set of norms was calculated for a third edition in 1972 which combined the best items contained in the two forms of the 1937 test. Starting at tasks designed for the chronological age of the child, the test calculates a basal age and a ceiling age. From these a series of weightings allow a calculation of mental age; and the test is considered appropriate for subjects from the age of two years up to 'superior adult'. The test (except at the lowest age ranges) is biased towards comprehension and knowledge of words, and it also measures memory and the ability to follow directions.

The Wechsler Intelligence Scale for children (WISC) was published in 1949 and a revised version (WISC-R) in 1974. Covering the ages 6 to 16, the test does not have an age-level format. Rather the raw scores for each sub-test are transformed into standard scores with a mean of 10 and a standard deviation of 3.

The crucial difference between WISC-R and Stanford-Binet is that WISC-R provides performance as well as verbal tasks, thus making it possible to use it with those who are illiterate or who have an impoverished language background (the lack of this facility with Stanford-Binet is central to some of the criticisms of IQ tests considered below). Correlations between WISC and Stanford-Binet tests are normally between .75 and .85.

Some individual performance scales such as Cattell Infant Intelligence Scale are also useful for avoiding the bias of the verbal responses required by Binet's tests. These performance scales usually involve such activities as manipulating objects to form designs, tracing, copying, solving mazes or completing formboards.

Jackson (1974) lists a wide variety of tests of mental ability for primary and secondary pupils, and in the present context enough has been said to show some of the pitfalls in using these. Above all, they are expensive to administer, especially in terms of time by trained personnel. At present a British Intelligence Scale has been recently developed, and its use is still being pioneered. This has a number of distinct advantages over other tests:

... its norms are accurate for British children

... its score system will be expressed in wide bands (90-99) rather than with a spurious accuracy (IQ 97)

... sub-sections deal with specific areas or skills (reasoning, number, memory, fluency, verbal skill, spatial skill) with appropriate sub-scales; so a profile picture of the testee can be compiled

... the test deals with a wider range of thought processes than do most other IQ tests.

This scale has considerable promise but is designed with an age-ceiling of twelve years.

In addition to individually administered tests of ability, group tests have been devised. These can be administered quickly, by less highly trained personnel; though they still rely heavily on Spearman's concept of a general factor in intelligence (Gold, 1965). Most, though, contain both verbal and non-verbal components. Each test has its strengths or weaknesses. Thus the Otis quick-scoring Mental Ability Test (7-10 years) was standardized in 1937; Raven's Progressive Matrices A-E (8-14 years) is wholly non-verbal; Cattell Intelligence Tests (Scale 11, Forms A and B, 11-15 years) have a standard deviation of 25 instead of the more usual 15. Vernon et al (1977) go so far as to advise against the use of these tests on the following grounds:

... the subtests, being short, are low in reliability

... norms and score distributions vary widely from test to test

... many have a ceiling at about IQ 125 (too low to spot the most able)

Clearly, then, no single test of intelligence is extant which can be labelled effective. This in itself presents difficulties when one comes to explore which pupils are more (or less) able. But there are other, more serious, objections to testing as a practice; and it is to these we must now turn.

B.2 Bias on measured intelligence

We owe it to Ned Block and Gerald Dworkin (1977) that a sizeable collection of papers summarizing the debate about the cultural inadequacies of IQ measures has been compiled from a multiplicity of sources. The editors conclude that:

> 'no issue in the history of science presents such a complex mixture of conceptual, methodological, biological, psychological, ethical, political and sociological questions as the controversy over whether intelligence has a substantial genetic component.'

For this is indeed the basic issue. The use of IQ tests began to suggest that American immigrant populations were less intelligent than whites. In an attempt to explain this phenomenon:

> 'Professor Jensen has argued vigorously not only that individual differences in IQ are largely inherited, but also that average differences between blacks and whites are possibly determined by genetic differences between races.'
>
> (Kamin, 1977)

A similar view is shared by Herrnstein (1973) who is more cautious about the racial issue but disturbs Kamin's social conscience by suggesting that 'in our open society those who have risen to the top have better genes than those who are mixed at the bottom'.

The debate has a sizeable history, and its tone is overtly emotive. Protagonists such as Terman and Lippmann are openly sarcastic and verge on the personally insulting in refuting each other's views. It is, therefore, a welcome relief to follow the debate through the more detached eyes of Professors Block and Dworkin themselves, and they begin from three questions:

1. Can we reasonably ask whether IQ tests measure intelligence?

2. If so, how good are the arguments that IQ tests do measure intelligence?

3. If they do not measure intelligence, what do they measure?

The first flaw in the process of IQ testing is that there is no agreed definition of intelligence (see Section B1 of this chapter). A significant danger is that the defendants of testing may adopt a tautologous approach and define intelligence as the quality measured by intelligence tests. Worse still is the fact that early tests such as Binet's were devised in an atheoretical context; though, logically, theory and measurement need to proceed in tandem. Though the form of tests has changed, though non-verbal measures have been introduced, and though group tests are available - nevertheless, Goodenough's (1949) proposition stands: that improvements have been 'for the most part on an empirical rather than a theoretical basis'. Even when theoretical advances have been made (e.g. by Guilford or Cattell) these have not had much effect on the tests themselves. Further, the operationalist views of psychologists like Jensen and Herrnstein contain three flaws. First, if intelligence is something which correlates fairly well with various forms of success or with subjective judgements it is likely that "intelligence" is but one of many "measures" which might so do. Secondly, some widespread expectations about what intelligence will correlate with may be erroneous. Finally, though it may be possible to measure accurately and reliably, in a way which can be repeated for a number of different individuals, some correlates, e.g. of success in learning, these measurable correlates may not be intelligence, but perhaps more limited factors. There is thus a semantic problem if words like 'able', 'bright' or 'clever' are used interchangeably with the description 'high IQ'. To be a test of intelligence an IQ test must be concerned with cognitive processes rather than of 'a disposition or tendency to occupational success in our kind of society'. There is thus some doubt as to whether IQ tests in fact measure intelligence if this last is defined in cognitive or intellectual terms.

Block and Dworkin cast doubt upon the validity of IQ tests. They reject Eysenck's reasoning (1973) that:

> "there is no doubt that success in life defined either in terms of income or of social prestige (and thus defined essentially in terms of what the man in the street thinks) correlates quite well with IQ ...; hence IQ does clearly measure much the same thing as the man in the street means by intelligence."

It seems to the present writer that Eysenck here falls into the trap of confusing the possible (but not inevitable) outcomes of intelligence with the quality of intelligence itself. However, Block and Dworkin prefer to refute Eysenck by examining the alleged correlations and then reviewing their validity.

They suggest that the correlation of IQ with completed high school grades is claimed to be about 0.68, and that higher figures may be quoted for correlations with general scholastic achievement (Jensen, 1968). IQ is also said to correlate at 0.5 with occupational status, at 0.35 with income. (In itself, this last figure is rather low!) The argument runs that success is a measure of intelligence; IQ correlates with success; therefore, IQ is a measure of intelligence. But clearly we are now on extremely tenuous ground: for many factors must contribute to (worldly) success [e.g. looks, luck, family, even sex appeal!] besides intelligence. And success itself is ill-defined and multi-faceted. Certainly such correlations, if they have meaning, do not tell us what 'intelligence' is, nor can they support the view that IQ tests measure intelligence. It may not be surprising that IQ tests correlate quite highly with achievement tests since both are designed to assess a broad range of information processing and intellectual skills. Correlations between IQ and scholastic achievement grades are moderate. But Hoyt (1965) has shown that college grades are not a reliable indicator of potential vocational success. The correlation of IQ with higher completed grade in school is substantially greater for adult IQ than for childhood IQ; and this may be due to three factors. First, prior knowledge of a student's IQ score may condition the kind of opportunities and schooling he receives (the self-fulfilling prophecy - this is discussed in more detail later). Secondly, external variables such as social class or economic deprivation may affect <u>both</u> IQ test results and the type of schooling received.

Finally, occupational success may depend on school credentials; and achievement of these may have been pre-conditioned by school experiences which have themselves been determined by judgements on the basis of an IQ test. The wheel has turned full circle. This is not surprising since correlation data with pre-determined criteria of success was itself a factor from the beginning in deciding which items were retained in tests (Stoddard, 1945); and 'the whole history of IQ testing ... is littered with the corpses of (whole) tests which were dropped because these failed to correlate sufficiently with measures of success (e.g. the Cattell-Wissler tests and the Davis-Eels games)' (Block and Dworkin op. cit.).

Taking the arguments about the inadequacies of testing a stage further, Block and Dworkin call into question the concept of Mental Age used by, and since, Binet. They suggest that 'there is little reason ... to believe that intelligence corresponds to a basic intellectual development' (p. 449). This is a rather curious weakness in the progression of their case in so far as they do not discuss the evidence, and not even Piaget gets a mention at this critical point.

The argument thus comes to its crux: that even widely accepted tests such as WISC are culture-biased. In one subtest we find the question: 'Who wrote Faust?'; in another the respondent is asked to explain a proverb, and answer: Why should people pay taxes? But:

> "People with equal intelligence may differ in knowledge and skills because of differential access to cultural information due to differences in parental vocabulary and knowledge; presence of books, magazines, and newspapers in the home, and quality of local schools; differences in parental encouragement and intellectual and scholastic activities; desire to appear cultured or to do well in school, attentiveness, and so on."
>
> (p. 450)

The evidence appears to be that IQ tests measure a mixture of things which include socio-cultural background; personality, motivational and temperamental characteristics (Anastasi, 1967 and Wechsler, 1939 - though this may be more true of adult tests, and only secondarily true in relation to children); cognitive abilities; and probably some other factors which are less clearly defined. They fail to correlate highly with tests of creative ability (Wallach and Kogan, 1972). Very few (i.e. those which deal with rote memorization and series of digits) seem to get away from acquired learning and skills. If these premises hold true then inevitably IQ tests of traditional type will discriminate against respondents from those cultures or socio-economic segments of society not attuned to traditional patterns of knowledge acquisition by skills learning.

The resultant arguments about whether intelligence is a global factor (g) or a series of more specific abilities have been referred to and need not hold up this review. Nor is it necessary to delve deeply into the emotive areas of racial discrimination that form the focus of much of the discontentment with traditional 'g' tests /this is summarized in Eysenck (1973) for the one side and Kamin (1977) for the other]. But it is necessary to glance briefly at the underlying issue: to what extent, if at all, can intelligence be regarded as a genetic characteristic?

From a practical point of view this question is of interest to the classroom teacher in the formation of his philosophy of educational procedure. If one believes that a child with a low IQ is genetically incapable of performing better at school tasks then one will not construct a remedial programme but rather a tailor-made curriculum divorced from what Hegarty and Lucas (1978) call 'normal educational goals'. The same viewpoint may lead to prejudice against the more able, the attitude being that they already (genetically) advantaged should not be given yet more privileges (this attitude emerged during the Teacher Education Project research and is reported in Chapter 4.)

The degree of heritability in IQ is variously estimated, the underlying data hotly contested. Jensen (1969) suggested that 88% of IQ score was due to inherited factors; Burt and Howard (1956) agreed with this high figure. Jencks et al (1973) put the figure at 45%. Kamin (1977) and Block and Dworkin (1977) dispute the more exaggerated claims. Kamin's approach is to question the quality of research in this field; Block and Dworkin attack the legitimacy of the underlying philosophy. Each approach will be summarized in the following paragraphs.

Imagine that we take two handfuls of seeds from genetically heterogeneous sack, urge Block and Dworkin; then ...

> "We carefully prepare two homogeneous nutrient solutions. One is normal; the other lacks essential nutrients and trace elements. We grow the two handfuls in the two homogeneous nutrient solutions with homogeneous lighting, temperature, humidity and so on. Since each lot has perfectly uniform environmental conditions, the heritability of height in each lot will be 1.0. But there will be a large

> difference in the average height of the two lots, a difference ascribable entirely to the environmental difference in nutrients."

Thus if a child does have a genotypic advantage in intelligence it is possible for this to be magnified by environmental factors. He or she may choose to read books and solve puzzles; parental encouragement and stimulation may be high; intelligent parents may consciously provide environments for enhanced learning so magnifying any advantage which might be inherent. Block and Dworkin suggest a distinction be made, therefore, between 'ordinary heritability' which includes environmental factors of this kind outlined, and 'direct heritability' which is defined as 'the proportion of variance directly caused by genetic variation.'

The exact degree of variance in IQ which is attributable to 'direct heritability' as defined, and the degree which is contributed by environmental factors at one level or another, is unknown. The studies of identical twins (e.g. Burt, 1966) should throw some light on this, but these may be suspect [this will be discussed shortly]. If the Burtian position is correct, then improving the environment of upbringing and learning for everyone to the same level would have a small effect only on improved intelligence (if this is defined in terms of performance on IQ tests). That situation has far-reaching negative implications for classroom teaching, and indeed for educational provision at L.E.A. and national level.

Much of the remaining controversy at the theoretical level revolves around the relationship between IQ scores and overt measures of success (income, status); yet this seems a sizeable side issue to the real issues of genetics. There is a danger in the Block approach of suggesting that

... a connection between IQ score and heritability is socially desirable

... such a connection is not yet empirically established

... to establish it empirically, even if it were possible, would be undesirable (especially because of its possible racial implications)

... therefore it would be better to abandon empirical research.

In this way a fairly balanced account of the problem ends with an ascientific conclusion:

> "At this time, in this country, in this political climate, individual scientists should voluntarily refrain from the investigation of genotypical racial differences in performance on IQ tests."
>
> (p. 520)

Kamin (1977) is generally on safer ground in pointing to two major flaws in the case of the Jensenites: first, that controlled scientific experiments have so far failed to establish the direct heritability of intelligence as a major factor, and secondly that the nature of IQ tests as measures of 'intelligence' is questionable.

Identical (monozygotic or MZ) twins are same sex and physically similar; they share identical genes. If through accident or default they are separated, then investigations into the relative effects of heredity and enviroment can be conducted with fewer complications than for other kinds of individual. If IQ were wholly inherited then IQ scores for separated MZ twins should correlate at 1.0. Since few workers would deny some effect on intelligence to environmental effects and since IQ tests are not perfect this perfect correlation would be reduced but still substantial. Does it happen in practice?

There are four major studies of MZ twins: in order of sample size these were carried out by Burt (1966), Shields (1962), Newman et al (1937) and Juel-Nielson (1965). The correlation between their IQs of their MZ twin pairs is shown in the Table taken from Kamin (op. cit. page 54).

Figure 5.1

I.Q. Correlations in Four Studies of Separated MZ Twins

Study	Test	Correlation	Number of pairs
Burt	'Individual test'	0.86	53
Shields	Dominoes + 2 x Mill Hill	0.77	37
Newman et al	Stanford Binet	0.67	19
Juel-Nielsen	Wechsler	0.62	12

Kamin goes through these four sets of data with a fine comb. Burt suffers worst. In the present space only the bones of the argument can be reproduced. There is, however, some clear evidence, when Burt's studies are viewed alongside one another, of some scientific failings, of inconsistencies, and of suspicious consistencies. The following examples give the flavour.

1. Through his career Burt studied correlations of IQ between pairs of MZ twins. His correlations remain surprisingly static, thus:

Figure 5.2

Correlations for MZ Twins, 'Group test' of Intelligence

Source	Twins reared apart	Twins reared together
Burt, 1955	0.771 (N = 21)	0.944 (N = 83)
Burt, 1958	0.771 (N = 'over 30')	0.944 (N = ?)
Conway, 1958	0.778 (N = 42)	0.936 (N = ?)
Burt, 1966	0.771 (N = 53)	0.944 (N = 95)

2. However, his "group test" of intelligence is unspecified.

3. Burt employed 'adjusted assessments' of IQ rather than raw IQ scores. On some occasions he failed to acknowledge that scores were adjusted (Burt, 1955); on the others (Burt, 1956, for example), he sets out for us ground rules for adjustment.

4. Though the twins' intelligence was measured by an undefined group test it emerges (Burt, 1955, in a footnote on p. 172), that the IQ of the parents was guessed at during an interview.

5. Burt's language is imprecise. In Burt (1955) there is a reference to 'doubtful or borderline' cases which by Burt and Howard's (1957) work have become 'a representative sample'.

6. The 'group test' of intelligence was used over a period of 45 years and unfailingly produced a twin correlation of 0.77, regardless of sample size (Burt, 1921, 1933). In Burt (1933) no group test is named; and in Burt 1921 seven are named, but as all are wholly verbal none fits the 1957 description of the group test as both verbal and non-verbal.

7. Burt's assignment of the parents and foster parents of the MZ twins to social class (which was done on a six point scale) is questionable. In the study by Burt's assistant Conway (1959) it was averred that at least four children of professional parents had been reared in 'orphanages'; while the Burt (1966) account, with an increased sample size,

records that only two small children had been reared in what are now described as 'residential institutions'.

8. Some of Burt's data seem to be more convenient than convincing. Thus Kamin (p. 68) notes:

> "There are many other oddities in the data. We note briefly that, among upper-class children reared in their own home, the social-class-I.Q. correlation was a significant 0.61, despite the very severe restriction of social class range. For lower-class children reared in own homes, the class-I.Q. correlation was -0.04, significantly different. That might be plausible, but among children reared in adoptive homes the picture was entirely reversed. For upper-class adopted children, the class-I.Q. correlation was a modest 0.12; for lower-class adopted children, it was a significant 0.34. These data, if taken seriously, would suggest that home environment makes a difference only within the range of working class homes. Further, we would conclude that the gene pools are sharply differentiated between the various strata of white-collar workers, but not among the strata of manual workers and ne'er-do-wells. There is no good reason to take these data seriously. The calculational effort we have expended on them was prompted only because these data have been so repeatedly cited by major theoreticians of heritability."

Sad though it may seem for such an eminent man to have allowed unscientific bias to insinuate itself into his data, even Burt's supporters are inclined to discount at least a proportion of his credibility.

Shield's work (1962) is more scientific and the data more fully reported. The tests given by Shields were Dominoes (20 minutes, non-verbal) and part of the Mill Hill test. Dominoes has been standardized on an all-male military population and the Mill Hill has been standardized in its full form only. Many of Shields' sample were female. Shields' double-weighted the Mill Hill test and gave a raw score of intelligence by adding this figure to the Dominoes score.

Shields tested 45 MZ twin pairs, 40 pairs personally; but because of geographical distance five pairs were tested by two examiners of whom one was usually Shields. Kamin compares the five double-tester pairs. On the Dominoes test he finds that double-tester twins correlated -0.27, the Shields-only tested twins correlated 0.82; and he points to dangers of bias in an involved tester-researcher and to the inherent problems of the Dominoes test which relies heavily on the testee's understanding of (and consistency of being given) instructions.

Nevertheless Shields' data and methods are explicit. He admits that only in thirteen cases were the separated twins reared in totally unrelated families. Correlations in IQ score for twins brought up by separate but related families were 0.83; for those in unrelated families 0.51 - a significant difference and one which argues for the influence of environmental factors. For ten pairs of twins only had there been both separation to unrelated families and a change of immediate environment (many of the others had attended the same school, for example); and correlation of IQ scores for these was 0.47. Kamin concludes: 'not a very powerful testimonial to identical genes'.

The Newman et al (1937) study began with a sampling technique which could have provided an initial source of bias. The pairs were chosen by correspondence, and a number of legitimate MZ pairs were almost certainly rejected because they claimed that, although mistaken in identity by outsiders, they did not feel identical in looks or disposition. Thus the eventual sample was selected to be of extreme examples of the MZ type. The IQ testing procedure used Stanford-Binet (1916) which has a higher mental age of 19.5 - yet some of these were adult subjects. Stanford-Binet suffers from another problem: its standardization contained no women, while Newman's sample was female dominated. While Newman found a 0.67 correlation in IQ between twin pairs, Kamin lists the twins in age-order. By making pseudo-pairs of subjects from two pairs of twins closest in age (thus twins A^1A^2 are 13.5; twins B^1B^2 are 13.6 in age; the pseudo-pairs are A^1B^1 and A^2B^2), and correlating their IQ scores, Kamin can demonstrate that:

> "The observed IQ correlation (between true male pairs) is 0.58. The pseudo-pairing procedure produces a correlation of 0.67. For the males, at least, we can predict an individual's IQ just as well from knowing his age as from knowing his twin's IQ."
>
> (p. 90)

Juel-Nielsen's (1965) Danish study concerned nine female pairs and three male pairs of MZ twins, and uses an adaptation of the WAIS test which is standardized on Americans to produce a mean IQ of 100 at every age. For the female sample, Kamin again uses the pseudo-pairing device to derive identical correlations on the basis of age to those obtaining to the IQs of twin pairs (0.59). He concludes about the age-IQ relation:

> "either that our leading IQ tests are very badly standardized, or that general population norms do not apply to twins, or that the twin samples studied by psychologists are bizarre - or all three."
>
> (p. 96)

If the studies of MZ twins just reviewed (and these are the most likely source of evidence) add little to the view that an individual's level of intelligence as measured by IQ tests is largely an inherited characteristic then this may be due in part at least to two factors: IQ tests are inefficient at measuring intelligence and our view of knowledge of genetics is too incomplete. Later it will be argued that IQ tests do not necessarily measure the cognitive processes which are the true business of classrooms and crucial to the education of bright pupils. Shortly it would seem appropriate to glance briefly at the field of genetics as it impinges upon the functions of the brain. First, though, some mention should be made of the alternative culture-fair testing procedures sometimes advanced by the environmentalists.

Two solutions to the problem of IQ test inadequacy are that tests be devised which are culture-free and that tests should not measure intelligence but learning ability. In practice the approaches are similar.

Hegarty and Lucas (1978) set out the requirements of a test of learning ability. It must :

... test activities equally unfamiliar to all respondents

... ensure that items like nonsense syllables must be nonsense to children of all linguistic backgrounds

... contain items related to school work

... provide instructions which are accessible and clear to testees

... have items which fit into an appropriate theoretical structure.

Reuven Feverstein (1972) developed his Learning Potential Assessment Device in a multi-langual Israeli context to measure the potential of deprived children. The scheme has the merit of acknowledging that if appropriate environmental stimuli are absent and children lack opportunities for active manipulation of them their mental development will be (irreversibly) retarded. Thus Feverstein brings together Hebb and Piaget in order to develop a theory of mediated learning in which the adult frames, focuses, selects and feeds back environmental experience to create appropriate learning sets in the child.

Most work on learning ability has been undertaken in a context dealing with slow learners. The results from it are ambiguous and sample sizes have as yet been small. There is some suggestion that Budoff (1975) was able to explore the distinction between educationally retarded children and mentally retarded children using adapted versions of Kohs Blocks and Raven Matrices alongside a specially composed Series Learning Potential Test. Such a distinction may aid teachers in the provision of appropriate remedial programmes.

One of the better known culture-fair tests is that of Cattell and Cattell (1973). It follows the frequent pattern of picture tests; instructions are read to testees so that the tester can establish that these have been understood. The test handbook suggests that the test is 'less affected by the vagaries of place and time and the prejudices of ethnocentrism' (p. 7) than are traditional IQ tests; but Mehrens and Lehmann (1975) conclude that 'these tests are not culturally fair if, by this phrase, we mean groups from one culture score as well as the tests as groups from another culture. Indeed, the latter cast doubt on culture-fair testing and the aspirations of the environmentalist school:

> "If there were really no genetic differences between people and if we used a measuring instrument that ruled out (or equated) environmental effects, then everyone would get exactly the same score on the test."
>
> (p. 139)

Finally on this subject, therefore, we might profitably return to the problem of genes in the make-up of the individual's intelligence or mental capacities.

B.3 Genetics and Intelligence

On the issue of the role of genetics in determining intellectual ability it is difficult to proceed further without detailed biological and medical knowledge, and this in itself is far from complete and unambiguous. These facts, combined with the problems of testing, suggest that no satisfactory answer can be given to the relative role of genes in determining the proportion of an individual's intelligence which is due to heredity. However, this much can be said:

Intellectual functioning is in part physical. It depends upon nerve pathways through the body and to the brain, and the capacity of cells within the brain to interpret the messages running along these pathways. Chemistry plays a part, too. Since the physical make-up of the brain is a product of genetic inheritance then it seems likely that at least a proportion of an individual's brain function (which go to make up manifest 'intelligence') must be determined by the DNA molecules from which he or she is ultimately fashioned. This is a long way, however, from a simplistic view seen in the "inheriting his father's musical talent" statements of popular conversation.

It is to the manifestation of intelligence that we can now turn.

B.4 <u>Identification through checklists of professional judgement</u>

How do we decide whether a given pupil is 'bright' or 'able'? Since the whole subject of objective testing is fraught with so many dangers is there an alternative strategy?

The two most recent decades have seen a checklist approach, in which teachers make judgements on the basis of behavioural criteria. This has certain advantages in that it requires less time-consuming activity and is done by the classroom teachers who know pupils best, as opposed to a skilled but strange tester.

Ogilvie's (1973) list, perhaps more than some, suffers from problems and limitations. From the point of view of this work it concentrates too heavily on the primary pupil (though many of the items would apply similarly to secondary pupils). In general, the list is rather too large and too diverse to be really helpful. For example, item 20 could apply to a pupil of any ability; item 31 may apply to young children regardless of whether the individual turns out later to have a high measured IQ; items 32 and 33 are not untypical of a majority of pupils in the middle years of primary education. Freeman (1982) has questioned the validity of item 37. Item 13 is by no means applicable to all able pupils.

Criticisms of these kinds against individual items in a checklist are easy to substantiate by references to specific cases of children who exhibit the characteristic without being bright in terms of measured intelligence or attainment. Conversely, any one bright pupil may not exhibit that specific characteristic. Nevertheless, checklists are useful for busy teachers. A possible solution to the problem is to cluster items under broader groups of characteristics and to include items which discriminate more sharply between able and average pupils. As a step on this road a number of other writers have tried to telescope the list of behavioural characteristics.

BRIGHT PUPILS: A LIST OF BEHAVIOURAL CRITERIA

(from E. Ogilvie, 1973, *Gifted Children in Primary Schools*, Macmillan)

1 Display of extraordinary initiative: singleness of purpose
2 Intense curiosity, sometimes in only one direction
3 Day-dreaming through boredom: possibly idle and can't be bothered with mundane tasks
4 Divergent, or even delinquent behaviour: independent
5 Highly imaginative forms of expression
6 Exasperation in the face of constraint
7 Contempt for adults of less ability: supercilious
8 Above average dependability
9 Ability to rationalise about lack of achievement
10 Highly developed sense of humour
11 Lively and stimulating conversation: not keen on writing everything down always
12 Ability to be absorbed in work for long periods
13 Suggestion of associated musical ability
14 Exceptional speed of thought
15 Exceptional depth of thought which shows itself, *inter alia*, in:
(a) their power to organise material
(b) ability to see the need for many different words to express shades of meaning
(c) their power to make and understand analysis
(d) their power to use images
(e) their capacity for adopting methods for unusual purposes
(f) attention to truthful detail
16 Finding no need to labour the practical approach; jumping to the abstract
17 Finding it necessary to listen to only a very short part of the explanation given; will withdraw if compelled to listen further
18 Interests – sometimes may seem unhealthy or precocious
19 Questions – may be tiresome and difficult to answer: asks lots of 'might' and 'maybe' questions
20 Bossy or cocky attitude – means of defence because they feel inferior in (say) games or handwork
21 Fear of failure – doesn't like to be proved wrong or inadequate
22 Dissatisfaction with own efforts and contempt of approval for work of standards which they realise are very ordinary
23 Perfectionism; mental speed faster than physical capabilities permit in action
24 Impatience – sometimes difficult to control – intolerant, pernickety
25 Less conformity – does not always do well; will opt out
26 Uneasy relationships with other children sometimes
27 Sensitivity and highly strung behaviour
28 Acute awareness of verbal puns etc.
29 General preference for sharing ideas with older children
30 A tendency to direct others in play and project situations
31 Alertness; often too observant for comfort
32 Good memory, frequently, but not always for 'facts' – for the way things 'work' or are related; often forgetful of 'minor' matters
33 Keenness at collecting ('rubbish' sometimes)
34 Humility about their achievements; not necessarily anxious to shine
35 Inclination, sometimes, to be self-centred or aggressive; attention-seeking
36 Lack of enthusiasm about group activities or group games
37 Appearing not to need a massive amount of sleep
38 High achievement in some line(s) or other

French (1960) listed 21 items:

1. Superior physique as demonstrated by earlier walking and talking; above-average height, weight, coordination, endurance and general health.
2. Longer attention span.
3. Learns rapidly, easily, and with less repetition.
4. Learns to read sooner and continues to read at a consistently more advanced level.
5. More mature in the ability to express himself through the various communicative skills.
6. Reaches higher levels of attentiveness to his environment.
7. Asks more questions and really wants to know the causes and reasons for things.
8. Likes to study some subjects that are difficult because he enjoys the learning.
9. Spends time beyond the ordinary assignments or schedule on things that are of interest to him.
10. Knows about many things of which other children are unaware.
11. Is able to adapt learning to various situations somewhat unrelated in orientation.
12. Reasons out more problems since he recognizes relationships and comprehends meanings.
13. Analyzes quickly mechanical problems, puzzles, and trick questions.
14. Shows a high degree of originality and often uses good but unusual methods or ideas.
15. Possesses one or more special talents.
16. Is more adept in analyzing his own abilities, limitations, and problems.
17. Performs with more poise and can take charge of the situation.
18. Is not easily discouraged by failures.
19. Has more emotional stability.
20. Can judge the abilities of others.
21. Has diverse, spontaneous, and frequently self-directed interests.

In a D.E.S.-sponsored booklet of guidance for teachers Hoyle and Wilks (1976) provide 20 items taken from Laycock (1957):

1. Possess superior powers of reasoning, of dealing with abstractions, of generalising from specific facts, of understanding meanings and of seeing relationships.

2. Have great intellectual superiority.

3. Learn easily and readily.

4. Have a wide range of interests.

5. Have a broad attention-span that enables them to concentrate on and persevere in solving problems and pursuing interests.

6. Are superior in the quantity and quality of vocabulary in comparison with children of their own age.

7. Have ability to do effective work independently.

8. Have learned to read early (often well before school age).

9. Exhibit keen powers of observation.

10. Show initiative and originality in intellectual work.

11. Show alertness and quick response to new ideas.

12. Are able to memorize quickly.

13. Have great interest in the nature of man and the universe - problems of origins, destiny, etc.

14. Possess unusual imagination.

15. Follow complicated directions easily.

16. Are rapid readers.

17. Have several hobbies.

18. Have reading interests which follow a wide range of subjects.

19. Make frequent and effective use of the library.

20. Are superior in mathematics, particularly in solving problems.

The expectation associated with each of the checklists detailed so far is that the list would be used by teachers as a quasi-systemic way of categorizing a pupil who appeared to have special learning needs resulting from high ability. In America and Canada education authorities are less averse to consulting parents. Typical of this approach is the School Board Inquiry into Gifted Children quoted by Vernon et al (1977). Issued by a city education department, this explores the pupil's past history and present parental encouragement as well as listing some behavioural criteria for judging giftedness.

6. What are the characteristics of this child which make you think that he or she is much above average in ability? Please check any of the following that apply, and add others if you wish.

   a. Spoke fluently, and used difficult words, by three years old ____

   b. Learned to read at 4 to 5 years ____

   c. Showed an intense, continuing, interest in some special area from an early age. Which area? ____________________

   d. Shows exceptional understanding of advanced topics and ideas ____

   e. Shows remarkable knowledge of many topics, and very good memory ____

   g. Shows unusual imagination and original ideas in his leisure time activities ____

   h. Showsexceptional initiative and independence in games or hobbies, or doing things for himself ____

   i. Says that his school work is boring because it is too easy ____

   j. Always gets very high grades at school. ____
   Others: please specify ____________________

   ____

7. Estimate the number of hours per week (outside school hours) that he or she spends on reading ____

8. What are his main reading interests (types of books, magazines, newspapers, comics, encyclopaedias, travel, science, literature, etc.? ____________________

   ____

9. What are his or her special hobbies and interests (e.g. collections, making models, photography, drawing, and painting etc.)? ____________________

   ____

10. What do you do to encourage him or her to develop their talents and interests? (Check any of these that apply.)

    a. Supply more advanced books ____

    b. Supply scientific, model-making, painting or other equipment ____

    c. Encourage use of the local library ____

    d. Arrange for music lessons ____

    e. Family excursions to museums or other places of interest ____

    f. Encourage him to watch serious TV programmes rather than popular crime, sport, or comedy programmes ____

    g. Give help with school homework ____

    h. Teach him or her more advanced maths, science, foreign language etc. than is available at school ____

    i. Go to concerts, theatres, or good films ____

    j. Discuss political or world news with him or her. ____
    What else? ________________________________

11. Have you yourself (or your wife/husband) got a special interest or talent which you would be willing to share with a group of gifted children?

    ____

One excellent example of a checklist is that of Renzulli and Hartman: a Scale for Rating the Behavioural Characteristics of Superior Children. In four parts, this looks at learning characteristics, motivational characteristics, creativity characteristics and leadership characteristics.

Since many checklists now available are inter-dependent it is pointless in a work of this size to multiply examples. Rather, attention may be turned to other forms or criteria for identifying the more able.

Before leaving this topic, however, mention must be made of Gowan's (1967) approach. While advocating the use of a variety of measures to

Scale for Rating Behavioral Characteristics of Superior Students

Joseph S. Renzulli/Robert K. Hartman

Name ______________________________ Date ______________

School ______________________ Grade ______ Age ______ ______
Years Months

Teacher or person completing this form ______________________

How long have you known this child? ______________ Months.

Directions. These scales are designed to obtain teacher estimates of a student's characteristics in the areas of learning, motivation, creativity, and leadership. The items are derived from the research literature dealing with characteristics of gifted and creative persons. It should be pointed out that a considerable amount of individual differences can be found within this population; and therefore, the profiles are likely to vary a great deal. Each item in the scales should be considered separately and should reflect the degree to which you have observed the presence or absence of each characteristic. Since the four dimensions of the instrument represent relatively different sets of behaviors, the scores obtained from the separate scales should not be summed to yield a total score. Please read the statements carefully and place an X in the appropriate place according to the following scale of values:

1. If you have *seldom* or *never* observed this characteristic.
2. If you have observed this characteristic *occasionally*.
3. If you have observed this characteristic to a *considerable* degree.
4. If you have observed this characteristic *almost all of the time*.

Space has been provided following each item for your comments.

- *Add* the total number of X's in each column to obtain the "Column Total."
- *Multiply* the Column Total by the "Weight" for each column to obtain the "Weighted Column Total."
- *Sum* the Weighted Column Totals across to obtain the "Score" for each dimension of the scale.
- *Enter* the Scores below.

Learning Characteristics ______________

Motivational Characteristics ______________

Creativity Characteristics ______________

Leadership Characteristics ______________

Part I: Learning Characteristics

	1*	2	3	4
1. Has unusually advanced vocabulary for age or grade level; uses terms in a meaningful way; has verbal behavior characterized by "richness" of expression, elaboration, and fluency (National Education Association 1960, Terman & Oden, 1947; Witty, 1955)	☐	☐	☐	☐
2. Possesses a large storehouse of information about a variety of topics (beyond the usual interests of youngsters his age). (Ward, 1961; Terman, 1925; Witty, 1953)	☐	☐	☐	☐
3. Has quick mastery and recall of factual information. (Goodhart & Schmidt, 1940; Terman & Oden, 1947; National Education Association, 1960)	☐	☐	☐	☐
4. Has rapid insight into cause-effect relationships; tries to discover the how and why of things; asks many provocative questions (as distinct from informational or factual questions); wants to know what makes things (or people) "tick." (Carroll, 1940; Witty, 1958; Goodhart & Schmidt, 1940)	☐	☐	☐	☐
5. Has a ready grasp of underlying principles and can quickly make valid generalizations about events, people, or things; looks for similarities and differences in events, people, and things. (Bristow, 1951; Carroll, 1940, Ward, 1961)	☐	☐	☐	☐
6. Is a keen and alert observer; usually "sees more" or "gets more" out of a story, film, etc. than others. (Witty, 1958, Carroll, 1940; National Education Association, 1960)	☐	☐	☐	☐
7. Reads a great deal on his own; usually prefers adult level books does not avoid difficult material; may show a preference for biography, autobiography, encyclopedias, and atlases. (Hollingworth, 1942; Witty, 1958, Terman & Oden, 1947)	☐	☐	☐	☐
8. Tries to understand complicated material by separating it into it's respective parts; reasons things out for himself; sees logical and common sense answers. (Freehill, 1961; Ward, 1962, Strang, 1958)	☐	☐	☐	☐
Column Total	☐	☐	☐	☐
Weight	1	2	3	4
Weighted Column Total	☐	☐	☐	☐
Total			☐	

*1—Seldom or never
2—Occasionally
3—Considerably
4—Almost always

Part II: Motivational Characteristics

	1	2	3	4
1. Becomes absorbed and truly involved in certain topics or problems; is persistent in seeking task completion. (It is sometimes difficult to get him to move on to another topic.) (Freehill, 1961; Brandwein, 1955; Strang, 1958)				
2. Is easily bored with routine tasks. (Ward, 1962; Terman & Oden, 1947; Ward, 1961)				
3. Needs little external motivation to follow through in work that initially excites him. (Carroll, 1940; Ward, 1961; Villars, 1957)				
4. Strives toward perfection; is self critical; is not easily satisfied with his own speed or products. (Strang, 1958; Freehill, 1961; Carroll, 1940)				
5. Prefers to work independently; requires little direction from teachers. (Torrance, 1965; Gowan & Demos, 1964; Mokovic, 1953)				
6. Is interested in many "adult" problems such as religion, politics, sex, race—more than usual for age level. (Witty, 1955; Ward, 1961; Chaffee, 1963)				
7. Often is self assertive (sometimes even aggressive); stubborn in his beliefs. (Buhler & Guirl, 1963; Gowan & Demos, 1964; Ward, 1961)				
8. Likes to organize and bring structure to things, people, and situations. (Ward, 1961; Gowan & Demos, 1964; Buhler & Guirl, 1963)				
9. Is quite concerned with right and wrong, good and bad; often evaluates and passes judgment on events, people, and things. (Getzels & Jackson, 1962; Buhler & Guirl, 1963; Carroll, 1940)				
Column Total				
Weight	1	2	3	4
Weighted Column Total				
Total				

Part III: Creativity Characteristics

	1	2	3	4
1. Displays a great deal of curiosity about many things; is constantly asking questions about anything and everything. (National Education Association, 1960; Goodhart & Schmidt, 1940; Torrance, 1962)				
2. Generates a large number of ideas or solutions to problems and questions; often offers unusual ("way out"), unique, clever responses. (Carroll, 1940; Hollingworth, 1942; National Education Association, 1960)				
3. Is uninhibited in expressions of opinion; is sometimes radical and spirited in disagreement; is tenacious. (Torrance, 1965; Gowan & Demos, 1964; Getzels & Jackson, 1962)				
4. Is a high risk taker; is adventurous and speculative. (Getzels & Jackson, 1962; Villars, 1957; Torrance, 1965)				

5. Displays a good deal of intellectual playfulness; fantasizes; imagines ("I wonder what would happen if. . ."); manipulates ideas (i.e., changes, elaborates upon them), is often concerned with adapting, improving, and modifying institutions, objects, and systems. (Rogers, 1959; Gowan & Demos, 1964; Getzels & Jackson, 1962)	☐	☐	☐	☐
6. Displays a keen sense of humor and sees humor in situations that may not appear to be humorous to others (Torrance, 1962; Gowan & Demos, 1964, Getzels & Jackson, 1962)	☐	☐	☐	☐
7. Is unusually aware of his impulses and more open to the irrational in himself (freer expression of feminine interest for boys, greater than usual amount of independence for girls); shows emotional sensitivity. (Torrance, 1962; Rothney & Coopman, 1958; Gowan & Demos, 1964)	☐	☐	☐	☐
8. Is sensitive to beauty; attends to aesthetic characteristics of things. (Wilson, 1965; Witty, 1958; Villars, 1957)	☐	☐	☐	☐
9. Is nonconforming, accepts disorder; is not interested in details; is individualistic; does not fear being different. (Carroll, 1940; Buhler & Guirl, 1963; Getzels & Jackson, 1962)	☐	☐	☐	☐
10. Criticizes constructively; is unwilling to accept authoritarian pronouncements without critical examination. (Ward, 1962; Martinson, 1963; Torrance, 1962)	☐	☐	☐	☐
Column Total	☐	☐	☐	☐
Weight	1	2	3	4
Weighted Column Total	☐	☐	☐	☐
Total			☐	

Part IV: Leadership Characteristics

	1	2	3	4
1. Carries responsibility well; can be counted on to do what he has promised and usually does it well. (Baldwin, 1932; Bellingrath, 1930; Burks, 1938)	☐	☐	☐	☐
2. Is self confident with children his own age as well as adults; seems comfortable when asked to show his work to the class. (Drake, 1944; Cowley, 1931; Bellingrath, 1930)	☐	☐	☐	☐
3. Seems to be well liked by his classmates. (Bellingrath, 1930; Garrison, 1935; Zeleny, 1939)	☐	☐	☐	☐
4. Is cooperative with teacher and classmates; tends to avoid bickering and is generally easy to get along with. (Dunkerly, 1940; Newcomb, 1943; Fauquier & Gilchrist, 1942)	☐	☐	☐	☐
5. Can express himself well; has good verbal facility and is usually well understood. (Simpson, 1938; Terman, 1904; Burks, 1938)	☐	☐	☐	☐
6. Adapts readily to new situations; is flexible in thought and action and does not seem disturbed when the normal routine is changed. (Eichler, 1934; Flemming, 1935; Caldwell, 1926)	☐	☐	☐	☐
7. Seems to enjoy being around other people; is sociable and prefers not to be alone. (Drake, 1944; Goodenough, 1930; Bonney, 1943)	☐	☐	☐	☐
8. Tends to dominate others when they are around; generally directs the activity in which he is involved. (Richardson & Hanawalt, 1943; Hunter & Jordan, 1939; Bowden, 1926)	☐	☐	☐	☐
9. Participates in most social activities connected with the school; can be counted on to be there if anyone is. (Zeleny, 1939; Link, 1944; Courtenay, 1938)	☐	☐	☐	☐
10. Excels in athletic activities; is well coordinated and enjoys all sorts of athletic games. (Flemming, 1935; Partridge, 1934; Spaulding, 1934)	☐	☐	☐	☐
Column Total	☐	☐	☐	☐
Weight	1	2	3	4
Weighted Column Total	☐	☐	☐	☐
Total			☐	

identify able children his series of questions to teachers asks them to nominate the

... best student

... child with the biggest vocabulary

... most creative and original

... child with the most leadership

... most scientifically oriented child

... child who does the best critical thinking

... able child who is the biggest nuisance

... best motivated child

... child the other children like best

... child who is most ahead on grade placement

... brightest minority group child in the class in case there are more than five, and one has not been named heretofore

... child whose parents are most concerned about increasing the enrichment of his educational progress.

Gowan's approach is adopted in this work; details appear in the description of the research design in Chapter 6 and in Chapter 7, Analyzing the Data.

B.5 Creativity: a general view

So far we have examined some suggested definitions and possible instruments to measure intelligence and 'creativity' which, on the face of it, seems to suggest that intelligence itself may differ in its qualities or form of manifestation between one individual and another. While this may seem plausible on the basis of normal daily observation (the use of such descriptions as 'ingenious', 'intellectual', 'original' and 'with flair' are certainly semantically distinct), scientifically the differences are harder to establish.

Dacey and Madaus (1969) review the many attempts to define creativity. Getzels and Madaus (1969) have drawn attention to the fact that

> "Most attempts at definition may be classified into three categories, depending on the relative emphasis given the product, the process or the experience."

Flanagan (1963) argues that a creative product ought to be a clever, rather than just a satisfactory, solution to a problem; and that such a solution should not be producible simply by logical, routine or mechanical processes. Jackson and Messick (1965) posit four criteria for a creative product: unusualness, appropriateness, transformation and condensation.

Unusual solutions are sometimes assessed by measures of statistical infrequency (Torrance, 1966; Guilford, 1967). Appropriateness as a criterion is designed to eliminate the unusual but bizarre. Transformation is described by Bruner (1962) as 'effective surprise'. Condensation implies the simplification of complex material or approaches (Jackson and Messick, 1965).

A typical process definition of creativity is that of Medwick and Medwick (1964):

> "Creative thinking consists of forming new combinations of associative elements which combinations either meet specified requirements, or are useful in some way."
>
> (p. 55)

Experiential definitions are of the kind offered by Maslow (1959) who thinks that creative acts are accompanied by transendance of self and a loss of self-consciousness, revelation of hidden truths, exaltation, spontaneity, aesthetic perception and the recovery of the unconscious and pre-conscious. In much the same way Barron (1963) thinks that even healthy and stable individuals need temporary upset and agitation as a pre-requisite for creative experience. Obviously this last approach needs to be treated with some caution in a classroom setting, though it may be legitimate in so far as (for example) the writing of an effective poem may demand a heightened consciousness of an otherwise daily occurrence, an emotional response to the subject, and an excitement in the task.

A broad-based definition which aims to be inclusive is that of Drevdahl (1956):

> "the capacity of persons to produce compositions, products, or ideas of any sort which are essentially new or novel, and previously unknown to the producer. It can be imaginative activity, or thought synthesis, where the product is not a mere summation. It may involve the forming of new patterns and combinations of information derived from past experience, and the transplanting of old relationships to new correlates. It must be purposeful or goal directed, not mere idle fantasy - although it may not have immediate practical application or be a perfect and complete product. It may take the form of an artistic, literary or scientific production or may be of a procedural or methodological nature."
>
> (p. 22)

Pfeiffer (1979) reviews the last decade's deliberations concerning the definition of creativity, but makes no progress beyond the range of approaches already quoted.

A moment's reflection will suggest that this could well be a useful definition for describing the degree of creativity of verbal and written transactions in school: the empathetic historical account, the mathematics problem, the generation or testing of scientific hypotheses, or the debate of issues in the social field.

The literature of creativity is so vast and has proliferated so rapidly that it is possible in this account to do little beyond giving a summary with brief annotation about the value of the work reviewed.

Best known workers in the field of creativity are Getzels and Jackson (1963) whose now classic study, carried out in a mid-western private school among pupils with a mean IQ of 132, is pioneering if not universally acclaimed. Purpose of the study was to identify two groups of students, one high in intelligence but not in creativity and the other high in creativity but not in intelligence. Two other groups [which are of less relevance to this study] were identified, one high in morality but not in psychological adjustment, and the other with characteristics reversed. The research questions concerning each pair of groups were as follows:

... what is the nature of their behaviour in school?

... do they do similarly well on scholastic achievement tests?

... do class teachers perceive them as equally desirable?

... do they attach the same meaning to the educational experiences?

... do they aspire to similar career and 'life' goals?

... what is the character of their fantasies and imaginative productions?

... do parents perceive the groups similarly?

... are there differing patterns in home and parental circumstances or environment?

The instruments and procedures of the Getzels and Jackson study are well documented. Methodology involved both specific objective measures and longer-term case study, which seems particularly appropriate in examining such ill-defined and elusive qualities as intelligence and creativity.

For ease of discussion it will help if Getzels two pairs of groupings are described in shorthand as follows: Intelligent/Creative pupils; Moral/Adjusted pupils.

In studying the Intelligent/Creative pupil groups Getzels and Jackson found the Creative pupils apparently overachieving on measured IQ scores, but the Intelligent groups to be better known and liked by teachers. This finding was replicated by Torrance (1960) using a more representative sample of schools and also some college student groups. The Intelligent pupils may well have been more teacher-orientated since

> "for the high IQ students the relationships between the qualities they value for themselves and those they believe lead to 'success' as adults is quite close. That is, these students appear to be highly success orientated. For the high creativity students the relationship between the qualities <u>they</u> value and those they believe lead to 'success' as adults is virtually nil."
>
> (p. 35)

Likewise in verbal and non-verbal imaginative productions the Creative pupils showed more examples of stimulus-free themes, unexpected endings, humour, incongruities, playfulness, violence, and a tendency to mock conventional attitudes or behaviour. These characteristics mirror those of Rogers (1959) who listed as pointers to a potentially creative person: openness to experience, an internal locus of evaluation and the ability to toy with elements and concepts.

In the home, mothers of the Intelligent pupils observed more, and more objectionable, qualities in their children - 'as if they were on the lookout for things to improve about their children' (p. 69). But they were less critical of themselves and their own child-rearing practices than the mothers of Creatives; for if the mother of the high IQ child has aimed 'to rear children who do well in school, who are well-liked by teachers, who accept the conventional values, and who aspire to careers in the prestige professions, she has of course succeeded' (p. 72).

In linking their findings to the theoretical and educational context Getzels and Jackson review the insights of workers such as

Koestler (1959) and Wertheimer (1954). The former pointed to the place of logical fallacies and apparent lapses of thinking in the innovative production of thinkers like Kepler and Galileo. Wertheimer emphasizes the reorganization of what is known about a problem, its inner-relatedness, in traditional thought; but suggests that in a creative approach the subject may begin not with the idea of one situation (S_1) which must be resolved to another ($S_1 \longrightarrow S_2$), but with a vague notion of, or an 'envisaged', S_2. Getzels and Jackson saw problem-solving as central to intelligence, but problem-devising as a feature in creativity. To the extent that stories and drawings of the high creatives 'provide examples of their toying with ideas and their combinatory play' their work accords with Freud's attempts to analyse creativity (Freud, 1947): creative thought derives from the elaboration of the 'freely rising' fantasies and ideas related to day-dreaming and childhood play.

Some important issues in creativity are set out by Getzels and Jackson as pairs of elements in need of distinction one from the other, thus:

1. intelligence is a component in creativity but not synonymous with it,

2. creative pupils show individuality, which must be distinguished from rebelliousness,

3. the creatives had a healthy solitude which should not be confused with morbid withdrawal,

4. the creatives were tolerant, but not indecisive,

5. the possession of many isolated facts is not to be confused with genuine education,

6. the creative pupils went beyond sense perception to intuitive perception,

7. the novel response of the creative pupil was evaluative but not judgemental,

8. in the classroom, teachers need to distinguish between impossible tasks (which should <u>not</u> be set) and demanding tasks (which present a legitimate challenge),

9. in curriculum planning teachers need to move away from factual curriculum and testing into 'evaluating the quality of wisdom' as the criterion of achievement.

10. teachers must guard against encouraging the 'precious' response but go out of their way to value the creative qualities in individual pupils.

It is not proposed to review the work of Getzels and Jackson on the pairs of groups described as Moral and Adjusted, except in so far as it impinges on the subject of creativity and IQ. Two brief verbatim passages sum up the central message:

> "The high IQ and the high adjusted groups hold in common qualities that are the reverse of the high creativity and high moral groups ... (i.e. both are participating in activities that are expected and approved by the social order. Both groups are moving with the tide.")

By contrast:

> "The highly moral individual seems to share with the highly creative individual the general posture of the outsider, the rejected and rejecting spectator as against the welcome and committed participant ... Both seem to have repudiated ... the superficial aspects of success and popularity ... both groups stand in opposition to the expected and immediately approved."
>
> (Both quotations from p. 158)

The work of Getzels and Jackson has been criticized in some quarters on two main grounds: first, that they used a limited and highly selected sample; and secondly, that much of the material is of the case study kind and therefore open to varieties of interpretation.

The IQ scores of the sample were obtained from school records and the same test was not used for all pupils: these facts cast some doubt on the reliability of the measures. There is no data cited about the reliability of the creativity tests when used with other groups, nor about the relationship between the test scores and creativity in task performance. Nevertheless, it is inevitable that, if (as seems likely) creativity and intelligence are linked though not identical, then the first steps in researching them should be among the able. The case-study data is presented and discussed openly, and is appropriate as well as persuasive. The private school background of the subjects may have had an appreciable effect on the sample of parents and thus of those parts of the research which deal with pupil and parental attitudes or with definitions of success. Yet the fact remains that other case studies of gifted pupils do reveal the kind of attitudes and phenomena highlighted by Getzels and Jackson. The collection from various sources in Povey (1980) makes interesting reading in the light of their findings, and similar reports can be found in Wallace (1982).

In England the work of Hudson (1966) led to the belief that thinking could be divided into two kinds: convergent and divergent (corresponding roughly to high IQ and high creativity). Like Getzels, Hudson's sample consisted of above average pupils from private schools, or drawn from selective schools. Hudson found differences between the two groups which seemed to reflect deep-seated variations in personality (cf. moral creatives with adjusted high intelligence pupils in Getzel's study). Divergent thinkers specialized in the arts subjects generally and convergers in the sciences. But the real nature of this relationship between cognitive style and subject specialization has been placed at the door of the greater degree of, and earlier, specialization in English education. Thus, Cameron (1967) used a sample of Scottish undergraduates to partially replicate Hudson's findings but found the relationship less marked in the Scottish educational system.

Some workers, such as Hasan and Butcher (1966), claim that tests of creativity and intelligence given to the same population (100 boys and 75 girls in the second year of an Edinburgh comprehensive school) correlate so closely that distinctions between so-called high IQ and high creative pupils are almost impossible to draw. The boys in the sample, for example, provided a correlation of +0.726 between results on tests of IQ and on the 'Fables' creativity test used by Getzels and Jackson.

Lovell and Shields (1967) studied 50 pupils aged eight to ten years each of whom had a WISC verbal score of 140 plus. In looking for factors in divergent and convergent thinking six cognitive variables were orthogonally rotated. The researchers concluded:

> "the first dimension clearly indicates an ability measured by the WISC scales or g + v.ed. ability; the second reflects a capacity to think logically in the Piaget type situation, while the remaining dimensions suggest that divergent thinking cannot be accounted for by one dimension; rather the able pupil is "creative" to different degrees according to the task that is set him."
>
> (p. 206, 207)

The choice, then, seems to be between regarding creativity as an independent cognitive reality related to, but distinct from, intelligence and characteristic of certain 'individuals'; or seeing creativity as one of the various strands or specific abilities which go to make up intelligence and which may be more or less strong in any given individual. Such evidence as there is seems to favour the view that creativity is a factor in judging someone to be gifted, and that it is among the able that creativity comes with its own as a discriminator between one intellectual (perhaps the logical) approach and another (possibly characterized by intuition). Schachtel (1959) thus distinguishes between the autocentric and allocentric modes, the latter being characterized by a perceptually open approach to the world.

As to where creativity originates (one must recall here the heredity-environment conflict surrounding IQ testing) Hudson (1968) sees convergent thought as emanating from children whose parents express love and approval on occasions of mastery of impersonal, practical skills. Divergers are likely to have been rewarded with approval on a more personal basis. Weisberg and Springer (1967) suggest that the creative child is the product of a home which fosters expressiveness, accepts regression and encourages individuality and independence. But Gutmann (1967), in an analogy with the DNA molecule or gene, describes creativity as a 're-enactment of the biological process of self-duplication on the behavioural level' (p. 10).

Wherever and however it originates, encouragement of creativity is obviously a factor in the education of the able. This is clear from Torrance's definition (1967), which speaks of creativity almost in terms of teaching activities:

> "the process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, misharmonies, and so on; identifying the difficulty; searching for solutions, making guesses, or formulating hypotheses about the deficiencies, testing and re-testing these hypotheses and possibly modifying and re-testing them; and finally communicating the results"
>
> (p. 73, 74)

It is then to creativity in the educative process that we now turn.

B.6 Creativity and education

There have been relatively few studies of creativity among school pupils; most are at student level in higher education. But some of the results are worthy of consideration. Thus Snyder (1967) distinguished between scientists and engineers in initial training in one American institution: scientists needed greater opportunities for intellectual risk-taking. Snyder measured the creativity of 721 freshmen using the Omnibus Personality Inventory (Thinking Introversion Scale, Complexity Scale and Impulse Expression Scale). Studying the freshmen identified as creative he concluded:

> "It is at least plausible that an antagonism may exist between professionalism, the achieving of professional status in the arts, science and engineering, and developing creative competence in these fields. Education may be more focussed on the former than the latter."

Snyder found that creative students were more frequently to be found among the drop-outs from the Massachusetts Institute of Technology; and he extended his investigations to check that this ostracism was not accounted for simply by the technological bias of the institution. His conclusion here was that there was an "invisible curriculum" unrelated to formal syllabus which may hinder (or help) the survival of certain kinds of student in one institution as compared with another. So,

> "It is precisely this that challenges educators to consider the consequences of their curricula for the development of excited, imaginative and concerned students."

These conclusions about the emphasis, balance and ethos of formal curriculum are important in school settings, and not least because in Britain the individual teacher has such a high degree of control over what is taught and how the teaching and learning process is organized. The results reported by Snyder are paralleled by Heist (1967). In a study of seven institutions, identified creative students were found to drop out in up to 80% of cases in some of the studied colleges. Heist's measurement of creativity, based on the Allport, Vernon and Lindzey Study of Values (1951), did not assess creativity in performance; but a case-study phase of the research tended to confirm the AVL ratings through peer and faculty nominations. In these case-studies detailed descriptions are given of individual students' disenchantments with their colleges, and the important descriptors they offer are words like 'frustration' and 'dissatisfaction'. In British schools the problem of frustration is less likely to lead to truancy, though college students may drop out: there is more likely to be a decrease in motivation and interest within the classroom.

Some attempt to account for this frustration is required; and the seeds of an explanation have been present at least since Osborn (1957). He suggested three bases or inhibitors: perceptual, emotional and cultural blocks to creative thinking. Sometimes students do not possess the tools of creative learning: they cannot isolate problems for themselves, cannot isolate attributes, or fail to use all their senses in observing so frequently there are underlying fears, e.g. of making errors, or of launching out from authority or conformity. Parnes and Meadow (1959) experimented with brainstorming techniques, giving problems to trained and untrained subjects and asking them to produce either quality solutions (non-brainstorming) or solutions without evaluation (brainstorming). The solutions were rated for creativity. Their conclusions were

> ... that brainstorming produced more solutions of quality than non-brainstorming
>
> ... that subjects trained in creative problem-solving produced more solutions of quality than did untrained students
>
> ... that there was a positive correlation between quantity and quality of ideas.

This work tends to cast doubt on the validity of the usual method of problem-solving in British classrooms, by rapid closed questioning with solutions pre-determined by teachers (a phenomenon discussed in detail later). It is subject to some methodological criticism, however, in that it fails to account for the degree of prior learning in its individual subjects. More recently the approach advocated by Edward de Bono (1976) in his CORT thinking materials has been widely tried with some success (Tripp 1979).

It might be reasonably suggested that a creative (or at least a problem-solving) approach to intellectual tasks can a) be taught and b) be learned by youngsters who are not necessarily of unusually high IQ. If this is so, it has important implications for the conclusions drawn about classroom learning in this study. The issue will, therefore, be raised in more detail as the discussion proceeds.

So, if creativity can be taught and its results are valuable to problem-solving or the devizing of new questions, why are creative pupils or students less well regarded than intelligent uncreative ones? To date, the burden of the answer seems to fall to three insights:

... creativity is threatening at a social level

... creativity is threatening because of the non-conformity of its intellectual ideas (e.g. Galileo)

... extreme creative production is often linked in the popular mind to processes akin to those at work in the disturbed individual /thus Kaplan (1977), citing a tradition which goes back to Prescott (1922): "it has been reasonably well documented that creative persons utilize some of the operations occurring in neurotic formations, in schizophrenic ideation, in child thought, and in the collective representations of non-literate societies" (p. 82)/.

These kinds of 'popular' attitudes may, it seems, result in some prejudice despite the fact that numerous studies have suggested that the exceptionally able are not psychologically maladjusted. Thus Terman (1940) in his 16-year follow up of his 'genius' group said of them that they

> "are not as a group characterized by intellectual one-sidedness, emotional instability, lack of sociality, or other types of maladjusted personality ... in practically every personality and character trait such children average much better than the average population."
>
> (p. 68)

This general state of affairs has been confirmed also in more recent studies (e.g. Freeman, 1979).

If creativity can be taught and if the creative pupil should be freed from the bondage of prejudice by peer-group and adults, how exactly can the school encourage this quality? Answers in the literature are generally unsatisfying. In English teaching and language work generally N. J. George (1971) - an experienced teacher, headmistress, college and university tutor - offers almost no practical classroom advice. The following passage about the pupil's 'free writing' illustrates the tone:

> "In other words, not to have him fortuitously produce a happy juxtaposition of felicitous phrases and call this 'creativity' but to operate the discipline of a linguistic approach which gives him the skill to verbalize complex thoughts and to narrate complicated events clearly. Opinion which is not backed up by knowledge, personal remarks made without taste, investigations which lack a scientific structure, all contribute to a flow of language whose centrifugal force is emotionality not backed by intellect ..."

Yeoman (1968) is a little more positive about work in the sciences. Despite the (then) recent evidence that science tended to attract convergent thinkers he felt that less emphasis should be placed on sheer volume of knowledge in school syllabuses; more opportunities should be found for teacher and pupil to explore scientific ideas (as opposed to the transmission of them by teacher to pupil); and that science specialists should retain a more balanced general curriculum alongside their specific studies. Yeoman also advocated an approach to the material of scientific syllabuses which permitted a more personal and emotional response to the learner, in order to encourage the convergent scientist towards the more intense motivation apparently exhibited by divergent thinkers.

Shackel and Lawrence (1969) go so far as to attempt to improve creativity through a course of programmed instruction. Comparing the verbal performances of groups of pupils trained by means of an autoinstructional programme designed to develop creative skills, by a conventional lesson covering the same ground, and by a set of exercises drawn from the instructional programme, with those of an uncontrolled group, they concluded that performance in creativity tests were enhanced by all three training procedures. The autoinstructional-trained group performed significantly better at the .01 level on 35 or 39 single test comparisons made. Pupils in the study reported, in a follow-up questionnaire, that they had also enjoyed the programmed instruction method: so the scepticism of Crutchfield and Covington (1965) seems unjustified, viz. that "the techniques of programmed instruction appear in some respects inconsistent with, or even antithetical to, the requirements of creativity".

Clearly, then, for the present purposes, what has emerged in our discussion of creativity in the process of classroom education is not just that teachers can promote it and therefore need to give some opportunities for its expression in the content and presentation of learning material; it is also, as Hudson (1966) has suggested, that creative people have a deep-seated need to create and that the classroom must provide a suitable psychological background to the creative process. Intellectual discovery is dangerous and so "the intellectual plays a solitary game in which, in a sense, the integrity of his personality is at stake".

Later in this thesis a good deal of evidence will be adduced to suggest that teachers fail to capitalize effectively on pupils' creative potential. They are not often aware that:

"the exactness of knowledge is the anteroom; beyond the classroom threshold, the presence chambers shine with dim gold, and all can walk or wander there ... book knowledge can be more or less according to advantage, or opportunity, but these inarticulate and subconscious realms have other rivers from which all men, in their moments, can drink their fill."

(Freya Stark: Persons in the Wind)

B.7 Underachievement

In the review of literature about able pupils emphasis so far has been upon children who score highly on IQ tests. A subset of these pupils may be labelled creative or divergent thinkers. However, not all these able pupils achieve in schools at a level commensurate with their measured or subjectively estimated potential. This sub-group might be described as 'the underachievers'.

Turner (1977) following Shaw (1968) lists several definitions of underachievement:

... the difference between attainment test grades and expected attainment

... the difference between attainment grades and measured IQ or scholastic aptitude

... the difference between achievement test scores and measured IQ or scholastic aptitude

... the difference between academic grades and measured IQ or scholastic aptitude

... the discrepancy between school grades and expected attainment.

Teachers in conversation show awareness of the presence of underachieving pupils of all abilities in their classes; their presence among the less able is clearly attested throughout the literature of this subject (see below). But the standard textbooks on the able are surprisingly coy. Even the words 'underachievement' or 'underachiever' do not appear in the index to a number of relatively recent and reputable publications: Ogilvie (1973), Vernon (1977) and Povey (1980).

Mia Kellmer Pringle (1970) is one of those most concerned with the underachievement of the able. She attributed the aggravation of the problem to slow pace of work in school, working alongside limited pupils, and pedestrian teaching methods. Parental attitudes to the child and to scholastic success, the level of cultural stimulation in the home, the child's personality and emotional relations were all involved too. The able misfits in her study were mostly boys with high intelligence but only average literacy and numeracy who failed to do themselves justice in intelligence tests. Parents were often professional, but homes were not typically harmonious, and (oddly) inadequate cultural and social opportunities were provided in many, only a quarter of the parents of Kellmer Pringle's sample of children were judged to be sensible and consistent about discipline. Obviously, therefore, she judged that not only the intellectual needs of the child, but emotional and social needs had to be met in any remedial programme. Her recommendations were that the size of the problem should be established, diagnostic tools devised and that studies be made of those who, conversely, appear mediocre in school but blossom and do well later.

Two observations should be made about this work. First, that it was undertaken when selection at 11+ was widespread. If the initial observations about pace, boredom and teaching methods were true then it may be that they are even more so in a mixed ability context. Theoretically mixed ability teaching caters for individuals; the question is whether it does.

Secondly, the 103 pupils surveyed in this work all exhibited learning or other difficulties 'severe enough to persuade their teachers to seek psychological advice' (p. 2). As such these pupils are likely to be both untypical and also just the tip of the underachievement ice-berg.

Despite a general reticence to admit what many teachers would like to think is a peripheral problem, the more extreme cases have made the national press from time to time throughout the duration of this study (March, 1977; Express Reporter, 1978; Macrory, 1978). The scenario has common features: an able pupil ostracized by his or her peer-group, insufficiently valued by teachers, too socially deprived or simply financially average to benefit from special education in the sphere of major talent, having to fight an unsympathetic head and/or L.E.A., and sometimes winning out through public pressure.

One very recent, small but in-depth, survey of comprehensive schooling and mixed ability teaching by H.M. Inspectorate was, however, bold enough to state the issue in uncompromising terms (H.M.I., 1978):-

> "Most frequently it was pupils of well above average ability who were not adequately catered for. For them, low expectation by teachers and failure to provide appropriate work programmes resulted in underachievement."
>
> (p. 57)

H.M.I. went further:

> "In most cases, however, the more able were underachieving, usually because the level of work demanded was aimed at the average or below."

> "In modern languages, mathematics and science, particularly, pupils were often operating at level which failed to ... extend them."

> "In English and the humanities the range and content of the work were often restricted."

> "Some conceptual aspects of history and geography were not encountered."

More sinister was the assertion that:

> "There was evidence in what H.M. Inspectors saw and what they were told by some pupils and teachers that abler pupils sometimes under-achieved to conform to the level of the majority of their classmates."

Nor do H.M.I. compromise about where the blame is to be laid:

> "Examination courses often revealed deficiencies in what has been learned in the first three years."

> "Teachers whose classes were achieving mediocre or poor standards were sometimes unaware of the fact."

> "Teachers' expectations of those of high ability were very frequently pitched too low."

> "Heavy reliance ... on written worksheets and assignment cards ... seemed to account for some of the failure to extend pupils adequately."

Some emphasis has been given to this damning indictment; for the fears of the popular press have been translated, in these extended quotations, into the judgements of experienced professionals. This thesis will, in due course, suggest that the failure to extend able pupils in school work is correctly laid at the door of teachers and teaching methods - though the Inspectors are too quick to blame simply the organization of mixed ability teaching and the ubiquitous and stultifying workcard (Student, 1979). The problem is deeper and more fundamental, affecting the teacher's whole approach to the balance and role of the main activities of teaching, i.e. managing, informing and stimulating pupils. For the moment it is appropriate to set aside the exposition of this point of view in order to concentrate on what little the literature does have to say about the underachiever.

According to Havighurst (1961), compared with achievers, underachieving intelligent youngsters might show some or all of the following characteristics:-

1. Think of themselves as inadequate.
2. Have lower aspirations in common with their parents.
3. Do not favour school so much.
4. Dislike learning from books.
5. Peers do not rate them highly for personality or leadership.
6. Often come from inadequate or broken homes.
7. Often come from lower socio-economic homes.
8. Have less clearly defined vocational goals.
9. Poorer study habits.
10. Narrower interests.
11. Not so well adjusted personally.

A possible approach to the underachiever is to see his problem as one of psychological inadequacy.

In a now somewhat dated piece of research Miriam Goldberg (1959) compared achievers with underachievers and found that the underachievers 'see their ability to perform ... as too far from what they would like it to be to warrant making an effort to improve'. Shaw (1968) obtained consistent evidence of underachievers having a more negative self-concept than achievers. In his view it is THEY who cause their own ostracism of the kind referred to above:

> "It seems clear that those pupils manifest behaviour characteristics which <u>cause negative social judgements to be made about them</u>." (My italics)

But the balance of evidence seems to be, as already implied, the reverse: external social pressure provokes a negative response. The problem is not new. Nearly fifty years ago Shaffer (1936) wrote these lines, prophetic in the light of H.M.I. (1978):

> "The pupil of superior intelligence is also educationally maladjusted in the conventional school, for he is kept from progressing up to the potentialities of his ability ... Compelled to sit through lessons which are boresome (sic) to him, the gifted pupil may resort to daydreaming and ... slipshod habits of work."
>
> (p. 509)

Numerous studies (Gowan, 1961; Miner, 1957), some of them with extensive samples (Green, 1962; Flanagan, 1964) and beginning from Terman's classic works, have documented what Newland (1976) has come to call "the near-typical underachievement of the gifted". But Newland himself makes three valuable points. First, that some underachievement may well have its roots in social disadvantage; secondly, that habits of non-work are learned in school; and thirdly, that underachievement itself may be learned and is certainly reinforced by teachers. Thus, an average or poor performance is accepted or, even worse, greeted with "He's at least trying". The whole situation can be a vicious circle: the pupil is undetected, his underachievement reinforced, it becomes a habit, his problem is harder to identify, educators do not even see there is a problem, so the pupil goes undetected. Some workers in the field have tried to redress the balance by introducing programmes of affective education in the areas of interests, attitudes, aesthetic appreciation and values (Morse, et al, 1980).

Examples from case studies of underachieving pupils could be multiplied, but this would be unproductive at this point. Suffice it to say that the argument of the thesis will attempt, at an appropriate later stage, to demonstrate that the atmosphere of most mixed ability classrooms in the present study was unconducive to stimulating intellectual achievement.

B.8 Grouping for the able: streams, sets and bands

If some able pupils fail to produce their creative ideas or to perform up to measured IQ potential in the regular classroom, could this be because of the organization of learning? How does the use of streaming, setting, banding or mixed ability grouping affect the performance of able pupils? This last method of grouping has been discussed earlier in this review with reference to the Banbury Report (Newbold, 1977). But for a number of years the problem was tackled from the opposite end, i.e. researchers asked how streaming or homogeneous grouping affected the able.

The present research was conducted in a mixed ability context, and it did not set out to balance, through the medium of a controlled experiment, the advantages and disadvantages of grouping by ability. The research began from the reality of the late seventies, of comprehensive schools and mixed ability classes. In the late sixties and early seventies, in the run-up to comprehensive schooling following D.E.S. Circular 10/68, however, the advocates and adversaries of ability grouping tried to assess its effectiveness. Best and most well-known among these studies is that of Barker Lunn (1970).

Barker Lunn studied 72 English primary schools, of which 36 used ability grouping and the other half did not. In the 'unstreamed' schools about half the teachers used 'hidden grouping'. The teachers who resorted to hidden grouping laid more stress on formal subjects and competitiveness than did the other unstreamed teachers. In cases where the school policy was to unstream and where teachers genuinely practised this, the pupils scored significantly higher on a short battery of divergent thinking tests. The teachers were also more child-centred and permissive.

In streamed schools and in those which allowed hidden grouping average and below average pupils showed poorer attitudes towards school, less favourable self-concepts, and less good relationships with teachers. There were no apparent gains in achievement by the able pupils in streams as opposed to unstreamed classes but there were, then, socio-emotional losses.

A number of studies have tended to balance this picture by tending to suggest that improved achievement in streamed groups happens only when teaching methods are also changed to suit the ability level of the pupils. This was the view of Ekstrom (1959) in his literature review. Goldberg et al (1966) and Esposito (1973) concur. Thus the emphasis is (rightly) shifted from organizational ploy to teaching technique. [This change of emphasis mirrors more closely the approach of Bennett (1978), who looked at teaching styles and their effect on learning rather than at organizational units.]

Vernon et al (1977) cite a Canadian example of streaming which failed because of teachers' objections to the removal of what has come to be known as the 'cream' from their classes. There were competitive elements, too, and pupils were under pressure to pass the qualifying tests to be chosen for this 'able' group. Political and social pressure played a part in the demise of the scheme; though it was popular with pupils involved and their parents.

Husen and Svensonn (1960) [cf. Svensonn, 1962] studied the period of change to comprehensive schooling in Stockholm. In 1956 the southern parts of the city became comprehensive but the northern part retained a two-tier system (this has now changed also). Husen and Svensonn studied 2,755 pupils in the two school systems. They tested them for intelligence, reading comprehension, writing ability and numeracy. Assessments were made of their social class.

Some of their conclusions are interesting:

... there was no advantage for pupils in the selective school except for those from less privileged homes

... children from high-status homes receive full intellectual stimulation outside school

... the classes in the low ability selective schools were generally unstimulating compared with those in the comprehensive system

... "alleged superiority of the selective or academic-type of pedagogic milieu is not strongly supported by the present study".

On the other hand, the population of pupils in the selective schools for the more able were predominantly upper class. The opposite held true for the pupils in the selective schools for the less able. Therefore, the results leading to the first conclusion reported above may be contaminated to the extent that the lower class able youngsters may have been affected in part not by grouping method but by imbibing class values.

Husen and Svensonn's work is the more interesting in the light of a follow up study by Elsa Ferri (1971) to the Barker Lunn survey already quoted. 1,700 pupils from Barker Lunn's study were followed into 83 secondary schools, where they were tested in the following eight areas: verbal reasoning, English, maths, divergent thinking, personality, attitudes to school, participation in school activities, and aspirations. Comparisons were made between groups of pupils from streamed primary schools and those from the genuinely unstreamed schools. Ferri concluded:

(1) Pupil attainment at 12+ was not related to whether the child came from a streamed or unstreamed primary feeder school.

(2) There were no differences in academic progress made by pupils in streamed or unstreamed secondary schools.

(3) There was "slight evidence" to suggest pupils from unstreamed primaries maintained their better performance on divergent thinking tests.

(4) Pupils transferred to secondary modern schools deteriorated in divergent thinking.

(5) <u>All</u> the pupils developed poorer attitudes to school and liked it less (this was especially true of girls).

(6) Girls, especially above average girls, developed a poorer self-image and became more anxious.

(7) Boys, especially the below average, improved in self-image and had lessened anxiety.

(8) "Differences found at 10+ between pupils in streamed and non-streamed junior schools had, on the whole, been eradicated by the end of their second year in the secondary school."

This study was not able to follow clearly-defined groups of pupils who had experienced streaming on the one hand, and non-streaming on the other, at both primary and secondary level. Some of the findings (e.g. nos. 6, 7) may simply reflect outcomes of puberty rather than of educative organization. The effect of subject-orientation in the secondary school and whether this lessens the effects of streaming or unstreaming was not researched. Nevertheless, it is worth noting that the unstreamed primaries appeared to foster divergent thinking. Too much research in this field has concentrated on the results of dichotomous systems of organization and their effect on a narrow criterion of achievement such as examination results. In this finding there may be a clue to a more significant factor in making learning effective: the interdisciplinary and problem-orientated approach of many primary teachers. This kind of approach will be discussed as the research for this thesis is explored.

Using American college students Laughlin (1978) examined whether individuals or groups (of up to five persons) solved problems better; and whether high-ability homogeneous, low-ability homogeneous or medium-ability groups exhibited consistent patterns in problem solving. He gave the subjects the Terman Concept Mastery Test (115 jumbled pairs of words to be sorted into correct pairs of synonyms and antonyms). He found that:

> ... high ability groups performed better than high-ability individuals
>
> ... low ability groups performed better than low ability individuals
>
> ... groups of four medium ability persons performed better than a medium ability individual; but groups of two or three did not. Further,
>
> ... "the performance of mixed groups of high, medium and low (ability) persons is basically proportional to the number of high ability members of the group: the greater the proportion of high ability members the better the group performance." (p. 117)

No doubt this last finding explains why many teachers intuitively prefer mixed ability groups and resist so vehemently the process of 'creaming' already referred to. In individual classrooms teachers can (this research implies) improve the performance of each working group of pupils by controlling the composition of working group and spreading around the leaven of the more able. Naturally, Laughlin's work would need to be replicated with primary and secondary pupils for its full implications to be revealed; and it suffers from an acute fault in reporting if not design, in as much as the criteria for being judged 'high', 'medium' or 'low' in ability are not explicit.

A thorough survey of ability grouping in the United States was carried out by NEA (1967). Because of the vast numbers of individual studies referenced it cannot be considered in detail, so it is perhaps useful to reprint the summary from this work in full (see Figure 5.3, next page). This shows quite clearly how the real issues about ability grouping revolve less around findings from specific pieces of research (at the end of the day the sum total of research is contradictory anyway) than about underlying philosophical arguments. These usually concern the social or non-cognitive effects of grouping by ability rather than the cognitive or intellectual ones. In this context two individual studies may be used as examples, one in an Australian context and in the other in a British setting.

Nicholson, Brown and Kenna (1979) looked at several non-cognitive factors: pupils' views of their worthiness as people (social self-esteem), their views of their performance as learners (academic self-concept), their social interactions within the peer-group, and their view of the social climate of the school. Some significant results were obtained:

... scores of social self-esteem were higher for pupils in socioeconomic high-status schools than for those in low status schools (but there was no difference between scores of children in streamed and tracked /unstreamed/ classes)

... pupils in higher status streamed schools had higher self-esteem scores than those in lower status streamed schools

... pupils in lower status streamed schools had lower self-esteem scores than those in lower status tracked schools

... pupils "above the sample mean in ability had a significantly higher mean academic self-concept score of 22.68 than the mean of 18.79 for those below the sample mean (F = 8.64)"

... pupils in tracked schools made social choices from outside their own class or form significantly more often than children in streamed schools.

Figure 5.3 Some arguments for and against mixed ability grouping.

Arguments for some form of ability grouping	*Arguments against ability grouping and for mixed ability classes*
Ability grouping allows pupils to advance at their own rate	A stigma may be attached to the pupil if he is placed in a slower group, in a fast group he/she may develop snobbishness and an exaggerated view of himself/herself
It challenges the pupil to do his best in the group to which he/she is assigned	Mixed ability classes provide personal contacts similar to those the pupil will encounter as an adult
Pupils may still associate with others of different abilities in games, assemblies, clubs and other joint activities	Pupils need the social experience of working with others of different abilities.
Methods and materials used with homogeneous ability groups are directly applicable to the entire group of pupils because of the pupils' similarity.	Less able pupils benefit from learning experiences in association with those of more ability.
This form of organisation makes it easier for the teacher to make the class feel an entity; so there are better opportunities e.g. for whole class discussions.	True ability grouping is impossible, since any particular factor used for such grouping may be the only point of similarity in the class.
Pupils of less ability are able to receive more individual attention from the teacher when they are placed together in a class.	In ability grouping, teachers may neglect pupils' differences. Since individuals have different patterns of ability, mixed ability grouping allows various levels of ability to show themselves among pupils of the same age.
Providing for individual differences within the mixed ability classroom becomes complex and time-consuming with such a great variation of individual differences.	Pupils do not all develop at the same rate. Mixed ability classes help pupils cope with different maturation rates.
When mixed ability grouping is used, the teacher tends to teach to the average or below.	

This Australian research tends to summate the findings of other workers in this field in Britain and the U.S.A. over the last two decades: it confirms the general picture that high ability pupils have more positive attitudes to school, and that pupils in high status areas improve in self-esteem. It suggested that for streamed pupils in high status areas, self-esteem is relatively high compared with that of pupils in unstreamed schools. So the pros and cons of streaming are less than clear-cut and may be complicated by external factors such as the status of the area of school's location. Thus Pattinson (1963) and the N.E.A. (1968) had argued that placement of less able with more able pupils in unstreamed situation may lead the former to develop feelings of inferiority. Eagle (1961) concluded that grouping practice within schools may build social situations which affect the pupil's self-perception and self-esteem; and the school structure as a dominant aspect of a pupil's motivation, personal and social adjustment is commented on by Rudd (1958), Lippitt and Gold (1959), Jackson (1964), Boocock (1966), Barker Lunn (1970) and Davies (1975).

Findley (1971) blames ability grouping for low self-esteem among the less able, and says it removes the stimulation provided by the more able and helpful teacher expectations.

One of the most carefully researched investigations into the non-academic correlates of ability grouping is that of Essen, Fogelman and Tibbenham (1979). This study uses data from the National Child Development Study organized by the National Children's Bureau: a longitudinal study of the educational, social and physical progress of youngsters born in a single week in March 1958. The data used is taken from the sample's performance at age 16. The children were tested on reading comprehension, mathematics and general ability and on a number of non-academic dimensions. Schools were asked to indicate whether they used one of the following organizations:

... streaming or banding

... setting (for at least some subjects)

... mixed ability; or

... some other arrangement

Schools were asked to indicate which of the above organizational methods was in use when the pupils were 12-13 years old so as to ensure that pupils had been fully exposed to the method; and only pupils who had been in the school for four years were included in the study. Only comprehensive schools were included, since terms like 'setting' may be quite differently interpreted by streamed schools, and their results quite different because of the narrower ability range present.

When Essen et al examined the pupils' self-rating in the four areas studied (English, mathematics and practical subjects; academic motivation; plans for further education and occupation; behaviour at school), there were no overall differences found between children in streamed, setted and mixed ability schools.

There are some inherent problems in this kind of survey - not least that it is very unlikely, that these pupils had in fact been organized solely by one of the three major methods (streaming, banding or mixed ability) <u>consistently</u> for the whole of their school careers. Both Dooley et al (1978) in the East Midlands and Reid et al (1982) nationally found that secondary schools vary the pattern so that early years tend to be mixed ability and later ones veer towards some form of ability grouping. It is also somewhat questionable whether streaming and setting really belong <u>together</u>. A child in a 'set' situation may well have quite varying self-concepts from one subject to another depending upon his level of set. This is insufficiently explored. The merit of this research is that not only is it carefully carried out within its limitations it is almost unique in trying to look at setting and banding techniques across a large sample of schools and pupils. Margaret Reid (1977) has rightly drawn attention to the dangers of generalizing on these issues from studies carried out in individual schools, and to the many factors for which it is almost impossible to account: teachers' attitudes to school policy, quality of teaching and the match between school policy and organizational practice.

The upshot of the ability grouping debate, in our present state of knowledge, seems to be that <u>in the context of the State primary or comprehensive school</u> very little damage is done by unstreaming to the learning or intellectual progress of able pupils. There may, on the other hand, be some social disadvantages to children of less than high ability in streamed situations. Many writers have an implicit or explicit view that any minor retardation of the able pupil in an unstreamed situation, could it be proved to occur, would be the acceptable price to pay for the raising of social morale on the part of the majority of pupils. Common sense and annual figures indicate that pupils in highly selective, mainly private, schools do perform more effectively on certain measures of success, e.g. Oxbridge scholarships, than other able pupils. In the research reported here it will be argued that, in mixed ability classes in comprehensive schools, all pupils - especially the most able - are unnecessarily retarded intellectually largely because of poor teaching methods.

One final issue in this section requires a mention. Almost all writers on the education of the able agree that selective classes, talent classes or some opportunity for gifted youngsters to pursue specific skills are both intellectually desirable and socially acceptable. Only Gold (1965, page 326), however, sets out any criteria as to when and how this form of ability grouping should be used:

... grouping should be employed for highly specific learning outcomes

... areas of study covered by groups should not be narrowly academic - there should be groups for students in a wide variety of areas

... the assignment to a special group should apply to 'distinctive' students and for that activity; students return to "the generality" in areas where they are more limited

... assignments to special groups should not be as a result of one global measure, and interest should play a significant role in selection

... small groups, with students distinctive in ability and interest, are better for these purposes than those with wider membership

... the move to special groups should be accompanied by appropriate changes in curriculum, methods and materials

... guidance programmes to aid with identification and to advise about enrichment beyond school should be set up.

B.9 Teachers' perceptions of ability and able pupils

Pygmalion in the Classroom has, perhaps a little unfairly, become a by-word for poor research into education (Rosenthal and Jacobson, 1968). Set up to explore the self-fulfilling prophecy (how one person's behaviour can quite unwittingly become a more accurate prediction simply for its having been made), this study is questionable on three separate grounds. First, the research procedures used are themselves open to debate; secondly, the morality of this kind of researcher intervention, though it may benefit some pupils, is dubious; and thirdly, it deals far too inconclusively with a subject that was inevitably bound to stir passions that went deeper than a purely rational and detached response. Nevertheless, the theme of Pygmalion is an important one; and even the objections may not invalidate the overall conclusions, regardless of the quality of the evidence.

The argument of Pygmalion runs as follows. In everyday life (social relations, commerce, politics) people who expect to fail and are expected to fail, do fail. In the behavioural sciences, the technical literature supports the view (it is alleged) that the self-fulfilling prophecy operates. In education, too, be it rats in mazes or Negro pupils in school, evidence suggests that those who are believed to be failures fail, and the putatively successful succeed. If this is so, then obviously it is crucial to know how the teacher views the pupil and consequently how the pupil views himself. To test out whether the self-fulfilling prophecy worked Rosenthal and Jacobson devized a research programme. At Oak School children were tested using the school's normal intelligence testing procedure and also on the 'Harvard Test of Inflected Acquisition' (in fact Flanagan's TOGA general ability test). Teachers were informed that the experimenters would be able to predict troughs and plateaux in pupil performance. They would alert the teachers to impending plateaux so that they could be prepared for them. It was hypothesized that teachers made aware of the potential 'blooming' of certain pupils would recognize its symptoms and act accordingly. In fact, the so-called 'potential bloomers' were randomly selected across the class ability range. Teacher judgements about their progress would then be compared with the pupils' actual gains of measured IQ during the experimental period. Morally the research was justified by the researchers simply because adjustments in teacher opinions were engineered in positive directions only. If selected pupils were found to gain by this treatment, well and good; unselected pupils would not suffer.

Some of the reported results are, on the face of it, impressive. In the first grade the control group gained 12 IQ points over the experimental period, but the special children gained 27.4 points; in the second grade the control gained only 7 points to the special group's 16.5. After this the differences tended to level out. In the first two grades a fifth of the control group gained 20 IQ points or more; but a half of the special group made this level of gain. There were sex differences between the pupils in the way in which they responded to teacher expectations: girls bloomed more in the reasoning sphere, boys in the verbal. In case studies of twelve of the special group it is suggested that two additional factors may promote intellectual growth: parental interest in the child's progress, and attractive physical appearance (which presumably affects the treatment given by third parties to the youngster). In some cases the improved performance following improved expectation turned out to be almost a handicap: the now "brighter" children were required to perform better than formerly in order to merit the same evaluation by the teacher. The teacher's expectancy was also found to endure for quite a long period. Indeed, follow-up IQ and performance tests showed that expectancy advantage was higher after two years than after one semester, though lower than the level after one year. So 'a moderate degree of expectancy advantage remained after two years' (p. 129). Middle track special pupils benefitted most from increased teacher expectations both in IQ and reading performance. When the pupils moved on to a teacher who did not know they were special, bright or fast-track pupils suffered an expectancy disadvantage (although they had already gained 7 IQ points on average), while medium track pupils continued to make intellectual progress. Nor does it appear that the gains of the special children were made at the expense of the rest: teachers appeared to spend less time with them.

So, Rosenthal and Jacobson conclude that the self-fulfilling prophecy has been demonstrated in the classroom.

Clearly, this is a piece of research with far-reaching implications. For those who do not like its findings one way to counter-attack is to question its methodology. The potential for such an approach appears to be sizeable. Thus Thorndike (1972) notes that raw scores for the IQ test results are not given; nor are the precise ages of the pupils. Working from estimates based on information in Pygmalion (first grade mean IQ 58, SD 36.8), Thorndike calculates that this would be equivalent to a mental age of 3.5 for TOGA if such norms were quoted - but they are not! Similarly Table A2, A3 (pp. 188, 189 in Pygmalion) shows class 1C Control Group with a mean IQ of 30.79. As Thorndike remarks: 'they just barely appear to make the grade as imbeciles' (p. 74).

There can be little doubt that Pygmalion *is* suspect. It also suffers from a tendency to generalize without producing evidence at all (however spurious). Thus on p. 179 we read that 'teachers appeared to give slightly less time to their special children'. Nowhere is there any description of systematic evidence to support this claim.

Nevertheless, a steady stream of studies have suggested that teacher perceptions of pupils may be a factor in learning gains. In an important review of the literature Brophy and Good (1974) make a significant point:

> "Most studies using product measures found no expectancy advantage for the experimental group, but most studies using process measures did show teachers to be treating the experimental group more favourably or appropriately than they were treating the control group.'
>
> (p. 73)

This is an important insight; and they go on to advocate the testing of it against the background not of false information supplied to teachers by researchers, but on the basis of genuine teacher judgements.

Here are two points to be followed up. First, what judgements do teachers make? Secondly, are there more subtle ways in which these judgements operate than can be measured by IQ gains or other rather crude scores? Two further pieces of empirical work are interesting in this context.

Wood and Napthali (1975) used a Kelly repertory grid to elicit up to 12 bi-polar constructs from each of sixteen teachers in a London comprehensive school. The teachers were asked to rank the elicited constructs and to indicate their role preferences. The eight most highly rated constructs were then made into a revised grid, each item being allotted a 5-point scale. Teachers ranked their pupils using this grid. Thirty completed grids were obtained and correlations calculated between constructs for a particular teacher and class. These correlations were then subjected to factor analysis. Constructs fell into three kinds: cognitive, affective and motivational. Six constructs emerged as important across the teachers studied:

... involvement of the pupil in the learning situation

... the ability of the pupil in the subject

... the overall ability of the pupil

... the behaviour of the pupil

... the quality and tidiness of work presented

... the interest displayed by the pupil in the subject

The researchers concluded that teachers certainly do make judgements about pupils' ability and cognitive constructs were central to teachers' judgement. This suggests that a set of cognitive constructs of the kind given by Gowan (1961) earlier in this chapter (B.5) may be useful in soliciting teacher judgements about bright and slow learning pupils. The principle is incorporated into the Class Profile Instrument described in Chapters 6 and 7, and used in this investigation.

In another piece of research, more specifically designed to test the self-fulfilling prophecy, Haigh (1974) tape-recorded lessons in eight primary classes from four randomly selected city schools in New Zealand. Lessons were of a pre-determined kind in each case: a story read by the teacher and followed by class discussion. Teachers were told the study was to examine how pupils handle question-and-answer sequences. Pupils were tested using standardized reading tests and the Otis Test of Mental Ability. Results were fed back to the teachers.

Haigh found that Low Expectancy groups of pupils had a low participation in the discussion sessions. This was attributed by teachers variously to: poor ability, poor listening skill, short concentration span, deafness, shyness, and slowness of thought. But these characteristics seem in part to have been imposed by the teachers since there was little evidence that they took remedial action. If the teachers did not impose the self-fulfilling prophecy then they tacitly allowed it to fulfil itself with no attempt at professional intervention.

So Haigh concluded that at least as regards quantity of interaction the prophecy was shown to work. And he suggests that the study should be extended to look at the quality of interaction in cognitive terms; since it may be at that level of subtlety that the problems are exacerbated.

This section of our review, therefore, leaves three strands of thought to be picked up in the research design. First, that despite the equivocal nature of the evidence, the *Pygmalion* position may hold true. Secondly, that a checklist of cognitive constructs may be appropriate in explaining teachers' judgements of bright and slow learners. Thirdly, that the judgements so formed may produce differences in treatment between slow learners and bright pupils which are capable of investigation in terms of verbal transactions at differing cognitive levels.

B.10 <u>The objectives of bright pupil education</u>

Perhaps at this point it is worthwhile to look at the general question of what should be our objectives in the effective education of able pupils. This is most economically done by means of a composite list culled from a wide selection of books and papers to which reference has already been made. These authors recommend that our objectives should include:

to encourage higher level thinking, speculation and the generation of hypotheses

to provoke curiosity

to encourage creative talents

to promote a problem-solving approach to learning

to provide the basic skills necessary for higher level functioning to take place

to further an understanding of and sympathy for the environment

to encourage an aesthetic appreciation

to promote empathy in human relationships

to provide a degree of vocational competence or readiness

to encourage the application of knowledge to new situations

to provide for healthy social and emotional adjustment

to encourage a facility in oral and written language suitable to a variety of purposes (transactional, expressive)

to foster co-operativeness and the ability to work within a group

to draw out qualities of leadership

to stimulate originality of thought and an unconventional approach

to lead the pupil to self-fulfilment

to expand the pupil's range of interests

to develop citizenship and social conscience

to encourage an openness to new ideas .

One approach to these generalized aims of bright pupil education is to translate them into specific behavioural objectives. Thus Kincaid (1960) lists the skills of effective thinking as:

Recognizing a problem and defining it clearly.

Thinking in terms of the whole and parts in relationship to the whole.

Gathering and studying facts about a problem, distinguishing between fact, opinion and propaganda.

Learning to use sources of information effectively.

Weighing evidence, making inferences, and drawing conclusions.

Checking conclusions for accuracy, modifying thinking as the evidence indicates.

Detecting within oneself and overcoming such things as subjectivity, rationalization, projection, and prejudice, which inhibit effective thinking.

Using creative thinking, such as using the imagination, uniting the thinking of a group to form a new concept.

There is always a danger that behavioural objectives will become simplistic; but the approach is useful in any attempt a classroom teacher may make to analyse pupil activity within the classroom.

To produce such a list of objectives implies a) the need to train teachers to meet them and b) the importance of L.E.As. and others in authority to formulate policies and training programmes. It is to these two issues we now turn. In passing, however, it should be noted that the list of objectives given above is by no means one which need be confined to the education of the most able - many or all items might be applicable to average or less able pupils in proportion to their potential and ability.

B.11 Strategies and skills for educating bright pupils

The Americans have progressed further than the British in recognizing the problem of able children and experimenting with strategies to cope with the improvement in educational standards for them. Sanderlin (1979) notes extensive examples of in-class boredom by able pupils and that the two traditional answers to the problem are acceleration and enrichment.

Lundy (1974) suggests that in favour of acceleration it might be argued:

... that it is a logical step, since the gifted learn more rapidly than others

... achievement is not related to length of time spent in study, and appropriate pacing is less likely to cause boredom

... acceleration capitalizes on the biological peak of energy, alertness and productivity

... failure to accelerate leads directly to boredom

... acceleration is a form of enrichment by providing new and varied educational opportunities

... the schooling process already stretches over too long a period and adolescence is unduly prolonged by it

... a shortened period of schooling would have economic advantages to the community

On the other hand, it could be said that:

... an accelerated programme may lead to the omission of valuable opportunities to pursue studies in greater depth and with greater breadth

... there are more appropriate ways of alleviating boredom than risking a mismatch between emotional and intellectual development

... acceleration may lead to cramming and an undesirable loss of 'leisure and living' time

... there is a danger of setting the able pupil apart from his peers

... some subjects may be sequential in nature (possibly mathematics or modern languages); in which case vital steps in learning could be omitted.

Other writers concentrate wholly on curriculum, its content and enrichment (Martinson, 1968). Here a number of guidelines for success are laid down. The teacher is urged to evaluate the child's activity to see whether it provides:

... opportunity for search and discovery

... variety in response

... testing of new ideas

... varied resources in the seeking of answers

... self-initiated activities

... opportunities to cope with new or unusual ideas

... opportunity to apply ideas to other fields of knowledge

... a high demand on the conceptual ability of the pupil.

Martinson lays considerable stress on questioning as a skill in the armoury of the teacher of able pupils; but here the approach is unsystematic as is shown by the following examples of "good" questions:

... how can you learn to tell one bird from another?

... what do a bird's wings tell about it?

... how does a bird's bill tell what it eats?

... a bird's feet and legs tell you a lot about it.
Find out some information so you can tell us about this.

Martinson fails to classify questions or distinguish questions from tasks. The issues are referred to again throughout this thesis.

Hopkinson (1978) inveighs against the preponderance of factual approaches to education in the early years of the English comprehensive school; but he offers no remedy for the problem.

Strong (1960) listed various kinds of programmes tried by American School Boards with varying degrees of success:

... providing quality resources, a flexible curriculum and individualized instruction in the regular classroom

... holding special library-discussion periods for the gifted

... forming out-of-school clubs and interest groups

... extending the school day for the able (unpopular with parents)

... setting pupils

... half-day instructional programmes for the able

... the setting up of special schools

Havighurst et al (1955) described in detail fifty such programmes in American schools or school districts. They pointed out that the common elements of curriculum enrichment programmes were:

... emphasis on the creative and experimental

... emphasis on the skills of investigation and learning

... independent work, stressing originality

... high standards of accomplishment

... leadership training and social adjustment activity

... individual attention by the teacher

... first hand experience

... flexibility of organization

... extensive reading by pupils

... a concern for community responsibility

By 1957 two of the authors of this 1955 monograph had moved on in their thinking in two significant ways (DeHaan and Havighurst, 1957). First, they had begun to place more emphasis on the role and special skills of the teacher of the more able in the regular classroom. Secondly, they were beginning to place more emphasis on encouraging creativity in the education of the gifted. Thus of the teacher they say that attitude towards able pupils is important, he or she must be able to make sound professional judgements about pupil progress. There is an increased emphasis in using both the classroom as a resource and also the use of resources (libraries, audiovisual software) in the classroom. The teacher must be aware of curriculum developments in his field, must have clear policies about grouping pupils and must be able to prepare and organize schemes and individual lessons effectively. While reinforcing basic skills the teacher is advised to promote the use of the imagination, to study some of the great men and the great problems of civilization, and to promote empathy.

As for the second growth area, DeHaan and Havighurst divide creativity into three kinds: affective; problem-solving and abstract or formal. This kind of creative work is characterized by teachers who are open to pupils' ideas and activities which revolve around open questions or challenges.

Freehill (1961) covers much of the ground already mentioned, but emphasizes the importance of the underlying educational ethos. It should be characterized by opportunities to encounter other able people, work that challenges the limits of the pupil's ability, healthy questioning, relief from routine, compatible working groups and a sense of personal security. He also advocates a broad curriculum, including languages, philosophy and aesthetics in addition to the usual subject areas taught in schools.

Keating (1979) reviews a number of American attempts to educate bright pupils more effectively, but points to their limitations. These are largely due to failures in co-ordinating various programmes available and in counselling the able pupils appropriately so that individual courses or timetables are comprised appropriately.

Many attempts at providing handbooks of practical suggestions are so popularized as to be almost useless to teachers (thus, Congdon, 1978), or they are aimed overtly at parents (e.g. Pickard, 1976). Tempest (1974) recommended observation and enquiry methods for primary pupils: but his examples of the work in action show a heavy reliance on work-cards and tasks of collecting data. He does mention problem-solving and imaginative work, too; but again the examples are unexciting. A much more promising approach is to be found in an older book by Torrance

(1965). Torrance describes a course in educational research to sixth grade high achievers' class. The course had five aims:

... to familiarize the pupils with some research concepts in the behavioural sciences

... to communicate the excitement doing original research

... to provide experiences in conducting and reporting research

... to develop skills in formulating and testing hypotheses

... to make the pupils aware of their own creative thinking processes

No doubt some would find this approach too introspective; others would baulk at formulating behavioural objectives. However, it led Torrance to hypothesize some reasons for teacher-failure & educational inadequacy in gifted education. He suggested that a teacher should indulge in concentrated thinking rather than random thinking; should be intellectually honest even in the face of criticism; should investigate and explore; should be more aware of the varieties of ways in which any given situation can be perceived; should expand his own range of environmental experiences; should jot down good ideas before they get forgotten; be confident enough to be an individual and be one's self.

Dorothy Sisk (1976) produced a rather different list of skills for teachers of the able:

... knowledge of nature and needs of the gifted

... skill in utilizing tests and test data

... skill in utilizing group dynamics

... skill in counselling and guidance

... skill in developing lessons in creative thinking

... skill in utilizing such strategies as simulation

... skill in providing learning opportunities at all levels of cognition

... skill in relating the cognitive and affective dimensions

... knowledge of new developments in education

... knowledge of current research about the gifted

... skill in demonstrating lessons for the gifted

... skill in conducting action research.

The best advice on practical teaching in the classroom is to be found in Gallagher's (1975) now famous work. This contains a wealth of background information about the gifted which is invaluable to teachers and surveys possible approaches in most curriculum areas. He emphasizes the need for appropriate content; but also for appropriate methods of presentation and a sound learning environment. Above all he is concerned to improve the quality of thinking in the classroom: to move away from data into developing concepts and generalizations. Gallagher is sceptical of the value of lists of desirable characteristics required in teachers of the gifted; but is persuaded of their need to be student-centred, stimulating and cultured. This last is no part of our present enquiry; but the argument of this thesis will be to suggest that little work experienced by bright pupils in mixed ability classes is child-centred, and perhaps even less of it is intellectually stimulating on Gallagher's criteria. The subject is discussed again throughout this volume.

Little work has been done in this country on the qualities and skills required of the teacher of able pupils, but in the U.S.A. again Maker (1975) provides the best statement of the range of desirable attributes drawn from a variety of sources. These could be listed as being:

... highly intelligent

... flexible and creative in approach

... self confident

... having a wide variety of interests

... able to show a sense of humour

... fair, firm and patient

... sympathetic to the problems of the able

... clear about the teacher's role

... willing to put in extra time and energy

... enthusiastic about the subject and about teaching

... facilitating rather than directing

... willing to continue learning at own level

... emotionally secure

... strong in self-concept

... understanding the process of human development

... skilled in developing individualized curricula

... innovative in teaching method

... keen to engage pupils in higher order thinking

... willing to admit mistakes

... able to develop independence in pupils

... supportive of pupil initiatives in learning

... supportive of the able against peer-group pressure

... able to provide a secure classroom climate

... respectful of pupil ideas

... able to encourage work which is not necessarily under the pressure of assessment

She concludes that since able pupils are usually already competent in the use of cognitive memory processes, teachers need to help them to develop divergent and evaluative thinking. What is most needed is for teachers to analyse their own performance and to do this against some measure of the quality of their question technique.

> "In preservice as well as in-service situations, teachers can be taught to ask questions on different levels. They can be taught to analyze their own classroom performance in terms of the kind of thinking exhibited by students."

It is precisely this approach which is attempted in the present thesis. The thesis itself sets out the groundwork of research which was required a) to establish the present position regarding cognitive stimulation in mixed ability classrooms and b) to act as the basis for the development of training materials [published by the Teacher Education Project - though the account of the compilation of these is strictly beyond the scope of the thesis itself.]

June Maker goes on, in a vein which seems somewhat revolutionary in a British context, to make various recommendations, notably that:

> ... colleges establish minimum criteria for candidates accepted into a training programme for educators of the gifted
>
> ... two criteria be accepted as necessary for all teachers of the gifted: an ability to relate effectively to this group of youngsters and an openness to change
>
> ... colleges establish minimum criteria for candidates "graduating" from a training programme for teachers of the gifted: i.e. a knowledge of these pupils' characteristics, willingness to facilitate not dictate, skills in individualizing instruction and evaluating pupil progress and performance, and willingness to perform a variety of teaching roles
>
> ... teachers of the able should display a high degree of intelligence, self-confidence and emotional stability
>
> ... these teachers should show in the performance a high regard for the individual, concern for imaginative ideas, and a high sense of responsibility
>
> ... they should display skills in providing a secure class classroom climate in which creative ideas can be tried out
>
> ... a variety of assessment techniques be used to take account of the skill of the teacher: practical teaching of the able, personality and attitude inventories, interviews of the potential teacher by able pupils, their parents and other qualified teachers
>
> ... graduation should depend on the possession of practical competency - knowledge, skills and attitudes - rather than on reading, assignments and course attendance.

In the field of pre-service courses leading to the teaching qualifications in the area of gifted children Maker noted the following as course components:

... academic inputs on the education of the gifted

... work in a classroom to apply principles

... selection of appropriate curriculum materials

... participation in micro-teaching

... visits to the local Area Service Centre for the Gifted

... visits to other gifted child programmes

... attendance at courses and conferences

... independent research, field study, programme planning and evaluation exercises

Specific competencies required in these teachers in the California State University were listed as being:

... assessment of physical, intellectual, social and emotional characteristics

... assessment of learning abilities

... assessment of motivational and attitudinal factors

... utilization of procedures for individualized instruction

... identification of issues and research findings

... counselling skills for the pupils and their parents

... evaluation skills in weighing up instructional systems

... ability to analyse and evaluate programme elements

... ability to extend interaction

... ability to plan and conduct parents' meetings

... ability at self-assessment and professional improvement.

Graduates from these programmes informed Maker that what they found most useful were contacts with others working in the field of able pupil education, the content learned and the flexibility of choices within the overall programme. They claimed that, of the teaching methods learned, class discussion and independent study were the most useful in the classroom. They criticized the small quantity of practical experiences in their courses and the fact that courses were sometimes biased by the over-use of a single tutor. But they did comment that the programmes were characterized by more emphasis on

> "the higher thought processes of application, analysis, synthesis and evaluation."
>
> (p. 26)

This insight leads us to look more generally at thinking in the classroom - not just for the bright pupils, but for the average and less able too, and this is done in a moment in Section C of this chapter.

B.12 Special programmes and policies

In a work of this nature a full-scale review of programmes for the gifted is inappropriate; but it is useful to cast a rapid glance at these and at the philosophies which underpin them.

To travel around the world or to skim the international literature on the able reveals national differences of approach.

Mallinson (1980) reviews educational provision for the able in Western Europe. Belgium, he claims, accomplishes its aims for this group through 'complicated systems of option electives which can fully stretch the brightest', though there is no attempt to bring forward any evidence that they do. In Holland the system is academically geared to university entrance through a series of examination hurdles. France has developed a curricular-controlled system which, for the most able, assures a culture générale of considerable academic demand.

From personal experience it would appear that the Swedes value a particular view of democracy above any attempt to help the most able. They take the view that the under-privileged must be given extra chances and facilities, but the "already privileged" should not be rewarded with still more special attention and resources. Their system works well in training specialist remedial teachers; but differential provision for the able is a deeply offensive concept.

Oddly enough, it is Russia which puts more emphasis on fostering talent. The Russians acknowledge the socio-economic importance of skills in any field: academic, aesthetic, physical. The need to make a good show in the world is a spur to provision of special schools and training experiences for the specially talented in almost any field. Teaching methods might be considered to veer towards cramming, but lessons do not lack variety, activity or pupil participation. In a study of modern language lessons Muckle (1981) noted the high standards demanded of average pupils [one education official is quoted as saying "Ninety-nine per cent of the normal population can master a foreign language. We have proved this in practice and no longer discuss the matter"]. He also found a greater degree of high level cognitive demand than is typical of many modern language lessons in this country. He attributes the purposefulness of modern language teaching to five factors which would probably be equally true across the curriculum:

... course aims are clearly delineated

... methodology and materials are well organized to a set pattern

... professional monitoring by heads and inspectors is continuous

... syllabuses are not deflected from central issues into turgid background studies

... children's time is not wated by long periods of undemanding activity

Most well-known and well-documented of gifted child programmes abroad come from the United States. Here, there is a greater readiness to accept that giftedness comes in many forms, social giftedness for example may compare alongside academic ability (Pegnato and Birch, 1975). The Americans are not as afraid as we are of the rise of the meritocracy (Perritt and Mertens, 1979). Research and government reports are more readily commissioned (U.S. Commission of Education, 1971). Federal initiatives are undertaken (Bartolini, 1979). Writers such as Newland (1976) give detailed consideration to devising programmes for the gifted, staffing them, financing them and evaluating them.

To temper the picture, it still remains true that the U.S. Commission found that 57½% of school principals questioned claimed they had no gifted pupils in their schools; and Vernon et al (1977) introduced their work with the statement that:

> "It is surely ironic that the most able and talented children in western societies, such as Britain, the United States and Canada, by and large receive the worst education."

Despite this gloomy Canadian perspective, however, the authors are able to include a proforma compiled by one School Board which solicits parental involvement in identifying their able pupils and which is quoted in Section B 4 of this chapter. Such a thing would certainly not be countenanced in Britain, so perhaps the conclusion we should draw is that we fare worst of all in this country.

Terman's (1974) advice that 'special education for the gifted demands both differentiation within special programs in terms of individual needs and differentiation between programs for the gifted and those for others' falls oddly on British ears. Perhaps it is appropriate, therefore, to conclude this brief overview with the recommendations of the Devon L.E.A. to its teachers and headteachers. In a twelve-point plan, often cited as the exemplary British approach, Devon suggested:

1. Deliberate efforts should be made to give young teachers and inexperienced teachers confidence in identifying special gifts.

2. Attention should be drawn in courses of in-service training particularly associated with primary education to the signs of latent giftedness which children might reveal.

3. Special care should be devoted to the identification of high giftedness among children who suffer from physical or emotional handicap, who have recently changed schools, who have unambitious parents, who are discouraged by their peers or who may, while performing at a high level and behaving in a compliant and unexceptional way, find school uninspiring.

4. If a highly gifted child needs special help outside school it is hoped that schools will review both the desirability of making a contribution to special programmes and the possible need for flexibility in adjusting their own demands.

5. Schools should examine whether benefit is to be drawn from acceleration.

6. Schools should examine the extent to which the curriculum of highly gifted children might be enriched; this has particular relevance to small schools.

7. Certain schools, colleges and teachers' centres should be designated, on the basis of geographical spread and ease of access, as the base for some special part-time classes and activities for children with exceptional skills and gifts.

8. The staffing of part-time classes on this basis should be a matter of concern for the Authority together with the possibility of establishing "skill banks".

9. An investigation should be made into those methods of screening at an early age which would contibute to the wider identification of latent giftedness.

10. In recognising the importance of stimulus for the child, both in identifying and in sustaining high giftedness, teachers should pay special attention to the extent to which the stimuli of the school and the home complement each other.

11. A method should be devised by which schools and others might follow the subsequent success and failure of children who reveal high giftedness while at school. It should be particularly examined whether they assume leadership and responsibility for activities related to their particular skills and gifts.

12. The services of educational psychologists and of advisers should always be available to assist the process of identification and to act as sources of guidance and information.

In the present context what is important about this list is its omissions. Though in-service training gets a fleeting mention pre-service does not. Worse still, there is no specific mention at all about the need to train teachers in the encouragement of the crucial thinking skills which we have so far discussed. H.M.I. (1978) goes conceptually no further except for putting some flesh on a few administrative bones, with the emphasis firmly on curriculum context and problems of creaming off the able. Little wonder perhaps that, as this thesis goes on to show, awareness of teaching skill in bright pupil education is lacking among teachers, and that thinking skills are absent from the pupil's repertoire of abilities. It is to thinking skills that we now turn.

C. THINKING IN THE CLASSROOM

C.1 An overview

In this review of thinking in the classroom it will be necessary to be selective: Modgil and Modgil (1976) compiled some 3,500 references to Piagetian research alone, and for the present purposes it is necessary to keep the review close to current concerns.

Piaget's stage theory is well known. The term is used by Piaget to indicate the stages through which pupils pass, to indicate the increasing ability of pupils to solve tasks which demand more and more complex logical operations for their solutions. Piaget's stages are as follows:

pre-2 yrs approx	sensori - motor stage
c. 2 yrs to 7 yrs.	pre-operational stage
c. 708 until c. 11-12	concrete operational stage
c. 11, c. 12 to c. 15	stage of logical thinking or formal reasoning

This stage theory has been criticized as being too clear-cut, as giving the impression of discontinuity in cognitive progression. But Piaget himself points out that the intermediate steps a child may take between one stage and the next may be legion; and this long-drawn-out process can rather be seen as one of continuity and development (Piaget, 1960). Even so, Neimark (1974) carried out a longitudinal study, testing pupils twice a year over three years using a language-free test involving black and white figures; and she concluded that there were two qualitatively different approaches to problem-solving by her studied pupils. These corresponded approximately to those of the concrete and formal operations stages of Piaget, though they were linked by a discernible series of discrete steps.

From our point of view in this research it is the formal operations stage, and the transition to it, which is important. According to Piaget, average-ability pupils of approximately 12 years of age begin to think in formal operational ways. If this is so, then at this stage of education, teaching should reflect this emergent skill, bringing it on, encouraging, rewarding and practising it. In the schools covered by this research the transition to secondary schools takes place at 11+; so the pupils in our sample reached twelve years of age during the period when this work was progressing.

But the situation is complicated by several other factors. First, our schools were all organized mixed ability in the year-group concerned. Therefore, the abler pupils in our sample would have _already_ made this transition to formal thinking.

Secondly, our teachers then needed to be catering for able youngsters already entrenched in formal thought, youngsters of moderate ability who were just embarking on this, and less able youngsters who were unlikely to be coping with these demands, _all within the same class_. A crucial question related, then, to the _separate_ strategies our teachers would adopt, _relative to the three stages_ the youngsters would have reached.

Thirdly, some research studies have indicated that transition from one stage to another may take place (at least in part) earlier than c. 12 years for even pupils of undistinguished ability. Tough (1977) showed that favourable socio-economic factors may be significant in permitting even seven-year-olds to use complex sentences to make comparisons, recall the past, anticipate the future, look for similarities and differences and offer logical explanations. So the question recurs as to how teachers are coping in mixed ability classes in the early years of the comprehensive school in encouraging, developing and challenging these emergent skills. These are skills which are _not_ directly related to IQ (so the teacher cannot resort to the "there are no bright pupils ..." ploy), but rather to social background which in our sample schools and in most schools contains a complete cross-section of society. Of children from these higher socio-economic backgrounds Tough (1969) found that even three-year-olds talked about cause and effect; while Turner and Pickvance (1970) discovered that such primary pupils were more aware of alternatives in finding solutions, could formulate problems better and were more likely to ask for adult help. Bryant (1974) demonstrated 'that young children can make inferences very well indeed'. What happens to these relatively articulate problem solvers in the first year of the comprehensive school? Inhelder et al (1974) showed that pupils even in the age range 5.4-7.4 years could be trained to improve their performance in a test of conservation of length and they concluded:

> "Questions and discussions at certain crucial points in the learning process can induce an awareness of contradictions, and provide the impetus for high-level co-ordinations leading to the new cognitive structures."

This research explored teachers' language and questions to discover how it was designed to lead to these new cognitive structures.

So far the emphasis in this brief discussion has been to establish that formal thought, concerned with concepts and abstract ideas, is likely to have developed or to be developing in pupils of the age covered by the sample in this piece of research. Questions have been raised about teachers' strategies for dealing with these thinking skills [the answers to the questions will be attempted in a later chapter]. We move now to consider experimental work with pupils of secondary school age, and to look at some subject specific considerations [once more, the bias of this study will encourage us to look longer at R.E. than at other curriculum areas].

Piaget himself (1972) describes the thought characteristics of the child age c. 11-c. 15 years. What is novel about this stage is, he says, "the capacity to reason in terms of verbally stated hypotheses and no longer merely in terms of concrete objects and their manipulation". And again:

> "This is a decisive turning point, because to reason hypothetically and to deduce the consequences that the hypotheses necessarily imply (independent of the intrinsic truth or falseness of the premises) is a formal reasoning process."

Now the child can subordinate the real to the realm of the possible. Socially there are implications. The youngsters can now engage in discussion, e.g. taking (while not necessarily accepting) the role of adversary. He can go beyond his immediate field of experience, construct theories, evaluate and participate in ideologies.

Piaget refers in this article to research /unreferenced/ which indicates that while the four developmental stages are passed through by all children, in sequence, the rate at which pupils reach them varies. However, the research reveals that in western industrial communities such as our own the stages are reached more quickly.

Lunzer (1978) while experimenting with logic problems to show that logic is not the only component of effective thought, productive thinking may be analogic, nevertheless notes that even problems of logical inference are solved with increasing efficiency as the adolescent grows in cognitive competence and:

> "even when initial performance remains at a relatively low level there is an improvement in responsiveness to teaching and experience."

Put in classroom terms, then, perhaps we can construe this conclusion as follows: while some pupils may not have begun to think in formal operational ways at c. 11-12 years, the potential is there and it is the job of the teacher to exploit it.

In cognitive terms, one way of looking at the class of first year secondary pupils of mixed ability is to say that some will be well-launched on higher level, i.e. formal thinking, some will be embarking upon it, and the rest will generally be in a state of readiness or potential development for it. Once again, we are brought back to the concern of this research, which is how teachers exploit pupils' capacity for higher level thinking in lessons.

Initial investigations on mixed ability teaching support the view that teachers think of their classes as having a three-tier structure consisting of: the able, the middle band and the less able or remedial. The three groups, of course, are not necessarily equal in size, but teachers see them as constituting separate teaching problems. This accords well with the position deriving from the Piagetian and Lunzerian research reported, and the application to it of the concept of readiness. How do these differences manifest themselves in the classroom? Two pieces of research throw some light on this.

Mason (1974) tested a sample drawn from seven year groups of comprehensive school pupils with ages ranging from 11 to 17. He presented each group with four groups of four poems, short, complete and taken from school anthologies. He asked: what do these poems mean to you? He classified the responses as follows:

1. lacking comprehension
2. repeating poem's content
3. having unfused affective reaction
4. showing cognitive awareness of single referential element
5. writing cognitive and affective elements in a co-ordinated generalization
6. providing hypotheses linking the poems to wider human parallels.

The results of his categorization produced the following results when viewed against pupil age (Figure 5.4):

Figure 5.4 Mason's research (1974):

Frequencies of responses by categories and age

Age	Category 1 and 2	3 and 4	5 and 6	Total responses
11+	68	11	1	80
12+	25	51	4	80
13+	28	45	7	80
14+	27	44	9	80
15+	5	39	36	80
16+	9	44	27	80
17+	8	15	57	80

This experiment shows something of the progression of thought that takes place at c.11-12 until maturity. It is confirmed by Clarke (1974) who sought imaginative-explanation judgements to nine test items from a sample of 90 youngsters of varying ages between 9 and 18, and a sample of 90 adults with a mean age of 35 years. The pupils were divided in high ability and low ability groups and the adults were all selected for high ability. The incidence of imaginative-explanatory judgements across this sample is shown in the Fig. 5.5. From it Clarke points out:

... the spurt in imaginative-explanatory judgements for high ability pupils comes at the age 11-12 years

... the spurt for lower ability pupils is reached at 12+

... a ceiling appears to be reached by the end of adolescence

... not even in maturity are all judgements at a high level (734 out of a possible 810).

Figure 5.5 Clark's (1974) findings:

Incidence of Imagination - Explanatory Judgements

Age	Lower Ability	Higher Ability
9.0	42	136
10.0	61	137
11.0	135	195
12.0	189	366
13.0	368	472
14.0	396	565
15.0	457	573
16.0	531	620
17.0	-	727
18.0	-	698
35.0	-	734
Possible responses	810	810

Enough has been said, perhaps, to establish the principle that higher level thought, or the potential for it, develops in the period covered by the early years of comprehensive schooling. This is the context of the present research; and because of its special concern for the able and the slower learner, an especial watch will be kept on teachers' strategies for exercising and providing opportunities for higher level thinking. Since many teachers in the comprehensive school think of themselves as subject specialists it is appropriate to look at cognition in a number of subject areas. We begin with Moral and Religious Education (abbreviated to R.E.). /In keeping with the emphases outlined in the preface this is dealt with at greater length than the other subject areas./

C.2 Thinking in individual subject areas

Serious study of the cognitive development of pupils in R.E. did not begin until Piaget (1932); but there had been a single early attempt by Barnes (1902), who presented pupils with hypothetical situations and asked them to indicate what punishments they regarded as just or unjust. He discovered that English children were more mature than American ones because they more frequently favoured restitutional as opposed to punitive correction. Piaget applied his stage theory to the field, indicating a number of transitions through which children had to pass, thus:

... an egocentric gives way to a co-operation orientation

... adult constraint gives way to autonomy

... moral realism (fear of the consequences of one's actions) gives way to a view of the actor's motives or intentions

... automatic punishment gives way to equity, where due account is taken of circumstances.

Pringle and Edwards (1964) used a sample of pupils in three groups: able, average and dull according to a Stanford-Binet IQ test. Not surprisingly they concluded that the dull children were less subtle and abstract in their moral thinking. Thus on the issue of stealing the dull children assigned blame according to the amount stolen, but the able gave weight to the thief's intentions. However, the dull children were less punitive and more in favour of a second chance for the offender. Brennan (1962) studied the relationship between age, intelligence and certain moral variables using Lunzer's Vineland-Manchester Scale of Social Adaptation. He concluded that moral age was related to both chronological age and mental age up to 9½ years; thereafter, mental age became less important and chronological age was insignificant. However, this result may have been affected by the relatively 'young' nature of the problems used. Nesbitt (1962) used factor analysis of a range of test scores of honesty, intelligence, persistence etc. to show that a 'general moral factor' increased in importance with age from 10-14 years of age.

These studies have in common a concern for moral as opposed to religious thinking. Whole books (Peters 1981, for example) have been written to suggest that the two are quite distinct. This work takes the pragmatic view that what appears on school timetables is Religious Studies. While it is possible to study morals without religion it is impossible to study religions without looking at their related moral systems. The two, while philosophically separable, are thus practically united.

It was Goldman who pursued this connection most vehemently. His now classic studies (1964, 1965). took biblical examples of moral situations and asked pupils to make judgements about them. His conclusion was favourable to a stage-theory, notably that children below about 10 years of age had a retributive or expiatory view of justice; at about this age there was an intermediate stage which gave way to a distributive or importance view at about 11½ years. Goldman's stages appear to come rather later than those of Piaget; and he explained this by three possible factors:

... sampling or cultural differences in the research

... differences in the nature of moral stories presented

... the extra difficulty of transferring the remote biblical story to the pupils' own experience

Goldman's work is open to some criticisms. A longitudinal study would have been preferable to a cross-sectional sample. Goldman did not examine the social background of the pupils, nor the quality of the teaching they had received. Though his study could have taken account of these criticisms, they are not serious enough to deflect from its value. Indeed, his work has stood the test of time over two decades and there have been no other really significant advances in

R.E. teaching since the implications of his study began to be apparent. (In the 1970s R.E. became deflected from a concern with methodology into one of content, the increase in immigrant populations provoking a movement towards the teaching of world faiths.)

Given a basic stage theory in the development of religious/moral thinking the question centres around the age of transfer from one stage to another. Recent studies have suggested that quite young children may be able to deal with relatively sophisticated concepts like intentionality. Chandler et al (1973) felt that the verbal presentation of problems tended to pre-dispose pupils to concentrate on consequences rather than intentions: the bias was built in to the presentation. Using videotaped presentations they concluded that even six year olds can cope with intentionality. The same or similar judgement is made by Constanzo et al (1973), King (1971), Armsby (1971) and Gutkin (1972).

The most influential work on stage theory since Piaget is that of Kohlberg (1963). Of his six stages, only the first 4 correspond directly to Piaget's. The six stages are divided into three levels:

LEVEL 1 PRE-MORAL: child is responsive to cultural rules and some evaluative labels but concerned with pleasant or unpleasant consequences.

Stage 1 child is orientated in terms of obedience to authority, and punishment

Stage 2 values are egotistical, relative to his own needs

LEVEL 2 CONVENTIONAL: child is concerned to maintain expecations of family and peers.

Stage 3 child is concerned to please others and gain approval

Stage 4 child is concerned to maintain existing social order and authority

LEVEL 3 PRINCIPLES LEVEL: child has a concern for principles he himself accepts.

Stage 5 the stage of contractual and legalistic ability actions

Stage 6 the stage of conscience.

Kohlberg has been criticized in so far as his theory demands a too great emphasis on logical progression from one stage to the next (Peters, 1971). John Gibbs (1977) argues that 'the first four stages of Kohlberg's typology meet the criteria for a naturalistic developmental sequence but the higher stages instead appear to be existential or reflective extensions of earlier stages' (Gibb, 1972, p. 43); and Craig (1974) points to its strength in supplying evidence for the individual's autonomous moral development "by using more 'human' means than those suggested by the behaviourists and more rational means than those suggested by the maturationists' (p. 129).

Enough has been said to indicate that some form of cognitive-developmental approach to material taught in R.E. lessons is desirable. This has implications for the level of cognitive demand made by teachers during lessons. The empirical research in this field suggests that pupils of c. 12 years of age should be able to deal with the conceptual and abstract issues involved in the higher stages of moral/religious development. The same kind of argument can be sustained if one looks more narrowly at attitude to religion (i.e. Christianity) rather than at the whole religious-moral issue. Thus Richmond (1972) examined the responses of 120 pupils of a range of ability to a range of biblical material such as the Beatitudes, asking the children to state: What do you think about this? Why do you think this? He concluded that increasing maturity of judgement was revealed between the ages of thirteen and sixteen. Independent assessors graded answers on a four point scale as to essential nature:

1. Logically restricted
2. Circumstantial
3. Logical possibilities considered
4. Logical deduction

He concluded that pupils were often unable to locate a problem, analyse it and produce a solution, but that:

> "To assist adolescents to progress through levels of formal operational thought ought to be a major aim of the secondary school. The (desirable) approach to Religious Education would appear to be one that encourages competing solutions to religious problems ... the raising of competing hypotheses and the gathering of evidence in favour of acceptance or rejection."
>
> (p. 235)

In the empirical studies of this thesis we shall pursue the question of to what extent Richmond's ideal is being met, and whether, as Mitchell (1980) puts it, teachers are simply offering a diet of facts about religions in an attempt to pursue "a studied neutrality". For the moment, however, the issue is whether similar stories should be told in other curriculum areas about the need to encourage formal or higher level thinking in pupils of beginning comprehensive school age. In the following brief review of literature in the various subject areas a positive attitude to so doing will be suggested. Humanities subjects are considered first, and then the sciences and mathematics.

Da Silva used a similar methodology in history to the one Richmond (1972) had used in R.E. to discover whether pupils had achieved a proper understanding of the subject. Peel (1967) had defined the problem:

> "new concepts with unfamiliar names are introduced into connected texts and are not well defined in the process"
>
> (p. 166)

The methodology for this kind of study (pioneered by Werner and Kaplan, 1952) is to present pupils with samples of text but with an important conceptual word (e.g. slump, depression) replaced by an artificial word (e.g. MALMIR) which the pupil would then have to define.

The responses to Da Silva's puzzles were divided into four kinds: logically restricted, circumstantial, logical possibilities and deductive conceptualization. The results were plotted by age of pupils at yearly intervals from 12 to 16 years. A Pearson X^2 test was carried out and showed that the largest 'break-point' for effective coping with the concepts underlying Da Silva's ten nonsense words was 14 years, though a significant difference existed between the scores of 12 and 13-year-olds and those of the 14, 15 and 16-year-olds also.

The results of this study suggest that throughout the period 12 to 15 pupils are in the process of learning to come to terms with conceptual and abstract formulations. Some are already doing so at age 12, others at various points up to the age of 14+.

Da Silva's study is instructive in the present context, because it again emphasizes the need for teachers to be providing conceptually demanding work for those who have reached this developmental stage and for them to be introducing and encouraging those in the condition of 'readiness' to think in higher-level terms. His results may be a little pessimistic about the peak age of transfer to conceptual thought since he tested only 20 12 year olds, but 40 each of pupils aged 13, 14 and 15.

In geography Rhys (1972) explored the same problem of conceptualization and objectivity in handling and using data. The issue centred around whether pupils

... could, in absence of direct environmental contact, interpret evidence presented in verbal, pictorial, cartographic or statistical form;

... could orientate themselves specially to cope with local, national or global factors;

... could emphathize with the local decision-taking situation in the light of knowledge supplied;

... could inter-relate the factors thought to be significant in order to support a comprehensive explanation of a problem.

These abilities require formal operational thought. But are youngsters able to perform this before late adolescence?

Rhys examined the performance of 100 secondary modern boys (20 each from years 1-5 equally divided between A and B streams) and 20 primary pupils (10 each from the 3rd and 4th year; a cross-section of ability). These pupils were asked to solve a problem from data given in a prose passage; the passages dealt with issues which were spatially remote (Masai migration in East Africa, rice cultivation in Japan, etc.). Pupils had been tested for intelligence using the Simplex Group Intelligence Test and Raven's Progressive Matrices, from which their mental ages were computed. The pupils' responses to problems were analysed using a four-tier structure such as Kaplan's (already described above).

Results from this study closely mirror those of the Richmond and Da Silva findings in R.E. and history - that there is a progressive improvement to conceptualize, hypothesize and thus solve problems. An example from the problem about commercial grain-growing in Manitoba is illuminating and is quoted in some detail. The pupils were shown a map and set of aerial photographs showing a small farm surrounded by endless plain. The problem was: Is it wise for a farmer to grow one crop only over such a very large area? Their answers showed this pattern:

> "The younger (i.e. primary) children ... were unable to interpret and interrelate the information within the frame of the photograph(s) ... the youngest children could not structure the spatial field ..."
>
> "By 11 years of age both the landscape and human action could be organized ... in terms of the perspective granted by the camera."
>
> "At 12 years ... the children are at least partially successful in co-ordinating perspectives from a point-of-view set within a situation wholly detached from personal experience."

> "By 13½ the answers given made frequent reference to the Great Lakes, the St. Lawrence ... the observed area could now be related to an extended spatial framework ..."

> "At 14½ the pupils displayed a secure grasp of the overall spatial concept ..."

Even on the evidence shown Rhys has accepted that the move towards conceptualization and hypothesis formation is taking place from the inception into the secondary school. Yet these pupils were of limited (secondary modern) ability: it is fair to assume an abler group would have reached this stage quicker. Further, though the sample of pupils did not show the full awareness of an extended spatial framework until 13½, Rhys himself admits that to do this they would have used "knowledge gained from classroom tuition". But there was no evidence to suggest that this knowledge was available earlier: had it been, perhaps the pupils would have been able to have used it.

To summarize, in the Humanities it does appear as though independent strands of evidence are drawing us to conclude that pupils in first year mixed ability classes in secondary schools need opportunities to acquire and practise conceptualization, problem-solving through hypothesis generation and a degree of abstract thought. Some consideration will now be given to the areas of science and mathematics.

Wells (1972) carried out a series of investigations into problem solving in science using very similar methods to those described in the Humanities. Seven demonstration experiments were presented to groups of pupils aged 12-16 and tested for mental age. Written answers were obtained to short questions based on each experiment; and these were analysed and categorized as follows:

0 Intuitive level

1 Simple describer level - dependent on what was seen

2 Extended describer level - going beyond the seen but without adequate reasons

3 Explainer level - isolated a problem and drew several strands of evidence together towards a solution.

Wells concluded that among his sample mental age was a better index of the quality of thinking than was chronological age. Explainer thinking occurred at CA 14, MA 15 - though full explained thinking occurred in only about 6% of all possible responses. For each CA and MA there was a wide spread of responses of each level about the mean - so factors other than age and intelligence were bearing on the quality of thinking. These factors almost certainly included "the methods of teaching science which the boys had been used to and the style of questioning used in the investigation" (p. 219). Though full explainer level thinking was relatively uncommon "there were many examples of this transitional quality of thinking in which only partially successful hypotheses were advanced" (p. 320).

Now, one of the important features of this study is that Wells chose to use as his subjects secondary modern pupils. It is instructive that even with pupils of limited ability there is a clear reaching out - for <u>some</u> as early as age 12+ - towards the higher level thinking skills. Extended quotation from Wells is again apt.

> "There were many examples of 'low grade' or partial hypotheses which seemed to demonstrate that:
>
> (a) the pupils concerned had identified the problem area,
>
> (b) from their limited resources of possible explanations they had made quite useful guesses.

Their incomplete success was probably related to:

(a) a lack of sufficient or sufficiently rich store of concepts - thus limiting the choice of hypotheses and permitting an only partial evaluation of the chosen hypothesis,

(b) lack of ability in testing the chosen hypothesis,

(c) in any case pupils had no chance of putting their hypothesis to a practical test even if they had been able to devise such a test.

There is the obvious need to enlarge the pupils' store of possible explanations, i.e. to build up new concepts and to enrich and extend existing ones. There is also a need to provide experience of processing evidence and observation using both induction and deduction and to give experience of constructing and testing hypotheses.

Submitting hypotheses to practical procedures may well produce impossible demands and discussion with a teacher who is prepared to guide and prompt, to stimulate but be slow to give answers, may be the best way in a busy laboratory session.

In general the findings of this investigation give support for the proposed strategies for learning outline by Hilda Taba (1969). She identifies four main targets of learning: (1) knowledge (which depends upon the content of the curriculum), (2) thinking, (3) attitude, (4) skills (all of which depend upon the sorts of learning experiences provided). In the promoting of thinking she suggests that there are three cognitive tasks:

(1) concept formation,
(2) interpretation of data,
(3) application of facts and principles to new situations.

Upon these and some other considerations teaching strategies have been developed."

Once again, one is drawn to conclusions about the need for the teaching method in the early years of the comprehensive school to be such as will draw out or help even average pupils experiment with concepts, hypotheses and generalizations. If these pupils, then true able children will need yet more demanding work (Mott, 1979). So developed the concepts of 'match' and 'mis-match': the balance of teaching style and task demand within the pupil's stage of intellectual development. In science the concept is found embryonically in Shayer (1972); and explicitly in Harlen (1978).

Lists of characteristics of able pupils in science emphasize their ability to cope with this higher level thinking (H.M.I., 1978).

Finally, we can cast a brief glance at mathematics. Margaret Brown (1978) points to the difficulty of assigning any particular mathematical process or concept to a given stage of Piaget's model of conceptual development. The multiplication of two negative numbers is a point of dispute. In the studies underlying the 'Concepts in Secondary Mathematics and Science Project' it was found that in the algebraic example

'What can you say about c if c + d = 10 and c is less than d?' 44% of second year children, 41% of third years and 36% of fourth years gave only one number (c = 4), 'illustrating a desire to arrive in a single step at a unique and unambiguous answer'. However, she is drawn to conclude that Piaget's model is the best available.

She concludes that 'the fact that many children find it difficult to learn mathematics would seem to be attributable to their difficulties in building up a conceptual structure' (p. 371).

In the same way, Law (1972) in a study of grammar school pupils in upper and lower sets proceeding to 'O' Level came to conclusions which closely mirror those drawn throughout this section:

> "The results given above suggest that ability in problem solving may be related far more closely to intelligence and general academic strength, than to mathematical ability as demonstrated in orthodox school examinations in the subject. It seems likely that the mathematics syllabus has for too long been dominated by the need to learn and reproduce particular techniques. Traditional syllabus work and traditional methods of teaching together may over-emphasise such needs, especially in the face of traditional examinations. The newer syllabus, the so-called Modern Mathematics, and the increase in 'discovery' methods especially in the Primary school, may help to redress the balance, and may encourage a problem-solving approach. As it is, the ability to solve problems appears to be called upon to a very limited extent in the teaching of mathematics, with the result that very often a pupil's interest in the subject may wane. The high level of interest shown by the

subjects in this enquiry may encourage those who are keen to change the emphasis in mathematics teaching from 'learning' to 'thinking'."

This section has put considerable emphasis on two main issues:

... that pupils of 11+ in comprehensive schools are capable of degrees of higher level thinking in individual subject areas, probably in proportion to ability or mental age

... that teaching methods need to reflect those developed or developing cognitive skills.

Perhaps the final word here should go to Marjoribanks (1975), Studying data collected about 2,400 English primary pupils for the Plowden Report (1967) and Peaker's follow-up study (1971). Marjoribanks examined cognitive performance by analysing a path model which included family environment variables, social status indicators and a set of enabling conditions: self-esteem, attitudes to school work and educational/occupational aspirations.

He concluded that:

> "Although cognitive performance becomes more stable as the age of the pupils increases, the analysis suggests that manipulation of the environment for adolescents may still have a significant effect on cognitive performance. If stimulating home environments, which provide press for academic achievement, could be co-ordinated with family, peer-group and class circumstances that activate positive enabling conditions for learning, then substantial gains in the cognitive performance of students of secondary school age might be achieved."
>
> (p. 165)

Later in this thesis, therefore, we shall examine to what extent 'positive enabling conditions' in the classroom are likely to contribute to the cognitive performance of our studied students.

C.3 Thinking in the classroom: some theoretical issues

Much of the overt behaviour that takes place in a classroom is instruction. This is the realm of the teacher. Instruction may serve various purposes: it may inculcate facts, pose problems, explain solutions to problems, etc. In the mind of the pupils the cognitive processes to benefit from this instruction may or may not be happening: thought is invisible, and can be assessed only in so far as it manifests itself verbally or in graphic form. Bruner attempts a theory of instruction (1966) which breaks away from the descriptive learning theories of psychology and suggests a theory which may be prescriptive or normative. The prescriptive elements of a theory of instruction are the rules it sets out concerning the most effective way of achieving knowledge/skill, and the yardsticks it provides for criticizing or evaluating a particular way of teaching or learning. The normative elements are the generalizable criteria it sets up for learning and the conditions needed for meeting them. In short, a theory of learning does not describe the process of learning but how to improve it.

According to Bruner a theory of instruction has four elements:

1. Predispositions. Typically these include culture, motivational and personal factors affecting the desire to learn and to solve problems. But another predisposition is the predisposition to explore alternatives. This exploration has three phases: activation (something to trigger it off), maintenance (something to sustain it) and direction (something to keep it relevant). Curiosity has its part of play here (activation); but sustaining the process of exploring alternatives to a problem (maintenance) must bring benefits; and the goal of the task must be clear enough at least for the learner to assess the relevance of

the tested alternatives to the achievement of the goal. Predispositions then are about conduciveness; that there are circumstances conducive to learning and that learning or exploring alternatives is found to be a conducive process to the learner.

2. Structure and form of knowledge. A theory of instruction should specify how a body of knowledge can be structured so that it is more accessible to the learner; its merit depends on its power to simplify information, generate new propositions and increase the manipulability of a body of knowledge. Any idea, or problem, or body of knowledge can be presented in a form simple enough for a learner to understand it; and the effectiveness of this process depends on three factors: mode of presentation, economy and power.

Mode of presentation may be three-fold. A child on a see-saw moves to and from the centre and thus exemplifies the principles underlying a balance beam (enactive representation). An older child may be able to draw a balanced beam (iconic representation), so displaying a grasp of the principle. A simple diagram or stylized diagram in a textbook also captures the essence of the beam (symbolic representation).

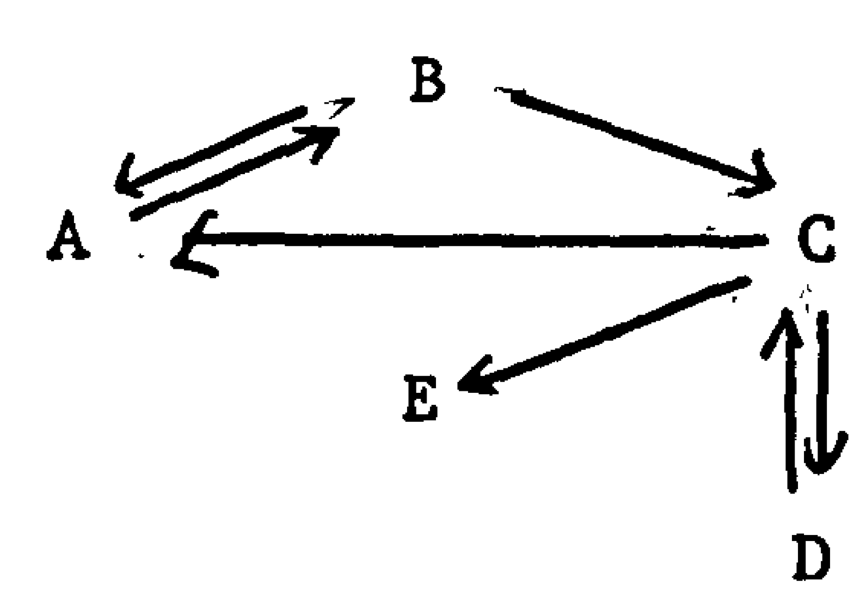
Economy in this context relates to the amount of information that must be held in mind and processed in order to achieve comprehension. The best example of this is Bruner's airline service example. An airline serves five cities, A, B, C, D, E. The learner is asked: What is the shortest way to make a trip from A to D? One way of processing this problem is to memorize a list of connections:

B-C
D-C
A-B
C-E
A-E
C-D
B-A
C-A

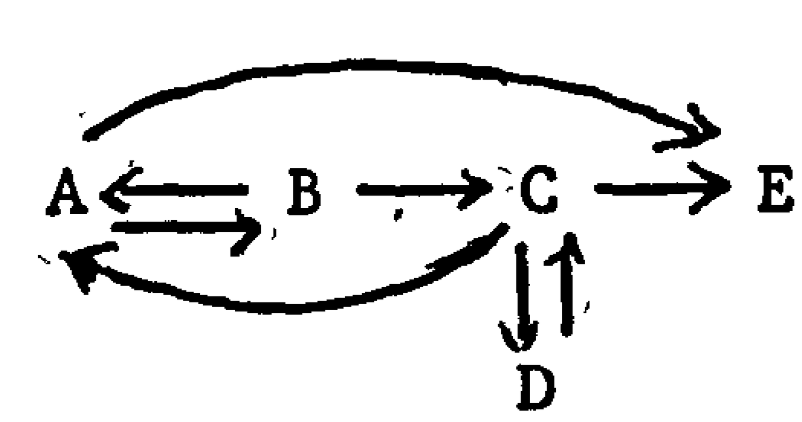
To make this task easier the connections can be ordered in a more easily memorized form thus:

A-B
A-E
B-A
B-C
C-A
C-D
C-E
D-C

But economy is increased with this diagram:



and even more so with this one:



These examples explain economy in the structure of knowledge; the power element in this structure is a statement of 'the canon of parsimony and the faith shared by many scientists that nature is simple: perhaps it is only when it can be made reasonably simple that it can be understood'. Therefore, power has to do with the analysis of the process of learning, and its appropriateness for developmental stage in the manner of Piagetian speculation and experiment.

3. Sequence. This last insight leads on to the view that a theory of instruction should specify effective sequences in which learning should be tackled. Bruner sees instruction as 'leading the learner through a sequence of statements and restatements of a problem or body of knowledge that increase the learner's ability to grasp, transform and transfer what he is learning'. There may be no unique sequence for all learners and the best sequence will depend upon past learning, stage of development, nature of the materials, and individual differences. Intellectual development moves from enactive through iconic to symbolic representation; and this may well form the basis of the optimum sequence of presentation. When the learner has a well developed symbolic system it may be possible to by-pass the first two stages.

4. Form and pacing of reinforcement. In the learning process the theory should specify the point where extrinsic reward (praise) gives way to intrinsic (satisfaction at completing the task). The process of procedure in learning is one of trial and check, discrepancy reduction or hypothesis generation and testing. Where this process is incomplete and corrective information as an in-put from the instructor it must be at a level appropriate to the stage of learning or problem-solving the pupil has reached: enactive iconic or symbolic. The learner must discover when he has completed this cycle and reached his goal. Initially he does this through the instructor's signals but gradually he acquires the ability to make his own judgement of the issue.

Bruner, then, accepts that classroom teaching is about problem-solving; and that the hypothesis generation and testing toward a solution can take place at three main levels of cognition. He is prepared to admit of a Piagetian-style stage-model in describing readiness for the attack on the higher levels of this problem-solving process. His theory is a theory of instruction - a theoretical underpinning. Its effectiveness must be judged in terms of observed phenomena. In this study two kinds of oral observed phenomena are used to explore the nature of the learning taking place: pupil and teacher talk, and teacher questions.

In this study the teacher and pupil talk are analysed by their level of abstraction. The concept is culled from Gallagher et al (1970). Gallagher recorded and then transcribed lessons. He found that these transcripts contained naturally occurring units - usually quite short, on a specific point, and obviously broken by a change, e.g. of speaker or subject. These units could be graded as one of three levels:

DATA LEVEL: the emphasis is on specifics, on information, on objects; this level includes anecdotal material and the re-statement of factual information.

CONCEPT LEVEL: the emphasis here is on ideas, classes of objects, processes. It includes simple explanations and reasons.

ABSTRACT OR GENERALIZATION LEVEL: here two or more concepts are involved; the concepts are inter-related in a logical, causal or other appropriate way; and the idea has wide applicability.

It will be seen that Gallagher's three levels correspond approximately with Bruner's model or theory of instruction. Bruner describes what the teacher does, Gallagher provides a schema for analysing the classroom dialogue.

But Gallagher's system does not lend itself to the analysis of classroom questions. Here it is necessary to fall back to Bloom's

(1956) taxonomy and to its use in question analysis as exemplified by Turney (1977). The Bloom-Turney system operates on a six-level scale:

RECALL
(SIMPLE) COMPREHENSION
APPLICATION
ANALYSIS
SYNTHESIS
EVALUATION

However, the first two components make up a LOWER ORDER, roughly equivalent to the DATA level functioning of Gallagher and Bruner's enactive level. The other four constitute a HIGHER ORDER of thinking equivalent to the upper two levels described by Gallagher and Bruner.

These three models come together then to allow us to analyse what learning is taking place both descriptively through the examination of talk and questions - the classroom, and theoretically by the relationship of these findings to the Brunerian model.

The exact process used in this study to analyse talk and questions is described in detail in Chapter 6. Related to this is the attempt to complete the conceptual survey of three classrooms studied by looking at a range of classroom tasks by teachers. The methodology for doing this is related to the analysis of oral transactions, and is described also at a more appropriate moment in Chapter 6.

Bloom (1976) maintains that 'variations in learning and the level of learning of students are determined by the students' learning history and <u>the quality of instruction they receive</u>' (p. 16). This appears to be obvious, but there is little overt evidence for the latter. Studies such as the Banbury Enquiry (Newbold, 1978) have concentrated on quality only in terms of examination success. The present study looks rather at the quality of instruction as it is measurable in terms of cognitive demand and comments upon its appropriateness for the pupils to whom it is aimed. First, hoever, we moved on to look in a little more detail at slow learners and their educational needs.

D. THE SLOW LEARNER

This section concerns the slow learner in the normal school. It is not in the main about ESN pupils as measured by IQ tests (except in so far as a pupil who is classifiable ESN(M) sometimes remains by chance or omission in regular education). It is about those who are at the bottom end of the attainment ladder in normal schools; but it is not about pupils of average intelligence who nevertheless have a specific learning disability which retards them: sight or hearing defects or another physical handicap. Nor is it about the maladjusted, though some slow learners may also be just that. It is about those

> "10% of children in the ordinary school population who exhibit by their school behaviour and performance that they have significant difficulties in meeting the usual demands of their school."
>
> (Leach and Reybould, 1977, p. 1)

Section D does not attempt to treat this subject in the same depth as bright pupils are afforded in section B.

D.1 Identification and causes

IQ tests were, as has been indicated, established in the first place to assess degrees of intellectual disability rather than intellectual ability. In the foregoing section on bright pupils various criticisms of IQ tests have been advanced. These criticisms apply equally whether the test score measures high or low. The performance of a normal child on a test which is culturally biased may have the effect of labelling him slow or remedial (in practice the words are used interchangeably in most schools). It is perhaps fair to say, however, that writers on the slow learner theme welcome the use of a battery of tests (including both verbal and non-verbal ones) as a pointer to overall slowness or as a form of diagnostic procedure to point up areas of specific weakness (thus Pope, 1977; Bell, 1970; Leach and Raybould, 1977, etc).

The trend now is away from the thought of slow learners as a clearly identifiable group of intellectual low-performing youngsters of similar characteristics, and towards the view of each child as an individual with a specific learning need or disability. This thinking has its roots in the recent past (for example, Gulliford, 1971), but has been popularized by the Warnock Report (1978).

Thus many writers (the approach is exemplified in Wall et al, 1962) represent the problem of the slow learner as one affecting the 'total child' i.e. his physical maturation and defects; his intellectual ability and attainment; his emotional growth, interests and attitudes; his ability to form social relationships; and his social and environmental background and history.

Roucek (1970) examined the implications of the description 'slow'. He points to its perjorative implications when used as a comparative description to contrast with 'fast learners', to its connotation of resistance to change, and to repetitiveness in learning.

Riessman (1965) offered nine reasons why a pupil might be slow in solving a problem:

... caution

... desire for thoroughness

... substantial interest

... meticulousness

... a desire to mull things over

... an emphasis on the concrete and physical

... the use of a circuitous path of reasoning

... ease of distraction

... hesitation to respond incorrectly

At least some of these motives for slowness would be regarded as prudent or desirable.

Empirical studies have sought to establish causes for slow learning in each of Wall et al's key areas: physical, intellectual, emotional and social. The best summary of the range of problems contributing to the slow learners lack of ability is that included in a handout from one L.E.A. (Lincolnshire, undated)*. The temptation at this point is to become side-tracked into a discussion of social disadvantage, but this is documented by others (eg Ronald Meighan 1981); and it is more productive to look at slow learners in the secondary school context. To do this it was decided to review the two major English-language journals /Special Education: Forward Trends; Remedial Education/ to discover what concerns had been expressed during the last five years or so. The following paragraphs represent a summary of the findings.

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* See Figure 5.6

FIGURE 5.6 THE SLOW LEARNING CHILD

1. Environmentally Handicapped

a) The Deprived Child

b) The Overprotected Child

Cultural Factors – Leading to Retarded Learning

a) The Deprived Child	b) The Overprotected Child
Poverty of language	Lack of opportunity to use language
Lack of books	Lack of exposure to learning situations because of danger involved
Lack of toys	Simple tasks such as dressing and feeding done by parent
Parents' absence	
Conflict of attitudes between local sub-culture and school	
Inconsistency of parents	

Physical Factors – Leading to Arrested or Abnormal Growth

a) The Deprived Child	b) The Overprotected Child
Lack of regular meals	Restrictions on play and adventure-exploring activities
Dietary deficiencies	
Lack of sleep	
Lack of supervision	
Overcrowding	

Emotional Factors – Leading to Withdrawal, Aggression, Anti-social or Attention Seeking Behaviour

a) The Deprived Child	b) The Overprotected Child
Broken homes	Parents' guilt feelings
Unhappy marriages	Pressures of handicapped child on family
Lack of love	Lack of real love
Neighbours' and peers' cruelty	Low expectation of achievement
Stigma	

2. Functionally Handicapped

Scatter of ability
Multiple handicaps
Lack of physical co-ordination
Distractible
Short span of attention
Demanding immediate gratification of needs
Temper tantrums
Hyperactivity

Functionally disadvantaged children may also be deprived or overprotected.

The term minimal cerebral disfunction is sometimes used when children exhibit some traits of brain injury but are not obviously in this category.

THE PROVISION	THE DEVELOPMENTAL CHALLENGE
1. Relationships	
Small classes Children, their parents and families are known as well as possible Children are respected	Independence Ability to work with others Acceptance of imperfections in others Respect for others, peers and superiors Ability to accept criticism
2. Individual Identity	
Small school - individual recognition Each child known to all	Role playing contribution to school society Responsibility accepted Development of self-image Development of own attitudes
3. Security	
Small school Periods of more than year in a class Class-teaching provides protection from child's own excesses and those of others Acceptable and unacceptable behaviour clearly defined	Self-confidence Ability to stand up for oneself Ability to make own decisions Ability to adapt to different conditions and cope with new experiences
4. Pressure on Children	
Tensions eased by keeping school routine as simple as possible accepting concept of readiness recognising the changing needs of developing children	Develop ability to tolerate less than perfect conditions work to a deadline finish work maintain standards and stickability
5. Opportunities for Success	
Interests, strengths and weaknesses known Learning tasks prescribed for individual children Attention to motivation	Ability to live with handicap Realistic levels of aspiration Ability to accept limitations and occasional failure Development of hobbies and leisure time pursuits

THE MEANS

Play
Exploration
New experience
Systematic instruction in basic subjects
Creative work
Practical work
Physical education including
  Walking, Gymnastics, Games, Dancing,
  Skating, Bowling, Swimming
Drama
Music
Discussion
Awareness of current affairs
Hygiene and health education
Religious education – a way of life
The School Meeting
Youth Clubs
Participation in running the school
Outings, camps, expeditions

Where possible children learn in concrete rather than abstract situations not too heavily contrived.

THE GOAL

A young adult, not noticeably different from normal, capable of earning a living, accepting social responsibilities, using leisure wisely, getting on with family and friends and, eventually, of making a home of his own.

N.B. Havighurst Development Tasks

1. Achieving new and more mature relationship with age mates of both sexes.
2. Achieving masculine or feminine role.
3. Accepting ones physique and using ones physique effectively
4. Achieving emotional independence of parents and adults.
5. Achieving assurance and economic independence.
6. Selecting and preparing for an occupation.
7. Preparing for marriage and family life.
8. Developing intellectual skills and concepts necessary for civic life.
9. Desiring and achieving socially responsible behaviour.
10. Acquiring set of values and an ethical system as a guide to behaviour.

Communication

Activity

New experience

Choice

Judgements

Awareness of others

Standards

Feelings

Appreciation

Attitudes

D.2 <u>Some recent issues in the education of slow learners</u>

Forward Trends deals with both slow learners in normal schools and also with those pupils who would be outside the normal system. A look at those articles concerned with pupils who might benefit from joining 'normal' school classes reveals emphases which are interesting. The most crucial issue appears to be that of segregation or integration of slow learners and pupils with other handicaps into normal classes: it featured ten times between volumes 2 and 8 of the journal . This is not surprising in a journal of this kind. Of articles about remedial education the use of T.V. or C.C.T.V. in teaching the less able was featured nine times and because volume 8.2 was almost entirely devoted to the theme, 'teacher role' and 'teacher training' were also well represented. Regular issues were social training and vocational training. Minority issues turned out to be dyslexia, teaching reading, involving parents, the implications of mixed ability teaching, classroom behaviour, numeracy, language development, the role of psychologists, and the use of teacher aides. Issues of IQ, teaching spelling, and encouraging creative writing each found one mention. A single article was dedicated to questioning skills.

Before looking at the major themes of Remedial Education journal it might be as well to glance at the messages being put about in the areas indicated.

Segregation or integration is a live issue even about remedial pupils in mixed ability classes, as this thesis has shown (p. 42). Garnett (1976) describes attempts to integrate ESN classified slow learners or children with emotional problems at Bicester Upper School. Given a supportive school staff, a dedicated special needs staff and local authority support they were able to send the remedial pupils out with higher attainments than similar pupils educated in special schools.

Fisher (1977) describes an experiment in Derbyshire to integrate slow learners (ESN) into mixed ability classes, with special tuition in English and maths. Here the key is the integration of the individual into as many areas of school life as he or she can cope with. Morgan (1977), in a review of special educational provision in Ontario, concludes that some pupils will always be sufficiently severely problematic as to need segregation; and emphasizes that integration would require additional preparation, resources and guidance for teachers. Hegarty (1980) advocates integration on the grounds that the normal school provides the widest access to curriculum; but he suggests that schools should constantly monitor the progress of integrative approaches. Pocklington (1980) looked at provision for special needs in the U.S.A. and found three features to distinguish the American from the British. Resources were better there, teachers had more supportive attitudes towards disadvantaged pupils whatever the handicap, and local authorities planned ahead more effectively to provide specialist staff with a view to 'mainstreaming' pupils as early as possible. But these writers are mainly concerned with the integration of 'special' pupils (i.e. those measurably ESN or handicapped) into normal classes rather than the issue of remedial pupil provision in regular classes.

Moving more specifically to the needs of remedial pupils and of their teachers, Mittler (1981) provides an excellent summary of the latter. He traces the underlying emphasis in specialist remedial provision from the individual as such to the individual in social and ecological context. The teacher thus needs to be able to exhibit skills in working with pupils, parents and other professionals, and in the area of acquiring knowledge. These skills include:

... using assessment measures

... making objective records of pupil behaviour performance

... designing and implementing individual programmes

... setting realistic goals

... analysing tasks

... writing programmes

... using prompting and reinforcing techniques

... organizing and managing the classroom efficiently

... coping with differentials in age, ability, maturing

... promoting pupils' social and life skills

... counselling pupils and parents

... involving parents

... juding when to involve other skilled professionals

... communicating and report preparation

... working as a team

... keeping up to date with research, technological advances and curriculum development

... adopting a 'research attitude' to pupils and their problems

... using opportunities to solve problems and test hypotheses.

Boyce (1980) reported a good response from B.Ed. students who were given the option to take specialist units in remedial and special education, and the Open University introduced distance teaching in special education (Swann, 1981) through its course E241 Special Needs in Education. McCall (1981) describes a system for providing feedback evaluation on courses of advanced study concerned with children with learning difficulties (though in fact his system is generalizable to any advanced course in education). Dwyer and Hargie (1980) advocate micro-teaching as part of the training for specialist remedial teachers, to cover the skills of reinforcement, demonstration, illustration and use of examples, questioning and explaining.

In vocational and social areas Browne (1975) looks at what F.E. courses offer the less able youngster. He concludes that for many employers of semi-skilled and unskilled workers literacy is not an issue, and that F.E. should do more for vocational and work skills training and worry less about even functional literacy. While the failing economy may put pressure on slow learning school learners more than on some others, part of the social failure of slow learners may be due to the school's omission to integrate the remedial pupils and give them realistic self-concepts, according to Alice Laing (1975). Group work, discussion, role playing and teacher alertness to social difficulties in the class may all help. McNamara (1976) advocated pupils' self-recording of behaviour as a means to behaviour modification in class and Holden (1976) set up 'practice' social situations for remedial youngsters to act out and discuss.

Of the minority issues, that of questioning is of relevance to the present discussion. Jones and Robson (1979) posit four rules for questioning ESN(S) pupils:

... simplifying the demands when the pupil has difficulty

... building up longer responses from fragmentary ones

... rewarding the child who succeeds, but

... not using praise indiscriminately.

But, though they point to the closeness between these strategies and those of behaviour modification, they do not try to improve upon these questioning skills (the issue is discussed later in this thesis), nor to apply the principles to less severely disadvantaged pupils who find themselves at the lower end of normal classes.

Moving to the concerns mirrored in Remedial Education journal, some of these are recurrent. The role which parents can play, the need for vocational training and pre-vocational training are stressed.

Reading is repeatedly acknowledged as a widespread problem; and not least in a secondary school context. Platt (1975) argues that reteaching in the primary school would effectively eliminate the need for much remedial education in the secondary. Gains (1975) advocates a 7-stage approach to remedial teaching of reading

... initial approach with emphasis on achievement

... vocabulary building

... visual discrimination and handwriting

... phonics

... look and say

... supplementary activities: books, games, etc.

... "readiness stage" - keyword schemes

Various writers emphasize the need to use standardized reading tests for diagnostic purposes. De Salis (1976) emphasizes the stimulation of <u>interest</u> in reading as a motivating force, and describes exciting poetry used to help some remedial pupils. Childrey (1977) describes the development of the Childrey-Lecson-Vaughan Reading Tasks inventory for diagnostic assessment of secondary pupils reading abilities. Cloze, word lists, and graded passages are used, and scores are awarded for vocabulary, factual responses, inferential responses, application responses and speculation responses (though the last two are less highly rewarded than the other categories). Interestingly, Topping (1977) found that of pupils attending a Psychological Service Teaching Unit, those with IQs over 85 (on a WISC scale) increased their progress in reading (R.A. rose one year in one calendar year) when transferred to normal classrooms, while those with IQs below 85 reached a stage of "virtually zero" progress. In the special teaching unit the below-85s made better progress, in general, than the above 85s. He concluded:

> "the most feasible hypothesis is that continuing, individually tailored, small-group teaching is essential to maintain the rate of reading progress in slow learning children and when such teaching is discontinued, reading progress also virtually stops."
>
> (p. 85)

In the field of curriculum Wood (1975) emphasizes that appropriate courses are necessary to fit pupils for leaving school, with pupils learning to relate to authority figures and to come to terms themselves as people at a period of considerable anxiety. Extending the idea to mathematics Cawley (1976) argues for an 'applied' curriculum in which the problems of computation emerge from situations in everyday life. Dagnell (1976/1977) in similar vein outlines a course which leads to conceptual learning (estimation, equivalence) through multi-sensory approaches. Bailey (1979) notes some common problems for slow learners at age 11 in mathematics:

... vocabulary concepts unknown

... reading age of material too difficult

... confusion of signs e.g. x and +

... poor listening skill or auditory memory

... visual sequencing difficulties

... poor transfer of computation skills to problems

... difficulties with place value

... notation problems

... inability to think abstractly

... pupil tied to one form of recording

In Scotland the Scottish Integrated Science course for slow learners in the early secondary years also emphasizes the need to progress to cognitive skills: observing, recording, predicting and concluding (Kellington and Mitchell, 1978). The formative evaluation of these materials has enabled their effectiveness in terms of pupil learning gains to be increased considerably. Tupp (1976) describes the teaching of thinking skills using De Bono's CORT materials, citing the case of a pupil who produced 11 ideas on the theme 'Should all buses in the city be made free?'. In a traditional curriculum the teacher admitted a project on buses would, previous to the use of CORT, have been followed not by the consideration of problems or issues, but by an equally bland and informational one on trains or planes. O'Bruba (1975) points to slow learners' needs to practise language and advises widespread use of oral work, discussion and stimulus materials leading to conversation. In particular, the teacher needs to encourage participation and wait for thoughts to be formulated and expressed. In the same year the Bullock Report had emphasized the need for support for slow learners in language skills in the regular classroom (para. 219-223), suggested the teaching of reading be added to teacher training syllabuses for the secondary age-range (para. 308-316) (cf. Geddes and Crone (1978), and had argued for the setting up of a national language centre (para. 333).

Some writers, at least, had begun to see the 'way of salvation' for slow learners as lying in mixed ability classes. In a carefully argued overview Hale (1980) dismissed all forms of differentiation as part of the self-fulfilling prophecy and suggested that concentration in the past had been too much on 'learned outcomes' and too little on 'thinking skills'. (The implication of this argument, that there is an inevitable relationship between a mixed ability organization and the encouragement of thinking skills in pupils, is refuted by the present thesis). He asks for the removal of so-called mechanistic measures of pupil achievement and describes language work in his department which is successful in aiding the slower learner because it:

... accepts the individual as of unconditional worth

... removes the climate of external evaluation and

... involves empathic understanding.

Together these three pre-conditions make up a 'climate of approval' (p. 90) in which slow learners can flourish too.

Oddly enough Hale then imposes on the pupils and teachers in the department a grading scheme with nine headings, seemingly no less 'mechanistic' than the objective criteria already decried: spelling, handwriting, punctuation, sentence construction, vocabulary, fluency, development of ideas, imaginative qualities and comprehension skills. Nor is it surprising to find that Mark, whose reading age is 9.09 compared with a class average of about 13.0, scores D/E grades on all counts.

Farman (1980) argues likewise for a mixed ability approach in the Humanities, based on team teaching. Principles of this scheme are that:

... it provides a common core for all pupils

... tasks are designed to stretch all pupils

... the material is chosen to interest all abilities

... the material is motivating

... there is provision within the team effort for pupils with poor basic skills

... assessment is carried out according to ability

... each child's progress is carefully watched

... explanations of the approach are given to parents, employers, etc. who have an interest in the pupils.

Several writers seem to sum up the approach of the late 70s and early 80s. Bell (1977) quotes Peters from Dearden's (1972) work to the effect that remedial education must meet four necessary conditions:

... cognition, i.e. knowledge in depth and breadth

... transformation, that knowledge must change the teacher's world

... commitment, to what is known and valued; thus . ...

... intrinsic values.

And Gains (1980) asserts:

> "the remedial teacher must now accept that children of all abilities can think effectively."

D.3 <u>The slow learner in the regular classroom: a summary</u>

It remains, in this section, to sum up what the literature of mixed ability teaching, cognition and remedial education has to tell about the slow learner in the normal school setting. Basically, it is this:

... slow learners usually lack basic skills

... reasons for this are cultural or socio-economic in most cases

... they may have a variety of other, quite disparate, learning handicaps, are inappropriately viewed as a homogeneous group, and need some individual attention

... there is some evidence that mixed ability teaching has beneficial effects on them both socially and educationally

... some of these effects are long-lasting

... their ability to think is not necessarily impaired by basic skills deficiencies

... they are reaching, on entry to secondary school, a stage where conceptual and abstract thought is appropriate in the right contexts

... they thrive on cognitive materials such as CORT

... they may require a lot of teacher attention

... team teaching may be an appropriate way to handle classes where some pupils need special help

... group work may be beneficial

... sensitive help in areas of deficiency is advised

... this means specially devised tasks, activities or worksheets

... there is a need to improve the self-image of these pupils

... in curriculum, work should be of an 'applied' nature.

E. SOME RECENT EMPIRICAL STUDIES AND THEIR IMPLICATION FOR STUDIES OF COGNITIVE DEMAND IN THE CLASSROOM

E.1 The value of educational research and interaction analysis

In the aftermath of the boom in classroom interaction research Nuthall (1968) reviewed a cross-section of such studies and concluded that they tended to suggest that verbal behaviours by teachers were the "significant 'cause' of pupil achievement". In fact, pupil growth appeared to depend on the teacher's ability to structure the verbal context of learning, his ability to present material in an organized and sequential way, and his ability to stimulate pupil participation and to develop and extend their ideas. What was less clear was how teachers use pupil feedback during lessons and make instant decisions on the basis of it; how non-participant pupils read cues from teachers about their expectations. He also felt that an important factor in learning might be "the motivation of covert mental responses ... as the stimulation of overt verbal responses".

In these few words Nuthall has crystallized much of the heart of classroom interaction research. His words have been taken too little to heart; but we ought not to blame the researcher too hastily. These may be desirable pieces of knowledge to pursue. But many of them are internalized events, visible only through observable acts which are open to interpretation and misinterpretation, and thus extremely hard to probe. Nevertheless, the investigation reported here may have some bearing on aspects of these mysteries. In the sections which follow there are some descriptions of recent researches which both exemplify something of Nuthall's ideal and which have been influential in shaping his investigation. First, however, it ought to be admitted that some are less enthusiastic about the virtues of interaction research.

A clear implication of Nuthall's rationale is that interaction research can inform, and lead to the improvement of, classroom practice. The present enquiry sought to provide the empirical underpinning of the initial and in-service training materials to be developed by the Teacher Education Project. Hogan (1980) suggests that this is over-ambitious; for

> "the demands inherent in this formula call always for the elimination of any trace of subjective bias ... (although) only the behavioural surface of human experience can be objectively disclosed"
>
> (p. 145)

While Hogan is doubtful about the possible achievement, or even the merit, of this detached objectivity he does stress the importance of not simply learning the syllabus of maths or history, but encountering its life. Yet he is not lucid about how one can decide whether this aim has been achieved by the teacher aside from external or 'objective' observation.

Another approach to assessing the value of research is to seek patterns or typologies. Clark (1980) distinguishes between the decision-making model and the information-processing model in researching teacher behaviour. Thus the information-processing model focuses on how the teacher limits and structures the learning environment in his own mind, and asks how the teacher's definition of it affects his behaviour. The decision-making model, observing the process and effects of teacher decisions about how to proceed with learning and what factors produce those decisions, asks: how do teachers make fast-moving decisions about courses of action against the kaleidoscope background of the classroom? But the models are not mutually exclusive. In this study some at least of the teachers' definitions of the learning situation are sought in the Class Profile Instrument and in the collection of the criteria for judging pupils bright, slow or middle band. The interaction analysis subsequently includes a look at class dialogue in which teacher-pupil, pupil-teacher talk reflect the changing scene of decision-making in the verbal and cognitive spheres. For in reality the paradigmatic approach (Popp, 1975) has problems. While it is possible to give labels to research styles /behaviourist for Skinner, interactionist for Piaget or Kohlberg, or naturalist for Maslow/ it is less useful to knock eclecticism. To gain the fullest appreciation of any classroom phenomenon, the widest possible variety of approaches is desirable. Limitations of time, energy and money may preclude any one researcher from contributing in a range of research styles; but the sum total of knowledge from different and differing research efforts is valuable. Perhaps each investigator should choose an approach best suited to his skills and temperament; and, of course, to the gaps in the knowledge of the given problem. What conditioned the style and scope of the present enquiry was a need for knowledge of exactly what cognitive levels teachers and pupils operate at in mixed ability classes, and a completeness of picture to cover as much as possible of teacher and pupil activity during lessons.

The purpose for gaining this knowledge was to inform practice; and the rationale for the links between research and practice have been outlined in Chapter 1. Later, for the sake of completeness, brief reference is made to the compilation of training materials issuing from this research programme. The link between investigation and practice is viewed sceptically in some quarters. If 'teachers frequently complain' that research has little to offer them, as Riding and Wheldall (1981) allege, it may well be because:

> "progress will only be possible when a large number of researchers investigate ordinary children in common-place situations, doing real-life tasks."

In this investigation it could hardly be argued that it was otherwise. Happily, not everyone is so dubious of the value of educational research in shaping more effective teaching, as Wragg's (1981) review of the literature shows.

To conclude this survey of the usefulness of educational research it is worth returning to Nuthall. In a more recent review of interaction research (Nuthall, 1974) he examines the two major criticisms: that research findings have little effect on the practice of teaching, and that the complicated nature of classrooms means that interaction research will always fall short of good scientific procedure. In a review of Flanders' studies of the relationship of teacher criticism to pupil attainment he demonstrates that the findings are worthwhile provided a) replication studies are carried out and the results compared, b) investigation is treated not as the testing of a theoretical hypothesis but as a wide-ranging exploration of possible relationships and c) studies are specific rather than comparative about the amounts of variables under consideration. /In his review, teacher criticism has a demonstrably negative effect on growth in pupil achievement up to 20 per 1,000 recorded behaviours but thereafter no determinate relationship occurred; a simple statement about 'more' or 'less' criticisms did not tell the whole story./

The present investigation set out to describe the cognitive aspects of classroom life using both new and tried techniques. It accords well with Nuthall's concluding picture of educational research:

> "The data should provide us with a clear picture of what teaching is like. We should direct our attention to ways of providing more precise and specific representation of how events in classrooms occur and how teachers affect the development of their pupils."

But,

> "It is not a question of statistically determined reliability and genralizability ... no data should even be ignored because it does not support the hypotheses being tested ... Scientific enterprise ... means ... a procedure for coming to understand the genuine mysteries that confront us. And the nature of teaching is just such a mystery."
>
> (p. 17)

What follows in this section is a description of some of those attempts to explore the mystery of teaching which have played a part in shaping this investigation. Constriction of space will inevitably make the descriptions inadequate and fail to do their authors justice.

E.2 Systems for analysing classroom interaction and performance: a brief survey of methods and issues

Systems for classroom interaction analysis are so numerous that no survey can be conducted here. Collections of instruments of various kinds can be found in Mirrors for Behaviour (Simon, 1966) British Mirrors (Galton, 1979), Cohen (1976) and Amidon and Hunter (1966). Not all are concerned with verbal behaviour, still less with measuring cognition.

Best known, and most widely used in research, are Flanders' categories (FIAC) (Flanders 1970), and these have been adapted for various purposes, such as analysis discourse in modern languages lessons (Wragg, 1972). For the present purposes FIAC has a number of drawbacks:

... it has a teacher-dominated perspective, giving no real scope for recording a variety of pupil responses

... it does not record directly the levels of cognitive demand made by each piece of teacher talk

... it does not distinguish between varying kinds of teacher questions and their thought-demands

... it requires a timed-interval approach, the observer recording at three-second intervals the kind of talk in progress at that moment.

Convenient though it would be to fulfil Nuthall's plea for replication, the use of this widely accepted system would not have helped distinguish between cognitive levels of teacher talk and questions, nor to record pupil responses and initiations adequately.

The Science Teaching Observation Schedule (Eggleston, Galton and Jones, 1975) comes rather closer to the requirements for this study: to measure cognitive demand in teacher talk, teacher questions and pupil responses. Furthermore, STOS has been widely used and written about (Eggleston et al, 1976; Dreyfus and Eggleston, 1977; Dreyfus and Eggleston, 1979; Dreyfus and Cohen 1979). STOS has some problems for use in the present kind of enquiry.

In the first place, STOS is subject-specific. While it could be argued that teaching is (in practice) subject-based, that each subject is bound by its teaching styles and conventions, and that a specific form of analysis is appropriate to each subject area, this is not necessarily so. The alternative view is of teaching as a set of procedures and behaviours common to all teachers and set against a background of differing subject content. Reality is almost certainly on a continuum between these two extremes, depending on the topic and age-level of the teaching taking place. Clearly, though, it was preferable in the present study to adopt and explore a common approach, through which comparisons could be made. To do this using STOS would have required sizeable revisions (for example, to categories such as 1a4 'designing of experimental procedure', or 2d4 'clarifying experimental procedure'). These adaptations would have been sufficiently wide-ranging to counterbalance any advantages in comparing the results with those of Eggleston et al: one would simply not have been comparing like with like.

During the period when the data for this investigation were being collected, two other sizeable research programmes were in operation (though the methodologies of these were not reported and available). These were Rutter's (1979) and that of Galton (Galton and Simon, 1980; Galton, Simon and Croll, 1980). It is instructive to glance at how they solved the problems of classroom interaction analysis.

Galton et al divided questions into five categories and statements into nine:

Q1 recalling fact
Q2 offering ideas, solutions (closed)
Q3 offering ideas, solutions (open)
Q4 referring to task supervision
Q5 referring to routine matters

S1 of facts
S2 of ideas, problems
S3 telling child what to do
S4 praising work, effort
S5 feedback on work, effort
S6 providing information, directions
S7 providing feedback
S8 of critical control
S9 of small talk

Items of non-verbal interaction were also included in this system.

Galton's classification was clearly not incisive in probing cognitive demand. Of the questions, Q, 4, 5 had to do with management, Q1 with information and Q2 recorded closed questions. All higher order questions, open in nature, are then grouped as Q3, without further distinction. Teacher statements are dealt with in the same way: S3, 4, 5, 8 and 9 are at least largely managerial, S1, 6 and 7 are basically at an information level. Only category S2 is left for higher level thinking. It has been argued elsewhere that many children of primary age are of sufficiently developed intellect to go beyond this, so the paucity of higher level thinking categories in this research is disappointing.

Rutter's methods of classroom observation did not lend themselves to full and systematic recording of the cognitive demands made by lessons. He looked at the teacher, selected individual children, and the whole class, for five minute time segments. Within each segment a time-sampling technique was used. Though Rutter reports on the learning context from these observations, he is not concerned with cognitive demand of dialogue or task so much as to calculate what proportion of time was spent, e.g. on whole class teaching or on-task by pupils. In this sense, at least, while the Rutter research is an interesting account of 'how schools work' it is not satisfying in suggesting 'what pupils are stimulated to learn'.

Meanwhile, at Nottingham, the work of Sheila Armstrong was moving closer to the kind of analysis of teacher talk demanded by the kind of requirement of this research. Brown and Armstrong (1979) describe a system for Analysing Instructional Discourse (SAID).

In this, episodes (consisting of an opening statement or question, a sustaining or continuing period, and a terminal unit) were analysed according to a system which included cognitive modes. These consisted of twelve categories: defining, designating/identifying, describing, classifying, stating, reporting, opining, comparing, evaluating, conditionally inferring (if...then), explaining a process or sequence, explaining a reason. Later in the same article the authors compare these categories with those of Bloom which are also used to classify questions in this research. When a hierarchy based on Bloom's taxonomy is established it is possible to see (Figure 5. 7) how the 1,291 explanations analysed by the authors compare with the findings of this thesis, reported later. However, it should be noted that these explanations are given in a Higher Education context, where one would expect a greater degree of cognitive demand and less need for class management than in schools.

Figure 5.7

Distribution of cognitive operations for explanations analysed by Brown and Armstrong

(Figures are percentages of the total of 1,291 operations)

	Managing	4.2%	Low
Low = 80.1%	Defining Describing Classifying Designating Reporting	4 % 27.3% 4.3% 19.8% 5.6%	Level 1 Knowledge (LOW)
	Stating Comparing	11.8% 3.1%	Level 2 Comprehension (LOW)
	Explaining (reasons)	12.5%	Level 3 Analysis (HIGH)
High = 19.9%	Conditional inferring Opining	5.1% 1.8%	Level 4 Synthesis (HIGH)
	Evaluating	0.5%	Level 5 Evaluation (HIGH)

The author had already analysed classroom talk by student-teachers using an analysis system borrowed from Gallagher (1970). This system used transcripts of lessons. Periods of dialogue (in practice about 1½ sides long) were found to form self-contained units, and Gallagher classified these at the levels of data, concept or abstraction. The system was conceptually useful, but Gallagher did not distinguish between periods of teacher talk or statement on the one hand and the use of questions on the other. It was decided, therefore, to use Gallagher's analytical structure but to apply it only to those sections of classroom life which were primarily in the form of statements. All teacher talk and most pupil responses were in this form; and so these segments of the classroom transactions could be subjected to scrutiny on this three-fold rating. Since it was planned to observe and take records of a large number of complete lessons, and to use the classification 'live' rather than on a transcript, the fairly simple structure of the Gallagher system was appealing. Furthermore, two practical issues intruded. First, spoken dialogue in first year mixed ability classrooms comes in shorter snatches than the kinds of student talk analysed by Gallagher; so the units of talk to be coded had to be re-defined. Also, some of the teacher talk fell outside this system and was found to relate to administrative or behavioural management of the class. In the next chapter there is a more detailed description of the adaptation of the Gallagher coding system to the purposes of the present research in assessing the cognitive demand of teacher talk and pupil responses.

Gallagher's three-fold classification was less useful for analysing teachers' questions, and though it made the research design more complicated an alternative was sought. In Australia Turney, working for the Sydney Microskills Project, had carried out a thorough review of classroom questioning. Following this, Turney (1975) adopted a Bloom-style taxonomy (Bloom, 1956) for analysing questions and to train student teachers to improve the cognitive demand made by their questions.

In his Microskills unit on advanced questioning techniques he elaborates, with examples, the Bloom's taxonomy in practice in question analysis. The present work parts company with Turney in one issue only - that of comprehension questions. Turney uses the category BOTH to describe those questions which require 'the simple expression of an idea in different words', but also to re-express 'a statement made in symbolic form or the giving of a specific example to illustrate a very abstract idea.'

In practice, this research found the simple comprehension question almost universal, and confined its use of this category to the simple cognitive demand.

The more advanced re-expression of symbolic or abstract ideas tended to be coded as synthesis (Q5). The full coding system used in the present thesis is described in chapters 6 and 7.

Much of the Sherwood Project is concerned with verbal transactions between teacher and learner; but for the sake of completeness it was desirable to look also to other forms of cognition. In classrooms, these consist of tasks. Most tasks are set by the teacher and require written responses from pupils. Some are set for homework. Many could be fairly described as covert questions. Thus, in a lesson, a teacher might ask: What were the causes of Hitler's downfall? But the equivalent written or homework task might be: Describe and account for Hitler's downfall. /A review of the philosophical problem of deciding exactly what constitutes a question is undertaken by Riegle (1975); though in this present research a pragmatic approach is adopted. Verbal periods of speech which contain an interrogative form are regarded as questions and included in the verbal analysis. Written periods in the form shown - common in examination papers - are regarded as tasks./ A few tasks may require pupils to do something rather than write something: to make, draw, invent, act. The literature of task analysis for cognitive demand in the comprehensive school is, as far as I have been able to discover, almost non-existent. Workers in the primary field have been concerned with task analysis to the extent that it affects matching tasks to pupils and vice versa. During the life of the Sherwood Project a summary of literature in this latter field was produced by Bennett et al (1981) as part of a study of matching in top infant classes.

The two basic approaches to matching emanate from associations and constructivist-developmental perspectives. Associationist theory holds that concepts and skills can be ordered and proceed in lock-step. The theory underpins programmed instruction and some textbooks. Learning can be tested and the pupil placed at a point in the sequence which assures his immediate and error-free progress. But the system is difficult to apply to classroom situations, which are less structured than programmed learning.

The constructivist or cognitive-development theory has its roots with Piagetian views of intellectual growth. Thus the cognitive demand of school materials should, it is suggested, be appropriate to the cognitive stage reached by the learner (this is the position of researchers such as Shayer whose work has been referred to already). Bennett et al point out that some have criticized the Piagetian theory per se (Donaldson, 1978); and some (Engelman, 1971) have claimed that, however valid,

> "Piaget's theory has no necessary implications for practice since establishing the natural order of development is not a necessary foundation for deciding what is educationally desirable."
>
> (Bennett et al p. 9)

Furthermore, though Neo-Piagetian theorists have attempted to combine Piagetian theory with those of information processing the attempts make unrealistic demands on teachers' time and energy. Harlen's (1978) theory of matching lacks, they feel, an empirical base. The crucial issues are to

> "describe what actually goes on in classrooms as tasks are assigned to children and analyse those conditions which foster appropriate task allocation and those which subvert it."
>
> (p. 14,15)

particularly since (despite clear theoretical and methodological guidelines for making judgements) there is overt disquiet expressed by experienced professionals (e.g. H.M.I., 1978) and in time-on-task studies (Wragg, forthcoming) about the effectiveness of task-setting and task-matching. Since many variables are at work in a classroom, process-product studies of task effectiveness are fraught with problems (these are recounted at length by Doyle, 1979). But one insight of Doyle is particularly telling in the present context:

> "Answers a teacher accepts and rewards define the real task in the classroom."
>
> (Doyle, 1980, p. 99)

This is not a new insight; but it applies equally to all responses, i.e. written as well as verbal, active as well as passive, the small-scale dramatic performance as well as the written essay. Doubtless it also applies in that the task itself, its nature and demand, signal the kind of reward the teacher is prepared to offer. Indeed, Doyle advances the view that what is paramount in the classroom is co-operation; to maintain pupil co-operation the teacher, in task performance, is prepared to sacrifice the concern for learning. This is a pessimistic view, and Bennett et al are right to point out that the teacher's need to fulfil to some degree externally-imposed criteria of success may militate against its more extreme manifestations.

At this point in their argument Bennett et al proceed to examine the concept of matching as an empirical problem and to devise a methodology for task analysis in the infant school. The present concerns are a little different. In the present case a choice had to be made between a) imposing a pre-conceived structure on the tasks set to pupils involved in the Sherwood project, against which teacher performance could be compared or b) allowing the tasks to categorize themselves. In the event, it was decided that the course b) was preferable; and the process by which a category system was devised from the listed tasks is described in Chapter 6. Method a) would have had the advantage that any system of imposed cognitive categories could have been tailored to match closely and compare with the verbal categories used to analyse the classroom dialogue. As it turned out the emergent category system was close enough to allow such comparison. This coincidence may suggest that the pre-ordained systems adopted are by no means valueless in the attempt to assess the degree of cognitive demand made by teachers in classrooms.

E.3 Some findings from recent empirical studies

The only large scale review of mixed ability teaching to emerge during the life of the Sherwood Project was that of Reid et al (1982). Since so many of its findings accord with those of the concurrent Teacher Education Project research recorded in Chapter 4, the briefest summary is required here.

The National Foundation for Educational Research indicated that many definitions of mixed ability existed and that varying methods of school organization came under this label. The teachers often indicated a feeling that the decision to 'go mixed ability' was imposed from above. Some staff felt that their subject areas were unsuitable for mixed ability teaching, notably mathematics and modern languages. The feeling was attributable to the alleged linear nature of these subjects.

There was a conflict between mixed ability organization and mixed ability teaching methods. Advantages listed tended to emphasize the reduction of labelling, social objectives being met, improved discipline and classroom climate, and the improvement in performance of the less able pupils.

Disadvantages noted were the failure to cater for the more able, increased demands on teacher time and resources, the difficulty of meeting a wide range of individual needs in one classroom, and the necessity for more economic resources to be made available.

Classroom talk and questions

Kapunan (1975) argues that teaching necessarily implies learning; that our confusion over whether this statement always holds true is due to the use of the verb to learn in two quite specific senses. The first is a task-achievement sense: here emphasis is on the fulfilment of some pre-determined end result. The alternative is a talk-task viewpoint, in which a process view of the word becomes paramount:

> "... task and achievement form a kind of continuum in which task and achievement pass from the initial to the terminal moments."

The act of carrying out the task itself becomes part of achievement and the teacher must have a consciousness of means rather than hold a concept of pupils as empty vessels to be filled with a commodity called 'knowledge of x'. Therefore,

> "The teacher must execute teaching activities such as explaining, defining, contrasting ... And, every act of teaching implies its intrinsic upshot even if the terminal goal is far from accomplished."
>
> (p. 375)

This is an important insight because it highlights two standpoints argued in this work: that the quality (in terms of cognitive demand) of teacher and pupil talk is an important event to measure, and that what teachers signal through their talk is of significance in affecting the covert processes of thought in pupils (intrinsic upshots) as well as their observable learning (terminal goals). What does recent empirical research have to say about teacher talk and its effect on pupils?

Researches carried out by Eggleston et al (1976) and Dreyfus and Eggleston et al (1977) show that higher level verbal transactions in science lessons are relatively infrequently used by experienced science teachers /STOS categories a3, b3, c3 and d3 gained the following percentage use respectively: 11.3%, 8.3%, 5.1%, 10%/. They were even less frequently used by student teachers of science, often failing to reach even a 4% level against total transactions. Since STOS measures intellectual transactions but has no categories for managerial/ administrative ones, the reality is that these higher order verbal events may well be even less common than they appear at first sight from those figures. Factual transactions dominated the work of both teachers and students (40.46% for teachers; 50.88% in the final period of student observation). Even more alarming is that the student teachers retreated even further from the model of the science teacher in their respective discipline (as evidenced from the behaviour of the 95 experienced teachers in the earlier sample) and became less cognitively demanding than before as teaching practice progressed. It is instructive to note that responses by pupils to both teachers and students ran at commensurate levels of fact-boundness. A heartening feature of STOS is that Dreyfus and Cohen (1979) found that its use in a training course raised student-teachers' awareness of classroom cognitive processes.

Findings of this nature are such that it was opportune to institute a research programme such as the Sherwood Project to get a cross-disciplinary view of cognitive demand as evidenced in classrooms, especially in order to inform in-service and initial training for teachers.

The Rutter (1979) research is disappointing in the amount of time and effort it allocated to observing in classrooms. The main findings on this topic come from one week's observations in the third year secondary classes involved. Emphasis is on class management: poor administrative management led to poor discipline which resulted in less time on task. However, time on task was not necessarily correlated with learning:

> "An attentive well-behaved class provides the opportunity for effective teaching and productive learning. What <u>use</u> is made of this opportunity, however, will be crucial in determining just what and how much the children learn."
>
> (p. 116)

Rutter does not spell out criteria for effective teaching and productive learning or attempt to measure them systematically. But it is interesting to note in passing that he recorded few examples of groupwork and only 10 (out of 312) of individualized learning were noted; usually teachers addressed the whole class. This is important here, for research in the primary field has tended to gravitate towards the correlation of teaching style with learning outcome (Bennett 1971; Galton and Simon, 1980). Since the present findings concur with Rutter's any attempt to define teaching style in the secondary sector which depends at all upon class organization is doomed to failure or banality; but, by contrast, what is important in the ORACLE work by Galton is its analysis of interaction data. Comparing the results of observations of 'successful' teachers (i.e. those whose eight target pupils had achieved highest overall scores in basic skills on pre-test, post-test data) in the class enquirers, group instructors and infrequent changers styles, Galton and Simon note:

> "Although the use of statements of ideas, closed and open questions is relatively low when these categories are grouped together ... both class enquirers and infrequent changers are above average in the use of the total number of higher-order transactions ... Of some significance may be the fact that all three groups of successful teachers had more task interactions than the typical teacher in the sample."
>
> (p. 196)

This high level of activity (of both low and high orders) as a feature of successful teaching is supported by Wragg's (1978) observations of the outstanding teacher in Bennett's work (1977).

Some other, generally smaller studies, are worthy of brief review. Kempa (1979), using video and audiotape to conduct a year's study in science lessons, concluded that Level 2 discourse (explaining, interpreting and hypothesizing) was rare in classroom groups even when pupils were required to work at this level. Sands (1981) reported that two trained observers analysing secondary science lessons commented that 'where one would expect higher thinking skills not much opportunity was given to groups (of pupils) to work on them.'

Two writers have examined teachers' verbal approvals and disapprovals. Heller (1973) in a study of an inner-city junior high school in New York observed five mathematics teachers and five social studies teachers. More disapprovals were emitted in low ability classes than high ability; more by social studies teachers than by mathematicians; and while teachers comment favourably on instructional behaviours they rarely or never do so for social behaviour. The research is suspect: the sample is too small for generalizability and the school is atypical even of American conditions because of its poor socio-economic background. In an English setting, in a 'typical' comprehensive school, Millar (1980) found that pupils ranked by teachers as 'A' on a five-point ability scale in most cases received more positive interactions than all other pupils except those rated 'D' or 'E'. The 'E' ranked pupil took up the largest proportion of teacher-individual interacts, and scored higher than all other pupils on both negative and positive interactions. Again involving a small sample in one school across a limited range of subjects means that the work is not generalizable. But the message emerging from these studies is that one should be alert to able and slow learners being the target of most individual teacher-pupil transactions.

Dillon (pending) classified classroom language into six cognitive levels: defining, interpreting, fact-stating, explaining, opining and justifying (lowest to highest, according to Dillon).

1,364 utterances by both teachers and pupils in 27 high-school discussion classes were analysed. Results suggested that there was a correlation between the cognitive level of the statement and the length of time it took to utter it. If the order of levels 4 and 5 is reversed, the relationship becomes virtually a linear one. While the basic conclusion here is that it takes more time to say complex things, the implication for teaching is important: that teachers need to wait longer for more complex answers to be formulated. The linear relationship follows for both teacher and pupil talk: and Dillon concludes that pupils consciously or unconsciously mirror the teacher's speech: a shorter question receives a shorter response and, by implication, a lower-order question receives a lower order response. This research would be worth replication across a large number of classrooms, in various subject and age groups, in both the U.S.A. and the U.K.

A specific form of classroom dialogue is the more formal discussion; not whole class question-answer directed by the teacher but a deliberative use of the conventions of debate, chairmanship, etc. A review of this literature is not attempted here, but has been attempted by Kerry (1976) and Turney (1977).

The literature of classroom questions puts out signals not at all unlike those described for other forms of dialogue. Research about questioning has shown over and over again that, of teachers' questions, the predominating ones are those concerned with simple data and the recall of facts already learned. This has been true for the last sixty years, and may be a measure of how little real progress has been made in raising educational standards. Thus Stevens (1912) found that 65 per cent of questions by teachers in American high schools demanded only the recall of information from textbooks. Haynes (1935) found that 77 per cent of questions asked in history lessons were questions of fact: and Floyd (1960) found that even teachers specially selected as 'good' asked 42 per cent data recall questions as opposed to 20 per cent requiring thoughtful answers. In 1965 Gallagher recorded more than half the questions asked of able pupils as being concerned with recall. A recent study of R.E. teachers showed that, in this most abstract of school subjects, out of exactly four hundred questions asked in the study school by R.E. staff 79 per cent were lower order questions.

Questioning skills are not always present in teachers. Thus, for example, Moore and Smith (1980) compared questioning in Papua New Guinea High Schools with results in the U.S.A. An observational study, in 18 classes in the urban high schools, across a range of subjects to obtain descriptive data, showed that teachers asked a median of 1.03 questions per minute of teaching time, and an average of 51 questions per hour. 70.8% of questions overall were controlled in Turney's sense. In eight out of nine classes in which sex data were recorded boys were the target of more questions than girls (ratio = 1.32:1). By plotting classroom distribution of questions on a 16-cell grid corresponding to the class seating plan it was discovered that questions were distributed evenly across the front of rooms, far left and far right sides were neglected, but both back corners were treated to a disproportionate amount of attention by the teacher as questioner. It seems that teachers may be unaware of distribution skills let alone the more sophisticated matter of cognitive demand.

Gall suggests three explanations as to why lower order questions feature so prominently (Gall, 1970). The first is that of Eggleston's pyramid (below): teachers need to be sure pupils have a basis of fact before they progress to speculation or higher levels of thought.

The second explanation is that thought-objectives (as opposed to fact acquisition objectives) have come to be written into the curriculum only slowly. Finally, Gall suggests that teachers simply do not possess the skills to ask higher level questions.

This work accepts that the last two reasons are important; and it contests the first only so far as it would change the shape of the pyramid. Figure 5.8 shows two possible knowledge pyramids. Pyramid A reflects a situation as teachers assume it to be. Pyramid B is an equally valid model, and more desirable.

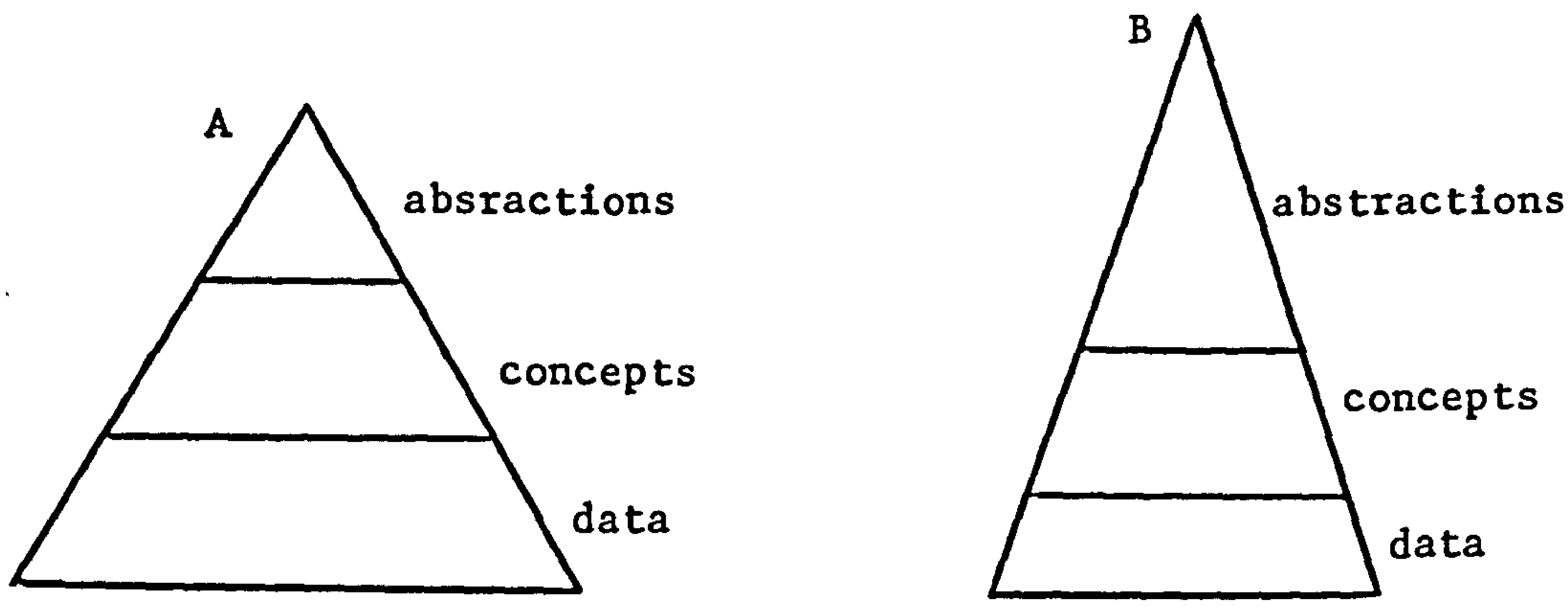


Figure 5.8 Knowledge pyramids

Perhaps Gall's reasons need some augmentation. Above all, two factors have worked in the last decade against higher order questioning in classrooms. The rapid rise in mixed ability organisation has meant that teachers frequently aim lessons towards or below the average level for the class. They are thus more reluctant to ask questions designed to provoke thought, and feel more secure with data-based activities in which the progress of all pupils can be measured against a common background.

Since the demise of grammar schools there has been an increased reluctance to give attention to those aspects of education or teaching skills which may appear to be élitist because of their beneficial effects upon the more able. Asking higher order questions is just one of the strategies which may be seen as undesirable by those who hold socio-political rather than educational ideals to be paramount in the classroom.

But do higher order questions really help pupils to think more effectively? Most researchh suggests that they do, though not all of it is free of criticism, and some has been methodologically suspect. Turney has made a good summary of the research.

The important response to the issue of the value of higher order questions seems to lie well back in the education process, at the point where one formulates aims and objectives for education. At root it comes to this: if one formulates into one's aims and objectives for a lesson, course, or school career the higher level thinking skills as well as lower level knowledge of information, then higher order questions will help the pupil towards achieving both low and high level understanding. If one is satisfied with data recall as the end-product of education then any workbook such as this loses its purpose.

Many teachers maintain that their lack of interest in higher order questioning stems from the failure of public examination syllabuses to include opportunities to use higher level thinking skills, and of the examinations to reward answers which are thoughtful rather than accurate. There can be little doubt that this is partly true, at least up to C.S.E. and G.C.E. 'O' level; and pressure to get through a syllabus does limit the time a teacher can spare for more provocative activities. However, it seems likely that pupils' interest will be better sustained if they are made to think more deeply rather than simply remember and regurgitate. This was the finding of Dunbar (1970) in American schools.

This decade more and more schools have put off the moment for serious embarkation upon an examination syllabus into year four. Various longstanding curriculum developments such as science 5-13, Nuffield science, the Humanities Curriculum Project and S.M.P. have, implicitly or explicitly, included opportunities for higher order questions and high level thinking. There is no legitimate reason why pupils should not be appraised of the value of thinking skills from the moment they enter into secondary school - and arguably before that for both the more able and even the average.

Classroom tasks

Bennett (1977) has argued that a pupil's activites (or tasks) are central to his learning (and it is through these activities that other aspects of the teaching/learning situation are mediated); that total active learning time on a given topic is the single most important determinant of pupil achievement on that topic; and that there is an enormous variation in time for learning for different pupils. He quotes five studies which support this view for various age levels, notably those by Samuels and Turnure (1974) for six-year-olds, by McKinney et al (1975) for eight-year-olds, by Cobb (1972) for eleven-year-olds, by Lahardarne (1968) for twelve-year-olds, and by Postlethwaite (1975). MacDonald demonstrated that pupil inattentiveness was negatively related to achievement; and in a study of 204 lessons at various levels in the comprehensive school by Wragg, Dooley, Kerry and Waltham (Dooley, forthcoming), the range of pupils average time-on-task for individual teachers was found to vary from 90% to around 11%, with a mean for experienced teachers of 62%. These figures are confirmed in an extensive review of the literature by Smyth (1980).

Other factors in successful learning through classroom activities or tasks are likely to be:

... the comprehensibility of task content (and instructions)

... matching the level and pace of instruction to the learner

... effectiveness of teacher feedback to the pupil

... appropriate reward-giving behaviour by the teacher

A number of issues are raised by this analysis. Obviously, the teacher's aims are important in determining the kinds of classroom tasks which are set; the balance between academic/intellectual concerns and social ones will help to determine both the nature and content of tasks; curriculum content is thus controlled and moulded by individual teachers. Homework may be used to increase learning time. A number of disciplinary and managerial issues emerge, notably: how effective are the transitions from one activity to another? How much task-time is actually engaged time? How much diversion from task is caused by disciplinary incidents? How and when are grouping techniques used to further classroom tasks?

Atkinson (1976) notes that the objective of the teacher may be

... to maximize the mean achievement of the class

... to minimize the variation in learning with the class

... to maximize the mean without further magnifying the differences between pupils

Atkinson's conclusion is that the third of these is brought about by managing the time allocation in such a way that initial differences between bright and slow are maintained. In the preliminary researches into mixed ability teaching reported in Chapter 3 one factor to emerge was that classroom tasks and the curriculum were managed by teachers in a manner Project staff came to call 'zeroing'. It worked like this: a class of mixed ability was set to study chromatography, and a worksheet of tasks was supplied. Over several weeks the brightest worked through and possibly beyond these set tasks; the middle band completed most but not all; and the slower pupils ranged from two or three sub-sections to struggling still to read the instructions. When the gap widened to an uncontrollable level, and the basic knowledge had been acquired by a majority of pupils, the teacher stopped the activity and started a new one - camouflage in nature. The class had 'zeroed' and the process could begin again. Reid (1982) reports similar phenomena. Indeed it seems very likely that the kind of task set is a reflection of the teacher's attitude to his job and his overall philosophy (however ill-defined) on education and the teaching process. There is some evidence to suggest that teachers view their role in terms of factual-transmission and that this view will affect their teaching behaviour. Thus Taylor et al (1970) in a study of styles of English teachers of science concluded that:

> "the four styles most valued by science teachers ... are likely to make some contribution to pupil achievement in one or other aspect of science, its factual and conceptual basis ... they certainly do not promise to fit the pupil to grapple creatively with scientific ideas ..."
>
> (p. 30)

And, in a comparative study of New Zealand and Queensland teachers' responses to a checklist of teaching orientations, Campbell and Campbell (1978) found the Australian sample 'strongly committed to ensuring that pupils understand facts; indeed this is the item to which they assign the highest ratings of all' (p. 8).

In their later work on task in the infant school Bennett et al (1981), in a very carefully structured piece of research, studied able, slow and average pupils in schools covering a variety of socio-economic settings. The research design consisted of an interview to explore teacher intentions, rationale and the expected pupil performance; systematic observation by field workers of pupils of varying ability; clinical intervention in which field workers explored pupils' perceptions of the task; and a post-interview with the teacher to evaluate intentions and outcomes. Information about the appropriateness of the cognitive demand of tasks set is not yet available and procedures for making appropriate judgements about this (since they involve field workers' ratings) have still to be evolved. Nevertheless this represents an interesting attack on a difficult problem.

Smyth (1979) studied sixth grade Canadian pupils and used both measured achievement and case-study methods to look at task performance in reading and mathematics. He concluded that both high and low achievers performed better when tasks were structured and teacher-directed. Engagement time in tasks considered 'easy' for the pupil varied widely: from 26% to 82%. Translated into hours on task over a school year the pupil at the 26% level could expect 46 hours of meaningful engaged time on demanding tasks, while the pupil at the 82% level could expect 280 hours of meaningful engaged time. These differences are instructive but, although the research was sensitively conducted, it is too small-scale to admit of generalization. Nevertheless, one insight is important in this context:

> "teachers are confronted with a prominent dilemma ... they are urged to follow a set of teaching procedures designed to attain high levels of pupil engagement by concentrating upon whole class settings, while at the same time pursuing a path aimed at maximizing the meaningfulness of learned content to pupils by having them work in individualized settings. Perhaps this dilemma becomes more manageable when teachers rely instead on an eclectic approach of individual seatwork, small groups, and whole class as circumstances permit."

The current research into tasks in five first year mixed ability classes set out to explore some of the problem areas indicated in the literature, but to leave aside others. The disciplinary, managerial, time-on-task elements were already the concern of other Teacher Education Project workers. Therefore the issues explored here were:

1. An analysis of teaching mode within which tasks were set: whole class, groupwork and individualized learning.

2. What kind of a system could be devised to analyze cognitive demand in classroom tasks?

3. How this system could be used to assess the levels of cognitive demand in the eight subject areas across the five mixed ability classes studied.

4. What the resulting analysis implied for the cognitive demands made upon bright, middle band and slow learning pupils.

5. Whether and how teachers adapted tasks to suit the three named groups of pupils.

6. How teachers' handling of task demand compared with their verbal demands made through talk and question.

E.4 Case study approaches to data collection

Finally in this section on empirical methods and findings in the field of classroom interaction it is opportune to make brief mention of a form of research peripheral to but included in this study. Part if the data collection involved a mini-case-study of the five schools in the main sample. This case-study was modelled on the excellent practices and models described by Nesbit and Watt (1977).

The authors suggest that case-study research should not simply be illustrative; the data should have regard to the scientific canons of research but should illuminate a specific instance (in our case, individual schools as the context for a process study). As such the case-study makes a study three-dimensional: an important feature in the present case, where the procession of numbers and types of transactions may lead the reader to assume (quite wrongly) that the researcher regards teaching as nothing more than a series of objective or mechanistic transactions.

The main weakness of case-study, that its results are not generalizable, is eliminated in the present instance by using it alongside more 'hard-nosed' data: rather as formative and summative evaluation might be used side by side. Where applicable the excellent procedures outlined by this Rediguide by Nesbit and Watt are adhered to, and due note is taken of the exemplary studies cited.

CHAPTER 6

EVOLUTION OF A RESEARCH DESIGN

Introduction

This chapter describes how the initial concerns emanating from the literature of mixed ability and the teaching of exceptional pupils, along with the more detailed questions emerging from the initial research of the Teacher Education Project, became crystallized into a specific examination of how bright pupils and slow learners are taught within the mixed ability context.

The first two parts of the chapter tease out some of the problems and solutions in the process of trying to record in the fullest possible detail the cognitive demands made or evidenced verbally in the lessons observed. Crucially, to discover whether and how able pupils were being stretched or slow learners catered for, it was necessary to find ways to assess and describe this cognitive demand. A rationale and approach for examining teacher talk, teachers' questions and pupil responses and initiations is discussed.

In the next section attention is turned to that other major area of classroom life: the task, or what pupils actually do. This section outlines a method which emerged from the pilot studies for assessing the cognitive demand for these tasks.

Having cleared the major conceptual ground, the fourth and fifth sections of the chapter are devoted to describing issues in the development of the remaining individual portions of the research instruments.

There follows a description of the entire research package with examples of the instruments. The chapter ends with a brief account of the pilot study to trial this package and an assessment of its reliability.

1. RECORDING THE COGNITIVE LIFE OF CLASSROOMS: THE VERBAL TRANSACTIONS

Rationale

Thought takes place in the mind of the thinker and is thus essentially an "out-of-sight" process. To measure the quality of thinking is, however, an essential part of any survey of "successful" classroom teaching if one accepts the premise that education is about "thinking skills" not about absorbing information. In effect only a small amount of classroom thought processes can ever be monitored or measured successfully, i.e. those aspects which become overt in the spoken or written word or in action. It is with this 'visible evidence of thought processes' with which we are concerned in this study and initially with verbal transactions.

The pages which follow attempt to describe a systematic approach towards classifying this verbal evidence into a hierarchy of levels. The oral evidence itself is held to consist of

1. Teacher talk: The level of teacher talk signals that a particular type of demand is being made upon a pupil's powers of thought: e.g. teacher language in a technical register and full of abstract terms demands a commensurate level of understanding.
2. Teachers' questions: Many researchers have indicated that the way in which questions are framed shows the level of sophistication expected by the teacher from pupils in their ability to manipulate, apply or interpret knowledge.
3. Pupils' contacts with and responses to the teacher: Answers to questions and other pupil-teacher contacts are evidence of the degrees to which the signal led demands of the teacher are being met or even perhaps exceeded.

4. Tasks set: Like responses, tasks are capable of feeding back to the teacher (and the researcher) a) the level of the teacher's "thinking demands" and b) the degree to which the pupil is measuring up to or exceeding these.

In the following sections an account is given of the ways which were used to build hierarchies of "cognitive level" appropriate to each of these four areas of observable eviddnce.

TEACHER TALK

STATEMENTS

Much of what goes on in classrooms is talk by the teacher. This talk frequently consists of explanations. In trying to measure the cognitive demands made by teachers upon pupils during this significant proportion of the learning experience it was decided to adopt a 4-point code which borrowed categories from a number of sources and welded them into an amended system which was both simple enough for use alongside the many other measures in operation but also detailed enough to provide the kind of information required. The four categories were

0 Management statements/instructions

1 Information giving/revision

2 Explanations and reason giving

3 Interpretations and hypothesis generation

Level 0: Management statements/instructions. This level of teacher talk made no demand on cognitive skills from the pupils in relation to the subject matter of the lesson. Under this heading came teacher talk concerned with class management, with control and discipline, with administration, and with the mechanics of carrying out tasks. Typical of this level of talk were the following statements and instructions by teachers:

"Today's work is on the subject of map-reading."

"Close the window, Linda."

"I think it's about time we stopped having all this chatter at the start of lessons. When I come in in future ..."

"Before you write anything, draw a margin and put the date."

"This exercise has to be finished in 25 minutes."

"You will see that question 4 asks you to provide examples. Don't forget that in cases like that ..."

"Tomorrow some of you will be required by the school dentist ..."

Level 1: Information giving and revision. This level of talk was concerned basically with Gallagher's 'Data' level of thinking. Pupils were provided with information or data about the subject matter which made little or no cognitive demand beyond the assimilation, retention or recall of the facts themselves. Examples of statements at this level were:

"Roman soldiers found Britain a cold and inhospitable place."

"You remember that carbon plus oxygen formed carbon dioxide."

"When we read T. S. Eliot's poem we were looking at the way people in families relate to one another."

"The French word for 'day' is 'jour'."

Level 2: Explanations, reason giving. Statements at level 2 were characterized by one or more of the following factors: they were in language of a more technical register than level 1 statements; they linked pieces of information; they explained why things happen or they dealt with single concepts or laws. Examples would be:

"The fact that the Romans found Britain an inhospitable place was due partly to the damp and misty climate compared with their Mediterranean sunshine; and partly to the strange customs of the people who turned out in battle daubed with woad to make themselves fierce to look at and who practised a savage religion called Druidism."

"Two molecules of oxygen combine with one of carbon to form carbon dioxide. The ratio 2 : 1 is due to the relative chemical value of the two substances."

"T. S. Eliot is particularly aware of conflicts between the relatives, and these conflicts are seen as all the more destructive because of the detailed knowledge relatives have of one another's private lives."

"Verbs ending in -er like 'donner' usually form the past participle by dropping the -er and adding é: donné. This is the regular form for first conjugation verbs."

Level 3: Interpretation and hypothesis generation. Here we were concerned with statements which analysed, evaluated or indulged in speculation. Pupils listening to these statements would have need to be able to deal with two or more concepts at a time and would have had to follow abstract language and speculative links between concepts. Examples were:

"A country's religion often gets in the way of change, and the Druid priests represented the old conservative values and ways of the British against the Roman Occupation. The Romans brought fast communications, orderly government and improved living standards; but their arrival meant a loss of freedom for the native population."

"Heat is one of the things which causes change in chemical substances. Water can be found in solid, liquid or gaseous form according to the temperature at the time."

"In the poem the relationships between the relatives involve conflicts which result from accepted social norms: there are hints of incest, the Oedipus conflict and social class barriers."

"You might like to think about the alternative ways in which a Frenchman could phrase the question "How are you today?"."

Summary. Each of the levels indicated represents a significant step forward in the intellectual demand made by the speaker (the teacher) on the listener (the pupil). One might hypothesise a tendency for lessons to begin at lower levels and work up, e.g. the teacher may begin by coping with management and administration (level 0), do some recall exercises (level 1), start to give information related to new work (level 1), then progress to single concepts (level 2), and finally build up to speculations about consequences of materials learned (level 3).

In practice, however, little or no management functions may be required. The class may begin where it left off recently, and so speculation or hypothesis generation may feature early in a lesson (level 3). Then the teacher may need to break new ground in order to take the class a stage further, beginning with a new set of data (level 1) and progressing to a conceptual (level 2) formulation.

Teacher talk must contain all levels of thinking in order to cater for a complete range of ability, at least on the Piagetian model, for all pupils after the age of 11 or 12. The greater the ratio of level 2 and level 3 talk to level 1 and level 0 talk, the higher the general cognitive level of the classroom (given that the pupils UNDERSTAND what is said - an issue to which we shall return). However, it is obvious that no lesson could exist without the lower levels of thinking (the data base from which the upper levels of thought proceed). Therefore the issue is raised about this proportion of higher cognitive demand in the form of two questions:

(1) how much higher level demand is made by teachers' talk in classrooms?

(2) what is the minimum proportion of higher level demand to cater for and keep stimulated the brighter pupils in a mixed ability class?

These are two of the questions to which the current research turns its attention.

TEACHERS' QUESTIONS

The 4-point scale adopted for analysing teacher talk was felt to be too crude for coding questions. Much research has been done on categorizing types of questions and registering the demands they make upon pupils' cognitive skills. It was felt to be appropriate to adopt a 6-point scale which has been widely used and to add "level 'O' management questions" to this ready-made device (Turney, 1975).

The codes thus adopted were

0	Management	- questions or pseudo-questions for class management or control purposes.
1	Recall	- eliciting data or information, and answers often limited to monosyllabic responses.
2	Comprehension	- seeking to see if pupils are able to understand simple information.
3	Application	- requiring the student to use abstracts and generalizations in particular situations.
4	Analysis	- requiring pupils to break down a situation into its component parts and explain their inter-relations.
5	Synthesis	- getting pupils to build a new idea, communication, plan or experiment.
6	Evaluation	- helping pupils make judgements about quality of ideas or phenomena (i.e. not mere opinions).

Some examples of each of these types are given below:-

0; Management

"Will you sit down, Johnny?"

"Where is your book ?"

1; Recall

"What did we learn about oxygen yesterday?"

"How many men were there in a legion?"

"How many miles long was Hadrian's wall?"

2; Comprehension

"What is the meaning of the word 'jour'?"

"How can you tell from the extract that the Romans thought Britain an inhospitable land?"

3; Application

"What examples of metaphors can you see in this poem?"

"What principle helps to explain why this container crumpled when removed from the heat?"

4; Analysis

"In the poem, how does Eliot put across this feeling of claustrophobia?"

"Why did Hadrian site his wall on its present line?"

5; Synthesis

"How would you test the hypothesis that migration in birds is an innate drive?"

"In what ways could you re-write the Joseph story to get across its message in modern terms?"

6; Evaluation

"Is the route he took the best for Hadrian's wall?"

"Which is the more convincing theory: that bird song is innate or that it is learned?"

Summary. This 7-point system represents an appropriate hierarchy of thinking skills which are called into play by the teacher from the pupil. Each type or level of question is appropriate to average ability pupils in the 11-12 age-range and the question types, in theory, not only draw knowledge out from them but help the pupils to structure their own thinking. As such the responses to them can be regarded as useful indicators of pupils' cognitive skills.

PUPILS' RESPONSES TO QUESTIONS

Teachers' statements and teachers' questions can be used as a measure of cognitive demand made by teachers on pupils. To discover the level at which pupils absorbed and responded to these demands it was necessary to look at the cognitive levels of pupils' responses to and initiated contacts with teachers and at their performance on tasks set. In this section we look at verbal clues; a later section looks at pupils' written responses to tasks.

The cognitive level of pupil responses was indicated by 4 codes:

0 - management

1 - data level

2 - conceptual level

3 - abstract level

These four levels corresponded more or less with the levels indicated under 'Teacher Talk'.

Level 0: Management. These were, typically, responses to management questions. They included examples such as the following answers by pupils:

"I've forgotten it." (to 'where is your homework?')

"Sorry, sir!" (to 'will you shut up?')

"The doctor says I'm not allowed to use my arm." (to 'Why aren't you writing like the rest?')

Level 1: Data. The data level was characterized by short or monosyllabic responses, and by a simple statement of facts or information not put to any further use. For example:

"Blue" (to 'what colour does litmus turn in an alkali?')

"Yes" (to 'Is it true that Hadrian's wall is over 100 miles long?')

"Vert" (to 'What is the French for green?')

"Conflict" (to 'What is the theme of Eliot's The Reunion?')

[This last example is open to debate since "Conflict" is a word implying an underlying abstraction. But the "fact" of "What 'The Reunion' is about" in this simple recall form may require, in context, merely a regurgitated piece of information supplied by the teacher in dictated notes in a previous lesson. As such, this kind of response requires a degree of contextual judgement on the part of the observer.]

Level 2: Concepts. Here the pupils were required to show a grasp of a concept, a reason or a brief law and the answer, typically, required a sentence or more for proper expression. The language tended towards the technical register, though pupils often struggled towards concepts through language of their own. Some examples were:

> "It had to be chosen according to the lie of the land ... the sort of geography ... where the country was narrow and the stone available" (to 'How do you think Hadrian chose a site for his wall?')

> "Showy plumage has to do with holding a nest-site" (to 'Why do male birds have brighter plumage than females?')

> "The mother is angry with the son for falling in love with the maid, because the mother thinks he's too good for a servant" (to 'What are some of the conflicts which underly the poem?')

Level 3: Abstract level. Now pupils were required to group concepts together into major generalizations or principles, to use two more concepts in an answer and to make connections between them. Skills of analysis synthesis and evaluation were included at this level. Typical responses were longer than a single sentence and often contained language in a technical register in order to provide the necessary "shorthand" to keep sentences manageable. Examples included responses such as:

> "The wall had both advantages and disadvantages. The disadvantages were the length and the consequent drain on man-power to garrison it, as well as its remoteness. Some advantages were that it was partly based on natural barriers and its presence meant that the rest of the army was freer to campaign behind it without fear of attack. (to 'How useful was Hadrian's wall?')

"In terms of evolution, it must have been a big help for hen birds to have camouflaged plumage to conceal them on the nest. For the cocks it was necessary to be on show, in spite of the danger from predators, in order to maintain a territory." (to 'Why don't cock and hen birds of the same species necessarily share a similar plumage?')

"The problem between the son and the maid is one of social class. His position demands that he adopts a middle-class set of values, appearance, speech and so on. On the other hand she has only working class experience to draw on. They are attracted to each other; but pressures from the family is put on the son to conform to the family norms." (to 'Why does the mother resent her son's attraction to the maid?')

Some additional codes

In a trial experiment we found that the 4 codes used to collect information about pupil responses were inadequate and a new code was added as follows:

'C' - Contacts. Pupils made a large number of contacts with teachers which were either solicited or initiated by the pupils, but which were not necessarily concerned with cognitive demand. On the other hand, they were felt to be important a) because they were so frequent relative to other kinds of response and b) because they obviously "oiled the works of classroom life" in an important way. The quality of these exchanges was not directly managerial, nor disciplinary; nor were they always directly about thinking and learning. Sometimes they were reminders about things learned; but provided neither information nor stimulus to think deeply. A few sample exchanges were:

T: What's that?
P: The clef sign.

T: Margins, Johnny!
P: Yes, Miss.

T: Where's the accent?
P: There, Miss.

P: Is this the right ordér, Miss?
T: Yes, carry on.

W - Incorrect responses. Sometimes pupils answered questions incorrectly. In these cases the thought level of the answer was not coded, but an incorrect response was noted. It was felt that the important information to collect here was a) the frequency of incorrect responses as a total of all responses and b) whether these wrong answers were offered here uniformly to all teachers by pupils of all ability levels.

Summary. Pupils' responses were thus coded C, O, 1, 2, 3 or W. The pupil's name was logged against each response. A completed picture of responses or contacts between teachers and every individual pupil could thus be compiled under each of these six categories.

2. METHODOLOGY FOR RECORDING THE VERBAL EVIDENCE

Having settled on the shorthand coding system for the three areas of cognitive demand discussed so far, there remained one issue to be resolved. This concerned how the units of talk or response should be logged by the observer.

In case of recording questions there was no problem. Every question was coded, and a complete record of the cognitive demand made by teachers' questions was thus compiled. But units of teacher talk or of pupil response might be of any length: a word or two, a 'paragraph', or of some minutes' duration.

A favoured method of recording verbal data is by time-sampling: the observer keeps an eye on a stop-watch or is given a taped signal at regular intervals. He then records what kind of dialogue or event is in progress at that moment. The Flanders (1961) system is a good example of this procedure.

Such a process would have been cumbersome in the present case. The observer was aiming at a complete picture of cognitive demand;

and this required the recording of questions and tasks as well as talk and response. In the former cases time-sampling was inappropriate. Time-sampling has the major draw-back of being like a fishing net: the smaller items can slip between the meshes.

It was therefore decided to experiment to see whether teacher talk and pupil responses could be logged using more convenient units. In practice it was discovered that most pupils' responses are extremely brief; only once did we note a monologue of paragraph length from a pupil. Therefore, it was decided to ignore the length of the response, and to code each individual response for cognitive demand.

In that pupils seem to make short, immediate responses the system worked well enough. But teachers are known to talk a great deal. Would it be possible to categorize the teacher talk in some acceptable form of unit? Would there be problems in that a teacher might write a single short sentence or simply talk for an unbroken half-an-hour? Each of these inputs would be coded 'TO', but each would represent a quite different event.

In practice, the problem proved to be less complicated. It was soon discovered that teachers do not indulge in wholly unbroken monologue. Even the longer periods of teacher talk tend to change cognitive level every sentence or so. The idea of a 'unit' as a short burst of teacher talk at a specific cognitive level was, in fact, viable. Furthermore, talk was often punctuated by teacher questions - separately coded - which formed 'natural' breaks in the flow and broke up the units into manageable lengths.

Typical pieces of classroom talk by teachers, with their codings, would be as follows:

T: Now today we're going to look at the Coming of the Romans. (TO) Does anyone know when the Romans first came to Britain? (Q1). [No response.] Well, they came under the leadership of a man called Julius Caesar (T1) ...

Figure 1

Categories for coding verbal transactions

The following categories were used:

- T0 Teacher talk – management, demonstration, administration.
- T1 Teacher talk – data level.
- T2 Teacher talk – concept level.
- T3 Teacher talk – abstract level.
- Q0 Teachers' questions – management level.
- Q1 Teachers' questions – recall level.
- Q2 Teachers' questions – comprehension level.
- Q3 Teachers' questions – application level.
- Q4 Teachers' questions – analysis level.
- Q5 Teachers' questions – synthesis level.
- Q6 Teachers' questions – evaluation level.
- C Contacts with pupils – brief and of no learning significance.
- R0 Pupils' responses – management level.
- R1 Pupils' responses – data level.
- R2 Pupils' responses – concept level.
- R3 Pupils' responses – abstract level.
- RW Pupils' responses – incorrect answers.

Or,

> T: This experiment is important because it illustrates how heat travels. You remember we talked about molecules, and how these are in motion with little spaces between them. As they move along the bar they carry the heat along with them, as it were (T2). Johnny, come and hold this end of the bar in the flame (T0).

In practice, then, it was possible for the observer to record units of teacher talk and of pupil response, without losing information in the way that occurs with time-sampling. Though the units vary in length and in that sense are not strictly comparable with one another, the method has the advantage of completeness. Furthermore, it is possible for the observer to record every teacher question and task set to pupils, so fulfilling the picture with details, since (generally) only one of the four events (teacher talk, teacher question, pupil response, or set task) is in progress at any given moment.

In the next section the recording of classroom tasks is discussed. Before that, however, it might be helpful to look at the shorthand coding system in action.

Perhaps the reader will best understand the shape of the research if he imagines himself present in the lesson as an observer. The class enters, and we eavesdrop on the verbal transactions as pupils file in and go to their places:

1.	Teacher:	Don't push Sylvia ...
2.		Jane, before you go this lunchtime I
3.		want a word ...
4.		Right, settle down now. Ready!
5.		Last time, we looked at how plants use
6.		sunlight to make energy.
7.		Does anyone recall what this process
8.		was called?
9.	Michael:	Photosynthesis.
10.	Teacher:	And what substance was present
11.		in the leaves of the plant to enable
12.		this to take place?

The observer would be coding each transaction as it took place using the categories in Figure 1.

The short transcript just quoted would appear on the recorder's sheet thus:

Teacher talk	Pupil talk
TO (line 1)	
TO (line 2,3)	
TO (line 4)	
T1 (line 5,6)	
Q1 (line 7,8)	
	R1 (line 9)
Q1 (line 10,11,12)	

Each lesson, then, is made up of many transactions like these. The illustration above shows a typical lesson beginning. If we were to look at a lesson already in full flood it might be that a wider range of shorthand categories would be needed to code the transactions, thus:

1.	Teacher:	Why might this route not be a good
2.		one for an invading army?
3.	Mike:	The country is mountainous and the
4.		weather might be bad.
5.	Teacher:	Can anyone think of the advantages of
6.		using it?
7.	Julie:	It was the shortest.
8.	Teacher:	No. Look at your map and you'll see
9.		there are two shorter routes, one marked
10.		with dots and one with little triangles.
11.	Sally:	The point is surprise. It was the way
12.		an enemy would least expect an invader to
		choose.

The observer's code-sheet for the extract above would look like this:

Teacher talk	Pupil talk
Q2 (lines 1,2)	
	R2 (lines 3,4)
Q2 (lines 5,6)	
	RW (line 7)
T1 (lines 8,9,10)	
	R2 (lines 11,12)

In these two short extracts of typical classroom dialogue we can now see quite clearly that in the first the teacher spends a lot of time on managing the individual pupils and the class, and then proceeds to some revision of previous work. These are, in terms of the quality of thinking taking place, low level operations. In the second extract the teacher demands that pupils reason and think things out for themselves, i.e. that they use information or data, not simply reproduce it. Even at a glance the code sheets indicate the rise in thought level between extract 1 and extract 2.

3. RECORDING THE COGNITIVE LIFE OF CLASSROOMS: ANALYSING CLASSROOM TASKS

The purpose of studying classroom tasks

So far the research has looked at cognitive demand in lessons by examining the oral components of lessons (teacher talk, teachers' questions, and pupils' responses and initiations). These oral components have been used as evidence of the thinking in progress and of that expected by the teacher. The area of classroom demand so far unexplored in the attempt to measure 'thinking demand' is that of the set task. By collecting data about tasks alongside the analysis of oral transactions the research hoped to present as possible a picture of the cognitive climate of the lessons studied.

The nature of classroom tasks

For the present purpose it was desirable to find a way of analysing the cognitive demand made by classroom tasks which would be roughly comparable to that used in assessing demand made by talk, questions and responses. At root what the research aimed to do was to group tasks into two main categories: of high and low cognitive demand.

A low-demand task would be one which asked pupils to carry out simple operations requiring little thought (e.g. copying); or one in which the pupil dealt solely in information, often information already supplied by a textbook, worksheet or by the teacher.

A high demand task would be one in which pupils were expected to go beyond information or data, imaginatively or analytically; or one where given information was used in new ways or new situations.

In addition to this two-fold grouping it was felt to be desirable to examine whether the two kinds of tasks could be sub-divided. By looking at types of tasks the research aimed to be of practical value to the Teacher Education Project's overall purpose of initial and in-service training (this topic is discussed below).

Collecting the information about tasks

During classroom observation the researcher recorded all tasks set by the teacher using a separate column of the observation schedule (see Appendix). When all the data was collected, the tasks were listed. In the five first year mixed ability classes of the main study 640 individual tasks were identified (these are listed in the Appendix). Wherever possible, the researcher collected any worksheets used or other supporting information about the task. In many cases it was also possible to collect information about pupils' responses to the tasks in the form of photocopies of their written work, test papers, etc.

Devising an analysis system for tasks

Once the tasks had been listed it was possible to group them into the more obvious categories. Thus all those involving copying could be seen as belonging together; other emergent categories included such processes as reading aloud round the class, memorizing, writing imaginative or "creative" pieces, etc. The research assistants involved in the Teacher Education Project research were asked to evolve their own groupings and when it was found that these were approximately similar all the 640 tasks were allocated to appropriate categories by the author. As a check, the research assistants were also asked to categorize a sample of tasks and the results were compared. In making judgements about which category a task belonged to the evidence of the teacher's instructions, of the task itself and of the pupils responses (where available) were taken into account. The allocation of tasks to categories proved to be comparable between researchers with only a handful of tasks proving hard to place in the emergent category system. Finally, only three tasks were not placed in a category. In each of these three cases the data about the task was inadequate to allow a secure judgement to be made.

The system for analysis for classroom tasks was emergent from, rather than imposed upon, the process of data collection. For this reason it has been necessary to jump ahead slightly in this section and to anticipate some of the discussion about methods of data analysis. The theme is taken up in more detail in its rightful place in Chapter 7.

The emergent category system: Analysis Classroom Tasks (ACT) Proforma

The following category system emerged from the analysis of classroom tasks in the five schools of the main study:

Low level tasks

L 1	Disciplinary tasks	E.g. Write six reasons why you must not run round the classroom.
L 2	Administrative tasks	E.g. Move classroom furniture to make more space; collect or pack away equipment.
L 3	Drawing or colouring task	Commonest examples were of copying maps from atlases or colouring pictures to illustrate written work. These tasks took little thought, but some manual skill. A single example of doing breathing exercises in music was included here.
L 4	Copying or writing headings	Teachers frequently gave the instruction 'put a heading'; copying directly from blackboard or text was included here.
L 5	Reading aloud	In all subjects teachers were inclined to ask pupils to read passages round the class. This category was extended to include singing together, repeating phrases from a tape-recorder, or playing musical instruments one note at a time in direct imitation of the teacher.
L 6	Silent reading; listening or watching	Teachers often asked pupils to be a passive audience (to a record, a demonstration experiment). Pupils also read silently, often to allow time for slower workers to catch up.
L 7	Memorizing	E.g. Learn lists of vocabulary in a language or dates in history.
L 8	Revising or taking revision test	This category was reserved for those occasions when a teacher used the word 'revision' in a description of the task.
L 9	Carrying out an experiment (exactly following a demonstration); or make simple observation of results.	Many science lessons began by a teacher demonstrating and then pupils either observing the result or doing an exact replication of the experiment.
L10	Simple cloze, comprehension or note-taking	These tasks involved the pupils in understanding or make a précis of simple data already supplied by text book, worksheet or teacher.

L11	Reinforcing	A common set of tasks involved practice in a skill already learned, e.g. pupils, having learned about fractions last week, were given 20 examples of addition of fractions to perform. This category was used to include such tasks as logging results from experiments, matching French sentences to descriptive pictures, putting actions to words in foreign language songs, and doing corrections to previous work.
L12	Looking up, finding out information	This category was used only for looking up simple factual information (data) such as finding out a date or what happened in a particular incident. If the data was applied or used the appropriate higher level task category was used instead.

<u>High level tasks</u>

H1	Imaginative tasks	This category included what is often termed creative writing. Typical examples were: write a shape poem about fire; or, write a serial story called The Great Adventure.
H2	Collecting evidence, problem solving, deducing and reasoning tasks	E.g. Devise some questions you want answers to such as a) does temperature make a difference, b) which detergent product washes best, c) is biological powder better?
H3	Application tasks	Tasks in this category ask pupils to use knowledge gained in order to perform in a new situation. In a French lesson pupils were asked to use recently acquired words for foods to devise a menu and order a meal in a restaurant.
H4	Analysis tasks	In an experiment about water and its reaction to temperature pupils were asked to find out why, in one piece of apparatus, water levels dropped on heating before rising (as expected) because of expansion. Analysis tasks ask pupils to differentiate between fact and hypotheses, to find patterns and clarifying relationships.
H5	Synthesis tasks	Synthesis involves organizing ideas to make a new statement, developing plans to test ideas and discovering relationships or proposing changes or improvements, e.g. 'write a letter from the Emperor telling the people of Britain why the Romans have decided to leave.'

H6 Evaluation tasks — These tasks require pupils to appraise, assess or criticise according to justified criteria. Writing book reviews or an assessment of a character in a novel would be included here.

The category system in practice

Wherever possible each individual task set by a teacher was subjected to scrutiny prior to its assignment to a category. In a few cases teachers set multiple tasks, e.g. a set of questions. In these cases the category used for the composite task reflects the most demanding component of the task.

The category system as a hierarchy

The categories listed L1-L12 and H1-H6 are not intended to form a hierarchy of cognitive demands, though clearly tasks in group L11 (reinforcing) L11 are more relevant to academic school work than those in group L2 (administrative). It will be argued, however, that by calculating the proportions of L tasks to those of H tasks some measure can be made of the cognitive demand made by lessons in each school or subject area (see page 473). It will also be argued that the categories can be subdivided thus:

L1,2	management tasks
L3-L12	information tasks
H1-H 6	stimulating tasks

In this respect the finding report below closely parallel the findings of the sections on teacher talk, teachers' questions and pupil responses.

The classroom tasks listed

In a section which follows all the classroom tasks in the five schools of the main study are listed. Against each task is given the category to which it has been assigned according to the Analysis of Classroom Tasks proforma. A full discussion of tasks appears in Chapter 17. For the present the theme of collecting the remaining classroom data is pursued in sections 4 and 5.

4. LOOKING AT THE LEARNING CONTEXT

To spend several lessons on end in a classroom coding every verbal transaction between teacher and pupil can be an exhausting business. At times it required several entries per minute to be made on the observation schedules - one teacher managed to elicit up to three responses per minute for her language classes; and the observer had also to code and record questions and statements. For this reason it was impossible for the observer to write detailed case-notes of each lesson. However, it was felt to be important for some information, both factual and impressionistic, to be gathered about the context of the verbal transactions and tasks.

Two major pieces of information were collected about the learning context.

In the first place, each page of the observation schedule on which transactions were recorded contained a space for the observer to record the time of day. Each schedule also provided for the observer to keep track of the kind of teaching mode in operation at any given time. In this way it was possible both to keep track of the proportion of time spent on each teaching mode and also to relate mode to other activities, e.g. task setting. Teaching modes were defined in the ways described in the following paragraphs.

Teaching mode

A description of the coding system

Research and experience suggested that three main teaching modes could be recognized as the context within which thinking took place: whole class teaching, group work and individualized learning. This same research also suggested that group work could be crudely sub-divided into 'educational' and 'organizational' styles. Some account of these modes and the sub-groups is appropriate by way of introduction.

<u>Whole class teaching (W)</u>. Whole class teaching embraces any classroom situation in which all the pupils are meant to be paying attention to a teacher-led activity. It corresponds roughly to what is implied in the phrase "chalk and talk". But "chalk and talk" is a limited concept: it suggests a monologue by the teacher, usually with the character of an explanation, possibly involving some board work, audiovisual presentation or practical demonstration. But whole class teaching does not have to be construed as narrowly as this. In our pilot study for this research we found one teacher who asked well over 100 questions per lesson. These were short, requiring monsyllabic responses, and were sprayed around the room. The whole class was expected to be attentive to the activity all the time even though one pupil at a time was singled out to make a momentary response.

The characteristic of whole class teaching is that it demands all the pupils' attention simultaneously on the same task.

A specialized form of whole class teaching would be where a pupil was asked to address the class or some topic on which he showed interest or expertise. However, the characteristics of simultaneous attention to the same task by all pupils apply; and although a pupil is talking rather than a teacher, the activity is in practice teacher-controlled. Recording of this specialized form of whole class teaching would be thus: WP.

<u>Group Work (G)</u>. The distinguishing characteristic of group work is that pupils are split into two or more clearly identifiable working units within the class. These working units would <u>normally</u> consist of more than two pupils but less than a dozen; although sometimes a class might simply be divided into two parts. In some early research on groups teachers suggested that group work was of two kinds and in practice all group work in the present study was coded Gi and Gii.

Gi ; organisational group work. In the Teacher Education Project's case-study research, already referred to, a number of examples were found of pupils being divided into groups which did not function independently of one another when tasks were set. A typical example of this was the classroom where tables were arranged for pupils to sit in fours. These groups of four were geographically identifiable; but whenever work was set all the pupils in the class worked simultaneously on the same tasks. In other words, these groups were mainly friendship groups. The pupils in them sat together, their chatter was at a social rather than a learning level, they might share equipment and apparatus; but in reality all the children were engaged in tasks which were actually independent. Each pupil's work was clearly separable from every other pupil's work; each pupil worked simultaneously on the same task towards a personal end-product as in whole class teaching. This kind of group work was, in effect, 'sitting' in groups rather than 'working co-operatively' in groups.

In each case, where the group work showed any marked variation from these basic patterns the observer was asked to record freehand the points of interest in a footnote to the schedule.

Gii educational group work. The word 'educational' refers to the rationale and criteria on which the groups were formed by the teacher. Group work in this category consisted of several groups of pupils, normally numbering 2-12 pupils, each of which was working on a discrete task. Characteristically, some degree of co-operation between members of the group was necessary in order to achieve the set task. This co-operation was beyond the mere common use of apparatus in short supply and would involve some degree of task-sharing between members, who thus became inter-dependent towards a common educational goal.

Thus, in a history lesson on the Romans one group might be studying aspects of the Roman army, another plotting the line of Hadrian's wall, and another finding out about Roman gods and so on. The purpose of this group might vary; e.g. the various groups might be working on tasks of similar difficulty with a view to pooling their knowledge in a plenary session, or the tasks for each group might be graded in difficulty (a form of what is sometimes called "hidden streaming"). The characteristic of educational group work (Gi), however, was that each group had its own peculiar task.

I; Individualized learning. Individualized learning consisted of those situations where each pupil in a class was provided with work at a level of difficulty suitable (in the teacher's opinion) to his/her ability. In an extreme form every pupil in the class might be engaged on a totally discrete and separate task from every other pupil. In practice, this extreme form of the system was frequently diluted. Descriptions of typical examples of individualized learning may serve to illustrate the point.

In a maths lesson pupils were working from the SMP texts. Each pupil worked at his own pace and the class became widely separated in its progress through the course. The teacher acted as consultant and facilitator, moving from pupil to pupil to check progress and mark work. Though several pupils might be working on the same problem at any given moment, in effect each could work alone, proceed at his own pace and was thus engaged in individualized learning.

In a 'Topic' lesson each pupil chose a separate subject to research. No two chose the same topic and the work was proceeding with pupils selecting their own resource materials and determining their own pace of progress. This too was recorded as individualized learning. The task itself, then, may be either self-selected or imposed. The characteristics are the independent pace and nature of the task which together give each pupil a degree of "personalised tuition".

Summary. In theory, at least, it was possible for more than one of these teaching modes to be in operation in the classroom at the same time. For example, in a case-study conducted by the Teacher Education Project some pupils in a class worked in friendship groups (Gi), while others were taught (W) by the teacher. In such cases observers were asked to record freehand comments about classroom processes as well as to jot down the codes on the schedule.

Mini-case studies

As has been said, with so much coding and recording going on the observer had little time to write case-notes while lessons were in progress. However, each observer was asked to spend a few minutes after each school session in writing impressions of the teaching observed. In many cases teachers were viewed by more than one observer, each of whom contributed impressions. All the schools and classes were also visited at least once by a second observer; and the resulting impressions of all those involved in the research were collected over the observation period.

These collected observations form mini-case-studies of the schools, classes and teachers involved in the research. They are collected together in Chapter 8 ; and they serve two purposes.

They are an important backdrop to the research, allowing the reader to gain some insights into people and institutions that would otherwise be designated by rather impersonal codes. Their purpose is simply to demonstrate that these schools were indeed "normal" comprehensives covering, if anything, a slightly favourable range of catchment areas.

5. COLLECTING THE REMAINING DATA

So far, the data consists of some case study material about the schools, the teachers and children; of a time-record of the relative use of the three teaching modes; and of a detailed study of the cognitive levels of teacher talk, teacher questions and pupils' responses.

What else was requisite in order to answer the research questions? Primarily some information about the bright pupils and slow learners in each class.

Identifying bright pupils' and slow learners

Collecting information about bright pupils and slow learners posed some problems. Leaving aside the question of cultural bias in I.Q. tests, it soon became clear that the study schools were unhappy about both the possibility that we should administer tests to the pupils and that they might pass on such confidential information. Some schools went so far as to hint that, in this politically sensitive area, if the Sherwood Project were to look overtly at pupils' ability they would not be prepared to participate. In general terms there was considerable pressure from L.E.As. not to jeopardize the recent comprehensive reorganization by obvious reference to differences between pupils' abilities. Rather, the emphasis was on the benefits of equal opportunity and educational treatment.

In the discussion of the literature reference has been made to the importance of the teacher's perceptions of a given pupil in the treatment he or she receives from the teacher. Therefore it was decided to adopt a more oblique approach to the problem of identification.

A proforma was compiled, labelled the Class Profile Instrument (C.P.I.), which asked teachers to identify the pupils who conformed most and least closely to a number of characteristics. These characteristics were those commonly found in checklists for the identification of bright pupils on the one hand and slow learners on the other.

Thus the teacher was asked, for example, to identify the child with the longest concentration span (a characteristic of bright pupils according to Ogilvie, 1973) and the shortest concentration span (a characteristic of slow learners according to Downie (1979).

By asking the teachers to make a series of these choices it was hoped that some pupils' names would recur - and that these children could be identified with some confidence as those perceived by the teacher as bright or slow learners.

By offering a variety of criteria, some positive and some negative, it was also hypothesized that teacher resistance to putting simple all-pervasive labels on pupils would be overcome.

Following analysis of the C.P.I. and the identification by the researcher of the perceived bright pupils and perceived slow learners, the classroom observer would cross-check in informal conversation with the teacher the appropriateness of the identifications made.

A copy of the complete C.P.I. appears in the appendix.

Teachers' criteria for judging bright pupils and slow learners

In addition to the C.P.I., in which the researcher could impose some categories to which teachers would respond by identifying pupils most and least associated with a named characteristic, it was to be useful to ask the teachers themselves to list those "cues" which they picked up almost intuitively from pupils in their classes and which led them to rate the pupils concerned as bright or slow. The same question was asked in relation to 'typical' middle-band pupils also.

Responses to this request for cues or pointers to high ability, slowness or typical middle-of-the-roadness in pupils would, it was hoped, lead to the building up of a profile of how teachers view these pupils and description of the criteria of judgement they use in reaching their assessment.

6. OVERVIEW OF THE RESEARCH DESIGN

What has emerged from this chapter, then, has been a research package consisting of the following items:

1. A structured interview document for use with the class teacher of the selected class. This was composed of:

   a. The Class Profile Instrument.

   b. Teachers' descriptions of the cues or pointers to the typical bright pupil, slow learner and middle band pupil.

2. A lesson observation sheet, which would give scope for collecting the following information:

   a. the lesson context (teaching mode),

   b. time spent on each teaching mode within a lesson,

   c. all units of teacher talk broken down into codes indicating the level of cognitive demand (0, 1, 2 and 3),

   d. all teachers' questions broken down into codes indicating the level of cognitive demand according to an adapted Bloom's taxonomy (0, 1, 2, 3, 4, 5, 6),

   e. all pupil responses or contacts with the teacher (including pupil-initiated talk), each unit codes for cognitive level (0, 1, 2, 3),

   f. space to describe, as fully as possible, all classroom tasks set by the teacher,

   g. blank spaces in which to jot notes for the compilation of the short case-studies of schools, teachers and pupils.

3. In addition, photocopies of pupils' work were collected where this was possible and the school was co-operative.

Examples of the instruments are included in the Appendices.

7. A PILOT PROJECT

To try out the research instruments and to see whether they could be handled by more than one observer while retaining an acceptable level of reliability it was decided to use a simulated classroom in the first instance.

The researcher trained two research assistants in interview techniques to carry out the semi-structured interviews.

To code the verbal behaviour in the way required by the lesson observation sheet meant that the observer might be very busy during a lesson if the dialogue between teacher and class became animated. Since the aim was to collect <u>all</u> the information (in contrast to the time-sampling methods often used in classroom interaction analysis) the observer had to be quick and thorough. However, it was also easier to check this thoroughness since, if three observers watched the same lesson, they should theoretically obtain identical records. By contrast, in time-sampling of fast-moving dialogue, two observers who became marginally out of time-phase might produce quite markedly different records of events.

Not only did the observers have to collect <u>all</u> the verbal transactions, their judgement of which code to use had to be exact.

Initially, observers learned to code teacher talk. This was then practised using transcripts of lessons - so that observers could proceed at their own pace. Then coding of teacher questions was added, and finally coding of pupil talk. These two were practised on 'static' transcripts.

The next stage was to try to cope with all three sets of codes at once, this time using a simulated classroom, i.e. a videotape of a lesson in progress. Any failures to record events or discrepancies between observer could be checked very thoroughly by replaying the tape to confirm the nature of the event. During this process any minor amendments could be made in the coding system of the instructions for using it.

When the observers had reached a high level of proficiency it was possible to try the system in a real classroom. Since events in the real classroom were not edited by the CCTV producer, the limit of the camera lens and the efficiency of the microphone, recording in real classrooms was found to be easier than coding from videotaped lessons.

Recording tasks was not difficult: observers did not have to cope with other kinds of data while the task was being set; and all that was required was a brief but accurate description, with supporting documentation such as worksheets, where possible and appropriate.

Once the definitions of groupwork (already referred to in section 4 of this chapter) had been agreed upon, it was simple enough for observers to record the teaching mode in progress at the beginning of any given lesson and then to note any subsequent change in that mode.

Thus equipped, two teachers agreed to accept observers into their classes and to be guinea-pigs for a pilot run. These trials proved to be satisfactory - the observers reaching high degrees of correlation in their observations, thus:

	Observer 2	Observer 3
Observer 1	92%.	90 %
Observer 2		86%

The structured interviews related to these pilot studies produced no unforeseen problems.

It was now possible to make a final selection of schools and proceed with full-scale data collection.

CHAPTER 7

ANALYSING THE DATA: an.. outline of procedures

The data collected for this study, then, fell into four main kinds:

... case-study information about the schools, the teachers and the children

... presage data concerning the

pupils (whether and how often the teachers selected them on the categories of the Cross Profile Instrument)

... process data which permitted an assessment to be made of the overall cognitive demand made in lessons by teacher talk, teachers' questions and tasks set

... information which allowed an assessment of whether teachers' verbal and written task demands on bright and slow learning children differed appropriately in cognitive level from those directed at the remaining 'middle band' pupils.

This chapter looks briefly at the ways in which the data were analysed; and these which follow present the results of this analysis.

1. The case study data

As has been described the author, as devizer and team leader, and the research assistants assigned to assist his work, compiled case-notes on the schools, teachers and children throughout their association with the classes observed. Each school and class involved was visited by the author; and his impressions were pooled with those of the second observer. Each noted, independently, points of interest in lessons or conversations with teachers, whether about the research or informally in the classrooms. The report contained here is, therefore, a collation of impressions. Because of the reticence (or even hostility) of the involved schools to talk openly about educational provision for the able it was decided not to attempt triangulation of the data by asking teachers to comment on these summaries. This would have been more efficient research, but definitely less good public relations. We had also agreed not to 'leak' information between any two teachers in the same school, and so any coherent overall view of the pupils' work would have had to omit references to individual teachers or subjects. The results are therefore included here as individual negotiated accounts about each school and its personnel compiled on the basis of observers' reports alone. Since there were no major discrepancies between observers it would be fair to assume that the accounts are accurate; and their main purpose is to substantiate that these schools were at least typical, perhaps a little privileged, in overall provision; that they contained the usual range of more able and less able teachers and pupils, and that the pupils and locations were not hand-picked to pre-determine the outcome of the research.

2. The Teachers

A small amount of presage information about the teachers was collected to discover something of each teacher's length of service, type of training and level of school responsibility. This information was used simply to check that the teachers' involved in this study represented a cross-section of the profession.

3. Teachers' criteria for judging brightness and slowness

During the teacher interviews each teacher was asked to describe in his/her own words a typical bright pupil, a typical slow learner, and a typical middle band pupil. The researcher listened intently to the response and listed out of it all descriptions, abilities, skills or behavioural criteria mentioned by the teacher. When all the interviews were complete the researcher took each of the three categories of pupil in turn and ran through the lists of descriptions resulting from the teacher interviews. Every item mentioned was culled out and written down, along with a note of its frequency of occurrence. The result was three sets of perceptions, in the teachers' own words, describing children in the middle and at the extremes of the ability range. It was possible to compare this list of teachers' own criteria with that presented in the Class Profile Instrument which is discussed next.

4. The Class Profile Instrument

The class profile instrument consisted of 22 questions each of which asked the teacher to name a child who exhibited, within the class, the most and least degree of a given characteristic. The characteristics were those which were likely to pinpoint which pupils teachers regarded as the most able in a variety of intellectual spheres; and conversely, to select those who least conformed to this perception of ability, i.e. the least able. Items for this list of characteristics were culled from Gowan (1961) and others; and these characteristics have been discussed in Chapter 5 Section B.3-5.

Characteristics identifying the able pupil as perceived by teachers were:

1. the most able
2. the most original thinker
3. the most creative
4. the child with largest vocabulary
5. the main contributor to class discussion
6. the most academic potential
7. the child with the best overall marks
8. the child with the longest concentration span
9. the most logical thinker

10. the most numerate

11. the most abstract thinker

Items in the list were put into pairs of opposites. Then the teachers were given a copy of the class list so that all the pupils' names were in front of them and, in an interview, asked to nominate one child for each category. In three schools this meant that pupils were nominated in each of eight teacher interviews. Suppose pupil A were to be regarded as the best example of each of the 11 characteristics listed he or she could score 11 x 8 = 88 choices. In practice, no pupil was consistently named, as might have been expected. No individual is likely to be such a paragon or so hopeless a case. So the scores for each pupil were collected and set down in tabular form. In two schools, where integrated studies subsumed several subjects, the possible pupil score was 11 (items) x 6 (teachers) = 66. Having tabulated the raw scores it was possible to decide which pupils were perceived as the bright pupils and which the slow learners by the teachers in that school.

This was done by examining, in two ways, the choices given to pupils by teachers. First, those children nominated at least once on all or most of the categories were noted. These would appear to be pupils whom a cross-section of teachers regard as exhibiting a range of characteristics which have been found to epitomize 'brightness'. Secondly, those two or three children receiving the largest number of choices, albeit across a limited range of items, were listed. From these two lists it was possible to argue that certain individuals were perceived by teachers as being the bright pupils in the class. This case is argued further in Chapter 9.

The items forming the list of characteristics of the slow learner were the direct opposites of those for the bright pupil. The teacher choices were handled in an exactly parallel way. The identity of certain pupils in each of the classes studied as perceived slow learners is also argued in situ in Chapter 9.

5. The context of learning

Earlier, the concept of teaching mode was introduced, and the three common teaching modes were defined. A description was given on page 238f about how the researcher recorded which teaching mode was in operation. /It will be recalled that groupwork was sub-divided into two kinds: G1 organizational grouping and G2 educational grouping./

From the notes of time kept on the researcher's recording sheet and the code-letter indicating which teaching mode was in operation, it was possible to calculate how many minutes of any given lesson were allocated to each teaching mode.

Chapter 10 sets out the allocation of time in minutes to each mode and expresses these as percentages of total teaching time. From these calculations it is possible to make comparisons between individual teachers, between schools, and between subject areas.

6. Teacher talk

As has been described, all teacher talk was coded on a four-point scale for cognitive level. In practice, such talk fell into short units, usually of a sentence or two. Each unit was coded; and the relative incidence of talk at each of the four levels was calculated as a percentage of total teacher talk for each teacher. These percentages can then be compared from one teacher to another, across schools, and across subject areas. Since a great deal of what happens in classrooms is teacher-dominated talk, judgements can be made from the results about the levels of cognitive demand made on the pupils, and these are set out in Chapter 11.

7. <u>Teachers' questions</u>

Besides talking (explaining, giving information, etc.) teachers contribute to lessons by asking questions. These questions were each individually coded for cognitive demand as the lessons proceeded. By calculating the percentage of each of the seven categories of question against the total number of questions asked by teachers it was again possible to look at patterns of questioning by comparing individual teachers, what happened from one school to another, and across subject boundaries. From the results it was possible to add to the store of knowledge emanating from this research into exactly what kinds and levels of cognitive demand are made in classrooms; and the conclusions about this are drawn in Chapter 12.

8. <u>Pupils' responses and initiations</u>

Teacher talk is generally directed at the whole class; questions at the class or at individuals. Pupils join in a lesson by responding to questions or by initiating conversations with comments or questions of their own. During group work or individualized learning brief contacts are also made between teachers and learners. Using the coding system described in Chapter 6 (C, RO, R1, R2, R3) measures were made of the number of pupil responses, contacts and initiations; and by calculating the relative frequency of responses at each cognitive level it was again possible to assess the degree of cognitive demand inherent in these verbal elements of classroom transactions. The number of responses initiated by teachers was investigated; and the relative frequency of responses at each cognitive level, expressed as a percentage of formal responses, allows a cross-check on whether pupils are responding in kind to the demands made by teacher talk and questions. Chapter 13 summarizes the results.

9. Bright pupils and slow learners as respondents

Once the Class Profile Instrument had been used to identify those pupils who were widely regarded by teachers as being bright and slow, it was possible (since the name of each individual child responding to teacher talk or question had been recorded) to discover what proportion of pupil responses, initiations or contacts were directed at these two groups. The results were compared with the incidence of 'middle band' pupils as the respondents. It was possible to examine in some detail the relative frequency with which male and female, bright and slow, and middle band pupils responded at each cognitive level. Tests of significance were used to establish the importance of apparent differences between the scores of individual pupils. Chapter 14 outlines the findings from these analyses.

10. Classroom tasks

Finally, all tasks set in all the lessons observed, were described. An earlier chapter (Chapter 6) has described the scheme of analysis whereby tasks were assigned to a 'high' or a 'low' cognitive level according to the demand made on the pupil. These broad categories were further subdivided. In this way, and by calculating the percentages in each case, it was possible to examine the range of tasks set by teachers; the relative frequency of high level tasks as compared to low level ones; and the relative frequency of each sub-group of both high and low level tasks. From these figures it was possible to compare the patterns of task setting between individual teachers, and across schools and subject areas. Chapter 17 summarizes the findings about cognitive demand in classroom tasks.

11. Procedure for setting out the analysis of the data

The collected data is now analysed section by section. Each of the following chapters, 9-17, begins with a statement about the research questions or hypotheses to be investigated. Then the raw data is set out; a description of any further analyses is given; and the results of the full analysis for that section are reported. In Chapter 18 there is a discussion of the implications of all the findings of the research.

CHAPTER 8

THE SCHOOLS, THE TEACHERS AND THE CHILDREN

WILL SCARLET

The School

Will Scarlet (coded 2 in this research) was originally a secondary modern school which became comprehensive in the early 1970s. It has a smart, modern exterior and is situated in an attractive and expensive residential area. All the pupils are housed on the same campus, and there are three blocks of buildings labelled A, B and C. No separate areas exist for first years, the sixth form etc. From the beginning first years studied in rooms in all blocks. The layout of the school and numbering of rooms is very confusing and must be extremely difficult for incoming 11 year olds to cope with after their sheltered existence in primary schools.

C Block contains the leisure centre and main administrative areas; it is only a few years old so classrooms and furnishings are still in reasonable condition. In A and B blocks all corridors and staircases and most classrooms are very scruffy and dirty. The general appearance of the pupils as they moved around was also scruffy as they all wore coats and took these from lesson to lesson. Thus there was much unnecessary clutter when they were working. /I was about to hang my coat outside the first classroom I went into and was advised against this by the teacher./

Most lessons were timetabled in double periods of 70 minutes and there is always a break after such a lesson. However, when this time was split into two single periods a great deal of time was wasted through the movement around the large campus. Registration and most lessons were in class groups, but there is some mixing for craft subjects.

The Class

The class observed is one of the nine mixed ability classes into which the first years are split. There are 28 in the class although one pupil had only recently joined the group, having been moved from another class because of poor work and behaviour.

According to primary school records there are several very able pupils in the class but most of the teachers were of the opinion that this was not so. Several staff felt that the pupils were very middle of the road and immature. There were sharp contrasts in the attitude and behaviour of the class with different teachers. Oddly, my impression was that the more senior the position of the teacher the worse was the attitude of the class. Pupil behaviour was far more mature for male teachers; though behaviour was probably at its best in French with teacher 2.2, a French national.

In all the lessons observed the class were all working simultaneously on the same task and kept very much together. This gave very little scope for individuals to progress beyond the levels set by the teacher and so it was difficult to pick out bright pupils by content of work produced, especially as the level of work set was generally very low. This may explain why teachers in the school queried the primary school assessments.

HUNTINGDON

The School

Huntingdon (coded 3 in this research) was a secondary modern school until September 1978, when it became comprehensive. At present then there are only two years of comprehensive children. These lower classes spend the majority of their time in the purpose-built (in 1978) lower school unit which has an extremely attractive interior. At its heart is the Resources Centre which is fully utilised by the pupils and which they are shown how to use properly as soon as they come to the school. The main irritation for those in the building is the open plan layout which means that there is no sound-proofing. Many of the rooms areas are also too small for whole classes to fit into comfortably.

Each year is split into seven mixed ability classes of about 26 pupils. It has not yet been decided for how many years the mixed ability system should operate. No tests are given on entry to the school. Each child is asked to name one child with whom they would like to be, otherwise the intake of about 180 from three different primary schools is split into mixed ability classes based on the Pupil Profile which the school asks the primary schools to complete.

When the school became comprehensive the staff was reorganised together with the other schools in the area and as a result the Huntingdon staff is now made up partly of former secondary modern staff, partly of the old grammar school staff, and partly of people new to the area. Probably because the change-over is so recent there is an enthusiastic atmosphere. The lower school building is aesthetically pleasing and very well equipped; the staff are all apparently keen and are actively developing their teaching methods and aims.

Huntingdon school is situated in attractive grounds near to, but secluded from, a prosperous estate of wholly private housing. Most parents are firmly of the professional classes. The catchment area is wider than the immediate estate, but this would be regarded generally as a favoured area in social and economic terms.

The Class

It is a randomly chosen mixed ability group of normal, lively youngsters. The atmosphere in which they work is worthy of some analysis.

Apart from music (which the class had only once a week) all the staff laid great importance on knowing each pupil and tried to cater for individual needs.

Special classes were organised for slow readers, those with mathematics difficulties and those who were particularly good in mathematics and English.

Geography, history and R.E. are combined as Integrated Studies and this is also made to overlap with English. Basically there is one teacher who takes the class for Integrated Studies and one for English, but other teachers are brought in on occasions; and great emphasis is laid on interaction between subjects and staff.

Therefore in this Integrated Studies set up there is more carry over from the primary school situation, and the teacher of Integrated Studies has about six hours of class contact each week. He therefore knows the pupils very well as individuals and in return the class feel needed and cared for.

Uniform is worn, and general appearance of pupils very smart in keeping with the lower school building; work presentation generally neat as well. Staff encourage this.

Resource centre is fully used. Staff always encourage pupils to find out for themselves. Plenty of references are given.

A great variety of media is used: film strips, video tape recorder, sound tapes, flash cards, slides (available for individuals to use in the Resources Centre), booklets written by staff, modular mathematics system, lots of textbooks, O.H.P.

Teaching method was varied in comparison to other schools in the sample. Most staff believe all pupils have some potential and try to develop it. All are encouraged to participate fully and give opinions especially in Integrated Studies. Despite this the less able appear to have the greatest share of teacher attention while the brightest do not always get much attention (except perhaps Chris).

Modular mathematics cards tend to be used to the exclusion of all other methods. Teacher 3.5 was involved in a number of external curriculum experiments for much of the time; she gives the impression of not having time to give to this class.

Despite the varied teaching approaches the level of questioning in most subjects did not reach higher levels on many occasions. The most demanding questions were asked in science. As with most other schools, orally the class seemed good, but found much more difficulty when asked to put pen to paper.

Whole class teaching was used most of the time in French, and because the whole class took the subject the best were kept back because of inability of weaker ones to cope. Very little written work was done, with the greatest concentration on oral work and variety of approach.

The lower school has its own head teacher and she knows all the children as individuals and also teaches them sometimes. Her presence around the building also helps to maintain the high standards of discipline.

The headmaster also frequently wandered around the lower school and went into classrooms. This means he was a known and respected figure to the pupils.

ROBIN HOOD

The School

Robin Hood (coded 4 in this research) had been built as a purpose-designed comprehensive; but the intake was too great for the main site, and so the first year pupils occupied a 1900s former primary school building several miles from the campus. To make this work reasonably effectively most of the first year staff spent a good deal of time in the first year building, though a few visited for just a few specialist lessons.

The first year building was old, the classrooms fitted with high windows, drab and prison-like. Nevertheless, there were obvious attempts by staff to brighten up classrooms, which were kept clean and tidy. There was plenty of display material on view. Several first year class teachers were primary trained, and this rather more exciting ethos showed in the classrooms despite the unpromising nature of the plant itself.

The children had no school uniform, and there was no apparent restriction on wearing jewellery. The classes were small (lower 20s); but the system was a little regimented. Lining up in the playground and outside classrooms was frequent. Discipline was generally good.

Because staff are kept away from the main site for long periods the lower school had its own staffroom. This led to some visiting specialists being almost unknown to their colleagues. Even names are not always known, and there were two occurrences of this on one day during the observation period. A short staff meeting each morning was an attempt to keep everyone informed. In the staffroom itself talk was predominantly about pupils, parents and school organization; other common topics of conversation were mortgages, the job market, union sanctions, sport and driving lessons. The small, isolated unit tends to make the atmosphere claustrophobic if not closed-shop.

The Class

This class (1Q) represented a wide range of abilities within a small but extremely pleasant group of pupils. The youngsters were tractable and easily managed; they seemed to like the presence of the observer and chat freely at breaks. These remarks are not such as to suggest the pupils were a soft option to teach. Indeed, in the lessons where organization slipped below a reasonably acceptable level there were plenty of signs of inattention and potential disruptiveness. While two pupils (Nigel, Helen L.) were apparently slightly aloof, the group was generally integrated in a social sense. Predictably perhaps, boys were more noisy than girls, except in music lessons. The less able sought help from the more able; Robert especially found himself cast in the role of pupil-teacher by his peers. They get on readily, and very few ask insightful questions(apart from Andrew.)

As far as could be observed there was little evidence of teachers really catering for the wide range of abilities, except in English (where Nigel and Chris go to a remedial specialist) or in maths where some pupils also go off to a special group for slower learners. Sometimes, in other subjects, tasks could be interpreted at more than one level; but that was the nearest one came to special provision for the more able.

FRIAR TUCK

The School

Friar Tuck school (coded 6 in this research) is a community school, or at least it occupies a community campus. Infants, juniors and comprehensive school share a site laid out in multi-storey units and the usual temporary buildings which seem to remain forever around extensive playing areas. The three schools are run quite separately, however, and have separate access roads.

Around the school are packed dense avenues of middle-class red-brick private housing. In Friar Tuck the classrooms are traditional boxes. Equipment appears to be quite sparse; and the general atmosphere is one of vague untidyness. There are O.H.Ps., but the image they cast is dimmed by dirt on the machine. There are few frills like screens or blackout. Desks are old and bear the marks of time. The best description is 'down-at-heel'; but this is certainly not a down-at-heel neighbourhood.

The head is pleasant but not wildly excited by the idea of the teachers coming under scrutiny. Since the staff who are likely to be observed seem not to object, he raises no problems. He doesn't seem to expect university researchers to be able to understand the business of classroom teaching.

The staff is various in age and attitude. Departments appear to be strong, so that most educational issues are viewed from a subject specific standpoint. Some staff talk animatedly about such issues as mixed ability teaching; others take narrowly traditional views and are intransigent.

The Class

Children in this school are pleasant, orderly and polite. On the corridors one notices some noise; but this is mainly because they are narrow and restrict movement. Though the building is scruffy there is no evidence of vandalism or bad behaviour generally.

To some extent these pupils are characterized more by apathy than by any other attribute. It is hard to decide whether the home background or the rather stolid teaching approach contributes most to this.

Overall, these youngsters are rather colourless, responding to able teachers and exuding a disinterested patience with those of more mundane abilities. No individuals stand out by force of personality.

ALAN ADALE

The School

Alan Adale school (coded 7 in this research) is a very modern concrete and glass multi-storey purpose-built comprehensive school. It is set on a hillside site, surrounded by landscaped green lawns. On the outskirts of town, it looks down onto busy main roads carrying fast-flowing freight and commuter traffic.

The catchment area is of modern housing; and there is no lack of money in the district. Socially, however, it is mixed, with middle-class or professional parents as well as some better paid artisans.

Inside, the school is clean and tidy. There is some good artwork - not all of it by pupils. The foyer is business-like, presided over by the school secretary.

The headmaster is co-operative and interested. His own leanings are towards the judiciary and Rotary. Smart-suited and efficient, there is a slightly clinical air about him in spite of his genial manner.

Pupils are uniformed. There is a small proportion of immigrants. Corridors are orderly. It takes very little time before youngsters who are in the observed class greet the researchers in the playground.

Here the first year pupils are housed in a first-year block, separate from but close to the main building. Some staff, too, tend to have major responsibilities here. This slightly protective atmosphere is nevertheless obviously useful for the children in the transition to this large school and campus.

The Class

Alan Adale's pupils are friendly. During the research period some took to engaging the observer in conversation on journies to and from his car. The resulting dialogues were at an easy, relaxed level about current events concerning sportsmen or pop idols. They were not unduly curious about the research itself, but regarded this stranger as part of the classroom fittings.

With a rather varied socio-economic background, the pupils demonstrate a wide range of individual personalities and interests. This class includes one coloured child. She is well integrated and gets on famously with peers and staff.

In lessons, the class is generally lively. The pupils respond easily when invited to do so. They seem very happy and relaxed in the limited environment of the lower school unit.

CHAPTER 9

AN ANALYSIS OF THE PRESAGE DATA

The purpose of this chapter is to analyse the data gathered from the teacher interviews which were conducted before systematic observation of classes began.

The data is presented under two headings:

A. The teachers' perceptions of bright pupils and slow learners in their classes; and

B. the cues used by teachers in the sample to identify bright pupils and slow learners.

A. <u>The teachers' perceptions of pupils as bright and slow learners using the Class Profile Instrument</u>

i) <u>Processing the data</u>

It will be recalled from Chapter 7 that teachers were presented with a complete class list and that, with this in front of them, they were asked to nominate pupils who. most and least characterized each of eleven cognitive dimensions on a Class Profile Instrument (C.P.I.). Theoretically, therefore, any individual bright pupil could obtain nominations on all eleven "most ..." dimensions from up to eight teachers in Will Scarlet, Robin Hood and Friar Tuck; and from up to six teachers in Huntingdon and Alan Adale, where Integrated Studies subsumed R.E., History and Geography (88 or 66 nominations respectively). The same scoring pattern could be repeated for "least ..." dimensions. /Theoretically, a pupil could score on separate items at either end of the spectrum, but this was thought to be an unlikely event and indeed it took place once only to a pupil who emerged as bright: see below./

Figures 9.1, 9.2, 9.3, 9. 4and 9. 5show the patterns of nominations by teachers in the various schools. Some teachers refused, or were unable (through extended absence in one case) to make nominations, and felt that this was a form of 'labelling'. Others were generally happy to discuss pupils in this way, but did not feel competent to make judgements on every dimension. In all, 32 teachers made full or partial lists of nominations.

To be of use the nominations had to indicate that certain pupils were judged by teachers to be 'bright' and 'slow'. The procedure adopted was to scan the lists shown in Figures 9.1-9.5 and to look for those pupils with high numbers of nominations. A cut-off point was arbitrarily fixed at 10% of all nominations, i.e. 9 for Will Scarlet, Robin Hood and Friar Tuck schools and 7 for Huntingdon and Alan Adale. For pupils on the borderline below these scores, the scatter of

Figure 9.1

Teachers' perceptions of their pupils as bright pupils and slow learners

1. Will Scarlet	Helen	Lisa	Rebecca	Stella	Lorraine	Rachel	Judith	Julia	Louise	Anne	Catherine	Heather	Lyn*	Linda	Jason*	Mark	Richard	Edward	Neil*	Timothy	Shaun	Phillip	Steven	Michael	Martin	Simon*	Leigh	David
1. Most Able						1	1	2		1				1								2						
2. Most Original			1			1	1					1		1				1										
3. Most Creative			1			2								1								1						
4. Largest Vocabulary						1		3				1																
5. Main Contributor	1	1					1		1					2				1			1							
6. Most Academic Pot.						3		2						1								2						
7. Best Overall Marks			1			2		3		2																		
8. Longest Concentration			2				2	2		1								1										
9. Most Logical Thinker								4														1						
10. Most Numerate										2							1											
11. Most Abstract Thinker						2				1				1														
	1	1	5			12	5	16	1	7		2		7			1	3			1	6						
1. Least Able																					1				3	4		
2. Least Original Thinker				1																1	1					3		
3. Least Creative																		1			1		1		2	1		
4. Smallest Vocabulary											1								1						1	2		
5. Least Contributor				2							2					1							1		1			
6. Least Academic Pot.				1																	1				1	4		1
7. Worst Overall Marks																									5	3		
8. Shortest Concentration		1																			2				4			1
9. Least Logical Thinker											1										3		2					
10. Least Numerate																					1		1			1		
11. Most Concrete Thinker		1	1							1												1						
		2	1	4						1	4					1		1	1	1	10	1	5		17	18		2

* missed a complete subject

Figure 9.2

Teachers' perceptions of their pupils as bright pupils and slow learners

2. Huntingdon	Samantha	Jenny	Amanda	Louise	Joanne	Maria	Tina	Marie	Angela	Debra	Lisa	Valerie	John	Kevin	Andrew	Simon	Chris	Paul	Christopher	Mark	Dale	Nicholas	Tim	Peter	Ian	Craig
1. Most Able							1												3							
2. Most Original									1										1							
3. Most Creative			1								1								1							
4. Largest Vocabulary																			3							
5. Main Contributor			1						2										1							
6. Most Academic Pot.							1												2							
7. Best Overall Marks		1					1												3							
8. Longest Concentration					1		1												2							
9. Most Logical Thinker									1										2							
10. Most Numerate									1						1											
11. Most Abstract Thinker																										
		1	2		1		4		5		1				1				20							
1. Least Able																	2								1	1
2. Least Original Thinker								1					1													1
3. Least Creative						1												1								
4. Smallest Vocabulary	1					1																				1
5. Least Contributor						1								1										1		
6. Least Academic Pot.													1				2								1	1
7. Worst Overall Marks						1											2						1		1	
8. Shortest Concentration						1										1	1						1			
9. Least Logical Thinker						1				1							1									
10. Least Numerate																							1			1
11. Most Concrete Thinker	1																1									
	2					6		1		1			2	1		1	9	1					3	1	3	5

Figure 9.3

Teachers' perceptions of their pupils as bright and slow learners

3. Robin Hood	Pauline	Teresa	Julie	Helen L.	Sandra	Helen R.	Susan	Nicola	Lisa	James	Simon	Andrew	Mark	Ian H.	Nigel	Chris	Paul	Ian L.	Robert	Roy	Guy	Richard	Adrian
1. Most able					1						2	1							3		1		
2. Most original									1			2							1		4		
3. Most creative		1		1							2								1		3		
4. Largest vocabulary									1			4							2		1		
5. Main contributor					1				1			3									2	1	
6. Most academic pot.				1							1	1							4		1		
7. Best overall marks				1	1				1		2								2		1		
8. Largest concentration			1	1	1	1					1								1		2		
9. Most logical thinker				1	1							2							2		2		
10. Most numerate											1	1							4				
11. Most abstract thinker		1									1	3							2		1		
		2	1	5	5	1			4		10	17							22		18	1	
1. Least able															4	4							
2. Least original thinker	1	1													3	3							
3. Least creative								1					1		3	1		2					
4. Smallest vocabulary															4	4							
5. Least contributor	2			1		1														3			1
6. Least academic pot.															3	5							
7. Worst oral marks															1	5				2			
8. Shortest concentration											1			1	2	3		1					
9. Least logical thinker		1					1								3	2		1					
10. Least numerate										1					3	2							
11. Most concrete thinker							1						1		2	3				1			
	2	2		1		1	2	1		1	1		2	1	28	32		4		6		1	1

Figure 9.4

Teachers' perceptions of their pupils as bright and slow learners

4. Friar Tuck	Edmund	Richard	Andrew	Daryl	Stephen	Shaun	Antony	Russell	Timothy	Adrian	Keith	Andy	Tim	John	Ian	Tony	Karen	Lisa	Kate	Joan	Marie	Julie	Jane	Dianne	Veena	Hayley	Claire	Debra	Sally	Alison	Debbie
1. Most able																			5												
2. Most original						1													3												
3. Most creative				1		1													1	1											
4. Largest vocabulary																			5												
5. Main contributor	1								1								1		3						1						
6. Most academic pot.																			6										1		
7. Best overall marks														1					3					1							
8. Longest concentration									1										3	1											
9. Most logical thinker						1													2	2					1						
10. Most numerate																	1		1												
11. Most abstract thinker																1		1	2												
	1			1		3			2					1			2	1	34	4				1	2				2		
1. Least able				2						2																		3			
2. Least original thinker							1			3			1															1			
3. Least creative										2			2													1					
4. Smallest vocabulary										2																1		2			
5. Least contributor				1						1					1								2					1			
6. Least academic pot.				1									1															4			
7. Worst overall marks				1						1			1			1												2			
8. Shortest concentration		1						1		1						2															
9. Least logical thinker									1				1			2															
10. Least numerate																															1
11. Most concrete thinker							1						1			1							1					1			
		1		5			2	1	1	12	12		7		1	6							3			2		14			1

Figure 9.5

Teachers' perceptions of their pupils as bright and slow learners

5. Alan Adale	Ian	Anthony	Stephen	Gary	Christopher	Ross	Stuart	Michael	Chris	Alan	Ed	Wayne	Mark	Ivan	Paul	Anne	Gail	Marie	Tina	Samantha	Sat	Paula	Sandra	Jane	Lynn	Kim	Bronwen
1. Most able	1																						1				3
2. Most original						1																	1				2
3. Most creative	1		1																								
4. Largest vocabulary	1												1														1
5. Main contributor	2										2																1
6. Most academic pot.			1																								3
7. Best overall marks	1																						1				3
8. Longest concentration																											3
9. Most logical thinker		1													1												2
10. Most numerate	1																										
11. Most abstract thinker																											3
	7	1	2			1					2		1		1								3				21
1. Least able																					4					1	
2. Least original thinker									1												2						
3. Least creative								1													1						
4. Smallest vocabulary																					2			1			
5. Least contributor						1																		1		1	
6. Least academic pot.									1												3						
7. Worst overall marks						1			1												3						
8. Shortest concentration																					4						
9. Least logical thinker																					3						
10. Least numerate																					1						
11. Most concrete thinker						1		1													1						
						3		2	3												24			2		2	

nominations was scrutinized to see whether they were selected evenly across the items or whether they had clear difficulties or strengths in one or two areas. Judgements were then made about which pupils to include in the lists of 'perceived bright pupils' and 'perceived slow learners'.

ii) Perceived bright pupils

The following pupils emerged clearly on the lists of nominations as bright pupils:

Will Scarlet:	Julia:	16 nominations across 6 dimensions
	Rachel:	12 nominations across 7 dimensions
Huntingdon:	Christopher:	20 nominations across 10 dimensions
Robin Hood:	Robert:	21 nominations across 10 dimensions
	Guy:	18 " " 10 "
	Andrew:	17 " " 8 "
	Simon:	10 " " 7 "
Friar Tuck:	Kate:	34 nominations across all 11 dimensions
Alan Adale:	Bronwen:	21 nominations across 9 dimensions
	Ian:	7 nominations across 6 dimensions

From these choices it appeared that a pupil should be nominated on not less than six dimensions of the 11-point scale to be considered as a 'perceived bright pupil'. If this were done then the following should be added to the list:

Will Scarlet:	Linda:	7 nominations on 6 dimensions

The complete list of perceived bright pupils then becomes:

Will Scarlet:	Julia
Will Scarlet:	Rachel
Will Scarlet:	Linda
Huntingdon:	Christopher
Robin Hood;	Robert
Robin Hood:	Guy
Robin Hood:	Andrew
Robin Hood:	Simon
Friar Tuck:	Kate
Alan Adale:	Bronwen
Alan Adale:	Ian

This represents a total of 11 pupils or 8% of all pupils (total 135) in the sample. It could be fairly asserted that this is likely to be an underestimate of numbers (see Chapter 5, section B); but, if teacher judgement has any credibility, it ought to be an accurate assessment. At any rate, these perceptions might be expected to alter teacher behaviour towards these pupils to the extent that they were taught in ways thought to be appropriate to their perceived abilities.

It is interesting to note in passing that one perceived bright pupil at Robin Hood school was nominated negatively on a single dimension. Thus Simon, with 10 positive nominations was also possessor of the 'shortest concentration span' in Music. No doubt this represented an antipathy to the subject, though he was prone to fairly disruptive behaviour.

iii) Perceived slow learners

A similar approach was adopted with the 'least ...' dimensions of the C.P.I. The results were as follows:

Will Scarlet:	Simon:	18 nominations on 7 dimensions
	Martin:	17 nominations on 7 dimensions
	Shaun:	10 nominations on 7 dimensions
Huntingdon:	Chris:	9 nominations on 6 dimensions
Robin Hood:	Chris:	32 nominations on 10 dimensions
	Nigel:	28 nominations on 10 dimensions
Friar Tuck:	Debra:	14 nominations on 7 dimensions
	Adrian:	12 nominations on 7 dimensions
	Tim:	7 nominations on 6 dimensions
Alan Adale:	Satwant:	24 nominations on 10 dimensions

There were no borderline cases.

This represents a total of 10 pupils or 7% of all pupils in the sample of 135. Again, this is likely to be an underestimate, highlighting the most obvious and severe cases. But again, teachers' perceptions of the problem children might reasonably be expected to affect the teaching strategies directed at them.

One pupil, Shaun at Will Scarlet, who obtained 10 negative nominations was also ranked 'highest contributor to class discussion' by one member of staff.

This issue of whether and how teachers' perceptions of pupils in the 5 mixed ability classes sampled as bright and slow affects their teaching behaviour is discussed in Chapter 14. For the moment we shall look at the ways in which teachers themselves articulated the cues which lead them to make these judgements.

B. The cues used by teachers in the sample to identify bright pupils and slow learners in their classes

i) A profile of the bright pupil

Teachers were asked to list those cues or aspects of pupil behaviour which, even in a class with which they were fairly unfamiliar, would provide the tell-tale signs that an individual pupil was a bright pupil. The result was a list of 201 suggestions. These were scrutinized by the researcher and an experienced research assistant. Items which were identical or very similar were grouped together. The result was a 31 item checklist of criteria, shown in Figure 9.6.

These items represent the teachers' own behavioural clues, used in the classroom, to form judgements about pupils' relative abilities. Most are cognitive: e.g. items 4, 6, 8, 9, 13, 14, 15, 16, 20, 21, 23, 24, 25, 26. Some have to do with attitudes: items 2, 10, 12, 17, 18, 19, 28, 29. Some combine the two features, e.g. items 1, 3. Others refer to intellectual achievement: items 5, 7, 11, 22, 27. Two are contradictory: item 30 (with item 4) and item 31 (with 18) - but each is mentioned once only and describes pupils who may break otherwise established rules. For our teachers, then, the pupils whom they have selected as 'perceived bright pupils' would, it seems, be profiled by this checklist of characteristics.

Figure 9.6

Teachers' articulated criteria for judging pupils to be bright

Item no.	Description the bright pupil ...	No. of mentions
1.	is articulate and keen to answer	26
2.	shows alertness, curiosity and enthusiasm	17
3.	is an independent and resourceful worker	13
4.	is quick to understand and complete work	13
5.	writes well, with a good command of language	9
6.	is creative and imaginative	6
7.	has flair for the particular subject	6
8.	asks intelligent questions	5
9.	has a good memory	5
10.	does extra work at home and in class	5
11.	presents neat and accurate work	5
12.	is well-behaved and conscientious	5
13.	has a long concentration span	4
14.	is a logical, reasoned thinker	4
15.	can cope with abstract ideas	3
16.	follows explanations, instructions	3
17.	is sensitive (to others)	3
18.	comes equipped to lessons	3
19.	shows confidence	2
20.	can solve open-ended problems	2
21.	relates work to previous knowledge	2
22.	is fluent in basic skills	2
23.	anticipates and thinks ahead	1
24.	learns from his/her own mistakes	1
25.	has knowledge beyond school subjects	1
26.	is an accurate worker	1
27.	scores well in tests	1
28.	is neat in appearance	1
29.	is regular in attendance	1
	BUT ALSO:-	
30.	may NOT work quickly	1
31.	may be disorganized	1

ii) A profile of the slow learner

Descriptions of classroom cues to slow learners were compiled in the way already described for bright pupils and the data processed identically. The results are as shown in Figure 9.7 .

As for bright pupils, so for slow learners what emerges is a behavioural checklist. The items can be similarly categorized. Items 1, 2, 5, 10, 12, 13, 14, 15, 16, 19 are cognitive; items 8, 9, 18 and 24 have to do with attitude and behaviour. Items 3, 4, 20, 21, 22 combine the two in the form of cause-and-effect. Poor achievement is referred to by items 7, 11 and 23. Items 17 and 25 look to factors in learning failure: pointers then may be diagnosed perhaps after the passage of time when other clues have been read. Items 26 and 27 again suggest the exceptions to the common rules. Once again the items in the checklist can be used to build up a profile of a 'typical' slow learner of the kind teachers perceive to be present in their classes.

Figure 9.7.

Teachers' articulated criteria for judging pupils to be slow learners

Item no.	Description the slow learner ...	No. of mentions
1.	is slow and achieves poorly in written work, homework	32
2.	lacks confidence and initiative	15
3.	has short concentration and little interest	13
4.	is in constant need of teacher help, attention	11
5.	is unable to follow instructions, explanations	8
6.	contributes little, or just 'safe' short answers	7
7.	is poor at spelling, punctuation and grammar	7
8.	easily becomes disruptive	7
9.	is untidy in presentation	6
10.	lacks understanding or insight	5
11.	has problems reading texts, etc.	4
12.	lacks imagination, originality	3
13.	is not a logical thinker	3
14.	has poor memory span	3
15.	possesses disjointed fragments of knowledge	3
16.	is orally weak	3
17.	comes from a poor cultural or home background	3
18.	fails to bring equipment to lessons	3
19.	can't grasp new ideas, concepts	2
20.	is unco-ordinated	2
21.	prefers simple repetitive tasks	2
22.	is best working in a small group	2
23.	scores low in tests	1
24.	is slow to get started on a task	1
25.	is often absent	1
	BUT ALSO:	
26.	may be orally better than written work suggests	1
27.	may have a pleasant personality	1

C. Summary

This chapter has looked at the presage data collected by the research package. Each of the sets of findings will be referred to again as the discussion of the process findings proceeds in the chapters that follow.

CHAPTER 10

THE CONTEXT OF LEARNING IN FIVE MIXED ABILITY CLASSES

In the two preceding chapters we have looked at the schools, the pupils, the teachers, and the teachers' perceptions of and criteria for judging bright pupils and slow learners in their classes. We now turn to an analysis of the process data.

The review of the literature of mixed ability teaching suggested that, while classes were increasingly being organized into mixed groups especially at the lower end of the school, the incidence of appropriate changes in teaching methods was possibly quite low. One manifestation of this problem concerns teaching mode. Logically conditions arise in mixed ability groups where the learning of individuals can be matched to their perceived needs, and it is arguable that in mixed ability classes teachers should be more responsive to the needs of individuals than in homogeneous groups. It seems opportune, therefore, that whole class teaching should give way to individualized learning or group work to facilitate this concern for the individual. In many cases teachers in our case studies reported in Chapter 4 were claiming that this was so (p. 33). Our research question sought to discover the facts of the situation in the five study schools.

As described earlier, all lessons were timed, and the changes from one teaching mode to another were logged - again with notes of time. The tables which follow break down all the teaching observed according to teaching mode:

... Whole class

... Groupwork 1 (groups used an organizational convenience within a whole class structure)

... Groupwork 2 (for strictly educational purpose)

... Individualized learning

Definitions and illustrations of these terms are given in Chapter 6.

It will be seen from Figure 10.1 that whole class teaching accounted for 62.1% of all teaching observed and organizational groupwork accounted for another 16.8%; a total of 78.9% of teaching time. Only about a quarter of teaching time in these five schools was of such a nature that it could be said to be catering for individual needs in any way. Of this proportion two thirds (14.1% of total teaching time) was strictly definable as 'individualized'. In only 7% of teaching time, that allocated to groupwork of an educational nature, was the potential for these needs to be met by means of broad differentiation of tasks.

The patterns of teaching mode used varied considerably from school to school, though in all schools whole class work took the largest share. If the figures for whole class teaching and organizational groupwork are taken together (and it has been argued that G1 is a covert form of whole class teaching), then pupils in all five schools spent about three quarters of their teaching/ learning experience in this mode, a range from 71% in Alan Adale to 100% in Will Scarlet. This mixture of whole class and organizational groupwork (G1) might be labelled the undifferentiated mode, i.e. it fails to provide differentiated tasks for pupils who are at different points on the ability spectrum or who have any special learning needs.

It is noteworthy that in some schools certain teaching modes were not employed at all during the observation period (Will Scarlet had no Groupwork 2 or individualized learning, Alan Adale no organizational Groupwork, G1). Since there appeared to be no overall school policies on the issue of teaching mode one can only assume that these omissions are to be accounted for by teacher preference, or school ethos, or perhaps by the decision of the heads of department. Generally, however, the impression was that teachers made their own idiosyncratic decisions about teaching mode except in Integrated Studies, where team-teaching operated.

When the figures for teaching mode are broken down by subject area and school (and since only one subject teacher was observed in each school individualized variations between teachers can be observed in this breakdown), other interesting patterns emerge (Fig,10.2). Thus music is taught exclusively in whole classes except at Robin Hood; but even here the undifferentiated mode (WC and G1) makes up 90% of the teaching / learning experience. One wonders if this is the vicious circle of training: music is taught in a particular way, therefore the next generation of students teach it thus, and when they become trainers they in turn teach their students to teach it in the same way ... and so on. Reference back to the descriptions of music lessons in the five schools reported in the mini-case-studies by the observers tends to confirm a similarity and monotony of approach.

Mathematics relies quite heavily on individualized work. This is individualized work of a specific kind, as the case studies show. Pupils do work at their pace because they are working through a textbook, scheme or sets of examples.

The only teacher to use educational groupwork extensively, and the only one apart from the mathematician s to use one of the 'differentiated' modes (G2 or individualized learning where lessons are tailored to pupil needs)

is the R.E. specialist at Robin Hood School. A description of her style is given in Chapter 11 ; but it is interesting to note that she was trained for primary teaching, and was in her probationary year during this study. Chapter 15 will set out evidence to suggest that primary teachers rely less on whole class methods (the sample is too small to draw a firmer conclusion).

Two more points are of interest. First, that the proportion of time spent in the differentiated modes (G2 and I) - is the proportion of time within which it is possible that pupils' individual needs may be met. It does not necessarily mean that they will be met, or that all the needs of all the individual pupils can be catered for in this time [in real terms it is about 14½ minutes in every 70 minute double period; 58 minutes in a four-session school day].

Secondly, the results of this study simply do not match up to the ideals of mixed ability teaching if the claim of meeting individual needs is to be taken as a serious reason for the adoption of this form of organization in a school.

Figure 10.1

TEACHING MODE: summary of time spent on each of 4 modes for five first year mixed ability classes

SCHOOL	MODE (no. of minutes)			
	Whole class teaching	Groupwork 1	Groupwork 2	Individualized learning
Will Scarlet minutes per cent	1,100 (64%)	616 (36%)	0 (0%)	0 (0%)
Huntingdon minutes per cent	1,075 (58.1%)	312 (16.9%)	160 (8.7%)	301 (16.3%)
Robin Hood minutes per cent	1,064 (49.1%)	578 (26.7%)	316 (14.6%)	207 (9.6%)
Friar Tuck minutes per cent	1,188 (71.8%)	40 (2.4%)	79 (4.8%)	347 (21%)
Alan Adale minutes per cent	1,290 (71%)	0 (0%)	89 (4.9%)	439 (24.1%)
TOTAL MINUTES	5,717	1,546	644	1,294
% OF TEACHING TIME	62.1%	16.8%	7.0%	14.1%

Figure 10.2

**TEACHING MODE (subject by subject)
for five 1st year mixed ability classes
(all figures percentages)**

SUBJECT		SCHOOLS				
		Will Scarlet	Huntingdon	Robin Hood	Friar Tuck	Alan Adale
RE	wh.cl	67		24	63	
	Group 1	33		0	0	
	Group 2	0		70	0	
	indiv.	0		0	17	
FRENCH	wh.cl	88	89	76	87	79
	Group 1	12	8	20	0	0
	Group 2	0	3	4	0	0
	indiv.	0	0	0	13	21
SCIENCE	wh.cl	51	48	49	55	73
	Group 1	49	27	27	9	0
	Group 2	0	25	24	30	27
	indiv.	0	0	0	6	0
HISTORY	wh.cl	53		49	84	
	Group 1	47		37	0	
	Group 2	0		0	0	
	indiv.	0		14	16	
ENGLISH	wh.cl	58	54	44	70	100
	Group 1	42	46	40	0	0
	Group 2	0	0	0	0	0
	indiv.	0	0	16	30	0
MATHS	wh.cl	50	19	43	40	56
	Group 1	50	0	9	0	0
	Group 2	0	0	0	0	0
	indiv.	0	81	48	60	40
GEOGRAPHY	wh.cl	61		25	89	
	Group 1	39		75	11	
	Group 2	0		0	0	
	indiv.	0		0	0	
MUSIC	wh.cl	100	100	84	100	100
	Group 1	0	0	6	0	0
	Group 2	0	0	10	0	0
	indiv.	0	0	0	0	0
INTEGRATED STUDIES	wh.cl		59			36
	Group 1		14			0
	Group 2		12			0
	indiv.		15			64

CHAPTER 11

THE COGNITIVE DEMAND MADE BY TEACHER TALK IN FIVE MIXED ABILITY CLASSES

Teacher talk during the 230 lessons by 36 teachers observed was found to fall into relatively short episodes which were categorized for cognitive demand on a four-point scale:

T0 Management
T1 Data level
T2 Concept level
T3 Generalization or abstraction

Descriptions and illustrations of these categories were given in Chapter 6. The figures analyse the data for individual schools and individual subject teachers. A number of patterns emerge.

The two most commonly recorded cognitive levels are T0 and T1. In all schools (Figures 11.1-11.5, summary in 11.6) the vast majority of teacher talk during the study period was concerned with aspects of class management or with information-giving. Will Scarlet and Huntingdon share this talk almost equally between the two categories. In three schools, Robin Hood, Friar Tuck and Alan Adale, over 60% of all teacher talk had to do with class management. This compares with other research findings, e.g. Flanders (1970). It should be emphasized that a) these schools did not have anything more than minor discipline problems and b) it became clear that the management category of talk could have been sub-divided. These sub-divisions would have included the following descriptions:

... control of disciplinary events and transitions of activity

... managing apparatus and furniture

... administration (e.g. dealing with messages, notices)

... demonstrating apparatus or equipment

... routine chores (roll call).

It was decided that the observation schedule was already demanding enough to operate ., and so no attempt was made to record differing kinds of management activity. But the point should be emphasized that the predominance of the TO category overall is not a response to poor pupil behaviour, and the case studies in Chapter 8 emphasize this fact.

If TO is a management category, then its presence is useful so that the proportion of management talk to teaching/learning talk can be assessed (contrast STOS, Eggleston, 1977). Relative proportions of management talk to teaching/learning talk are as follows for the five schools:

School	Management talk (TO)	Teaching/learning talk (T1,2, and 3)
Will Scarlet	1 :	1.16
Huntingdon	1 :	1.12
Robin Hood	1 :	0.48
Friar Tuck	1 :	0.63
Alan Adale	1 :	0.44

In only two of the five schools do management talk and teaching/learning talk more or less balance each other. In the other three schools management talk is about twice as frequent as teaching talk: in other words, for each three episodes or units of teacher talk two will concern some aspect of class management or administration.

Two other points are clear from Figure 11.6. Teacher talk which signals to pupils a cognitive demand at the conceptual level was rare in all schools; at or below the 4% level in all except Robin Hood (7.6%). Abstract ideas were almost never presented by teachers in mixed ability classes. Talk demanding higher order thinking (T2 and T3 combined) failed to exceed the 5% level in all schools except Robin Hood (7.6%).

The picture presented by these figures is of teacher talk which is substantially about how the class is organized, and concerned with a diet of presented factual information lacking any real cognitive stimulus. Overall, this is a fair picture of how lessons came across during the study period. However, it is worth glancing at the breakdown of these figures by individual teacher/subject area (Figures 11.7-11.16).

Some teachers spent far longer on management talk that others. Figure 11.7 shows Robin Hood's R.E. teacher in this light. This teacher (4.1) organized her class into groups, and so most of her talk concerned the way the organization should work. But she talked infrequently to the class (63 units as compared with 262 at Friar Tuck); most of her work concerned groups or individuals and is therefore logged in categories C or Q which are discussed in the following chapters.

By contrast, Robin Hood's geography specialist (teacher 4.7) was shown to register talk categories at the management level for 98% of of her talk.

These two examples serve to demonstrate that the raw scores and percentages alone cannot describe a teacher's style or effectiveness. However, the global picture of teacher talk presented is undoubtedly a fair one. Thus, if one is looking for cognitive stimulation in first year mixed ability classes it appears that one will not find it in this particular activity. It seems reasonable to hypothesize that teacher questions may make rather more cognitive demands than teacher talk; and the next chapter explores this issue.

Figure 11.1

TEACHER TALK: Will Scarlet

Percentage of teacher talk at four cognitive levels

	TO	T1	T2	T3	TOTAL
2.1 RE	85 59%	53 37%	5 4%	0 0%	143 100%
2.2 FRENCH	231 35%	399 61%	17 3%	0 0%	647 100%
2.3 SCIENCE	174 69%	61 24%	19 7%	0 0%	254 100%
2.4 HISTORY	162 47%	164 48%	17 5%	0 0%	343 100%
2.5 ENGLISH	149 45%	179 54%	3 1%	0 0%	331 100%
2.6 MATHEMATICS	103 43%	119 50%	16 7%	2 1%	240 100%
2.7 GEOGRAPHY	82 47%	86 49%	6 4%	0 0%	174 100%
2.8 MUSIC	129 46%	141 50%	12 4%	0 0%	282 100%
Total Percentage	1115 46.2%	1202 49.8%	95 3.93%	2 0.07%	2414

Upper figure = number of talk transactions
Lower figure = percentage of category over total talk transactions

Figure 11.2

TEACHER TALK: Huntingdon

Percentage of teacher talk at four cognitive levels

	TO	T1	T2	T3	TOTAL
3.2 FRENCH	143 23%	476 76%	6 1%	0 0%	625 100%
3.3 SCIENCE	92 39%	88 37%	55 23%	0 0%	235 100%
3.5 ENGLISH	160 71%	62 28%	2 1%	0 0%	224 100%
3.6 MATHEMATICS	82 69%	36 31%	0 0%	0 0%	118 100%
3.8 MUSIC	167 52%	141 44%	12 4%	0 0%	320 100%
3.9 INTEGRATED STUDIES	521 55%	399 42%	28 3%	0 0%	948 100%
Total Percentage	1165 47.1%	1202 48.7%	103 4.2%	0 0%	2470

Upper figure = number of talk transactions
Lower figure = percentage of category over total talk transactions

Figure 11.3

TEACHER TALK: Robin Hood

Percentage of teacher talk at four cognitive levels

	TO	T1	T2	T3	TOTAL
4.1 RE	59 94%	4 6%	0 0%	0 0%	63 100%
4.2 FRENCH	239 59%	153 38%	14 3%	0 0%	406 100%
4.3 SCIENCE	104 58%	43 24%	31 17%	0 0%	178 100%
4.4 HUNTINGDON	111 62%	52 29%	16 9%	0 0%	179 100%
4.5 ENGLISH	60 37%	59 36%	44 27%	0 0%	163 100%
4.6 MATHEMATICS	112 79%	27 19%	2 1%	0 0%	141 100%
4.7 GEOGRAPHY	120 98%	3 2%	0 0%	0 0%	123 100%
4.8 MUSIC	239 80%	48 16%	11 4%	0 0%	298 100%
Total Percentage	1044 67.4%	389 25.0%	118 7.6%	0 0%	1551 100%

Upper figure = number of talk transactions
Lower figure = percentage of category over total talk transactions

Figure 11.4

TEACHER TALK: Friar Tuck

Percentage of teacher talk at four cognitive levels

	TO	T1	T2	T3	TOTAL
6.1 RE	157 60%	93 36%	12 5%	0 0%	262 100%
6.2 FRENCH	494 46%	581 54%	9 1%	0 0%	1084 100%
6.3 SCIENCE	457 75%	139 23%	16 3%	0 0%	612 100%
6.4 HISTORY	180 67%	77 29%	13 5%	0 0%	270 100%
6.5 ENGLISH	263 61%	158 36%	13 3%	0 0%	434 100%
6.6 MATHEMATICS	334 66%	162 32%	12 2%	0 0%	508 100%
6.7 GEOGRAPHY	149 57%	106 40%	7 3%	0 0%	262 100%
6.8 MUSIC	440 72%	170 28%	1 0%	0 0%	611 100%
Total Percentage	2474 61.2%	1486 36.75%	83 2.05%	0 0%	4043

Upper figure = number of talk transactions
Lower figure = percentage of category over total talk transactions

Figure 11.5

TEACHER TALK: Alan Adale

Percentage of teacher talk at four cognitive levels

	TO	T1	T2	T3	TOTAL
7.2 FRENCH	534 61%	326 37%	17 3%	0 0%	877 100%
7.3 SCIENCE	535 72%	194 26%	18 2%	0 0%	747 100%
7.5 ENGLISH	406 63%	208 32%	31 5%	2 0%	647 100%
7.6 MATHEMATICS	699 78%	188 21%	6 1%	0 0%	893 100%
7.8 MUSIC	539 73%	187 26%	8 1%	0 0%	734 100%
7.9 INTEGRATED STUDIES	483 70%	172 25%	36 5%	1 0%	692 100%
Total Percentage	3196 69.6%	1275 27.8%	116 2.5%	3 0.05%	4590 100%

Upper figure = number of talk transactions
Lower figure = percentage of category over total talk transactions

Figure 11. 6

TEACHER TALK SUMMARY: Five mixed ability first year secondary classes compared

School (no. of transactions)	T0%	T1%	T2%	T3%
Will Scarlet 2414	46.2	49.8	3.93	0.07
Huntingdon 2470	47.1	48.7	4.2	0
Robin Hood 1551	67.4	25.0	7.6	0
Friar Tuck 4043	61.2	36.75	2.05	0
Alan Adale 4590	69.6	27.8	2.5	0.05

(The above table summarizes data concerning all 15,068 talk transactions in the five schools)

Figure 11.7

TEACHER TALK SUBJECT BY SUBJECT: RE

Percentage of teacher talk at four cognitive levels

	TO	T1	T2	T3	TOTAL
WILL SCARLET	85 59%	53 37%	5 4%	0 0%	143 100%
HUNTINGDON	SUBJECT TAUGHT AS PART OF INTEGRATED STUDIES				
ROBIN HOOD	59 94%	4 6%	0 0%	0 0%	63 100%
FRIAR TUCK	157 60%	93 35%	12 5%	0 0%	262 100%
ALAN ADALE	TAUGHT AS PART OF INTEGRATED STUDIES				
TOTALS	301 64%	150 32%	17 4%	0 0%	468

Figure 11.8

TEACHER TALK SUBJECT BY SUBJECT: FRENCH

Percentage of teacher talk at four cognitive levels

	TO	T1	T2	T3	TOTAL
WILL SCARLET	231 35%	399 61%	17 3%	0 0%	647 100%
HUNTINGDON	143 23%	476 76%	6 1%	0 0%	625 100%
ROBIN HOOD	239 59%	153 38%	14 3%	0 0%	406 100%
FRIAR TUCK	157 60%	93 35%	12 5%	0 0%	262 100%
ALAN ADALE	534 61%	326 37%	17 3%	0 0%	877 100%
TOTALS	1304 46.3%	1447 51.4%	66 2.3%	0 0%	2817 100%

Figure 11.9

TEACHER TALK SUBJECT BY SUBJECT: SCIENCE

Percentage of teacher talk at four cognitive levels

	TO	T1	T2	T3	TOTAL
WILL SCARLET	174 69%	61 24%	19 4%	0 0%	254 100%
HUNTINGDON	92 39%	88 37%	55 23%	0 0%	235 100%
ROBIN HOOD	104 58%	43 24%	31 17%	0 0%	178 100%
FRIAR TUCK	457 75%	139 23%	16 3%	0 0%	612 100%
ALAN ADALE	535 72%	194 26%	18 2%	0 0%	747 100%
TOTALS	1362 67.2%	525 25.9%	139 6.9%	0 0%	2026 100%

Figure 11.10

TEACHER TALK SUBJECT BY SUBJECT: HISTORY

Percentage of teacher talk at four cognitive levels

	TO	T1	T2	T3	TOTAL
WILL SCARLET	162 47%	164 48%	17 5%	0 0%	343 100%
HUNTINGDON	TAUGHT AS INTEGRATED STUDIES				
ROBIN HOOD	111 62%	52 29%	16 9%	0 0%	179 100%
FRIAR TUCK	180 67%	77 29%	13 5%	0 0%	270 100%
ALAN ADALE	TAUGHT AS INTEGRATED STUDIES				
TOTALS	453 57.2%	293 37%	46 5.8%	0 0%	792 100%

Figure 11.11

TEACHER TALK SUBJECT BY SUBJECT: ENGLISH

Percentage of teacher talk at four cognitive levels

	TO	T1	T2	T3	TOTAL
WILL SCARLET	149 45%	179 54%	3 1%	0 0%	331 100%
HUNTINGDON	160 71%	62 28%	2 1%	0 0%	224 100%
ROBIN HOOD	60 37%	59 36%	44 27%	0 0%	163 100%
FRIAR TUCK	263 61%	158 36%	13 3%	0 0%	434 100%
ALAN ADALE	406 63%	208 32%	31 5%	2 0%	647 100%
TOTALS	1038 57.7%	666 37%	93 5.2%	2 0.1%	1799 100%

Figure 11.12

TEACHER TALK SUBJECT BY SUBJECT: MATHEMATICS

Percentage of teacher talk at four cognitive levels

	TO	T1	T2	T3	TOTAL
WILL SCARLET	103 43%	119 50%	16 7%	2 1%	240 100%
HUNTINGDON	82 69%	36 31%	0 0%	0 0%	118 100%
ROBIN HOOD	112 79%	27 19%	2 1%	0 0%	141 100%
FRIAR TUCK	334 66%	162 32%	12 2%	0 0%	508 100%
ALAN ADALE	699 78%	188 21%	6 1%	0 0%	893 100%
TOTALS	1330 70%	532 28%	36 1.9%	2 0.1%	1900 100%

Figure 11.13

TEACHER TALK SUBJECT BY SUBJECT: GEOGRAPHY

Percentage of teacher talk at four cognitive levels

	TO	T1	T2	T3	TOTAL
WILL SCARLET	82 47%	86 49%	6 4%	0 0%	174 100%
HUNTINGDON	PART OF INTEGRATED STUDIES				
ROBIN HOOD	120 98%	3 2%	0 0%	0 0%	123 100%
FRIAR TUCK	149 57%	106 41%	7 3%	0 0%	262 100%
ALAN ADALE	PART OF INTEGRATED STUDIES				
TOTALS	351 62.8%	195 34.9%	13 2.3%	0 0%	559 100%

Figure 11.14

TEACHER TALK SUBJECT BY SUBJECT: MUSIC

Percentage of teacher talk at four cognitive levels

	TO	T1	T2	T3	TOTAL
WILL SCARLET	129 46%	141 50%	12 4%	0 0%	282 100%
HUNTINGDON	167 52%	141 44%	12 4%	0 0%	320 100%
ROBIN HOOD	239 80%	48 16%	11 4%	0 0%	298 100%
FRIAR TUCK	440 72%	170 28%	1 0%	0 0%	611 100%
ALAN ADALE	539 73%	187 26%	8 1%	0 0%	734 100%
TOTALS	1514 67.4%	687 30.6%	44 2%	0 0%	2245 100%

Figure 11.15

TEACHER TALK SUBJECT BY SUBJECT: INTEGRATED STUDIES

Percentage of teacher talk at four cognitive levels

	TO	T1	T2	T3	TOTAL
WILL SCARLET					
HUNTINGDON	521 55%	399 42%	28 3%	0 0%	948 100%
ROBIN HOOD					
FRIAR TUCK					
ALAN ADALE					
TOTALS	1004 61.2%	571 34.8%	64 3.9%	1 0.1%	1640 100%

Figure 11.16

TEACHER TALK: A COMPARISON OF SUBJECTS

(all figures are percentages of total talk transactions for the individual subjects)

	TO	T1	T2	T3	TOTAL
RE	64	32	4	0	100
FRENCH	46.3	51.4	2.3	0	100
SCIENCE	67.2	25.9	6.9	0	100
HISTORY	57.2	37	5.8	0	100
ENGLISH	57.7	37	5.2	0.1	100
MATHEMATICS	70	28	1.9	0.1	100
GEOGRAPHY	62.8	34.9	2.3	0	100
MUSIC	67.4	30.6	2	0	100
INTEGRATED STUDIES	61.2	34.8	3.9	0.1	100

CHAPTER 12

THE COGNITIVE DEMAND MADE BY TEACHERS' QUESTIONS IN FIVE MIXED ABILITY CLASSES

During the course of 230 lessons by 36 teachers across eight academic subjects every question asked by the teachers was coded by the researcher according to the seven-point scale discussed and illustrated in Chapter 6:

QO Management
1 Recall)
2 Simple comprehension) lower order questions
3 Application)
4 Analysis) higher order questions
5 Synthesis)
6 Evaluation

Figures 12.2-12.16 set out the findings. Figure 12.1 is a breakdown of the number of questions asked in each subject area, plotted against the number of minutes of observed lesson time. From this it is possible to show (in the extreme right-hand column) the average number of questions asked in each hour of teaching time across the nine curriculum areas observed (eight subjects and integrated studies). The calculations below the box in this figure emphasize how important questions are to the teacher and, therefore, reinforce pleas made in this thesis for improvements to teaching skill in this area. French and music share a pattern of frequent questioning. It will emerge that in both there is a rapid interchange of brief, closed, factual questions. It is interesting that noticeably more questions are asked during integrated studies lessons than during subject-based lessons covering the same curriculum areas. This is almost certainly a matter of teaching style. The studies show that the integrated studies work was construed in a way which required pupils to find out answers rather than teachers to give them. As will emerge, the work was not necessarily less information-based; rather, it was a case of the teacher changing role from instructor to guide.

Moving on to figures 12.2-12.7, the most noteable feature is the paucity of higher order questions. The total raw scores for all five schools combined are as follows:

Q3	196
Q4	49
Q5	0
Q6	7
Total:	252 higher order questions

Since 6,928 questions were asked, this is a percentage of 3.6%; or one could say that seven questions in every two hundred asked for thinking of a higher cognitive order. This should be compared with a total of 1,440 management questions, or 20.8%. Thus 75.6% of questions asked by teachers in our sample lower order questions designed to elicit facts or test simple comprehension, usually of facts recently supplied.

Turning to the patterns of questioning across subject areas there seems to be little to add. In all areas of the curriculum higher order questions are sparse. The division of lower order questions between categories Q1 and Q2 is very variable (cf. especially Figure 12.9); and probably reflects the individual teacher's style. Mathematics (Figure 12.13) is notable for a total dearth of higher order questions except at Will Scarlet school; and one is left to conclude either that the use of texts and mathematics schemes limits teacher intervention and/or that there is little reliance on conceptual numeracy and a great deal upon following ill-understood formulae or numerical procedures.

Modern linguists tend to ask a lot of questions (Fig. 12.9): this is probably a feature of conversation designed to give practice to pupils in use of the language. Practice, reinforcement and revision seem to be the hall-marks of this subject.

Summary

Chapters 10, 11 and 12, then, have painted an unexpected picture of mixed ability teaching and especially of teaching methods of classes in which teachers claim to be aware of the presence of able pupils. 78% of teaching context has turned out to be of an undifferentiated nature, whole class or organizational group work. Of the teachers' contributions to classroom verbal transactions, teacher talk has been dominated by class management (69.6%) and factual information (27.8%), and teacher questions have been discovered to be 75.6% lower order. Talk designed to stimulate able pupils (T2, T3) has initially not exceeded the 5% level and higher order questions are as infrequent as 7 in 200. Individualized learning, a possible way to help the able work at their own level, has been shown to operate for only 14% of classroom time.

Figure 12.1

Frequency of teachers' questions in five first year secondary classes in nine academic subject areas

	Total number of questions asked	Number of minutes of teacher observed	Average number of questions asked in each hour of teaching time
RE	221	560	23.7
French	1733	1360	76.5
Science	807	1390	34.8
History	285	700	24.4
English	709	1405	30.2
Mathematics	858	1375	37.4
Geography	301	840	21.5
Music	886	740	71.8
Integrated Studies	1128	1140	59.3
Overall	6928	9510 ∓ 158hrs 30 mins	43.7

Using the overall figure, this would imply that an 'average' teacher might ask

204 questions per teaching day
1,018 questions per teaching week
39,710 questions per school year
1,588,408 questions in a 40-year career

Figure 12.2

TEACHERS' QUESTIONS: Will Scarlet
Percentage of teachers' questions at seven cognitive levels

	Q0	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
2.1 RE	6 11%	37 67%	12 22%	0 0%	0 0%	0 0%	0 0%	55 100%
2.2 French	45 11%	141 35%	186 46%	31 8%	0 0%	0 0%	0 0%	403 100%
2.3 Science	15 36%	18 43%	3 7%	4 10%	2 5%	0 0%	0 0%	42 100%
2.4 History	13 11%	57 49%	36 31%	10 9%	1 1%	0 0%	0 0%	117 100%
2.5 English	15 15%	52 53%	31 31%	1 1%	0 0%	0 0%	0 0%	99 100%
2.6 Mathematics	14 10%	52 37%	48 34%	16 11%	10 6%	0 0%	0 0%	140 100%
2.7 Geography	17 13%	56 42%	41 31%	18 14%	1 1%	0 0%	0 0%	133 100%
2.8 Music	18 11%	119 73%	21 13%	4 2%	2 1%	0 0%	0 0%	164 100%
TOTAL %	143 12.4%	532 46.1%	378 32.8%	84 7.3%	16 1.4%	0 0%	0 0%	1153 100%

Upper figure = number of teacher questions
Lower figure = percentage of categories over total number of questions

Figure 12.3

TEACHERS QUESTIONS: Huntingdon

Percentage of teachers' questions at seven cognitive levels

	RO	1	2	3	4	5	6	TOTAL
3.2 French	13 4%	140 44%	162 50%	6 2%	0 0%	0 0%	0 0%	321 100%
3.3 Science	41 22%	57 30%	57 30%	25 13%	7 4%	0 0%	0 0%	187 100%
3.5 English	33 33%	60 60%	6 6%	1 1%	0 0%	0 0%	0 0%	100 100%
3.6 Mathematics	42 74%	15 26%	0 0%	0 0%	0 0%	0 0%	0 0%	57 100%
3.8 Music	51 54%	37 39%	6 6%	0 0%	0 0%	0 0%	0 0%	94 100%
3.9 Integrated Studies	127 17%	508 67%	114 15%	14 2%	0 0%	0 0%	0 0%	763 100%
Total %	307 20.2%	817 53.7%	345 22.7%	46 3.0%	7 0.4%	0 0%	0 0%	1522 100%

Figure 12.4

TEACHERS' QUESTIONS: Robin Hood
Percentage of teachers' questions at seven cognitive levels

	Q0	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
4.1 RE	4 36%	5 45%	2 18%	0 0%	0 0%	0 0%	0 0%	11 100%
4.2 French	9 3%	210 73%	67 23%	3 1%	0 0%	0 0%	0 0%	289 100%
4.3 Science	6 4%	85 50%	31 18%	42 24%	1 1%	0 0%	5 3%	170 100%
4.4 History	34 31%	46 41%	23 21%	8 7%	0 0%	0 0%	0 0%	111 100%
4.5 English	3 3%	44 43%	29 29%	9 9%	14 14%	0 0%	2 2%	101 100%
4.6 Mathematics	12 12%	58 58%	30 30%	0 0%	0 0%	0 0%	0 0%	100 100%
4.7 Geography	39 95%	2 5%	0 0%	0 0%	0 0%	0 0%	0 0%	41 100%
4.8 Music	12 34%	13 37%	7 20%	2 5%	1 3%	0 0%	0 0%	35 100%
TOTAL %	119 13.9%	463 54%	189 22%	64 7.5%	16 1.8%	0 0%	7 0.8%	858 100%

Figure 12.5

TEACHERS' QUESTIONS: Friar Tuck
Percentage of teachers' questions at seven cognitive levels

	Q0	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
6.1 RE	50 32%	98 63%	7 2%	0 0%	0 0%	0 0%	0 0%	155 100%
6.2 French	20 5%	382 94%	6 2%	0 0%	0 0%	0 0%	0 0%	408 100%
6.3 Science	62 36%	108 62%	4 2%	0 0%	0 0%	0 0%	0 0%	174 100%
6.4 History	7 12%	47 83%	3 5%	0 0%	0 0%	0 0%	0 0%	57 100%
6.5 English	49 28%	113 64%	10 6%	2 1%	3 2%	0 0%	0 0%	177 100%
6.6 Mathematics	30 13%	186 82%	10 4%	0 0%	0 0%	0 0%	0 0%	226 100%
6.7 Geography	33 26%	92 72%	2 2%	0 0%	0 0%	0 0%	0 0%	127 100%
6.8 Music	32 34%	61 66%	0 0%	0 0%	0 0%	0 0%	0 0%	93 100%
TOTAL %	283 19.9%	1087 77%	42 2.9%	2 0.1%	3 0.1%	0 0%	0 0%	1417 100%

Figure 12.6

TEACHERS' QUESTIONS: Alan Adale
Percentage of teachers' questions at seven cognitive levels

	Q0	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
7.2 French	43 13%	267 86%	2 1%	0 0%	0 0%	0 0%	0 0%	312 100%
7.3 Science	53 23%	171 73%	10 3%	0 0%	0 0%	0 0%	0 0%	234 100%
7.5 English	73 32%	129 56%	27 12%	0 0%	3 1%	0 0%	0 0%	232 100%
7.6 Mathematics	179 53%	156 47%	0 0%	0 0%	0 0%	0 0%	0 0%	335 100%
7.8 Music	100 20%	399 80%	1 ·0%	0 0%	0 0%	0 0%	0 0%	500 100%
7.9 Integrated Studies	148 41%	205 56%	8 2%	0 0%	4 1%	0 0%	0 0%	365 100%
TOTAL %	596 30.1%	1327 67.1%	48 2.4%	0 0%	7 0.4%	0 0%	0 0%	1978 100%

Figure 12.7

TEACHERS' QUESTIONS: percentages of teachers questions at seven cognitive levels in five first year secondary classes

School/total no. of questions	Q0	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
Will Scarlet (1153)	12.4%	46.1%	32.8%	7.3%	1.4%	0%	0%	100%
Huntingdon (1522)	20.2%	53.7%	22.7%	3.0%	0.4%	0%	0%	100%
Robin Hood (828)	13.9%	54%	22%	7.5%	1.8%	0%	0.8%	100%
Friar Tuck (1417)	19.9%	77%	2.9%	0.1%	0.1%	0%	0%	100%
Alan Adale (1978)	30.1%	67.1%	2.4%	0%	0.4%	0%	0%	100%

figures based on a total of 6,928 questions

Figure 12.8

TEACHERS' QUESTIONS: percentages of questions on seven cognitive levels in five year 1 secondary classes broken down subject by subject

i) RE

School	Q0	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
Will Scarlet	6 11%	37 67%	12 22%	0 0%	0 0%	0 0%	0 0%	55 100%
Huntingdon	TAUGHT AS PART OF INTEGRATED STUDIES							
Robin Hood	4 36%	5 45%	2 18%	0 0%	0 0%	0 0%	0 0%	11 100%
Friar Tuck	50 32%	98 63%	7 2%	0 0%	0 0%	0 0%	0 0%	155 100%
Alan Adale	TAUGHT AS PART OF INTEGRATED STUDIES							
TOTAL %	60 27.2%	140 63.3%	21 9.5%	0 0%	0 0%	0 0%	0 0%	221 100%

Figure 12.9

TEACHERS' QUESTIONS: percentages of questions on seven cognitive levels in five year 1 secondary classes broken down subject by subject

ii) French

School	Q0	Q1	Q2	Q3	Q4	Q5	Q6	Total
Will Scarlet	45 11%	141 35%	186 46%	31 8%	0 0%	0 0%	0 0%	403 100%
Huntingdon	13 4%	140 44%	162 50%	6 2%	0 0%	0 0%	0 0%	321 100%
Robin Hood	9 3%	210 73%	67 23%	3 1%	0 0%	0 0%	0 0%	289 100%
Friar Tuck	20 5%	382 94%	6 2%	0 0%	0 0%	0 0%	0 0%	408 100%
Alan Adale	43 13%	267 86%	2 1%	0 0%	0 0%	0 0%	0 0%	312 100%
TOTAL %	130 7.5%	1140 65.8%	423 24.4%	40 2.3%	0 0%	0 0%	0 0%	1733 100%

Figure 12.10

TEACHERS' QUESTIONS: percentages of questions on seven cognitive levels in five year 1 secondary classes broken down subject by subject

iii) Science

School	Q1	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
Will Scarlet	15 36%	18 43%	3 7%	4 10%	2 5%	0 0%	0 0%	42 100%
Huntingdon	41 22%	57 30%	57 30%	25 13%	7 4%	0 0%	0 0%	187 100%
Robin Hood	6 4%	85 50%	31 18%	42 24%	1 1%	0 0%	5 3%	170 100%
Friar Tuck	62 36%	108 62%	4 2%	0 0%	0 0%	0 0%	0 0%	174 100%
Alan Adale	53 23%	171 73%	10 3%	0 0%	0 0%	0 0%	0 0%	234 100%
TOTAL %	177 22%	439 54.4%	105 13%	71 8.8%	10 1.2%	0 0%	5 0.6%	807 100%

Figure 12.11

TEACHERS QUESTIONS: percentages of questions on seven cognitive levels in five year 1 secondary classes broken down subject by subject

iv) History

School	Q0	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
Will Scarlet	13 11%	57 49%	36 31%	10 9%	1 1%	0 0%	0 0%	117 110%
Hungtingdon	TAUGHT AS PART OF INTEGRATED STUDIES							
Robin Hood	34 31%	46 41%	23 21%	8 7%	0 0%	0 0%	0 0%	111 100%
Friar Tuck	7 12%	47 83%	3 5%	0 0%	0 0%	0 0%	0 0%	57 100%
Alan Adale	TAUGHT AS PART OF INTEGRATED STUDIES							
TOTAL %	54 19%	150 52.6%	62 21.8%	18 6.3%	1 0.3%	0 0%	0 0%	285 100%

Figure 12.12

TEACHER'S QUESTIONS: percentage of questions on seven cognitive levels in five year 1 secondary classes broken down subject by subject

v) English

School	Q0	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
Will Scarlet	15 15%	52 53%	31 31%	1 1%	0 0%	0 0%	0 0%	99 100%
Huntingdon	33 33%	60 60%	6 6%	1 1%	0 0%	0 0%	0 0%	100 100%
Robin Hood	3 3%	44 43%	29 29%	9 9%	14 14%	0 0%	2 0%	101 100%
Friar Tuck	49 28%	113 64%	10 6%	2 1%	3 2%	0 0%	0 0%	177 100%
Alan Adale	73 32%	129 56%	27 12%	0 0%	3 1%	0 0%	0 0%	232 100%
TOTAL %	173 24.4%	398 56.2%	103 14.5%	13 1.8%	20 2.8%	0 0%	2 0.3%	709 100%

Figure 12.13

TEACHERS' QUESTIONS: percentages of questions on seven cognitive levels in five year 1 secondary classes broken down subject by subject

vi) Mathematics

School	Q0	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
Will Scarlet	14 10%	52 37%	48 34%	16 11%	10 6%	0 0%	0 0%	140 100%
Huntingdon	42 74%	15 26%	0 0%	0 0%	0 0%	0 0%	0 0%	57 100%
Robin Hood	12 12%	58 58%	30 30%	0 0%	0 0%	0 0%	0 0%	100 100%
Friar Tuck	30 13%	186 82%	10 4%	0 0%	0 0%	0 0%	0 0%	226 100%
Alan Adale	179 53%	156 47%	0 0%	0 0%	0 0%	0 0%	0 0%	335 100%
TOTAL %	227 32.3%	467 54.4%	88 10.2%	16 1.9%	10 1.2%	0 0%	0 0%	858 100%

Figure 12.14

TEACHERS' QUESTIONS: percentages of questions on seven cognitive levels in five year 1 secondary classes broken down subject by subject

vii) Geography

School	Q0	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
Will Scarlet	17 13%	56 42%	41 31%	18 14%	1 1%	0 0%	0 0%	133 100%
Huntingdon	TAUGHT AS PART OF INTEGRATED STUDIES							
Robin Hood	39 95%	2 5%	0 0%	0 0%	0 0%	0 0%	0 0%	41 100%
Friar Tuck	33 26%	92 72%	2 2%	0 0%	0 0%	0 0%	0 0%	127 100%
Alan Adale	TAUGHT AS PART OF INTEGRATED STUDIES							
TOTAL %	89 29.6%	150 49.8%	43 14.3%	18 6%	1 0.3%	0 0%	0 0%	301 100%

Figure 12.15

TEACHERS' QUESTIONS: percentages of questions on seven cognitive levels in five year 1 secondary classes broken down subject by subject

viii) Music

School	Q0	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
Will Scarlet	18 11%	119 73%	21 13%	4 2%	2 1%	0 0%	0 0%	164 100%
Huntingdon	51 54%	37 39%	6 6%	0 0%	0 0%	0 0%	0 0%	94 100%
Robin Hood	12 34%	13 37%	7 20%	2 5%	1 3%	0 0%	0 0%	35 100%
Friar Tuck	32 34%	61 66%	0 0%	0 0%	0 0%	0 0%	0 0%	93 100%
Alan Adale	100 20%	399 80%	1 0%	0 0%	0 0%	0 0%	0 0%	500 100%
TOTAL %	213 24%	629 71%	35 4%	6 0.7%	3 0.3%	0 0%	0 0%	886 100%

Figure 12.16

TEACHERS' QUESTIONS: percentages of questions on seven cognitive levels in five year 1 secondary classes broken down subject by subject

ix) Integrated Studies

School	Q0	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
Will Scarlet	NOT TAUGHT							
Huntingdon	127 17%	508 67%	114 15%	14 2%	0 0%	0 0%	0 0%	763 100%
Robin Hood	NOT TAUGHT							
Friar Tuck	NOT TAUGHT							
Alan Adale	148 41%	205 56%	8 2%	0 0%	4 0%	0 0%	0 0%	365 100%
TOTAL	275 24.3%	713 63.3%	122 10.9%	14 1.2%	4 0.3%	0 0%	0 0%	1128 100%

CHAPTER 13

THE COGNITIVE LEVEL OF PUPIL RESPONSES, INITIATIONS AND CONTACTS IN FIVE MIXED ABILITY CLASSES

In the previous two chapters we have been examining evidence of cognitive demand made by teacher talk and teachers' questioning.

In this chapter the spotlight turns to pupils' oral contributions to lessons. The analysis system employed closely mirrors that used for teacher talk, using the three-fold classification of Gallagher plus a category for management responses:

RO management
R1 data level
R2 concept level
R3 abstract level, generalization

The complete classification system has been described in Chapter 6, and it will be recalled that the 'R' code includes both responses to questions and pupil initiations. In addition, it was found necessary to add two codes to this shorthand:

RW for recording answers which may have been at any cognitive level but which were incorrect

C for those fleeting contacts which are not overtly about class management but which keep the process of learning going rather than concerning itself with content or skills.

Figures 13.1-13.6 summarize the cognitive level of pupils responses, initiations and contacts (the word response is used for convenience as a blanket term for both responses and initiations) in the five study schools of the main sample.

Commonest pupil-teacher verbal transactions in all schools except Friar Tuck are contacts (C), i.e. items not concerned with learning. When the pupil responses are also analysed it is found that contacts plus overt management responses constitute the commonest pupil-teacher verbal transactions, at about the 60% level, except in Friar Tuck school:

in Will Scarlet	57.8% of all pupil-teacher transactions
in Huntingdon	58.4%
in Robin Hood	66.3%
in Friar Tuck	45 %
in Alan Adale	61.6%

Except at Friar Tuck school the picture is remarkably consistent.

These pupil-teacher transactions are about 'oiling the works of classroom life' rather than about skills or knowledge. Codes R1, R2 and R3 attempt to distinguish between verbalized pupil thought of a lower order (R1) and of a higher order (R2,3). In 4 schools the emphasis falls on factual responses & pupils regurgitating knowledge or reproducing data. This is clear from the figures presented: but another way of displaying the same data would be to express R1 events as a proportion to R2 and R3 events. In that case one would find, for example, that in Will Scarlet school there was one higher order response to every 2.9 lower order ones. These proportions could be set out in tabular form thus:

Will Scarlet	1 : 2.9 (higher order: lower order)
Huntingdon	1 : 5.4
Robin Hood	1 : 3.8
Friar Tuck	1 : 495
Alan Adale	1 : 93

Figures for the first three schools listed are not particularly surprising: one could very well have hypothesized that there would be more data level response than higher order response. Results from the two remaining schools are nothing short of staggering.

Incorrect responses were recorded since few researchers have studied these. The present work does not attempt to do more than scratch the surface of how and in what circumstances such events occur. What is clear is that frequency of incorrect responses varies from school to school. When RW events are compared as proportions of total correct responses (R1 and R2 and R3), we find that:

in Will Scarlet	there is 1 incorrect response in	7.5
in Huntingdon	there is 1 incorrect response in	11.5
in Robin Hood	there is 1 incorrect response in	18.0
in Friar Tuck	there is 1 incorrect response in	6.9
in Alan Adale	there is 1 incorrect response in	6.0

Incorrect responses should not necessarily be regarded as a bad thing. In classes where pupils are encouraged to speculate and hypothesize they may be particularly frequent, necessary and fruitful. However, the results reported here suggest that, in this study, incorrect responses do not occur in that context: speculative thought, R2 and R3, are minimally represented. They are simply incorrect responses to factual questions for the most part. How many are offered probably depends on various factors. Thus it seems likely, for example, that children will offer more incorrect responses in two conflicting ways: to those teachers with whom they feel secure enough to guess, or to those teachers who direct questions in a pressurizing way at named individuals rather than accept answers from volunteers.

When attention is turned to Figures 13.8 to 13.15, which show a breakdown of responses and contacts across subject areas and individual teachers, few points of note emerge. Paucity of high level pupil talk elicited from pupils is constant across the 36 teachers in the sample: if there are exceptions they related to R2, concept level responses. Here seven teachers elicit R2 for 10% or more of total responses:

teacher	2.2 French at Will Scarlet	27%
"	3.2 French at Huntingdon	24%
"	4.2 French at Robin Hood	10%
"	4.3 Science at Robin Hood	12%
"	4.5 English at Robin Hood	12%
"	7.5 English at Alan Adale	17%
"	2.7 Geography at Will Scarlet	11%

This brief review of the pupils' contributions to classroom dialogue has shown tha t they respond to the lack of cognitive stimulus provided in teacher talk and questions by producing little higher order verbalized thought. While this finding is predictable, it is also rather sad.

In Chapter 14 we shall look again at these contact/response figures to see whether teachers elicit such high level thinking as there is from these pupils whom they themselves claim to recognize as bright pupils. The fate of perceived slow learners will also be explored. For the moment, however, it is opportune to continue our review of the general level of cognitive stimulation in our five mixed ability classes as it affects all pupils: bright, slow and middle band.

In that context one must conclude this chapter by recapping briefly, and these are the messages so far:

1) A great deal of the teaching is in the whole class mode, which in mixed ability classes may not meet individual needs.

2) Most teacher talk is about managing classes; little of it reaches the higher cognitive levels.

3) Few teacher questions seek to stimulate higher order thinking.

4) Pupils respond to lower order demands by teachers with transactions of a lower cognitive order, as we would expect.

This, then, is the way things were in the five observed mixed ability classes. In chapters 15,16 we shall look at how these findings compare with what happens in other educational settings.

Figure 13.1

PUPILS' CONTACTS AND RESPONSES: Will Scarlet
Percentage of pupil contacts and responses on four cognitive levels

	C	RO	R1	R2	R3	RW	TOTAL
2.1 RE	135 53%	45 18%	57 23%	5 2%	0 0%	11 4%	253 100%
2.2 French	125 16%	127 16%	247 31%	209 27%	0 0%	80 10%	788 100%
2.3 Science	344 78%	60 14%	25 5%	9 2%	0 0%	3 1%	441 100%
2.4 History	332 49%	125 19%	162 24%	43 6%	0 0%	12 2%	674 100%
2.5 English	298 48%	106 17%	189 30%	10 1%	0 0%	20 3%	623 100%
2.6 Mathematics	265 53%	44 9%	110 22%	42 8%	2 0%	36 7%	499 100%
2.7 Geography	78 28%	40 14%	106 38%	31 11%	0 0%	22 8%	277 100%
2.8 Music	9 4%	59 24%	156 64%	13 5%	0 0%	6 3%	243 100%
TOTAL	1586 41.8%	606 16%	1052 27.7%	362 9.5%	2 0%	190 5%	3798 100%

Upper figure = number of pupil contacts and pupils responses
Lower figure = percentage of category as a total number of contact/response transactions.

Figure 13.2

PUPILS' CONTACTS AND RESPONSES: Huntingdon
Percentage of pupil contacts and responses on four cognitive levels

	C	RO	R1	R2	R3	RW	TOTAL
3.2 French	125 19%	56 8%	297 45%	161 24%	0 0%	20 3%	659 100%
3.3 Science	293 55%	72 14%	100 19%	44 8%	0 0%	19 4%	528 100%
3.5 English	295 50%	119 20%	171 29%	1 0%	0 0%	2 1%	588 100%
3.6 Mathematics	386 81%	74 16%	14 3%	0 0%	0 0%	0 0%	474 100%
3.8 Music	75 43%	39 22%	50 29%	2 1%	0 0%	9 5%	175 100%
3.9 Integrated Studies	540 33%	312 19%	650 40%	29 2%	0 0%	82 5%	1613 100%
TOTAL	1714 42.4%	672 16.6%	1282 31.8%	237 5.9%	0 0%	132 3.3%	4037 100%

Figure 13.3

PUPILS' CONTACTS AND RESPONSES: Robin Hood
Percentage of pupil contacts and responses on four cognitive levels

	C	RO	R1	R2	R3	RW	TOTAL
4.1 RE	452 96%	14 3%	4 1%	2 0%	0 0%	0 0%	472 100%
4.2 French	117 15%	27 4%	528 69%	74 10%	0 0%	20 3%	766 100%
4.3 Science	324 60%	24 5%	105 19%	66 12%	10 2%	16 3%	545 100%
4.4 History	254 66%	42 11%	58 15%	28 6%	0 0%	8 2%	385 100%
4.5 English	254 69%	4 1%	52 14%	43 12%	3 1%	14 4%	370 100%
4.6 Mathematics	255 65%	46 12%	72 18%	18 5%	0 0%	5 1%	396 100%
4.7 Geography	420 94%	28 6%	0 0%	0 0%	0 0%	0 0%	448 100%
4.8 Music	174 49%	42 12%	125 35%	8 2%	0 0%	3 1%	352 100%
TOTAL	2250 60.3%	227 6%	944 25.3%	234 6.3%	13 0.3%	66 1.8%	3734 100%

Figure 13.4

PUPILS' CONTACTS AND RESPONSES: Friar Tuck
Percentage of pupil contacts and responses on four cognitive levels

	C	RO	R1	R2	R3	RW	TOTAL
6.1 RE	40 18%	42 19%	121 56%	0 0%	0 0%	15 7%	218 100%
6.2 French	107 12%	78 9%	571 66%	0 0%	0 0%	112 13%	868 100%
6.3 Science	197 37%	188 35%	120 23%	0 0%	0 0%	25 5%	530 100%
6.4 History	89 60%	12 8%	37 25%	1 1%	0 0%	9 6%	148 100%
6.5 English	83 22%	82 22%	200 53%	2 1%	0 0%	7 2%	374 100%
6.6 Mathematics	205 37%	94 17%	241 43%	0 0%	0 0%	19 3%	559 100%
6.7 Geography	53 27%	45 23%	87 44%	0 0%	0 0%	12 6%	207 100%
6.8 Music	36 17%	44 21%	109 53%	0 0%	0 0%	17 8%	206 100%
TOTAL	810 26.1%	585 18.9%	1486 47.9%	3 0.1%	0 0%	216 7%	3100 100%

Figure 13.5

PUPILS' CONTACTS AND RESPONSES: Alan Adale
Percentage of pupil contacts and responses on four cognitive levels

	C	RO	R1	R2	R3	RW	TOTAL
7.2 French	322 41%	138 18%	252 33%	0 0%	0 0%	58 8%	770 100%
7.3 Science	403 49%	219 27%	190 23%	0 0%	0 0%	11 1%	823 100%
7.5 English	158 30%	102 20%	247 48%	7 1%	2 0%	3 1%	519 100%
7.6 Mathematics	440 50%	262 30%	151 17%	0 0%	0 0%	26 3%	879 100%
7.8 Music	90 13%	108 16%	398 59%	0 0%	0 0%	79 12%	675 100%
7.9 Integrated Studies	216 34%	188 30%	160 25%	6 1%	0 0%	58 9%	628 100%
TOTAL	1629 37.9%	1017 23.7%	1398 32.6%	13 0.3%	2 0%	235 5.5%	4294 100%

Figure 13.6

PUPILS' CONTACTS AND RESPONSES: percentage of contacts/responses at four cognitive levels in five first year secondary classes

	C	R0	R1	R2	R3	RW	TOTAL
Will Scarlet (3798)	41.8	16	27.7	9.5	0	5	100
Huntingdon (4037)	42.4	16	31.8	5.9	0	3.3	100
Robin Hood (3734)	60.3	6	25.3	6.3	0.3	1.8	100
Friar Tuck (3100)	26.1	18.9	47.9	0.1	0	7	100
Alan Adale (4294)	37.9	23.7	32.6	0.3	0	5.5	100

(The above figures represent a breakdown of 18,963 transactions with or initiated by pupils.)

Figure 13.7

PUPILS' CONTACTS AND RESPONSES: percentages of contacts and responses at four cognitive levels in five year 1 secondary classes broken down subject by subject

i) RE

School	C	RO	R1	R2	R3	RW	TOTAL
Will Scarlet	135 53%	45 18%	57 28%	5 2%	0 0%	11 4%	253 100%
Huntingdon	TAUGHT AS PART OF INTEGRATED STUDIES						
Robin Hood	452 96%	14 3%	4 1%	2 0%	0 0%	0 0%	472 100%
Friar Tuck	40 18%	42 19%	121 56%	0 0%	0 0%	15 7%	218 100%
Alan Adale	TAUGHT AS PART OF INTEGRATED STUDIES						
TOTAL %	627 66.5%	101 10.7%	182 19.3%	7 0.7%	0 0%	26 2.8%	943 100%

Figure 13.8

PUPILS' CONTACTS AND RESPONSES: percentages of contacts and responses at four cognitive levels in five year 1 secondary classes broken down subject by subject

ii) French

	C	RO	R1	R2	R3	RW	TOTAL
Will Scarlet	125 16%	127 16%	247 31%	209 27%	0 0%	80 10%	788 100%
Huntingdon	125 19%	56 8%	297 45%	161 24%	0 0%	20 3%	659 100%
Robin Hood	117 15%	27 4%	528 69%	74 10%	0 0%	20 3%	766 100%
Friar Tuck	107 12%	78 9%	571 66%	0 0%	0 0%	112 13%	868 100%
Alan Adale	322 41%	138 18%	252 33%	0 0%	0 0%	58 8%	770 100%
TOTAL %	796 20.7%	426 11%	1895 49.3%	444 11.5%	0 0%	290 7.5%	3851 100%

Figure 13.9

PUPILS' CONTACTS AND RESPONSES: percentages of contacts and responses at four cognitive levels in five year 1 secondary classes broken down subject by subject

iii) Science

	C	RO	R1	R2	R3	RW	TOTAL
Will Scarlet	344 78%	60 14%	25 5%	9 9%	0 0%	3 1%	441 100%
Huntingdon	293 55%	72 14%	100 19%	44 8%	0 0%	19 4%	528 100%
Robin Hood	324 60%	24 5%	105 19%	66 12%	10 2%	16 3%	545 100%
Friar Tuck	197 37%	188 35%	120 23%	0 0%	0 0%	5% 5%	530 100%
Alan Adale	403 49%	219 27%	190 23%	0 0%	0 0%	11 1%	823 100%
TOTAL %	1561 54.5%	563 19.6%	540 18.8%	119 4.2%	10 0.3%	74 2.6%	2867 100%

Figure 13.10

PUPILS' CONTACTS AND RESPONSES: percentages of contacts and responses at four cognitive levels in five year 1 secondary classes broken down subject by subject
iv) History

	C	RO	R1	R2	R3	RW	TOTAL
Will Scarlet	332 49%	125 19%	162 24%	43 6%	0 0%	12 2%	674 100%
Huntingdon	TAUGHT AS INTEGRATED STUDIES						
Robin Hood	254 66%	42 11%	58 15%	23 6%	0 0%	8 2%	385 100%
Friar Tuck	89 60%	12 8%	37 25%	1 1%	0 0%	9 6%	148 100%
Alan Adale	TAUGHT AS INTEGRATED STUDIES						
TOTAL %	675 55.9%	179 14.8%	257 21.3%	67 5.6%	0 0%	29 2.4%	1207 100%

Figure 13.11

PUPILS' CONTACTS AND RESPONSES: percentages of contacts and responses at four cognitive levels in five year 1 secondary classes broken down subject by subject

v) English

	C	RO	R1	R2	R3	RW	TOTAL
Will Scarlet	298 48%	106 17%	189 30%	10 1%	0 0%	20 3%	623 100%
Huntingdon	295 50%	119 20%	171 29%	1 0%	0 0%	2 1%	588 100%
Robin Hood	254 69%	4 1%	52 14%	43 12%	3 1%	14 4%	370 100%
Friar Tuck	83 22%	82 22%	200 53%	2 1%	0 0%	7 2%	374 100%
Alan Adale	158 30%	102 20%	247 48%	7 17%	2 0%	3 1%	519 100%
TOTAL %	1088 43.9%	413 16.7%	859 34.8%	63 2.5%	5 0.2%	46 1.9%	2474 100%

Figure 13.12

PUPILS' CONTACTS AND RESPONSES: percentages of contacts and responses at four cognitive levels in five year 1 secondary classes broken down subject by subject

vi) Mathematics

	C	RO	R1	R2	R3	RW	TOTAL
Will Scarlet	265 53%	44 9%	110 22%	42 8%	2 0%	36 7%	499 100%
Huntingdon	386 81%	74 16%	14 3%	0 0%	0 0%	0 0%	474 100%
Robin Hood	255 65%	46 12%	72 18%	18 5%	0 0%	5 1%	396 100%
Friar Tuck	205 37%	94 17%	241 43%	0 0%	0 0%	19 3%	559 100%
Alan Adale	440 50%	262 30%	151 17%	0 0%	0 0%	26 3%	879 100%
TOTAL %	1551 55.3%	520 18.5%	588 20.9%	60 2.1%	2 0.1%	86 3.1%	2807 100%

Figure 13.13

PUPILS' CONTACTS AND RESPONSES: percentages of contacts and responses at four cognitive levels in five year 1 secondary classes broken down subject by subject

vii) Geography

	C	RO	R1	R2	R3	RW	TOTAL
Will Scarlet	78 28%	40 14%	106 38%	31 11%	0 0%	22 8%	277 100%
Huntingdon	TAUGHT AS INTEGRATED STUDIES						
Robin Hood	420 94%	28 6%	0 0%	0 0%	0 0%	0 0%	448 100%
Friar Tuck	53 27%	45 23%	87 44%	0 0%	0 0%	0 0%	197 100%
Alan Adale	TAUGHT AS INTEGRATED STUDIES						
TOTAL %	551 60%	113 12.1%	193 20.8%	31 3.4%	0 0%	34 3.7%	922 100%

Figure 13.14

PUPILS' CONTACTS AND RESPONSES: percentages of contacts and responses at four cognitive levels in five year 1 secondary classes broken down subject by subject

viii) Music

	C	RO	R1	R2	R3	RW	TOTAL
Will Scarlet	9 4%	59 24%	156 64%	13 5%	0 0%	6 3%	243 100%
Huntingdon	75 43%	39 22%	50 29%	2 1%	0 0%	9 5%	175 100%
Robin Hood	174 49%	42 12%	125 35%	8 2%	0 0%	3 1%	352 100%
Friar Tuck	36 17%	44 21%	109 53%	0 0%	0 0%	17 8%	206 100%
Alan Adale	90 13%	108 16%	398 59%	0 0%	0 0%	79 12%	675 100%
TOTAL %	384 23.2%	292 17.7%	838 50.8%	23 1.4%	0 0%	114 6.9%	1651 100%

Figure 13.15

PUPILS' CONTACTS AND RESPONSES: percentages of contacts and responses at four cognitive levels in five year 1 secondary classes broken down subject by subject

ix) Integrated Studies

	C	R0	R1	R2	R3	RW	TOTAL
Will Scarlet	NOT TAUGHT						
Huntingdon	540 33%	312 19%	650 40%	29 2%	0 0%	82 5%	1613 100%
Robin Hood	NOT TAUGHT						
Friar Tuck	NOT TAUGHT						
Alan Adale	216 34%	188 30%	160 25%	6 1%	0 0%	58 9%	628 100%
TOTAL %	756 33.8%	500 22.3%	810 36.1%	35 1.6%	0 0%	140 6.2%	2241 100%

CHAPTER 14

PERCEIVED BRIGHT PUPILS AND SLOW LEARNERS: A COGNITIVE ANALYSIS OF THEIR CONTRIBUTIONS TO LESSONS IN FIVE MIXED ABILITY CLASSES

The nature of the investigation

The picture painted so far has been a fairly depressing one of a lack of cognitive stimulation in the classrooms of our five schools in the main study. These first year pupils were involved, even by quite lively and conscientious teachers, in a large proportion of factual transactions, in a context where management intruded heavily into time when thinking and learning could have been taking place. Differential provision for exceptional pupils, both bright and slow, has emerged as minimal. But it is opportune to examine the targets of teacher contacts and the reactors in more detail to see exactly how perceived slow learners and perceived bright pupils fit into this picture.

The pupils involved in the C, R0, R1, R2, R3 and RW codes of the analysis system were logged individually by the observer. It was thus possible to make some assessment of whether interaction was elicited more often from able or slow pupils than from others; and to assess whether the higher cognitive categories R2, R3 were particularly associated with able pupils. Thus the results shown in Chapter 13 will be re-examined now to explore the contributions of those pupils nominated as exceptional by the teachers themselves. Before embarking on this, however, it is necessary to return to a thread of argument which ran through Chapter 4, especially 4B.

In Chapter 4, which described background research into mixed ability teaching, it emerged that teachers identified <u>two</u> groups of pupils as causing them concern: the bright and the slow. However, and this is an important point, while viewing the causes of the problem as different in each case the symptoms they described were identical. These pupils often faced periods of dead time; the able because they completed a job quickly but well, the slow because they wrote a sentence only or could not get started at all. Both were now unoccupied. For unoccupied pupils boredom sets in. When boredom is frequent there is a loss of interest, and though bright pupils are more tolerant of this both groups may become disruptive as a result.

This was the reconstruction of classroom events described repeatedly by teachers and leading to a "typical" mixed ability lesson observed in the case studies which began with a whole class input; the teacher set everyone a task, then average pupils plodded through the tasks, the teacher had to set more work for the able and get the slower ones started, before the whole class came back together for the final period of lesson.

Given this state of affairs, along with what we know from experience and the literature about the need for differential provision for the exceptional pupils, we should expect able and less able pupils to interact more than others with the teacher. In this respect we might hypothesize that bright and slow pupils, i.e. the exceptional pupils, **however exceptional**, would tend to have more interaction with the teacher. But, **in addition**, we might also expect the higher level transactions (R2, R3) to be elicited from the able group only. The question remains: do the facts of the situation support these informed guesses?

Figures 14.1, 14.2, 14.3, 14.4 and 14.5 set out the C and R transactions for the five schools of the main sample. Total transactions are summated under the heading 'Raw total'. Some pupils were absent for one or more lessons: the number is recorded in the 'Abs' column. Therefore, these raw scores are adjusted proportionately ('Adj. total' column) to take account of these absences. Some pupils missed all lessons in a complete subject area. These pupils are indicated with an asterisk and, though their scores for remaining lessons are shown, they are not included in the calculations described below. Those pupils perceived as bright (BP) and slow (SL) by teachers (see Chapter 9), are indicated by the appropriate letters in the left-hand margin.

Figure 14.1

Combined pupil responses and contacts

Will Scarlet	C	RO	R1	R2	R3	RW	Abs	Raw Total	Adj Total		Rank
* Jason	17	2	4	1	0	1	16	25	(50)	(27)	
Mark	26	1	26	10	0	6	0	69	69	25	22
Richard	37	19	16	12	0	1	0	85	85	21	18
Edward	39	9	45	23	0	14	5	130	154	10	10
* Neil	49	13	35	6	0	5	0(+ 6)	108	(108)	(18)	
Timothy	62	17	39	4	0	1	1	123	129	13	11
SL Shaun	121	90	87	18	0	16	1	332	347	1	1
Phillip	80	37	69	13	1	10	0	210	210	7	7
Steven	24	6	16	8	0	3	5	57	71	22=	19=
Michael	105	21	63	19	0	13	0	221	221	6	6
SL Martin	124	93	33	3	0	6	4	259	281	2	2
SL*Simon	76	21	19	3	0	6	1(+ 2)	125	(131)	(12)	
Leigh	29	5	12	8	0	0	0	54	54	26	23
David	81	59	58	14	0	14	2	226	241	4	4
	870	393	522	142	1	96	35(+ 8)	2024	2151		
Helen	71	13	24	8	0	1	0	117	117	15	13
Lisa	48	8	83	37	0	18	0	194	194	8	8
Rebecca	39	4	30	17	0	5	0	95	95	20	17
Stella	25	3	7	1	0	0	0	36	36	28	24
Lorraine	114	69	58	12	0	12	0	265	265	3	3
BP Rachel	28	1	50	27	0	4	0	110	110	17	15
Judith	15	5	21	11	0	3	5	55	70	24	21
BP Julia	20	0	27	22	0	2	0	71	71	22=	19=
Louise	87	47	69	12	0	17	1	232	237	5	5
Anne	38	6	34	14	1	7	0	100	100	19	16
Catherine	46	20	15	6	0	2	7	89	116	16	14
Heather	61	10	28	12	0	10	1	121	124	14	12
* Lyn	73	15	27	12	0	9	0(+ 2)	136	(136)	(11)	
BP Linda	51	12	57	29	0	4	2	153	161	9	9
GIRLS	716	213	530	220	1	94	16(+ 2)	1774	1832		
BOYS	870	393	522	142	1	96	35(+ 8)	2024	2151		
TOTAL	1586	606	1052	362	2	190	51(+10)	3798	3983		
* EXCLUDE	215	51	85	22	0	21	17(+10)	394	425		
NEW TOTALS	1371	555	967	340	2	169	34(+ 0)	3404	3558		

Figure 14.2

Combined totals of pupil responses and contacts

	C	RO	R1	R2	R3	RW	Abs	Raw Total	Adj Total	Rank
John	88	83	98	13	0	8	1	240	247	4
Kevin	41	19	21	3	0	1	0	85	85	24 (23)
Andrew	89	27	44	11	0	6	0	177	177	9
Simon	88	30	80	29	0	9	3	236	264	3
SL Chris	55	38	38	5	0	11	6	147	159	14
Paul	62	39	77	5	0	4	0	187	187	8
BP Christopher	90	37	80	14	0	5	1	226	239.5	6
Mark	76	28	32	6	0	4	3	146	169	12
Dale	43	15	66	12	0	5	5	141	172.5	10
Nicholas	45	12	25	7	0	2	1	91	94	23 (22)
Tim	77	51	70	6	0	13	11	217	310.5	2
Peter	28	8	62	16	0	3	0	117	117	18
Ian	109	12	35	6	0	8	0	170	170	11
* Craig	39	13	28	0	0	5	13	85	114	/Missed all maths/
	930	362	756	133	0	84	(44)	2265	2505.5	
Samantha	80	64	64	4	0	9	3	221	240.5	5
Jenny	41	20	48	22	0	2	0	133	133	15
Amanda	85	40	66	11	0	9	0	211	211	7
Louise	55	11	25	3	0	1	0	95	95	22 (21)
Joanne	67	16	30	5	0	0	2	118	126	16
Maria	42	20	44	2	0	11	9	119	160	13
Tina	25	4	29	6	0	2	4	66	74	25 (24)
Marie	39	18	22	6	0	2	4	87	95.5	21 (20)
Angela	116	62	81	22	0	5	5	286	337	1
Debra	47	17	35	6	0	0	0	105	105	20 (19)
Lisa	68	6	22	7	0	2	4	105	118	17
Valerie	118	32	59	10	0	5	2	224	249	
GIRLS	783	310	525	104	0	48	33	1770	1944	
BOYS	930	362	756	133	0	84	44	2265	2505.5	
TOTALS	1713	672	1281	237	0	132	77	4035	4449.5	
*Exclude Craig (missed all maths)	39	13	28	0	0	5	13	85	114	
TOTALS	1674	659	1253	237	0	127	64	3950	4335.5	

Figure 14.3

Robin Hood

	C	RO	R1	R2	R3	Abs	Raw Total	Adj. Total	Rank
James	65	6	26	18	0	1	115	118	17=
BP Simon	105	10	47	30	1	3	193	212	4
BP Andrew	164	39	56	24	1	1	284	293	1
Mark	112	4	38	11	0	1	165	170	11
John	82	5	49	12	4	0	152	152	12
SL Nigel	159	14	35	0	0	2	208	221	3
SL Chris	143	14	33	2	0	2	192	204	6
Paul	53	4	27	5	0	7	89	113	19
Ian	97	4	51	9	0	4	161	184	8
BP Robert	101	4	49	27	1	0	182	182	9
Royston	60	8	25	4	1	9	98	136	15
BP Guy	149	2	49	11	0	0	211	211	5
Richard	105	16	38	13	1	0	173	173	10
Adrian	52	2	25	5	0	2	84	90	22
	1447	132	548	171	9	32	2307	2459	-
Pauline	61	1	22	3	0	0	87	87	23
Teresa	97	10	38	8	0	6	153	188	7
Julie	85	4	22	7	0	0	118	118	17=
Helen	64	0	27	4	0	0	95	95	21
Sandra	104	3	40	10	0	0	147	147	14
Helene	78	1	24	4	0	0	107	107	20
Susan	112	2	32	3	0	0	149	149	13
Nicola	87	4	22	2	0	4	115	131	16
Lisa	112	10	64	21	4	3	209	231	2
GIRLS	800	35	291	62	4	13	1180	1253	-
BOYS	1447	132	548	171	9	32	2307	2459	-
TOTAL	2247	167	839	233	13	45	3487	3712	

Figure 14.4

EXCLUDING SCIENCE

Combined totals of pupils responses and contacts

Friar Tuck	C	RO	R1	R2	R3	RW	Abs	Raw Total	Adj Total	Rank
Edmund	7	4	39	0	0	6	1	56	59	23
Richard	46	56	113	0	0	11	0	226	226	1
Andrew	25	21	52	0	0	8	0	106	106	9=
Daryl	9	7	42	0	0	5	0	63	63	20=
Stephen	25	18	80	0	0	14	0	137	137	3
Shaun	23	14	55	0	0	10	0	102	102	11
Antony	11	9	49	0	0	4	1	73	74	18
Russell	22	13	59	0	0	7	0	101	101	12
SL Timothy	44	26	81	1	0	16	0	168	168	2
SL Adrian	11	6	32	0	0	6	0	55	55	25
Keith	9	7	14	0	0	0	2	30	35	28
Andy	28	19	52	0	0	10	0	109	109	8
Tim	33	16	41	0	0	6	0	96	96	14
John	4	3	52	0	0	4	0	63	63	20=
* Ian	2	0	10	0	0	4	14	16	31	(29)
Tony	39	18	49	0	0	13	0	119	119	6
	338	237	820	1	0	124	18	1520	1544	
Karen	29	7	35	0	0	2	2	73	78	17
Lisa	28	37	61	0	0	7	0	133	133	4=
BP Kate	19	28	81	0	0	5	0	133	133	4=
Joan	21	9	49	0	0	9	0	88	88	15
Marie	20	10	26	0	0	4	0	60	60	22
Julie	24	10	39	1	0	6	5	80	98	13
Jane	4	2	17	0	0	0	1	23	25	31(30)
Dianne	21	10	50	0	0	7	2	88	106	9=
Veena	20	7	48	0	0	7	0	82	82	16
Hayley	10	3	16	0	0	2	7	31	52	26
Claire	16	9	35	0	0	7	0	67	67	19
SL Debra	18	9	27	1	0	3	7	58	114	7
Sally	8	1	19	0	0	2	0	30	30	30(29)
Alison	17	2	24	0	0	6	1	49	50	27
Debbie	20	16	19	0	0	0	1	55	57	24
GIRLS	275	160	546	2	0	67	26	1050	1173	
BOYS	338	237	820	1	0	124	18	1520	1544	
	613	397	1366	3	0	191	44	2570	2717	
*Exclude Ian (missed all history)	2	0	10	0	0	4	14	16	31	
TOTAL	611	397	1356	3	0	187	30	2554	2686	

Figure 14.5

Combined totals of pupils responses and contacts

Alan Adale	C	RO	R1	R2	R3	RW	Abs	Raw total	Adj total	Rank
BP Ian	141	91	116	1	0	7	0	356	356	2
Anthony	69	35	48	1	0	13	0	166	166	13
Stephen	14	6	34	0	0	3	0	57	57	27
Gary	64	44	56	0	0	10	10	174	268	4
Christopher	123	52	50	0	0	5	3	230	245	5
Ross	38	22	40	0	0	4	6	104	136	20
Stuart	22	11	29	0	0	3	0	65	65	25
Michael	43	33	67	0	0	18	1	161	168	12
Chris	31	20	26	0	0	7	2	84	92	23
Alan	45	38	38	1	0	7	1	129	137	19
Ed	101	71	71	2	0	20	2	265	286	3
Wayne	76	38	50	0	0	8	8	172	221.5	7
Mark	42	12	54	1	0	7	1	116	119	21
Ivan	60	28	29	0	0	19	7	136	196	10
Paul	85	60	67	0	0	7	0	219	219	8
	954	561	775	6	0	138	(41)	2434	2731.5	
Anne	77	27	52	0	0	15	0	171	171	11
Gail	26	14	28	0	0	4	4	72	86	24
Marie	56	21	57	2	1	7	1	144	150	18
Tina	18	10	33	0	0	2	1	63	64	26
Samantha	13	24	25	0	0	1	9	63	105	22
SL Satwant	129	128	80	0	0	25	1	362	373	1
Paula	63	30	58	0	0	5	1	156	164	14
Sandra	67	38	74	4	0	3	3	186	211	9
Jane	59	32	38	0	0	10	3	139	162	15=
Lynn	56	40	53	0	0	13	0	162	162	15=
Kim	43	47	61	0	0	9	0	160	160	17
BP Bronwen	68	45	64	1	1	3	4	182	226	6
GIRLS	675	456	623	7	2	97	(27)	1860	2034	
BOYS	954	561	775	6	0	138	(41)	2434	2731.5	
TOTALS	1629	1017	1398	13	2	235	(68)	4294	4765.5	

The findings of the investigation

i) Exceptional pupils and frequency of teacher interaction

If one looks at the adjusted total column it is clear that pupil contacts, initiations and responses are much more frequent events in the lives of some pupils than others. When the pupils are rank ordered by frequency of contact with response to the teacher (highest number = 1st) what strikes one immediately is that in many cases the pupils in the exceptional group (BP + SL) come out at or near the top of the rankings, thus:

Will Scarlet:	Shaun	(SL)	1st	out of 24
	Martin	(SL)	2	
	Linda	(BP)	5	
	Rachel	(BP)	15	
	Julia	(BP)	19	
Huntingdon:	Chris	(SL)	3	out of 24
	Christopher	(BP)	6	
Robin Hood:	Andrew	(BP)	1	out of 23
	Nigel	(SL)	3	
	Simon	(BP)	4	
	Guy	(BP)	5	
	Chris	(SL)	6	
	Robert	(BP)	9	
Friar Tuck	Timothy	(SL)	2	out of 30
	Kate	(BP)	4	
	Debra	(SL)	7	
	Adrian	(SL)	25	
Alan Adale	Satwant	(SL)	1	out of 27
	Ian	(BP?	2	
	Bronwen	(BP)	6	

Since these pupils were regarded as a single group it was appropriate to use a simple t-test of significance to discover in each school whether the number of C/R interactions was significantly higher in statistical terms for the exceptional group as compared with the middle band pupils. The results of these tests are as follows:-

at Will Scarlet	t = 1.42
at Huntingdon	t = 0.5145
at Robin Hood	t = 4.304
at Friar Tuck	t = 1.43
at Alan Adale	t = 4.027

In two cases these results are significant: in Robin Hood and Alan Adale schools. Both results are significant at the 1% level.

From this it seems fair to conclude that teachers in these two locations do indeed regard the exceptional pupils as a single identifiable group, from which increased interaction is elicited.

At Will Scarlet, Huntingdon and Friar Tuck schools, the exceptional pupils are not treated to significantly more interaction with teachers even though the teachers are aware of their presence in the class. They do not, in quantitative terms, consume a disproportionate amount of teacher time, therefore; even though they may have, as individuals, some special and distinctive educational needs. In these schools 'teaching to the middle' appears to predominate.

The next section looks briefly at quality and interaction as opposed to its quantity.

ii) Bright pupils and the higher levels of cognitive stimulus

Do bright pupils interact with teachers at the higher cognitive levels R2 and R3 more often than other pupils in the class?

In the case of Alan Adale school and Friar Tuck school the answer is clearly: No. There is virtually no R2 and R3 interaction. At Huntingdon there is only one perceived bright pupil (Christopher), his total R2 and R3 score is lower than that of some other pupils, and the conclusion is therefore similar.

When the bright pupil group is compared with the rest at Will Scarlet school we find t = 2.946, significant at the 0.01 level.

When the bright pupil group is compared with the rest at Robin Hood school we find t = 4.67, which is significant at the 0.01 level.

The clear implication of this finding is that in two schools teachers are going some way to bring out the cognitive abilities of their first year pupils in the mixed ability classes studied. This is happening albeit in a limited way in Will Scarlet and Robin Hood schools. It is not happening in the other three schools, and apparently in two cases because almost no cognitive demand is being made at all on any pupils.

iii) Boys, girls and teacher interaction

One other trend is discernible in the raw data in tables 14.1-14.5. It is that boys apparently have more contact/response interactions with teachers than girls. If the adjusted totals for boys and girls in each school are divided by the number of pupils in each case (omitting the scores of pupils asterisked), the results appear as follows:

Average no. contacts*

	with boys	with girls	difference between means
Will Scarlet	169	130	39
Huntingdon	184	162	22
Robin Hood	176	139	37
Friar Tuck	103	78	25
Alan Adale	182	170	12

In no case, however, is the difference between boys' scores and girls' scores statistically significant.

Will Scarlet	$t = 1.156$
Huntingdon	$t = 0.615$
Robin Hood	$t = 1.751$
Friar Tuck	$t = 1.49$
Alan Adale	$t = 0.390$

iv) Summary

This chapter has suggested, then, that in our study schools

1. exceptional pupils (BP and SL) engaged in more contact/ responses with teachers than other pupils in two schools (results in those cases significant at the 1% level).

2. in some schools teachers are able to encourage bright pupils in appropriately high levels of cognitive activity for a significantly greater proportion of time than is the case with other pupils. (Results significant at 1% level in two cases).

3. teachers seem consistently to elicit more contacts/responses with boys than girls, though the differences are <u>not</u> statistically significant.

4. Teachers at Robin Hood school were conscious of exceptional pupils and provided extra opportunities for their learning in both quantity and quality of teacher-pupil interaction.

* to nearest decimal place

CHAPTER 15

THE COGNITIVE DEMAND OF ORAL COMPONENTS IN LESSONS IN OTHER EDUCATIONAL SETTINGS

When the present research began a reasonable set of expectations would have been that teachers in mixed ability classes use a variety of teaching modes in order to provide opportunities for perceived exceptional pupils to work at appropriate levels; that they direct differing and appropriate levels of talk at the children who form these groups; and that the overall stimulation in a lesson, as signalled in its oral components, would take account of all pupils including those perceived as able.

So far, what the research has documented is the almost total negative of this expectation. Whole class teaching predominates, and cognitive demand is minimal. Pupils respond in kind.

It was not possible to spend a great deal of time extending the research in order to discover how widespread are the phenomena described. However, for the sake of completeness, it was decided to select one middle school and one primary school which also used a mixed ability organization. Two schools were chosen on the basis of recommendation by knowledgeable tutors and both headteachers agreed to be involved. A fourth year middle school class was observed, the children being equivalent in age to the secondary pupils, i.e. 11-12 years. A third year primary group was also observed, with pupils aged 9-10 years.

It is not suggested that the results of this observation can be in any sense generalizable; they serve solely as a comparison on which questions for a more detailed comparative study might be based.

An important purpose in replicating this study in a varied sample (albeit a small one) of educational settings apart from the first year mixed ability classes of the main study was to see whether the instruments themselves were usable in these alternative settings.

Clearly, to regard the research instruments and methodology as effective for analyzing the interactions in these alternative settings, it was necessary to discover whether the individual measures (of teaching mode and teacher talk, of teacher questions and pupils' responses, and of classroom tasks) could be used without amendment to explore the interactions in progress. Additionally, it was felt that, if effective, the measures would highlight the differences between these classroom settings as well as the likenesses.

Thus there was a two-fold purpose to this phase of the research. First, to test out the applicability of the instrument for cognitive research across a range of classrooms. Secondly, to generate some additional data for comparison with the findings of the main study.

This chapter and the next report make use of the comparative data, with the emphasis on describing the cognitive events in the studied classrooms for all pupils rather than as an exploration of the particular teacher strategies for dealing with exceptional pupils within those classes.

The research methods were exactly parallel to those used in the main study. The researcher watched for an equivalent period of time using precisely the same techniques. Naturally, in the primary school only one teacher, the class teacher, was observed; while the middle school operated a system of semi-specialists. Some detail about the schools is omitted from the descriptions which follow, since these two schools would be easily identifiable to anyone familiar with the East Midlands area.

Little John Primary School

Little John Primary School is a modern open-plan building set amidst a new middle-class housing estate in a dormitory village on a main road between two major towns. The families whose children come here are obviously affluent, a glance at the mothers meeting pupils at the gate in the recently-registered second cars confirms this. The headmaster reports them to be concerned and supportive.

The school itself is open-plan; though classroom areas can be isolated. The teacher has had more than ten years' experience, and is regarded as an able colleague.

The classroom is tidy and well set out. There appears to be no lack of resource books and materials. Walls are laden with pupils' work.

During the observation period basic numeracy and literacy skills were taught; as well as a topic about homes and houses. Pupils are not precocious, but individually are able to converse intelligently about what they are doing.

It has to be said that this teacher is by no means happy about being observed, and though polite did not go out of her way to be specially helpful. In all cases, results of the observations were fed back to individual involved teachers. This lady refused to become involved in any discussion at all about what was observed.

In this and the other studies described in this chapter no attempt was made to get to know all pupils' names (there simply was not time) and so it was not possible to analyse the questions directed at, and responses given by, individual pupils. The scope of the enquiry was simply to discover if overall levels of cognitive stimulation were similar to those in the main study.

Maid Marion Middle School

Maid Marion School accepts pupils at 8 years old and transfers them to secondary schools at twelve plus. Buildings are crammed onto a small site, some modern and others typical of the 1905 red-brick style. Internally, there are good facilities such as craft areas; but classroom space as such is limited.

The head was amenable to the school being used simply on a comparative basis, attitudes among the staff varied.

Pupils were pleasant and easy-going; their work of an average standard and displayed throughout the school.

Catchment area is extremely varied. Red-brick Industrial Revolution housing provides a sizeable proportion of children from the poorer end of the working classes. But the special location of the school also ensures an intake of pupils from professional families of high social standing in the community.

The Sheriff: a third comparative study

Little John and Maid Marion provide an interesting comparison since they are of pupils from mixed ability classes not too far removed from the ages of youngsters in the main study.

In addition, the opportunity arose to look at a special group in another secondary school, code-named The Sheriff.

The Sheriff is a large (1100) purpose-built comprehensive on the suburban outskirts of town, in a mixed catchment area, and in pleasant surroundings. Facilities are excellent. The school has a long-standing reputation as a place for examination successes. The headmaster attempts to sustain this image. He has established an accelerated group: fourth year pupils accelerated to take 'O' level examinations a year ahead of schedule.

The accelerated group is taught exclusively by senior staff, mostly heads of department. Results are excellent, with many pupils in past years achieving seven passes a year early.

Clearly this is a 'perceived bright group'; and using the same methods as those for the main study group's teaching/learning experience is examined here.

Discussion

In the figures which follow, comparisons are made between lessons in the five main sample schools and those three described here.

Teaching mode

Figures 15.1-15.5 deal with teaching mode. Fig. 15.1 shows distribution of time between the four teaching modes already described in each kind of educational setting.

In the primary class observed what is striking is how little time (just 27%) is spent in whole class work. Individualized learning is the predominant teaching mode (42%); and individualized learning and educational groupwork account for 56% of teaching time. It seems reasonable to assume that there is considerable potential for meeting the needs of exceptional pupils, bright and slow, in this system.

The middle school continues a proportion of individualized learning (26.9%); but undifferentiated teaching (whole class + G1) account for all the rest of the teaching time. Heads in this middle school system generally claim that they try to accustom pupils at the top of the school to the same kind of learning situation they will encounter in the comprehensive scheme. The figures here suggest they mirror the comprehensive system very accurately.

In the G.C.E. accelerated set all work is undifferentiated, 92.7% simply whole class teaching.

Figure 15.2 gives a breakdown of the percentages for the middle school, showing how the time was spent in a little more detail. This process is continued in 15.3 where individual subjects are examined. Home Economics and mathematics are high in individualized learning, while the R.E., French and English observed were totally whole class in nature. In 15.4 a subject breakdown for the Acclerated Set is shown. The predominance of whole class teaching here is an issue taken up again in the discussions which follow in this chapter and Chapter 18.

Teacher talk

Figures 15.6-15.9 summarize cognitive levels of teacher talk across the range of educational settings studied.

Higher level talk (T2, T3) occurs relatively frequently in both the G.C.E. 4th year accelerated set and in the primary class. It might well have been hypothesized that the 'O' level group result would be thus; it seems strange that the primary teacher should have stretched her pupils through her verbal transactions more than do the comprehensive and middle school staff.

It is worth speculating that the frequency of higher level demand in the primary class may be in part due to the integrated nature of the curriculum. It is suggested elsewhere that such integrated approaches may raise the level of dialogue in a search for connections and comparisons.

Teachers' questions

Figure 15.10 examines the 831 teacher questions asked during the study period at Maid Marion Middle School. These show the following pattern compared with the five schools of the main sample:

	Middle School	Main Sample
Management questions (QO)	36.8%	20.9 %
Lower order questions (Q1,2)	61.2%	75.5 %
Higher order questions (Q3,4,5,6)	2 %	3.6 %

Figure 15.11 looks at the questions asked (total 1,412) in the observed period in the accelerated set at the Sheriff. Fewer (13.3%) are devoted to management, but 61.2% are lower order - the same proportion as in Maid Marion. The questions gained from the management area turn up as application and analysis questions, a promising 25.5% higher order questions in this perceived bright group.

A summary of findings is given in Fig. 15.12. Here it will be seen that management questions have come out at 28% and lower order questions at 63%.

The conclusion drawn from Fig. 15.12 must be that first year mixed ability classes, those in middle and primary schools (in so far as the study schools are typical) exhibit a tendency for teachers to spend nearly 30% of their questions on management, 60% on lower order reinforcement, and about 10% or a little below on stimulating higher order thinking. In the perceived bright group taking 'O' level management is less important (probably motivation is generally higher) and cognitive demand rises proportionately. The question one must ask one's self is whether something nearer this balance should apply also to the bright pupils, at least in the middle and comprehensive schools, who find themselves in mixed ability groups but lacking any significant cognitive demands.

Pupil contacts, responses and initiatives

Figures 15.13-15.16 examine the cognitive demand of lessons as evidenced in pupil talk.

In the primary school most pupil talk is of the contact (C) variety (81%) and 'oils the works of classroom life' as has been described earlier.

In the middle school setting the C code and overt management (RO) account for 55% of all pupil talk transactions. Pupil talk about work is fact-dominated (36.3%). Almost none (1.3%) is about concepts or generalizations. Wrong answers are offered at a frequency not dissimilar from that recorded in comprehensive school classes (7.4%).

Fig. 15.16 compares the main study schools with those of the comparative sample. The individualized learning and educational groupwork of Little John Primary clearly affects the kinds of talk pupils indulge in. In all other locations management (C + RO) ranks highly, with factual talk in second place. In all schools except the Sheriff higher order pupil talk (R2, 3) is quite rare, but just as the low cognitive demand of teacher questions signalled to pupils in the main sample that they should respond in kind, so the higher order questions at Sheriff do produce an increase in pupil talk at the conceptual level (32%). The slight increase in wrong answers may reflect the increased speculation and hypothesizing which is taking place in response to these intellectually more demanding questions.

Summary

This survey of results from a comparative study, albeit small scale, has been instructive.

It has thrown up clear differences in teaching mode between a primary school, first year comprehensive classes, and an accelerated group tackling 'O' level. Some of these differences have been associated with differences in quantities of verbal transactions at various cognitive levels.

The picture is complicated by age-factors. But it does seem that higher order thinking (as evidenced in teacher questions and pupil responses) can take place even within the restrictions imposed by whole class teaching if the group concerned is relatively homogeneous, in this case an able group. It also suggests that the hypothesis that a teacher gives verbal signals about cognitive level of response through his own questions and talk is probably valid. The implication of this is that, by improving question technique and general awareness of levels of cognitive demand, it would be possible for teachers to make work more appropriate for able pupils in mixed ability classes.

In the next few chapters there will be some consideration of a) whether and how teachers differentiate oral demands made upon the most and least able pupils in their classes and b) how the 'consciousness-raising' for teachers mentioned in the last paragraph might be undertaken.

Figure 15.1

TEACHING MODE in 4 kinds of classes

Type of class	Whole Class	Groupwork 1	Groupwork 2	Individualized learning
Primary class (10+ year olds)	27%	16%	14%	42%
Middle school (11-12 year olds)	59.6%	13.5%	0%	26.9%
First year secondary classes (11-12 year olds)	62.1%	16.8%	7%	14.1%
GCE accelerated set (14-15 year olds)	92.75%	7.25%	0%	0%

Figure 15.2

TEACHING MODE: Summary of time spent on each of four teaching modes in a fourth year middle school class

	Whole Class	Groupwork 1	Groupwork 2	Individualised learning
minutes	708	160	0	319
percentage of total time	59.6%	13.5%	0%	26.9%
percentage spent in 5 first year mixed ability classes - for comparison	62.1%	16.8%	7%	14.1%
percentage spent in a fourth year 'O' level accelerated group	92.75%	7.25%	0%	0%

Total time observed 1,187 mins (19hrs 47mins)

Figure 15.3

TEACHING MODE (subject by subject) in a fourth year middle school class (all figures percentages)

RE	wh.cl.	100
	Groupwork 1	0
	Groupwork 2	0
	indiv.	0
French	wh.cl.	100
	Groupwork 1	0
	Groupwork 2	0
	indiv.	0
Science	wh.cl.	22
	Groupwork 1	78
	Groupwork 2	0
	indiv.	0
English	wh.cl.	100
	Groupwork 1	0
	Groupwork 2	0
	indiv.	0
Maths	wh.cl.	18
	Groupwork 1	0
	Groupwork 2	0
	indiv.	82
Integrated Studies	wh.cl.	39
	Groupwork 1	11
	Groupwork 2	0
	indiv.	50
Art and Craft	wh.cl.	66
	Groupwork 1	0
	Groupwork 2	0
	indiv.	34
Home Economics	wh.cl.	22
	Groupwork 1	0
	Groupwork 2	0
	indiv.	78

Figure 15.4

TEACHING MODE (subject by subject)
in a first year '0' level accelerated set
(all figures percentages)

RE	wh.cl. Group 1 Group 2 indiv.	100 0 0 0
French	wh.cl. Group 1 Group 2 indiv.	93 7 0 0
Science subjects	wh.cl. Group 1 Group 2 indiv.	100 0 0 0
History	wh.cl Group 1 Group 2 indiv.	100 0 0 0
English	wh.cl. Group 1 Group 2 indiv.	98 2 0 0
Maths	wh.cl. Group 1 Group 2 indiv.	84 16 0 0
Geography	wh.cl. Group 1 Group 2 indiv.	81 19 0 0

Figure 15.5

TEACHING MODE: Summary of time spent on each of 4 modes in a 4th year 'O' level accelerated set

	Whole Class	Groupwork 1	Groupwork 2	Individualized learning
minutes	1,331	104	0	0
percentage of total time	92.75%	7.25%	0%	0%
percentage spent in 5 first year mixed ability classes for comparison	62.1%	16.8%	7%	14.1%

Total time observed 1,435 minutes = 23hrs. 55mins.

Figure 5.6

TEACHER TALK: percentages of teacher talk at four cognitive levels in a primary class

	TO	T1	T2	T3	TOTAL
Number of units	203	118	59	0	380
% of total	53	31	16	0	100%

Figure 15.7

TEACHER TALK: percentages of talk at four cognitive levels in a fourth year middle school class broken down subject by subject

	T0	T1	T2	T3	TOTAL
R.E.	21	79	0	0	100
French	50	50	0	0	100
Science	71	25	4	0	100
Humanities	53	33	12	2	100
English	81	19	0	0	100
Mathematics	69	29	4	0	100

Figure 15.8

TEACHER TALK: percentages of talk at four cognitive levels in an 'O' level accelerated group, broken down subject by subject

	TO	T1	T2	T3	TOTAL
R.E.	12	74	13	0	100
FRENCH	37	54	8	0	100
BIOLOGY	22	51	26	1	100
CHEMISTRY	24	41	35	0	100
PHYSICS	10	67	23	0	100
HISTORY	24	26	44	6	100
ENGLISH	36	48	16	0	100
MATHEMATICS	26	50	22	2	100
GEOGRAPHY	37	37	25	1	100

Figure 15.9

TEACHER TALK: percentage of talk at four cognitive levels in five first year secondary classes compared with a primary class, a middle school and a year 4 GCE accelerated set

School no. of transactions	TO	T1	T2	T3	TOTAL
Will Scarlet (2414)	46.2	49.8	3.93	0.07	100%
Huntingdon (2470)	47.1	48.7	4.2	0	100%
Robin Hood (1551)	67.4	25.0	7.6	0	100%
Friar Tuck (4043)	61.2	36.75	2.05	0	100%
Alan Adale (4590)	69.6	27.8	3.0	0.05	100%
Primary class 10-11 year olds (380)	53	31	16	0	100%
Middle school class (11-12) (1926)	61.4	33.2	4.9	0.5	100%
G.C.E. O level set (2324)	28.7	49.5	20.8	1.0	100%

This is a breakdown of 19,698 units of talk.

Figure 15.10

TEACHERS' QUESTIONS: percentages of questions at seven cognitive levels in a fourth year middle school class broken down subject by subject

	Q 0	Q1	Q2	Q 3	Q4	Q5	Q6	TOTAL
1.1 RE	2 3%	61 97%	0 0%	0 0%	0 0%	0 0%	0 0%	63 100%
1.2 French	21 25%	64 75%	0 0%	0 0%	0 0%	0 0%	0 0%	85 100%
1.3 Science	61 58%	43 41%	0 0%	2 2%	0 0%	0 0%	0 0%	906 100%
1.4 English	11 65%	6 35%	0 0%	0 0%	0 0%	0 0%	0 0%	17 100%
1.5 Mathematics	138 35%	242 61%	10 3%	7 2%	0 0%	0 0%	0 0%	397 100%
1.9 Humanities	73 45%	73 45%	10 6%	3 2%	2 1%	2 1%	0 0%	163 100%
TOTAL %	306 36.8%	489 58.8%	20 2.4%	12 1.4%	2 0.3%	2 0.3%	0 0%	831 100%

Figure 15.11

TEACHERS' QUESTIONS: percentages of questions at seven cognitive levels on a fourth year secondary GCE 'O' level accelerated set broken down subject by subject

	Q0	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
5.1 RE	12 18%	41 60%	6 9%	0 0%	9 13%	0 0%	0 0%	68 100%
5.2 French	45 14%	113 34%	71 22%	97 30%	0 0%	0 0%	0 0%	326 100%
5.3 Science Combined subjects	11 4%	161 66%	28 11%	15 6%	31 13%	0 0%	0 0%	246 100%
5.4 History	26 20%	37 28%	17 13%	0 0%	51 39%	0 0%	0 0%	131 100%
5.5 English	22 19%	45 39%	43 37%	0 0%	5 4%	0 0%	0 0%	115 100%
5.6 Mathematics	54 17%	99 31%	60 19%	32 10%	75 23%	0 0%	0 0%	320 100%
5.7 Geography	17 8%	71 34%	72 35%	40 19%	6 3%	0 0%	0 0%	206 100%
TOTAL %	187 13.3%	567 40.2%	297 21%	184 13%	177 12.5%	0 0%	0 0%	1412 100%

Figure 15.12

TEACHERS' QUESTIONS: percentages of teachers' questions at seven cognitive levels in five first year secondary classes compared with those in a primary class, a middle school class and a year 4 GCE accelerated set

School/ number of questions	Q0	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
Will Scarlet (1153)	12.4	46.1	32.8	7.3	1.4	0	0	100
Huntingdon (1522)	20.2	53.7	22.7	3.0	0.4	0	0	100
Robin Hood (828)	13.9	54	22	7.5	1.8	0	0.8	100
Friar Tuck (1417)	19.9	77	2.9	0.1	0.1	0	0	100
Alan Adale (1978)	30.1	67.1	2.4	0	0.4	0	0	100
Primary class 10-11 year olds (186)	28	40	23	8	1	0	0	100
Middle school class 11-12 year olds (831)	36.9	58.9	2.4	1.4	0.2	0.2	0	100
Secondary yr 4 GCE 'O' level set (1399)	13.4	40.5	20.5	13.9	11.6	0	0.1	100

(This breakdown is an analysis of 9,158 teacher questions.)

Figure 15.13

PUPILS' CONTACTS AND RESPONSES: percentage of contacts/responses at four cognitive levels in a primary school

C	RO	R1	R2	R3	RW	TOTAL
1305	121	151	39	0	4	1620
81%	7%	9%	2%	0%	0%	100%

Figure 15.14

PUPILS' CONTACTS AND RESPONSES: percentages of contacts/responses at four cognitive levels in a fourth year middle school class

	C	RO	R1	R2	R3	RW	TOTAL
1.1 RE	6 7%	1 1%	64 77%	0 0%	0 0%	12 14%	83 100%
1.2 French	1 1%	9 13%	52 78%	0 0%	0 0%	5 7%	67 100%
1.3 Science	69 51%	26 19%	25 19%	1 1%	0 0%	13 10%	134 100%
1.5 English	147 67%	6 3%	65 30%	0 0%	0 0%	1 0%	219 100%
1.6 Mathematics	165 34%	104 22%	174 36%	6 1%	0 0%	34 7%	483 100%
1.9 Humanities	63 30%	61 29%	54 26%	8 4%	0 0%	23 11%	209 100%
TOTAL	451 37.7%	207 17.3%	434 36.3%	15 1.3%	0 0%	88 7.4%	1195 100%

Figure 15.15

PUPILS' CONTACTS AND RESPONSES: percentage of contacts and responses at four cognitive levels in a fourth year secondary GCE accelerated set

	C	RO	R1	R2	R3	RW	TOTAL
5.1 RE	4 6%	2 3%	36 52%	32 32%	0 0%	5 7%	69 100%
5.2 French	6 2%	20 6%	145 42%	140 41%	0 0%	32 9%	343 100%
5.3 Science Combined subjects	1 0%	13 8%	92 55%	27 16%	0 0%	35 21%	168 100%
5.4 History	1 1%	0 0%	70 55%	48 38%	0 0%	9 7%	128 100%
5.5 English	4 5%	14 16%	46 53%	20 23%	0 0%	2 2%	86 100%
5.6 Mathematics	40 12%	15 4%	120 36%	119 36%	0 0%	40 12%	334 100%
5.7 Geography	33 16%	14 7%	88 42%	53 25%	0 0%	23 11%	211 100%
TOTAL	89 6.6%	78 5.8%	597 44.7%	429 32%	0 0%	146 10.9%	1339 100%

Fi gure 15.16

PUPILS' CONTACTS AND RESPONSES: percentages of pupils/contacts/responses at four cognitive levels in five first year secondary classes compared with those in a primary class, a middle school class and a fourth year GCE accelerated set.

School	C	R0	R1	R2	R3	RW	TOTAL
Will Scarlet (3798)	41.8	16	27.7	9.5	0	5	100
Huntingdon (4037)	42.4	16	31.8	5.9	0	3.3	100
Robin Hood (3734)	60.3	6	25.3	6.3	0.3	1.8	100
Friar Tuck (3100)	26.1	18.9	47.9	0.1	0	7	100
Alan Adale (4294)	37.9	23.9	32.6	0.3	0	5.5	100
Primary class	81	7	9	2	0	0	100
Middle school class	37.7	17.3	36.3	1.3	0	7.4	100
GCE set	6.6	5.8	44.7	32	0	10.9	100

CHAPTER 16

COGNITIVE DEMAND MADE BY THE ORAL COMPONENTS OF LESSONS IN A VARIETY OF EDUCATIONAL SETTINGS: A SUMMARY AND SOME IMPLICATIONS FOR RAISING TEACHER AWARENESS

Summary of the data

So far this thesis has looked at individual kinds of oral lesson transactions: teacher talk, teacher questions and pupil responses. Teacher talk was divided into transactions of four types (TO, 1, 2, 3); teachers' questions into seven types (QO, 1, 2, 3, 4, 5, 6); pupil responses into six types (C, RO, R1, R2, R3, RW). In the Figures which follow these seventeen components are set down as proportions of total verbal transactions in lessons.

Figures 16.1-16.9 set out all verbal transactions for the five schools of the main study, school by school and subject by subject.

Figure 16.10 draws together the relative proportions given to the 17 coded areas across the subject areas in the comprehensive school.

Figures 16.11, 16.12 and 16.13 give comparative figures from Little John Primary, Maid Marion Middle and the Sheriff's accelerated 'O' level set.

Figure 16.14 draws together all the findings.

When all the transactions are examined in context, the following observations can be made:

1) Management categories (T0, Q0, C, R0) are generally more frequent in first year comprehensive and middle school classes than in the accelerated set. Between them these categories account for a majority of transactions in first year secondary/middle school classes.

2) Information categories are next in frequency (T1, Q1, 2, R1), and predominate the learning process in all types of setting studied.

3) Higher order questions of types Q3, 4 are very infrequent, never above the 1.7% level in first year comprehensives.

4) Higher order questions of types Q5, 6 are negligible in the first year comprehensives.

5) The G.C.E. set shows a marked increase in higher level questions, Q4 at 11% in G.C.E. history being the largest subject score.

6) Wrong answers represent a range across school and subject area from 0% to 6% of all transactions.

Some implications for raising teacher awareness

During the analysis of data for this thesis there was continuing in-service training being carried out by the Teacher Education Project. The layout of the findings adopted in this chapter, where classroom transactions are coded into 17 kinds according to cognitive demand, suggested itself as a way for individual teachers to begin to analyse their own classroom performance and to raise their own awareness of classroom cognitive process. Therefore steps were taken to produce 'cognitive graphs of lessons'.

Figure 16.15 is a cognitive graph of one lesson given by one R.E. teacher to a first year mixed ability class. Let us assume that this teacher wishes, as part of an in-service programme, to look at his/her own level of cognitive demand on classes. By asking a colleague to observe him at work (observational pairing, see Chapter 1), or by tape-recording his lesson and playing it back later for analysis, he can discover this graph for himself. This alone is a consciousness-raising exercise, but it may be taken further. Suppose, for example, he were provided with the cognitive graph of R.E. teaching in the five first year mixed ability classes of this study. Using this graph as an overlay (Figure 16.16) he can now study how he differs from the pattern evinced from a large-scale study.

Other possible variations on the theme would be to compare graphs with a colleague; to use these graphs across the R.E. department; to persuade a cross-section of subject specialists to join in the exercise, and so on.

Apart from consciousness-raising this exercise demands that the participants should seek explanations for the differences evidenced between one graph and another, should discuss what verbal behaviour would constitute an improvement to teaching performance, and should go on to learn the skills (e.g. of higher order questioning) which might bring these improvements about.

The research described here was part of an underpinning operation, a fact-finding mission, to improve teacher performance. A hint of one such outcome is given here and it proved successful in practice [the idea was enshrined in an article by the author for British Journal of Religious Education, and has since been reprinted in John Hull's (1982) New Directions in Religious Education, Falmer Press]. The in-service training issues raised by the research are discussed further in the final chapter of the thesis.

Figure 16.1

Levels of cognitive transactions in five first year mixed ability classes compared subject by subject

1) R.E.

School	T0	T1	T2	T3	Q0	Q1	Q2	Q3	Q4	Q5	Q6	C	R0	R1	R2	R3	RW	TOTAL
Will Scarlet	85	53	5	0	6	37	12	0	0	0	0	135	45	57	5	0	11	451
Huntingdon	TAUGHT AS PART OF INTEGRATED STUDIES																	
Robin Hood	59	4	0	0	4	5	2	0	0	0	0	452	14	4	2	0	0	546
Friar Tuck	157	93	12	0	50	98	7	0	0	0	0	40	42	121	0	0	15	635
Alan Adale	TAUGHT AS PART OF INTEGRATED STUDIES																	
TOTALS	301	150	17	0	60	140	21	0	0	0	9	627	101	182	7	0	26	1632
%	18.4	9.2	1.0	0	3.7	8.6	1.3	0	0	0	0	38.4	6.2	11.2	0.4	0	1.6	100%

Figure 16.2

Levels of cognitive transactions in five first year mixed ability classes compared subject by subject

ii) FRENCH

School	T0	T1	T2	T3	Q0	Q1	Q2	Q3	Q4	Q5	Q6	C	R0	R1	R2	R3	RW	TOTAL
Will Scarlet	231	399	17	0	45	141	186	31	0	0	0	125	127	245	209	0	80	1838
Huntingdon	143	476	6	0	13	140	162	6	0	0	0	125	56	297	161	0	20	1605
Robin Hood	239	153	14	0	9	210	67	3	0	0	0	117	27	528	74	0	20	1461
Friar Tuck	494	581	9	0	20	382	6	0	0	0	0	107	78	571	0	0	112	2360
Alan Adale	534	326	17	0	43	267	2	0	0	0	0	322	138	252	0	0	58	1959
TOTALS	1641	1935	63	0	130	1140	423	40	0	0	0	796	426	1895	444	0	290	9223
%	17.9	21	0.7	0	1.4	12.4	4.6	0.4	0	0	0	8.6	4.6	20.5	4.8	0	3.1	100%

Figure 16.3

Levels of cognitive transactions in five first year classes compared subject by subject

iii) SCIENCE

School	TO	T1	T2	T3	Q0	Q1	Q2	Q3	Q4	Q5	Q6	C	R0	R1	R2	R3	RW	TOTAL
Will Scarlet	174	61	19	0	15	18	3	4	2	0	0	344	60	25	9	0	3	737
Huntingdon	92	88	55	0	41	57	57	25	7	0	0	293	72	100	44	0	19	950
Robin Hood	104	43	31	0	6	85	31	42	1	0	5	324	24	105	66	10	16	893
Friar Tuck	457	139	16	0	62	108	4	0	0	0	0	197	188	120	0	0	25	1316
Alan Adale	535	194	18	0	53	171	10	0	0	0	0	403	219	190	0	0	11	1804
TOTAL	1362	525	139	0	177	439	105	71	10	0	5	1561	563	540	119	10	74	5700
%	23.9	9.2	2.4	0	3.1	7.7	1.8	1.2	0.2	0	0.1	27.4	9.9	9.5	2.1	0.2	1.3	100%

Figure 16.4

Levels of cognitive transactions in five first year classes compared subject by subject

iv) HISTORY

School	T0	T1	T2	T3	Q0	Q1	Q2	Q3	Q4	Q5	Q6	C	R0	R1	R2	R3	RW	TOTAL
Will Scarlet	162	164	17	0	13	57	36	10	1	0	0	332	125	162	43	0	12	1134
Huntingdon	SUBJECT INCLUDED IN INTEGRATED STUDIES																	
Robin Hood	111	52	16	0	34	46	23	8	0	0	0	254	42	58	23	0	8	675
Friar Tuck	180	77	13	0	7	47	3	0	0	0	0	89	12	37	1	0	9	475
Alan Adale	SUBJECT INCLUDED IN INTEGRATED STUDIES																	
TOTAL	453	293	46	0	54	150	62	18	1	0	0	675	179	257	67	0	29	2284
%	19.8	12.8	2.0	0	2.4	6.5	2.7	0.8	0.04	0	0	29.6	7.8	11.3	2.9	0	1.3	100%

Figure 16.5

Levels of cognitive transactions in five first year mixed ability classes compared subject by subject

v) ENGLISH

School	T0	T1	T2	T3	Q0	Q1	Q2	Q3	Q4	Q5	Q6	C	R0	R1	R2	R3	RW	TOTAL
Will Scarlet	149	179	3	0	15	52	31	1	0	0	0	298	106	189	10	0	20	1053
Huntingdon	160	62	2	0	33	60	6	1	0	0	0	295	119	171	1	0	2	912
Robin Hood	60	59	44	0	3	44	29	9	14	0	2	254	4	52	43	3	14	634
Friar Tuck	263	158	13	0	49	113	10	2	3	0	0	83	82	200	2	0	7	985
Alan Adale	406	208	31	2	73	129	27	0	3	0	0	158	102	247	7	2	3	1398
TOTAL	1038	666	93	2	173	398	103	13	20	0	2	1088	413	859	63	5	46	4982
%	20.8	13.4	1.9	0.05	3.5	8.0	2.0	0.3	0.4	0	0.05	21.8	8.3	17.2	1.3	0.1	0.9	100%

Figure 16.6

Levels of cognitive transactions in five first year mixed ability classes compared subject by subject

vi) MATHEMATICS

School	T0	T1	T2	T3	Q0	Q1	Q2	Q3	Q4	Q5	Q6	C	R0	R1	R2	R3	RW	TOTAL
Will Scarlet	103	119	16	2	14	52	48	16	10	0	0	265	44	110	42	2	36	879
Huntingdon	82	36	0	0	42	15	0	0	0	0	0	386	74	14	0	0	0	649
Robin Hood	112	29	2	0	12	58	30	0	0	0	0	255	46	72	18	0	5	639
Friar Tuck	334	162	12	0	30	186	10	0	0	0	0	205	94	241	0	0	19	1293
Alan Adale	699	188	6	0	179	156	0	0	0	0	0	440	262	151	0	0	26	2107
TOTAL	1330	534	36	2	277	467	88	16	10	0	0	1551	520	588	60	2	86	5567
%	23.9	9.6	0.6	0.03	5.0	8.4	1.6	0.3	0.2	0	0	27.9	9.3	10.5	1.1	0.03	1.5	100%

Figure 16.7

Levels of cognitive transactions in five first year mixed ability classes compared subject by subject

vii) GEOGRAPHY

School	T0	T1	T2	T3	Q0	Q1	Q2	Q3	Q4	Q5	Q6	C	R0	R1	R2	R3	RW	TOTAL
Will Scarlet	82	86	6	0	17	56	41	18	1	0	0	78	40	106	31	0	22	584
Huntingdon	INCLUDED AS PART OF INTEGRATED STUDIES																	
Robin Hood	120	3	0	0	39	2	0	0	0	0	0	420	28	0	0	0	0	612
Friar Tuck	149	106	7	0	33	92	2	0	0	0	0	53	45	87	0	0	12	586
Alan Adale	INCLUDED AS PART OF INTEGRATED STUDIES																	
TOTAL	351	195	13	0	89	150	43	18	1	0	0	551	113	193	31	0	34	1782
%	19.7	11.0	0.7	0	5.0	8.4	2.4	1.0	0.1	0	0	30.9	6.3	10.8	1.8	0	1.9	100%

Figure 16.8

Levels of cognitive transactions in five first year mixed ability classes compared subject by subject

viii) MUSIC

School	T0	T1	T2	T3	Q0	Q1	Q2	Q3	Q4	Q5	Q6	C	R0	R1	R2	R3	RW	TOTAL
Will Scarlet	129	141	12	0	18	119	21	4	2	0	0	9	59	156	13	0	6	689
Huntingdon	167	141	12	0	51	37	6	0	0	0	0	75	39	50	2	0	9	589
Robin Hood	239	48	11	0	12	13	7	2	1	0	0	174	42	125	8	0	3	685
Friar Tuck	440	170	1	0	32	61	0	0	0	0	0	36	44	109	0	0	17	910
Alan Adale	539	187	8	0	100	399	1	0	0	0	0	90	108	398	0	0	79	1909
TOTAL	1514	687	44	0	213	629	35	6	3	0	0	384	292	838	23	0	114	4782
%	31.7	14.4	0.9	0	4.5	13.2	0.7	0.1	0.06	0	0	8.0	6.1	17.5	0.5	0	2.4	100%

Figure 16.9

Levels of cognitive transactions in five first year mixed ability classes compared subject by subject

ix) INTEGRATED STUDIES

School	T0	T1	T2	T3	Q0	Q1	Q2	Q3	Q4	Q5	Q6	C	R0	R1	R2	R3	RW	TOTAL
Will Scarlet																		
Huntingdon	521	399	28	0	127	508	114	14	0	0	0	540	312	650	29	0	82	3324
Robin Hood																		
Friar Tuck																		
Alan Adale	483	172	36	1	148	205	8	0	4	0	0	216	188	160	6	0	58	1685
TOTAL	1004	571	64	1	275	713	122	14	4	0	0	756	500	810	35	0	140	5009
%	20	11.4	1.3	0.01	5.5	14.2	2.4	0.3	0.07	0	0	15.1	10.0	16.2	0.7	0	2.8	100%

Figure 16.10

Relative proportions of cognitive transactions at each level in five year 1 secondary mixed ability classes over the study period broken down subject by subject

	T0	T1	T2	T3	Q0	Q1	Q2	Q3	Q4	Q5	Q6	C	R0	R1	R2	R3	RW
RE	18.4	9.2	1.0	0	3.7	8.6	1.3	0	0	0	0	38.4	6.2	11.2	0.4	0	1.6
FRENCH	17.9	21	0.7	0	1.4	12.4	4.6	0.4	0	0	0	8.6	4.6	20.5	4.8	0	3.1
SCIENCE	23.9	9.2	2.4	0	3.1	7.7	1.8	1.2	0.2	0	0.1	27.4	9.9	9.5	2.1	0.2	1.3
HISTORY	19.8	12.8	2.0	0	2.4	6.5	2.7	0.8	0.04	0	0	29.6	7.8	11.3	2.9	0	1.3
ENGLISH	20.8	13.4	1.9	0.05	3.5	8.0	2.0	0.3	0.4	0	0.05	21.8	8.3	17.2	1.3	0.1	0.9
MATHEMATICS	23.9	9.6	0.6	0.03	5.0	8.4	1.6	0.3	0.2	0	0	27.9	9.3	10.5	1.1	0.03	1.5
GEOGRAPHY	19.7	11.0	0.7	0	5.0	8.4	2.4	1.0	0.1	0	0	30.9	6.3	10.8	1.8	0	1.9
MUSIC	31.7	14.4	0.9	0	4.5	13.2	0.7	0.1	0.06	0	0	8.0	6.1	17.5	0.5	0	2.4
INTEGRATED STUDIES	20	11.4	1.3	0.01	5.5	14.2	2.4	0.3	0.07	0	0	15.1	10.0	16.2	0.7	0	2.8

(All figures are percentages)

Figure 16.11

Relative proportions of cognitive transactions at each level in a top junior class over the study period (integrated timetable)
(figures are percentages of total transactions)

T0	T1	T2	T3	Q0	Q1	Q2	Q3	Q4	Q5	Q6	C	R0	R1	R2	R3	RW	TOTAL
9	5	3	0	2	3	2	1	0	0	0	60	6	7	2	0	0	100%

Figure 16.12

Relative proportions of cognitive transactions at each level in a fourth year middle school class over the study period broken down subject by subject
(all figures percentages of total transactions)

	T0	T1	T2	T3	Q0	Q1	Q2	Q3	Q4	Q5	Q6	C	R0	R1	R2	R3	RW	TOTAL
RE	6	24	0	0	1	29	0	0	0	0	0	3	0	31	0	0	6	100%
FRENCH	31	31	0	0	5	16	0	0	0	0	0	0	2	13	0	0	1	100%
SCIENCE	34	12	2	0	13	9	0	0	0	0	0	15	6	5	0	0	3	100%
ENGLISH	27	6	0	0	3	2	0	0	0	0	0	41	2	18	0	0	0	100%
MATHEMATICS	33	15	2	0	8	14	1	0	0	0	0	9	6	10	0	0	0	100%
HUMANITIES	28	17	6	1	9	9	1	0	0	0	0	8	8	7	1	0	3	100%

Figure 16.13

Relative proportion of cognitive transactions at each level in a fourth year GCE O level accelerated set broken down subject by subject
(all figures percentages of total transactions)

SUBJECT	T0	T1	T2	T3	Q0	Q1	Q2	Q3	Q4	Q5	Q6	C	R0	R1	R2	R3	RW	TOTAL
RE	6	37	7	0	4	15	2	0	3	0	0	1	1	13	8	0	2	100%
FRENCH	15	22	3	0	4	10	6	9	0	0	0	1	2	13	12	0	3	100%
SCIENCES	9.7	28.3	14.4	0.1	1.2	17.3	3.6	1.7	3.6	0	0	0.1	1.5	10.5	3	0	4	100%
HISTORY	10	11	19	2	6	8	4	0	11	0	0	0	0	16	11	0	2	100%
ENGLISH	25	33	11	0	3	7	7	0	1	0	0	1	2	7	3	0	0	100%
MATHEMATICS	10	19	8	1	5	9	6	3	7	0	0	4	1	11	11	0	4	100%
GEOGRAPHY	13	13	9	0	3	11	11	6	1	0	0	5	2	14	8	0	4	100%

Figure 16.14

Relative proportions of cognitive transactions at each level if five year 1 secondary mixed ability classes, broken down subject by subject, compared with those in a fourth year middle school class and in a fourth year secondary GCE O level accelerated set
(all figures percentage of teaching time observed)

	TO	T1	T2	T3	Q0	Q1	Q2	Q3	Q4	Q5	Q6	C	R0	R1	R2	R3	RW	TOTAL TEACHING TIME
RE Sec yr 1	18.4	9.2	1.0	0	3.7	8.6	1.3	0	0	0	0	38.4	6.2	11.2	0.4	0·	1.6	100%
middle	6	24	0	0	1	29	0	0	0	0	0	3	0	31	0	0	6	100%
GCE	6	37	7	0	4	15	2	0	3	0	0	1	1	13	8	0	2	100%
FRENCH sec yr 1	17.9	21	0.7	0	1.4	12.4	4.6	0.4	0	0	0	8.6	4.6	20.5	4.8	0	3.1	100%
middle	31	31	0	0	5	16	0	0	0	0	0	0	2	13	0	0	1	
GCE	15	22	3	0	4	10	6	9	0	0	0	1	2	13	12	0	3	100%
SCIENCE sec yr 1	23.9	9.2	2.4	0	3.1	7.7	1.8	1.2	0.2	0	0.1	27.4	9.9	9.5	2.1	0.2	1.3	100%
middle	34	12	2	0	13	9	0	0	0	0	0	15	6	5	0	0	3	100%
GCE (all sciences)	9.7	28.3	14.4	0.1	1.2	17.3	3.6	1.7	3.6	0	0	0.1	1.5	10.5	3.0	0	4.0	100%
HISTORY sec yr 1	19.8	12.8	2.0	0	2.4	6.5	2.7	0.8	0.04	0	0	29.6	7.8	11.3	2.9	0	1.3	100%
middle	SUBJECT NOT TAUGHT (SEE HUMANITIES)																	
GCE	10	11	9	2	6	8	4	0	11	0	0	0	0	16	11	0	2	100%
ENGLISH sec yr 1	20.8	13.4	1.9	0.05	3.5	8.0	2.0	0.3	0.4	0	0.05	21.8	8.3	17.2	1.3	0.1	0.9	100%
middle	27	6	0	0	3	2	0	0	0	0	0	41	2	18	0	0	0	100%
GCE	25	33	11	0	3	7	7	0	1	0	0	1	2	7	3	0	0	100%
MATHEMATICS sec yr 1	23.9	9.6	0.6	0.03	5.0	8.4	1.6	0.3	0.2	0	0	27.9	9.3	10.5	1.1	0.03	1.5	100%
middle	33	15	2	0	8	14	1	0	0	0	0	9	6	10	0	0	2	100%
GCE	10	19	8	1	5	9	6	3	7	0	0	4	1	11	11	0	4	100%
GEOGRAPHY sec yr 1	19.7	11.0	0.7	0	5.0	8.4	2.4	1.0	0.1	0	0	30.9	6.3	10.8	1.8	0	1.9	100%
middle	SEE INTEGRATED STUDIES 1 HUMANITIES																	
GCE	13	13	9	0	3	11	11	6	1	0	0	5	2	14	8	0	4	100%
MUSIC sec yr 1	31.7	14.4	0.9	0	4.5	13.2	0.7	0.1	0.06	0	0	8.0	6.1	17.5	0.5	0	2.4	100%
middle	NOT TAUGHT																	
GCE	NOT TAUGHT																	
INTEGRATED STUDIES sec yr 1	20	11.4	1.3	0.01	5.5	14.2	2.4	0.3	0.07	0	0	15.1	10.0	16.2	0.7	0	2.8	100%
middle (Humanities)	28	17	6	1	9	9	1	0	0	0	0	8	8	7	1	0	3	100%
GCE	NOT TAUGHT																	

Figure 16.15

Cognitibe graph of one RE lesson

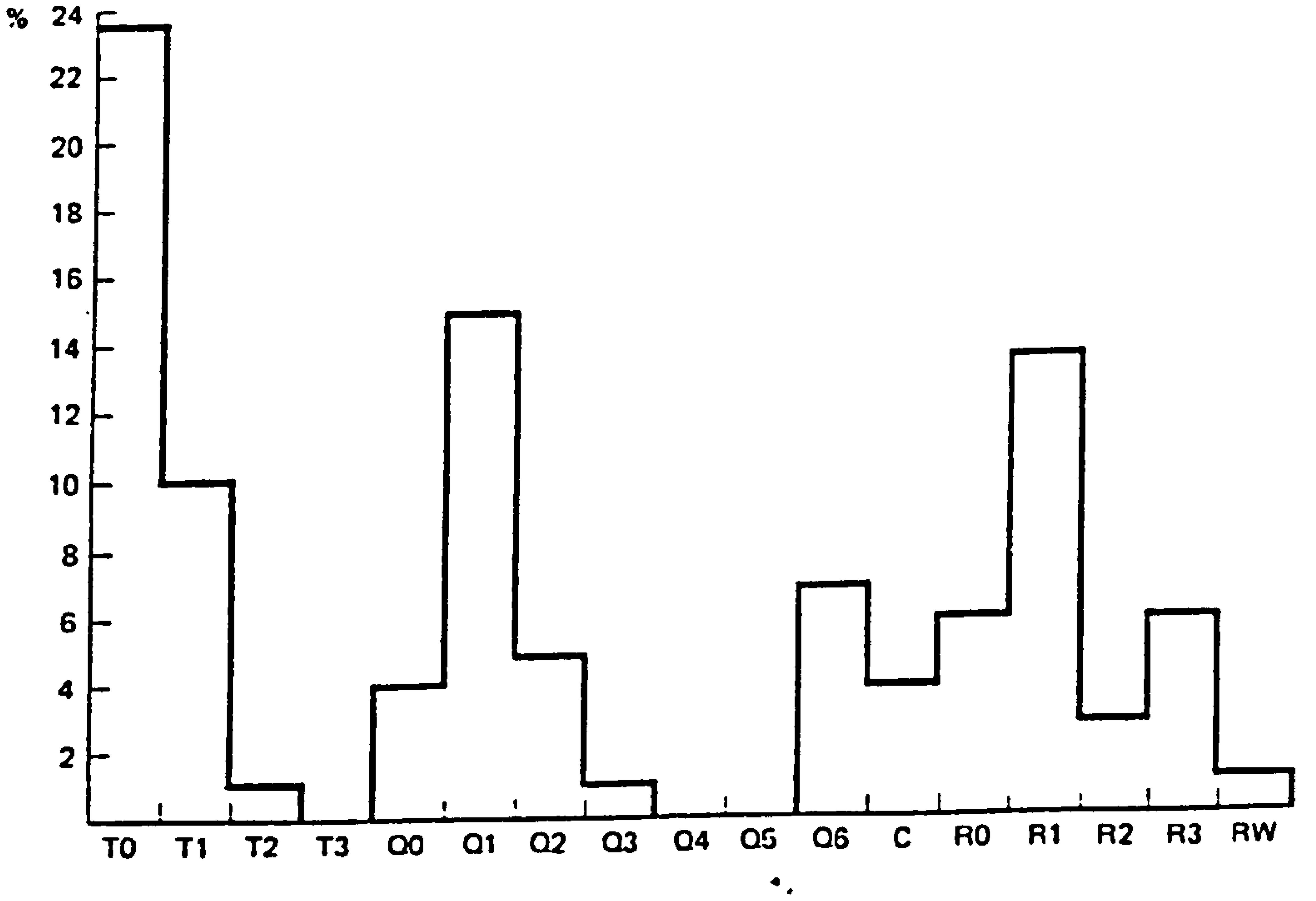
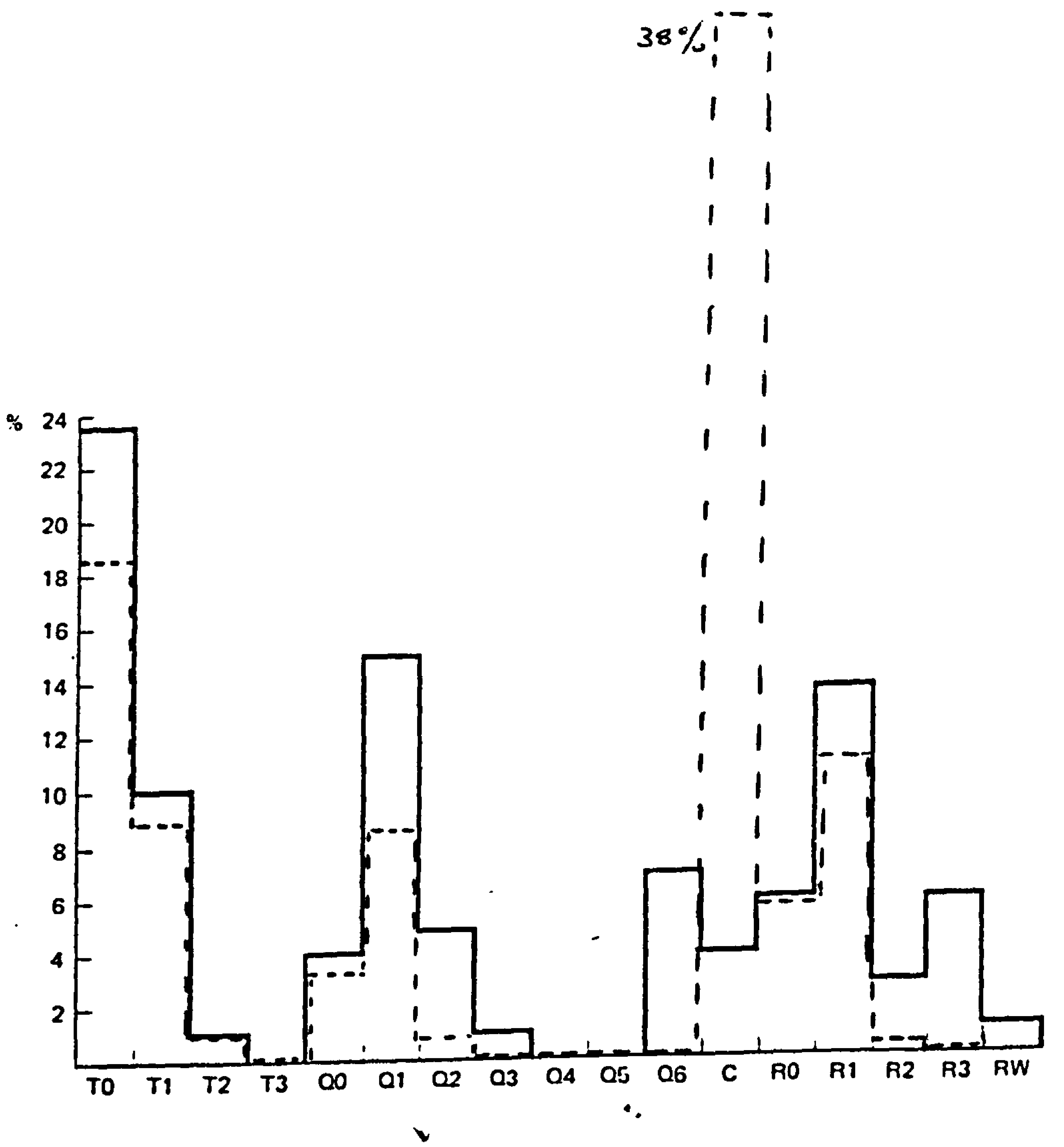


Figure 16.16

Cognitive graph of one RE lesson (continuous line) compared with all RE lessons taught in five first year mixed ability classes in the main study.



CHAPTER 17

THE COGNITIVE DEMANDS MADE BY CLASSROOM TASKS

The main question

The aim of this research project was to examine in as much detail as possible the cognitive life of the classrooms studied. It has been argued that almost every overt cognitive transaction can be divided into one of two broad categories: oral or task. Oral transactions can be sub-divided into teacher talk, teachers' questions and pupil talk; and these sub-divisions can be further refined into the seventeen codes used in this research, which allow an assessment of relative proportions of higher order and lower order thinking to be made. So much for the oral components of lessons. What of the task elements?

Earlier, in Chapter 6, an analysis scheme for looking at the cognitive demand made by classroom tasks was described. The description will not be repeated here, but these are the salient points:

... all tasks in the main sample schools were recorded

... collected tasks were sifted by two analysts

... a series of 'task types' emerged from this sifting

... the types were given appropriate labels using descriptions closely akin to the words the teachers themselves used to set up the tasks (draw, listen, etc.)

... a basic division was found to exist between high level tasks (H) and low level tasks (L) in terms of cognitive demand

... from this two-fold division and using the labels which had emerged a category system was developed (L1-12, H1-6)

... within the broad divisions L and H the numbered order is not necessarily intended to represent a hierarchy of difficulty.

The complete task classification system is included here as Figure 17.1 to remind the reader.

This chapter looks at one major question (others will emerge as we proceed). It is: what levels of cognitive demand are made by classroom tasks? 1)

The pages which follow set out the evidence. Since the investigation is, as far as I have been able to discover, unique in collecting classroom tasks over such a concentrated period and linking them to cognitive demand made in other ways; and since so much of what has been said so far has been somewhat negative; it seemed opportune to include a complete list of tasks in the Appendix. There, tasks are listed by school, then by subject area. Each lesson within the subject area is recorded separately. All tasks for that lesson are listed. To the left of the list is a letter indicating the classroom context of the task, i.e. the teaching mode in operation:

W: whole class or organizational groupwork
G: educational groupwork
I: individualized learning

Also to the left of the individual task is its classification according to the ACT list in Figure 17.1.

For the sake of completeness, tasks set in Little John Primary, Maid Marion Middle, Sheriff GCE accelerated set and in science and RE lessons in the banded situation of King John school are listed also.

With these tasks in mind we can proceed to an analysis.

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1) There are two possible ways to assess task demand: one in terms of cognitive level, and the other in terms of 'difficulty'. This thesis adopts the former since its dovetails most neatly with the methodology already in use by the researchers to observe and record the demands made by the oral transactions. It is recognized, however, that within eg the lower cognitive tasks recorded there were varying levels of difficulty in the sense that, say, a memorizing task may involve a few items of a simple nature, or more items of a more complicated nature. Task 'difficulty' in this sense has not been estimated here.

Figure 17.1

The emergent category system: Analysis Classroom Tasks (ACT) Proforma

The following category system emerged from the analysis of classroom tasks in the five schools of the main study:

Low level tasks

L 1	Disciplinary tasks	E.g. Write six reasons why you must not run round the classroom.
L 2	Administrative tasks	E.g. Move classroom furniture to make more space; collect or pack away equipment.
L 3	Drawing or colouring task	Commonest examples were of copying maps from atlases or colouring pictures to illustrate written work. These tasks took little thought, but some manual skill. A single example of doing breathing exercises in music was included here.
L 4	Copying or writing headings	Teachers frequently gave the instruction 'put a heading'; copying directly from blackboard or text was included here.
L 5	Reading aloud	In all subjects teachers were inclined to ask pupils to read passages round the class. This category was extended to include singing together, repeating phrases from a tape-recorder, or playing musical instruments one note at a time in direct imitation of the teacher.
L 6	Silent reading; listening or watching	Teachers often asked pupils to be a passive audience (to a record, a demonstration experiment). Pupils also read silently, often to allow time for slower workers to catch up.
L 7	Memorizing	E.g. Learn lists of vocabulary in a language or dates in history.
L 8	Revising or taking revision test	This category was reserved for those occasions when a teacher used the word 'revision' in a description of the task.
L 9	Carrying out an experiment (exactly following a demonstration); or make simple observation of results.	Many science lessons began by a teacher demonstrating and then pupils either observing the result or doing an exact replication of the experiment.
L10	Simple cloze, comprehension or note-taking	These tasks involved the pupils in understanding or make a précis of simple data already supplied by text book, worksheet or teacher.

L11	Reinforcing	A common set of tasks involved practice in a skill already learned, e.g. pupils, having learned about fractions last week, were given 20 examples of addition of fractions to perform. This category was used to include such tasks as logging results from experiments, matching French sentences to descriptive pictures, putting actions to words in foreign language songs, and doing corrections to previous work.
L12	Looking up, finding out information	This category was used only for looking up simple factual information (data) such as finding out a date or what happened in a particular incident. If the data was applied or used the appropriate higher level task category was used instead.

<u>High level tasks</u>

H1	Imaginative tasks	This category included what is often termed creative writing. Typical examples were: write a shape poem about fire; or, write a serial story called The Great Adventure.
H2	Collecting evidence, problem solving, deducing and reasoning tasks	E.g. Devise some questions you want answers to such as a) does temperature make a difference, b) which detergent product washes best, c) is biological powder better?
H3	Application tasks	Tasks in this category ask pupils to use knowledge gained in order to perform in a new situation. In a French lesson pupils were asked to use recently acquired words for foods to devise a menu and order a meal in a restaurant.
H4	Analysis tasks	In an experiment about water and its reaction to temperature pupils were asked to find out why, in one piece of apparatus, water levels dropped on heating before rising (as expected) because of expansion. Analysis tasks ask pupils to differentiate between fact and hypotheses, to find patterns and clarifying relationships.
H5	Synthesis tasks	Synthesis involves organizing ideas to make a new statement, developing plans to test ideas and discovering relationships or proposing changes or improvements, e.g. 'write a letter from the Emperor telling the people of Britain why the Romans have decided to leave.'
H6	Evaluation tasks	These tasks require pupils to appraise, assess or criticise according to justified criteria. Writing book reviews or an assessment of a character in a novel would be included here.

Task: intention and response

So far the ACT procedure and the tasks themselves have been described. However, it is worth pausing at this point to make an important observation. The bald statement of a task may be classifiable using the ACT categories. However, it is not absolutely certain that the statement of the task is unambiguous. Thus: 'Write about the Resurrection' as a task in R.E. may be as fact-bound by the biblical narrative as it appears. Or, the classroom conventions between teacher and pupils may permit an omission of context such that the pupils actually go away and write an evaluative critique of the evidence or a balanced assessment in the form of a dialogue between a Pharisaic Jew and an early apostle. Clearly, then, it was important for some, if not all, tasks that some evidence be obtained to assess whether the inferences made from teacher descriptions were correct. Further, it would be possible to decide whether able children were interpreting the task differently for middle band and less able, i.e. were imposing upon it their own level of cognition.

In the event a vast number of photocopies of pupil responses to tasks were collected. Some samples of work in response to the tasks indicated are included on the following pages. These are by perceived able and less able pupils, and by pupils randomly drawn from the middle band. From the discussion of these responses it will be seen that, while able children may be more efficient than others, in general <u>all</u> pupils interpret the task as set by the teacher at the <u>same</u> cognitive level. Once this has been established we can proceed to examine the implications of this analysis of classroom tasks.

<u>The perception of tasks by pupils: a validation exercise</u>

We have seen how a number of task types emerged from teachers' own use of, or phrasing of the instructions for, tasks set to pupils. A number of these task types are quite unambiguous, but this sections looks at cases where there may be an element of doubt about the consistency between teacher intention and pupil interpretation.

One emergent task form was L4, copying work, often associated with L3, drawing and illustrating work. One such task was set in geography at Robin Hood School: lesson 4 task 2. Instructions were: 'the remainder (ie those who had finished making a paper model) write and draw about crofters from the textbook.' Simon, Andrew, Robert and Guy had been nominated as able pupils in this class; Chris and Nigel as slow learners. The work of all but Simon was made available for photocopying, and the work of Andrew (BP) Robert (BP), Guy (BP), Nigel (SL) and Christopher (SL) is shown in that order. A number of points emerge:

.... none writes a great deal

.... the slow learners produce more words than the bright pupils - perhaps they are less bored by this low-level task

.... there is an occasional attempt at précis, but the underlying textbook dependence is clear

.... the bright pupils (especially Andrew) are no more accurate in their work than is Nigel (SL)

.... there is little system in what the pupils choose to write, each selects what takes his fancy

.... choice of topic may be influenced by which portions are most interesting to illustrate

.... Guy (BP) and Nigel (SL) both abandon writing for drawing while the others don't get that far

.... Chris (SL) fails even to copy the correct portion of the textbook.

This task, categorized L4 on the ACT proforma has been interpreted as a low level task by <u>all</u> the pupils at both ends of the abaility range (and by all the other pupils, too; though their work is not shown here).

1. Andrew

The crosters lise

Farming

The croster will own a small piece of lend between him and his wise which he will grow grops of hay and potatoes on. The sew animals they keep would graze on the roadside which would be cut and prepared for. Thousands of years ago glaciers scraped away the soil so it is very thin. Is the land is so bad sometimes the ~~g~~ croster can ~~by~~ buy ~~land~~ lime to put as top soil. Sometimes sarmers are lucy to get pastures good sor grazing called the machier ~~ae~~ on the sine wind blown sand. in the winter sometimes the sarmer will live in a hut with his animals to protect them and sometimes he takes his hole samily so the ~~wdl~~ wise would take her spinning wheel.

2. Robert

Summary Work

The crofters day usually starts by feeding the chickens. They have plenty of chickens so they would not run out. He also has to bring in the cows from the fields for milking. There is the corn to be cut stacked up and

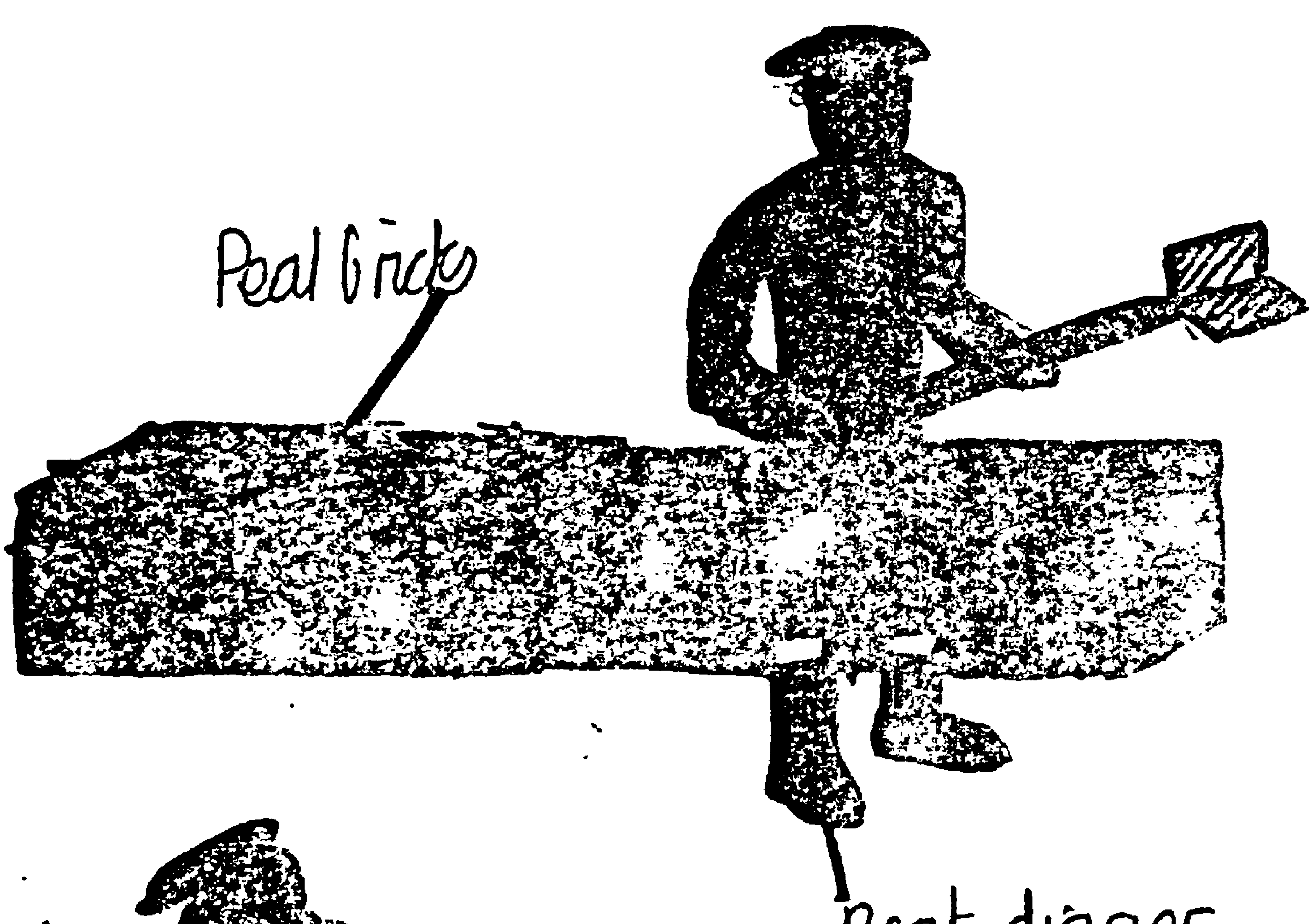
[unfinished]

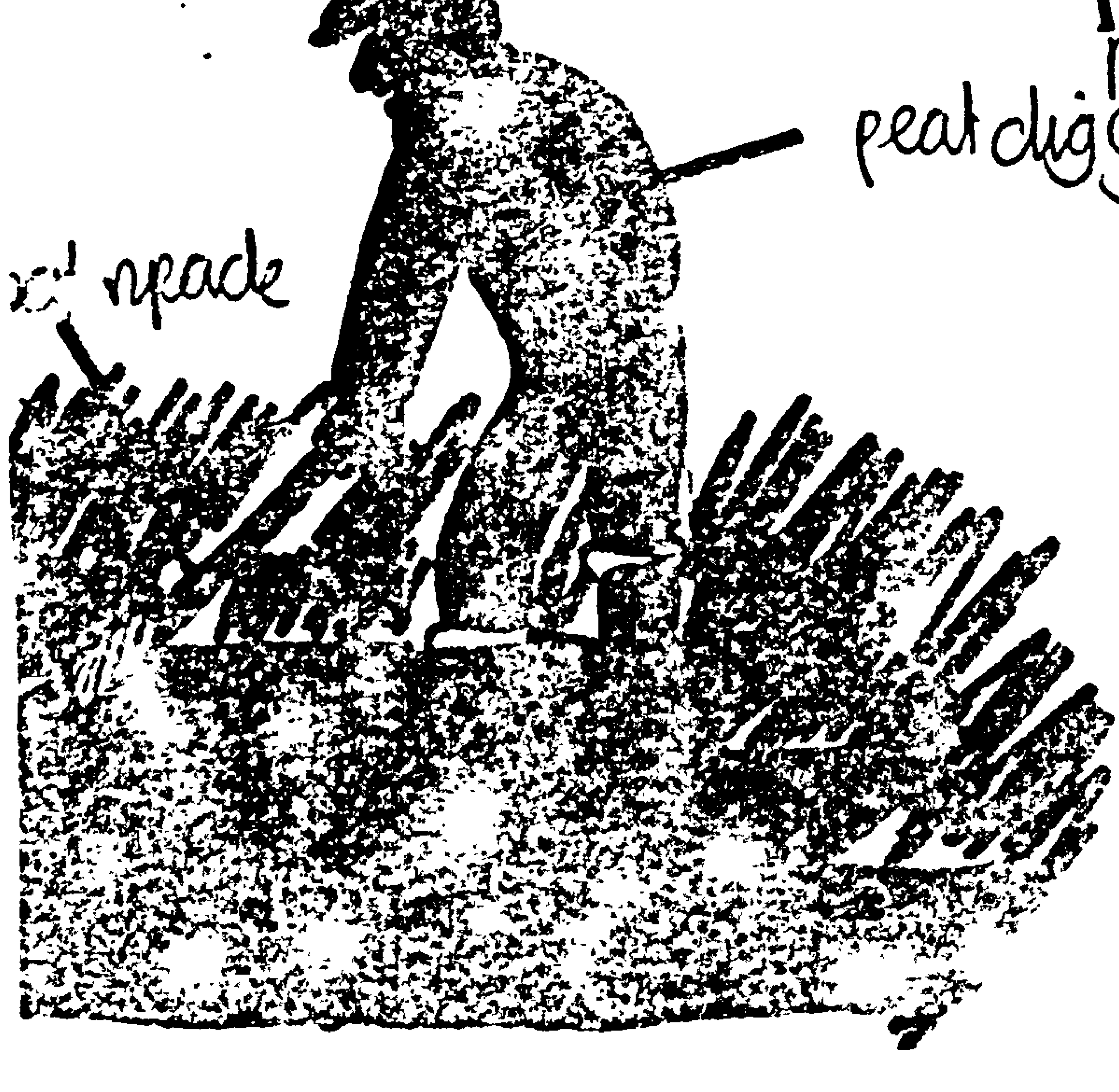
3/7/79

The crofters

Peat

Another task which takes up much time in summer is the cutting of peat for fuel. Peat is a black spongy soil which is formed by the partly rotted remains of roots, stems and branches. Over thousands of years it has formed on the moors. The crofters using a special spade. They cut the bricks and stack them neatly and let them dry in the wind. Then they are used as fuel.

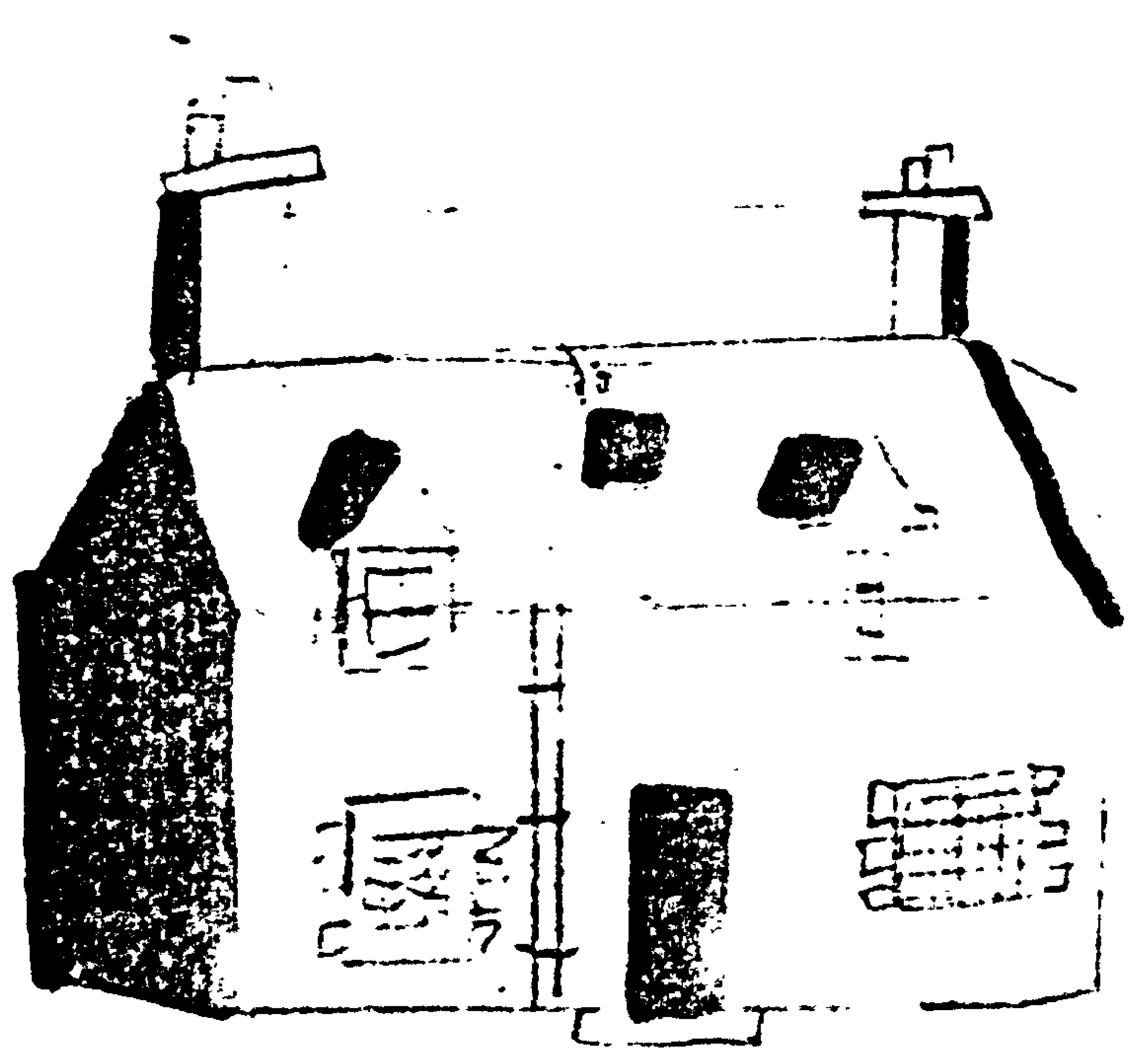




4. Nigel

Farming

~~In~~ In his ~~few~~ small fields the crofter and his wife will grow crops of hay and potatoes. Even the roadside verges are cut to provide enough fodder for the couple of ~~to~~ cows: the few sheep and hens that are kept. The soil is usually thin because most of it was scraped off by glacie thousand of years ago or has been ~~washing~~ washed away since by the rain. If ~~so~~ it is not thin it will very likely be acidic or sour ~~for~~ the water ~~can~~ cannot drain away through the Ln



5. Chris

Forecasts

The radio messages which a captain sends to base are a valuable part of the weather forecast service. On land it is easy enough to have lots of weather or ~~meteoral~~ meteorolgical stations. Man at these places, which are aerodromes ~~places~~ or coast guard speed and direction, the moisture in the air (HUMIDITY) cloud type and height four times a day. They do this at ground level from instruments in their Stevenson screen and also in the air by using radiosondes

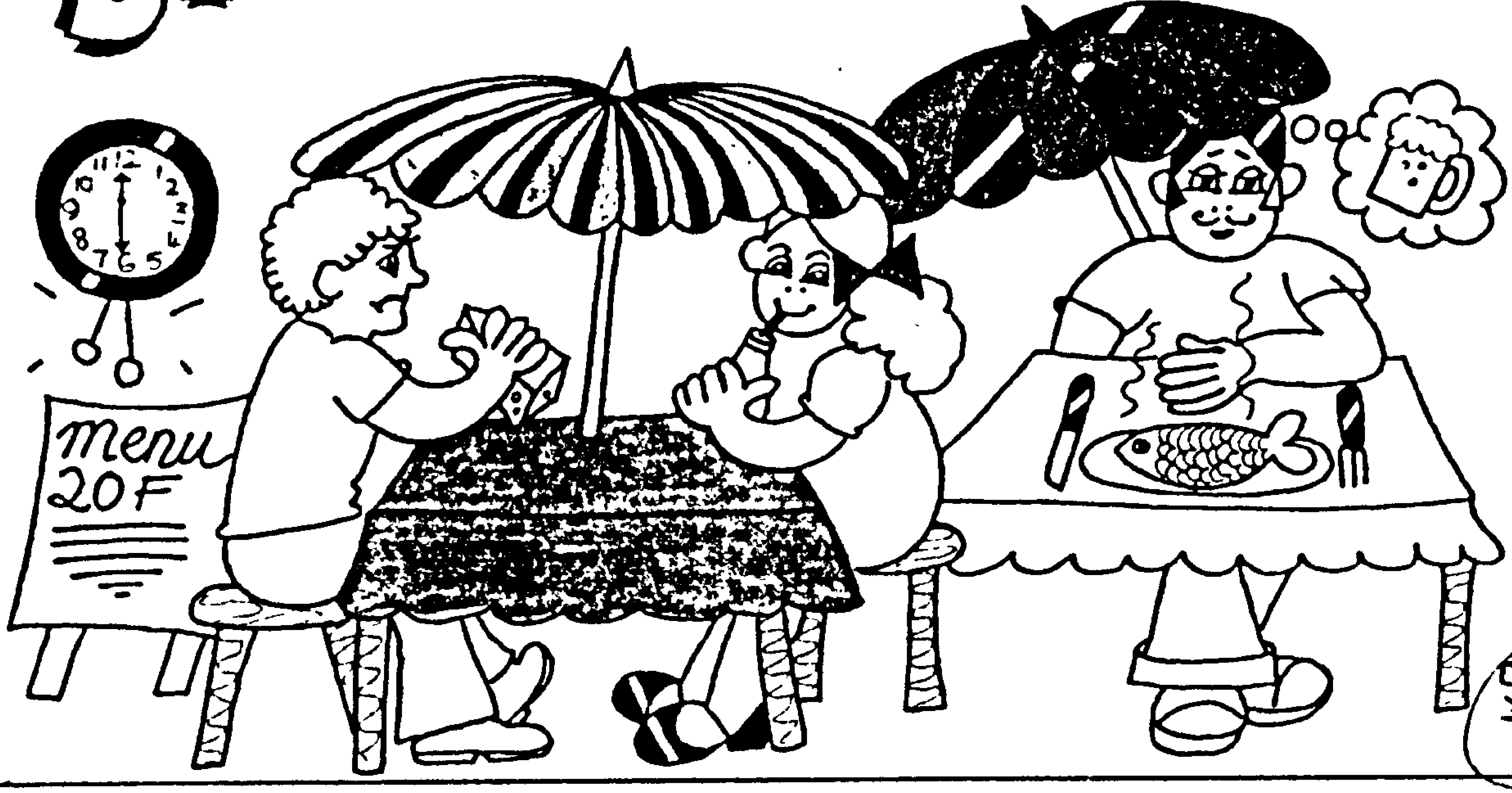
Moving to the area of Modern Languages, task 3 of lesson 5 in French at Huntingdon school is a practice task L11, in which pupils are instructed to match French sentences to small pictures on a commercial worksheet. The photocopy of Joanne's work (a middle band pupil in the view of the teachers) shows a competence at the exercise. Nevertheless, it will be seen that the level of response is wordless, requiring the pupils to listen to a tape-recording to answer with a tick simple factual questions based on already-acquired vocabulary and phrases. There is no room here for any alternative intepretation of the task.

Task type L10, simple comprehension, was illustrated in French at Robin Hood school by the third task in lesson 4 : complete a response to a number of French sentences for which a stimulus phrase, using the requisite vocabulary, was provided on a worksheet. Work of all four perceived bright pupils and both slow learners was available for photocopy (Robin Hood school was the most co-operative in this respect). The work of all six is shown here. It is clear that all the pupils have interpreted the task in the same way, as a simple comprehension low level cognitive task. Several pupils of both abilities have added spontaneous embellishments in the form of cartoon drawings (L3). Again, one cannot doubt that the ACT proforma has correctly categorized the task and measured the level of cognitive demand which the pupils recognize is required in their performance.

6. Joanne

Oui ou Non?

B Look at the picture and listen to the tape. If what you hear is true, tick the *oui* column. If it's not true, tick the *non* column.

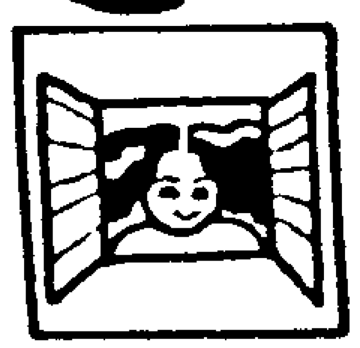


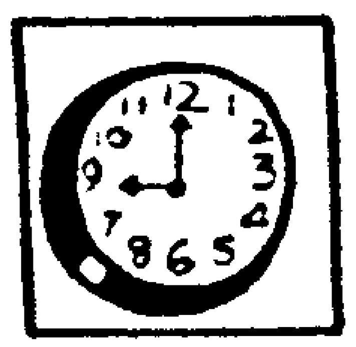
OUI	NON

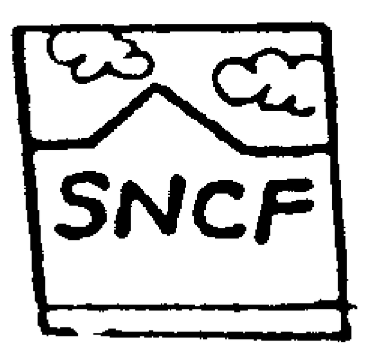
5/6

C TICK THE CORRECT ANSWER

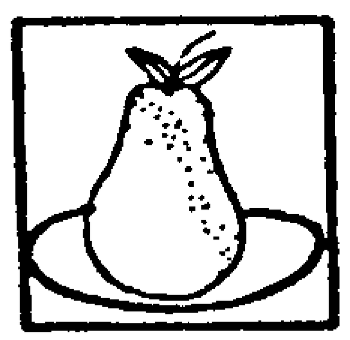
6/6 Bien

1. 
   a) C'est fermé. ....
   b) C'est ouvert. .... ✓
   c) C'est l'hôtel. ....
   d) C'est loin. ....

2. 
   a) Il est une heure. ....
   b) Il est dix heures. ....
   c) Il est neuf heures. .... ✓
   d) Il est midi. ....

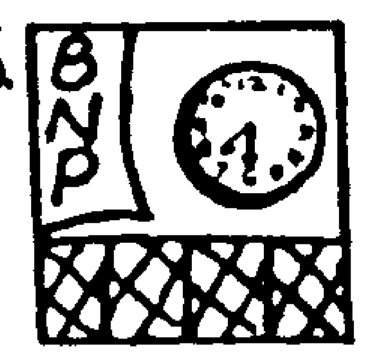
3. 

   a) C'est le café. ....
   b) C'est la gare. ....
   c) C'est le stade. .... ✓
   d) C'est le restaurant. ....

4. 
   a) Voici un café. ....
   b) Voici un Orangina ....
   c) Voici une poire. .... ✓
   d) Voici un ananas. ....

5. 

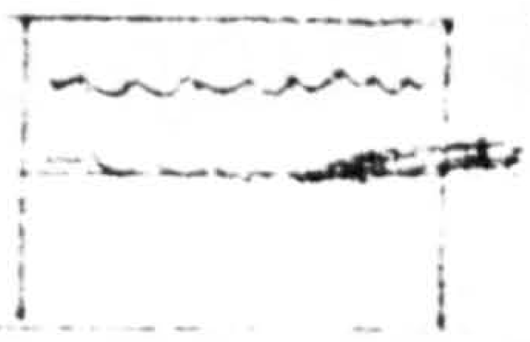
   a) Ça fait neuf francs. ....
   b) Ça fait trois francs. ....
   c) Ça fait cinq francs. ....
   d) Ça fait sept francs. .... ✓

6. 

   a) La banque, c'est fermé. .... ✓
   b) La poste, c'est fermé. ....
   c) La banque, c'est ouvert. ....
   d) La poste, c'est ouvert. ....

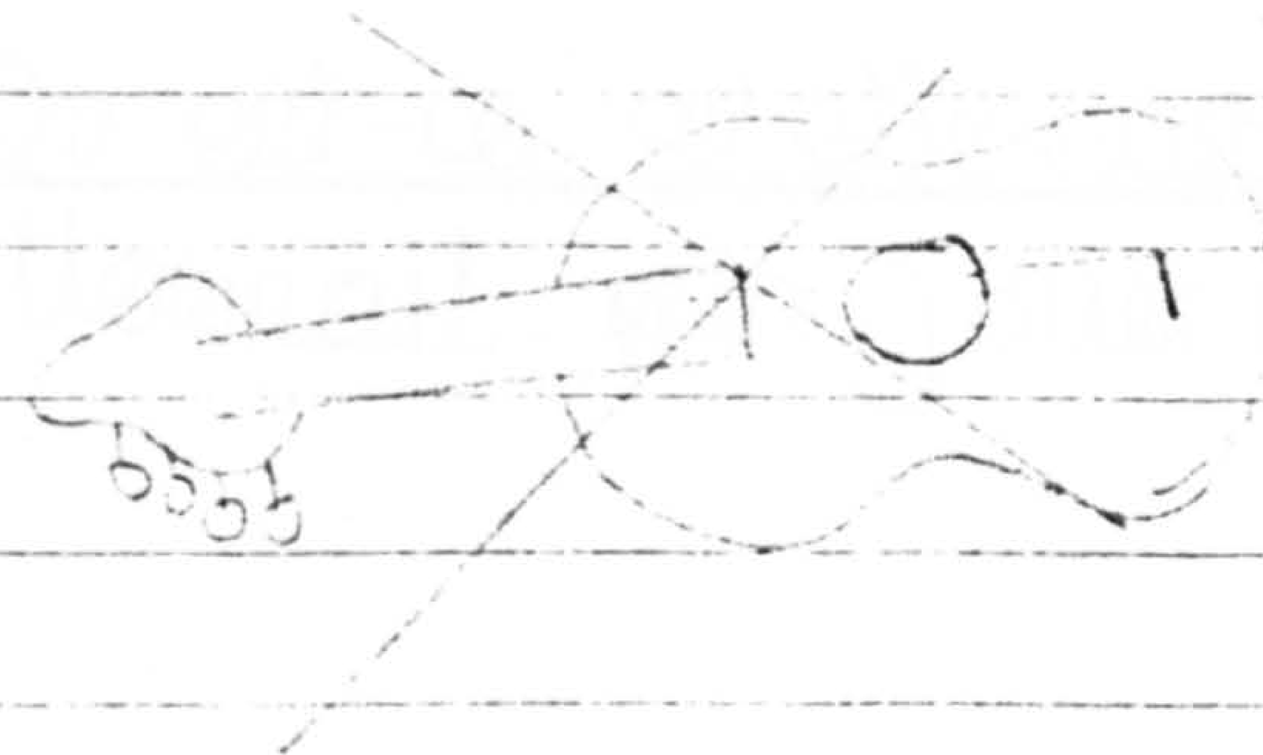
Jeudi 14 Juin Savoir Faire

A Je sais jouer au tennis ✓

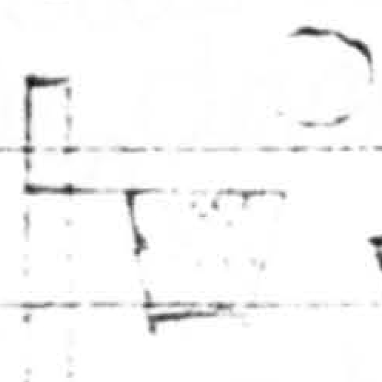


Je sais ~~et~~ écrire ✓

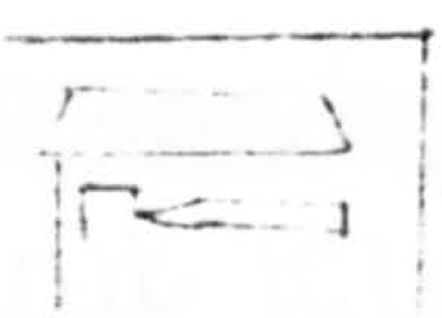
Je ne sais pas nager ✓



Je ne sais pas jouer de la guitarre ✓

B 

Elle ne sait pas jouer au basket ✓



elle sait ~~te~~ dessiner ✓

BonJour ÇA va elle sait parler français ✓

elle sait jouer aux cartes ✓

C. 

il sait jouer au football ✓

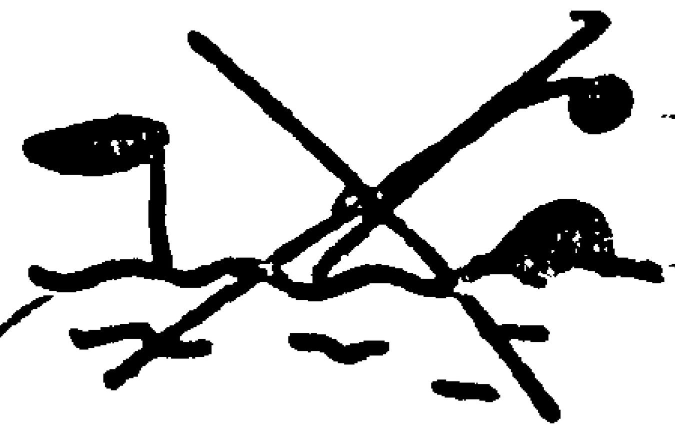
Savoir Faire Jeudi 14 juin

Qu'est-ce que tu sais faire?

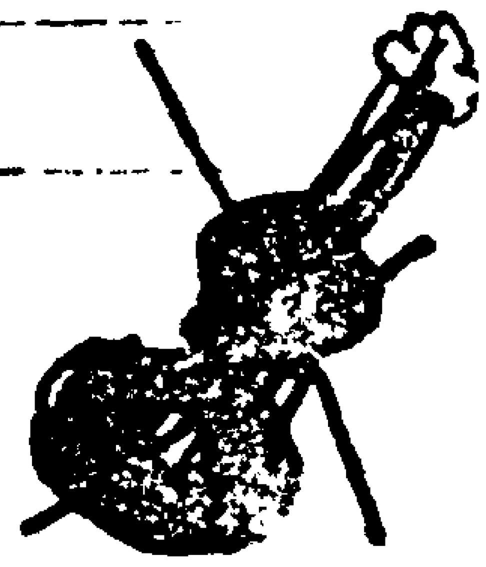
(A) ① Je sais jouer au tennis. ✓

② Je sais écrire. ✓

③ Je ne sais pas nager. ✓

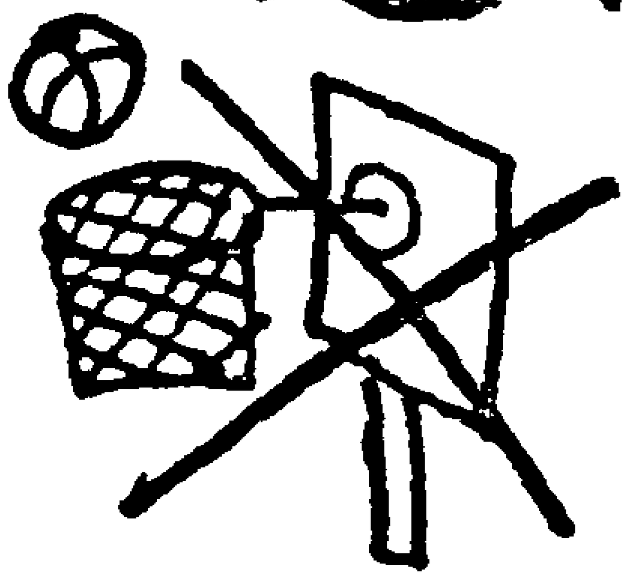


④ Je ne sais jouer de la guitare ✓



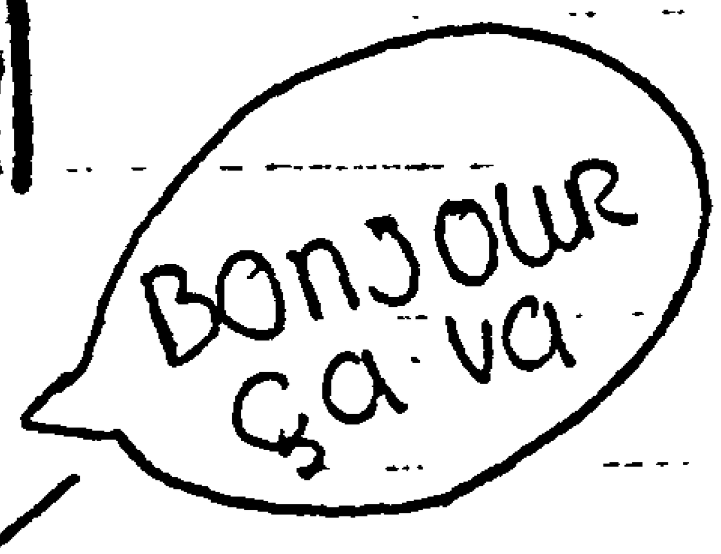
(B) Qu'est-ce qu'elle sait faire?

① Elle ne sait pas jouer au basket ✓



② Elle sait dessiner ✓

③ Elle sait parler français ✓

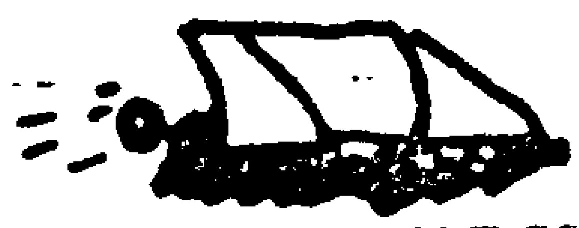


④ ~~Elle ne sait pas aux car~~

Elle sait jouer aux cartes ✓

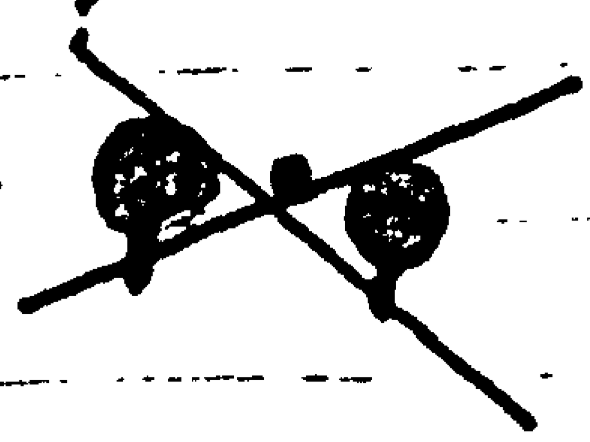
(C) Qu'est-ce qu'il sait faire?

① IL sait jouer au football. ✓



② IL ne sait pas jouer au cricket ✓

③ IL ne sait pas jouer au ping pong ✓



④ IL sait lire. ✓ excellent!

9. Robert

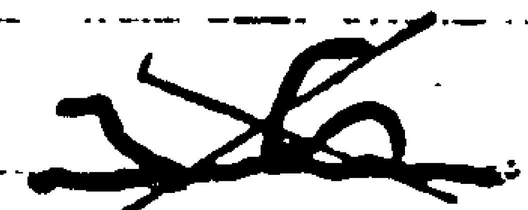
'Savoir faire' : 14 jeudi juin

Qu'est-ce que tu sais faire?

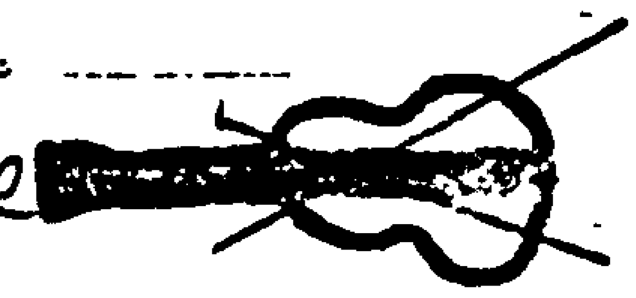
A. Je sais jouer au tennis. ✓

Je sais écrire. ✓

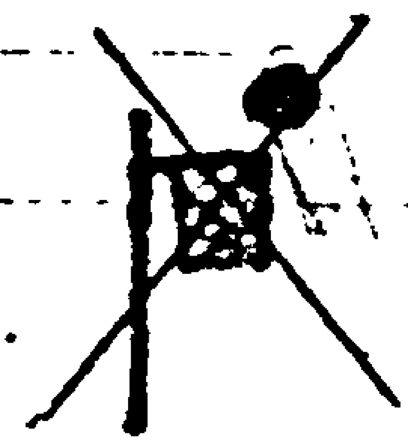
Je ne sais pas nager ✓

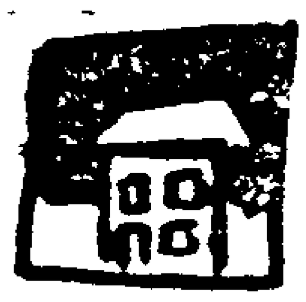


Je n sais pas jouer de la guitarre ✓



B. Qu'est-ce qu'elle sait faire?





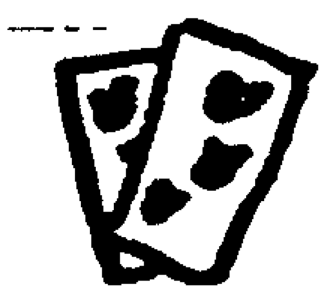
Elle ne sait pas jouer au basket. ✓

Elle sait dessiner. ✓

Elle sait parler français. ✓

Bonjour ça va?

Elle sait jouer aux cartes ✓

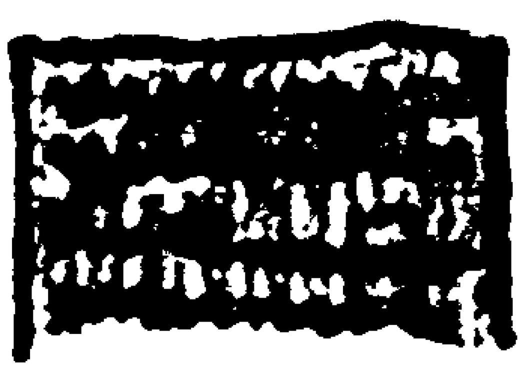


10. Simon

"Savoir Faire"

Qu'est-ce que tu sais faire?

Je sais jouer au tennis ✓



Je sais ~~et~~ écrire ✓

(unfinished)

11. Nigel

Jeudi 14 Juin

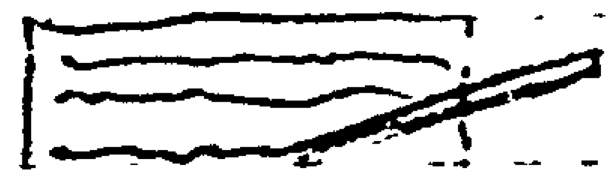
complétez les phrases:

1 Je sais jouer au tennis ✓ 

2 Je ne sais pas jouer au football 

✓

3 Il sait nager  ✓

4 Il ne sait pas écrire 

✓

5 Elle sait ~~pas~~ jouer au basket 

✓

6 Elle ne sait pas jouer aux cartes 

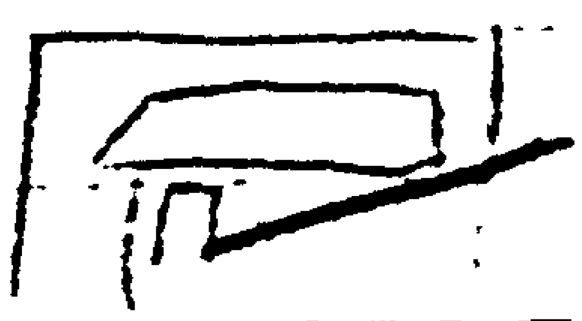
✓

7 Je sais jouer au ping pong 

✓

8 Tu sais parler français 

✓

9 Est ce que ~~tu~~ sais dessiner 

✓

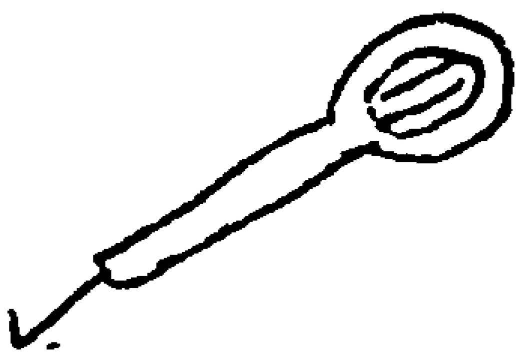
10 Je ne sais pas lire 

✓

excellent!

12. Chris

Complétez les phrases. Jeudi 14 juin

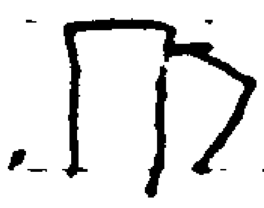
1. Je sais jouer au tennis. 

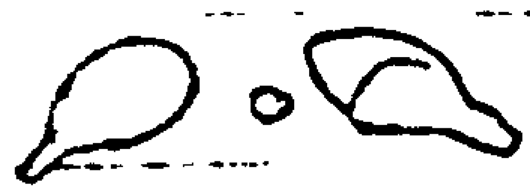
2. Je ne sais pas jouer au football! (1)

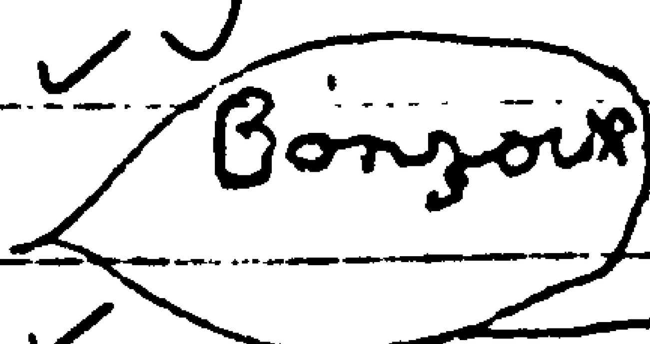
3. Il sait nager.

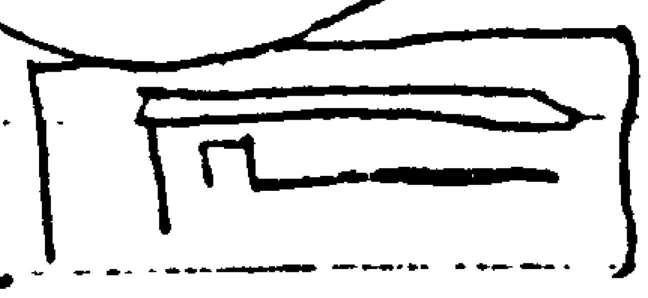
4. Il ne sait pas écrire. 

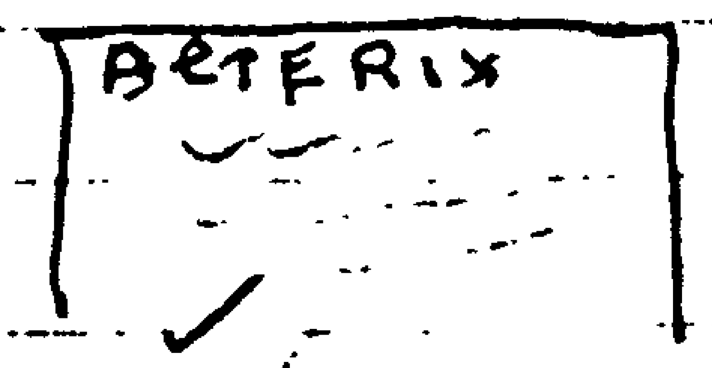
5. Elle sait jouer au basket. 

6. Elle ne sait pas jouer aux cartes. 

7. Je sais jouer au ping pong 

8. Tu sais parler français 

8. Est ce que tu sais dessiner 

10. Je ne sais pas lire 

excellent!

Other L categories (eg L1, 2,6,9) are sufficently carefully defined by behavioural verbs describing them that there can be little doubt that, whenever they occur, a cognitively low level event is taking place. However, it is worth pointing out that, if L categories are not treated to a high level cognitive response by pupils (able or otherwise), H level tasks are equally open to interpretation by youngsters. The teacher may intend to set a demanding task only to find that some or all of the pupils fail to read the situation in that way. In practice, pupils did generally distinguish when higher level demands were being made (one can hardly write a short story - and H 1 task - without at least a minimal use of the imagination). But they were not always able to respond in kind. Two examples will illustrate the problem.

At Robin Hood school the sixth task in lesson 3 asked pupils to write half a page explaining what innovations the Romans had brought to Britain. This was classified as H5 since, to do it properly, the pupil would need to know what went before, what the Romans put in its place, and to be au fait with the concept of change and its implications. As this was a homework task not all the pupils completed it. Five responses are shown, one by a perceived bright pupil (Andrew), one by a perceived slow learner (Chris), and three by middle band youngsters. The most detailed and perceptive response is by Christopher. Most of the pupils handle the question in a purely factual way: but clearly they have absorbed some of the implications of Roman occupation. Chris's is the most interesting because it shows that a slow learner can respond effectively to a potentially high level task.

13. Andrew

~~What the Romans brought to Britain~~

When the ~~too~~ Romans came to Britain they brought new ideas and new things. When they first arrived they built ~~a~~ Hadrians wall to cut of scotland because the tribes were stong and could not be defeated. They also brought the idea of houses when the Britains were still in iron age huts Caves.

14 Richard

~~nat the Romans brought to~~ Britain?

The Romans brought quite a lot of things to Britain. After the Romans conquored Britain they made Hadrians Wall. The wall was to stop the people from Scotland taking invading over Britain. The wall was very long It spread for miles. The Romans also brought strong men to defend them from other counteries.

15 Adrian

What The Romans Brought to Britain

The Romans brought roads to Britain. The roads were straight and long. This was so their soldiers could get to places fast. The Romans also brought ~~to~~ stone walls to keep out enimies and tritors. The Romans brought Hadrian's wall.

16 Mark

What The Romans ~~Brout~~ brought to Briton

The Romans Brart meany thing to Briton. They Brart cities to Briton and walls The Romans also Brart Brick houses, Trading wich helped alot, they Brart an army ~~conarey~~ and better ~~Betar~~ weapons to Briton. A well is water is user to get. Boats are also a Big thing that the Romans brart to Briton. They Brout armys. They Brart forts and castles ~~casals~~ heated floors Baths That were very Big in size sore times they would Bathe in milk.

V. Good.

17 Chris

Before the Roman geme to England the people live in seperate tribes in small villages. Their houses ~~theyr~~ were made of wicker covered with wattle.

The Romans changed all this. They built towns with Roads and houses and villas of stone.

They also brought law and order to the country.

They made ~~got~~ great straight Roads to there ~~For~~ Forts in Lincoln, york, and chester.

They also built a great wall accross the North of England to keep out the Savage picts and Scots. Good effort

By contrast, in Robin Hood's third lesson in science, the teacher set an H2 task: list the questions to which we want answers when we carry out this experiment to test detergents for effectiveness. This appears to be a very open-ended high level task; but the class has been so conditioned in the preceeding discussion that the resulting answers all look remarkably similar! The perceived slow learners Nigel and Chris have difficulty in proceeding any further than the given information; of the able pupils Guy manages a little more. Andrew, however, does show some ability to use evidence towards a conclusion. Nevertheless, one feels that potential task demand has been under-exploited by this inexperienced probationer.

This has been a relatively brief description of a validation procedure to check that pupils' interpretation of classroom tasks accords with that of the researcher in using the ACT proforma. It does show, however, that if anything ACT is slightly optimistic in assigning higher level categories. So any conclusions drawn from the task analysis seem unlikely to suffer serious bias caused solely by the research's interpeation or perception of the events witnessed. To the analysis itself we turn in the next section.

Investigation of the effect of detergents on Stains

1. How does the temperative effect cleaning power?

We got a pices ~~some~~ of cothes and we stared

?

2. Which brand of detergent is best?

3. Is a biological power better then ordingry powders

4. which types of dert cannot be ~~rem~~ remaved easily?

medoht

we had hot water with a little of cold water and we stered the cothes and ~~tittle~~ 5 mins went by the cothes was ~~not~~ no Died

Results

19 Chris

Investigation of the effect of detergents on stains

① How does the temperature affect cleaning power?

we got a pen some cloths and ~~stream~~ strained it and then ~~wass~~ wash

② which brand of detergent is best?

③ is a biological powder better than ordinary powders

4 which types of cannot be removed easily

20. Guy

Investigation of the effect of detergents on stains 26/6/79

1. How does the temperature affect cleaning powder.
We will wash stains in cold, warm and hot water with the same powder each time

2. Which brand of detergent is best?
We will try different detergents on the same stain to see which is the best.

3. Is a biological powder better than ordinary powders?
We will wash a natural stain in a biological powder and in an ordinary powder to see which is best.

4. Which types of dirt cannot be removed easily?
We will see which stains are the hardest to remove from the cloth.

21 Andrew

Investigation of the essect of detergents on strains

② . ~~tract are~~

① . How does the tempreture essect cleaning power?

We are going to get three stains on three seperate pieces of meterial and one piece spare as a control. We are going to wash one piece in warm water one in cold and one in, net. and see which washes the best.

② Which brand of detergent is best?

get the same stain on a few pieces of cloth and wash then at the same tempreture but with dissernt powders.

③ Is a biological powder better than ordinary powders?

number three is the same as number two

④ Which types of dirt cannot be removed easily?

The one we try that will not come of will be the stongest stains.

How to get rid of a wood die stain

Method I got a beaker a glass rod and some Dreft washing powder I washed thee pieces of sheet with stain on them. I washed one in ~~a~~ cold one in warm and one in hot.

And the same again but with ariel

Results

The cold and warm in the Dreft made no differerence but the ~~co~~ hot made the sheet go abit lighter.

In the ariel the hot was also the only one wich made a differonce and this was stronger than the dreft

conclusion

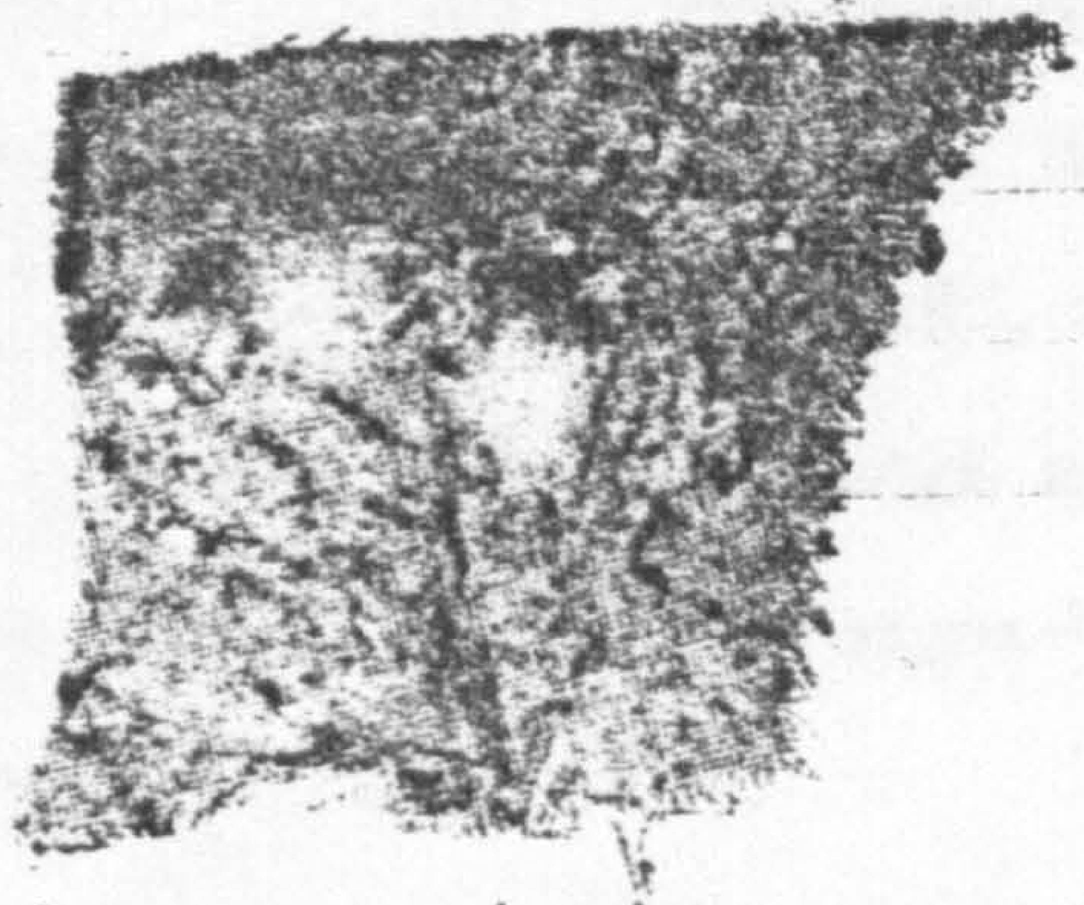
The ariel is alot stronger than the dreft when washing in hot water.

Garden stains

Method

First we made stains on a piece of cloth and cut it up into four we washed three pieces in warm cold and hot and kept one staindd piece as a control and also a peice before stained.

Results here are the results.

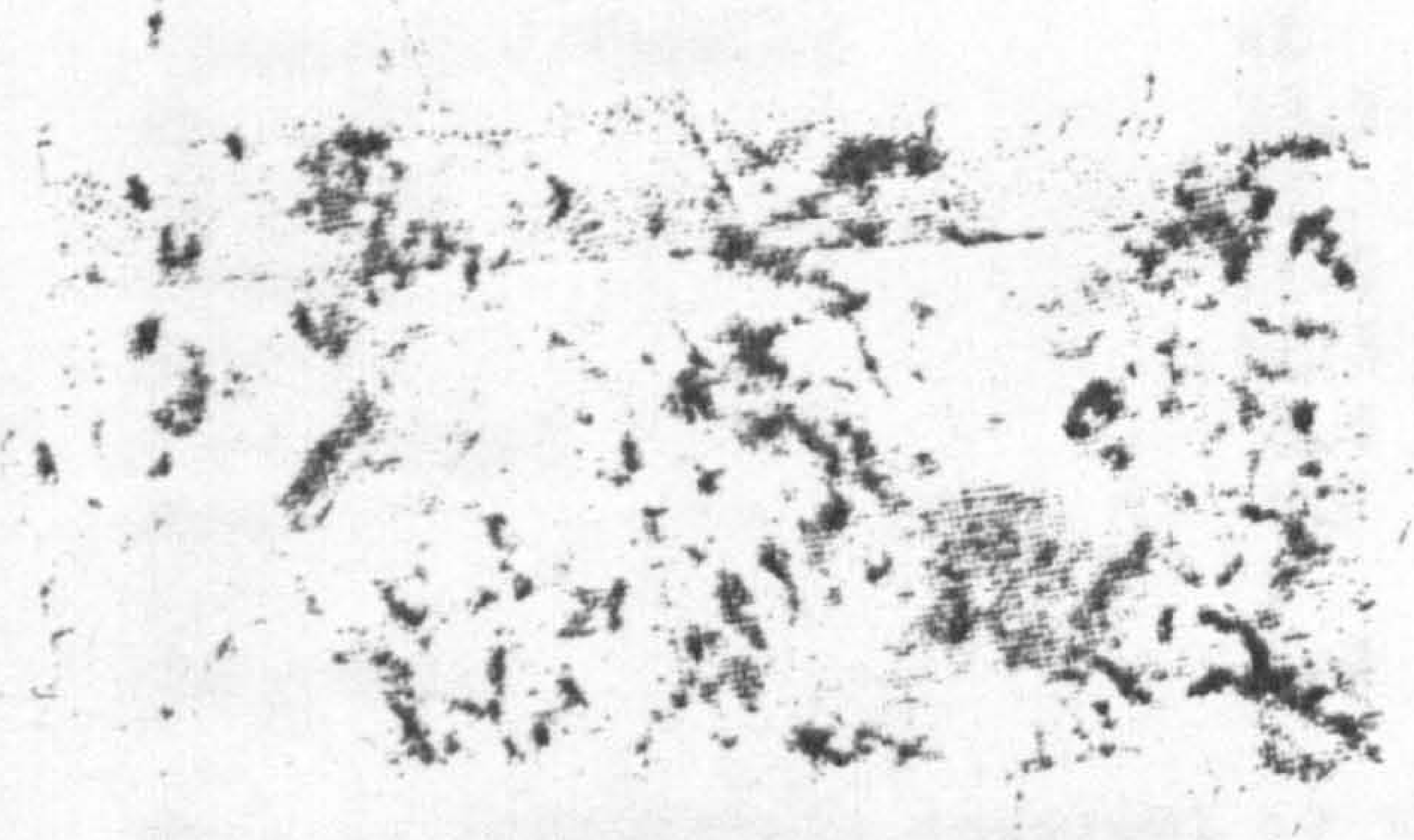


controls

non washed (control)

cold

Warm



An analysis of the classroom tasks

The Figures which follow examine the cognitive demand made by the classroom tasks.

Fig. 17.2 shows that, in the main sample of 5 first year mixed ability classes, an average of 4.3 tasks is set per lesson (most of the lessons are double periods). It is noticeable that teachers at Robin Hood School set a lot more tasks than others, and this is especially true of the R.E., French, Science and History specialists. It is their individual high scores which help to make these subjects come out on top in the right-hand column, average number of tasks per subject lesson.

Figure 17.3 sets out the tasks school by school and classified by ACT categories. The picture is surprisingly consistent. Though teachers at Robin Hood set more tasks, the balance between those making higher order thinking demands and those on the lower level is fairly uniform. Only Friar Tuck School is slightly out of line at 9% of higher order tasks; the rest vary between 15.3% and 18.8%.

Figures 17.4-17.12 examine the situation subject by subject. The following list rewrites the findings in rank order according to the number of higher order tasks:

	Higher order	Lower order	
Integrated Studies	41	59	%
English	33.3	66.6	
Science	23	77	
History	11.5	88.5	
French	11.3	88.7	
Mathematics	8.9	91.1	
Music	6.7	93.3	
R.E.	5	95	
Geography	4.2	95.8	

What is immediately apparent is that Integrated Studies, English and Science make sizeable cognitive demands; while R.E. and Geography make almost ten times fewer!

The reason for this is not too hard to find. In Integrated Studies the interdisciplinary approach lends itself to making connections and relationships. These usually involve pupils in either tasks needing empathy (H1) or in evaluative tasks (H6); and these almost certainly feed into and out of the subject matter with ease. English, too, is dominated by the need to empathize - this is especially true of English literature or of "creative" writing. For science the approach is different: here collection of evidence, deduction and reasoning are paramount (H2). Again the subject matter itself tends to condition the kind of task set.

But if this is so, how can R.E. be so low in cognitive demand? By its very nature it is about the most abstract idea we possess; and the whole of religious language is a conceptual minefield! Yet probably this is precisely why the tasks set are lower order. To make the subject intelligible, teachers side-step the real issues and reduce everything to its lowest common denominator: everyday life in Palestine, or a map of Paul's route from Tarsus to Antioch. So it is no coincidence that the commonest task in R.E. is L3, drawing or colouring. Exactly the same is true of Geography.

If the interpretation here put upon events is correct, then this is tangible evidence in favour of interdisciplinary studies replacing R.E., History and Geography in the early years of the comprehensive school. Though history ranks fourth in the list above, the commonest single task in this subject is still L3.

Figure 17.13 summarizes the 640 tasks set in the five main sample schools. The three commonest tasks in rank order are:

L11	reinforcing and practising already acquired skills	15.8%
L 4	copying or writing headings	15.6%
L 3	drawing or colouring	13.7%

The top two of these are more frequent than all higher order tasks put together. Higher order tasks comprise about 15% of all tasks set in our first year mixed ability classes; so this discovery answers the main question of this chapter for this educational context.

We can now turn aside to another issue: the teaching mode context in which tasks are set. One might reasonably assume that tasks set in a blanket way to the whole class do not as a rule provide for differentiated stimulation for the perceived able, nor special work if required for the perceived least able. If they do so, then it is through a set of graded questions in which the most able are expected to reach the most demanding questions. In that case the task is already designated higher order according to the ACT categories for, it will be recalled, a task of the kind described is allocated to an H category even if only a single part of it is higher order in demand.

If differentiated tasks are set, distinguishing between the work done by separate individuals or groups according to ability, these tasks must fall to a groupwork as individualized learning context. It is <u>here</u>, if anywhere, that special provision can be made. But is it made?

Figure 17.14 shows that the whole class context accounts for 91.9% of all tasks set in the main sample schools, leaving just 8.1% of tasks in teaching contexts where differentiation could purposefully take place. At the Sheriff, all tasks are set to the 'O' level group in a whole class context. Groupwork is fairly common in the primary class at Little John as a context for task performance. A quarter of tasks at Maid Marian Middle are in individualized learning contexts.

If one now looks to the section of this thesis which lists those classroom tasks, however, it soon becomes obvious that the few which have I or G in the left-hand margin may fall to these contexts, but are rarely so organized as to cater for the perceived able or less able (see Appendix).

Tasks, then, are NOT used as a medium through which teachers can serve the most and least able by giving them differential work. Tasks are aimed at classes not pupils. Though some tasks (about 15% in the main sample schools studied) have enough built-in cognitive demand to provide some challenge to the more able.

Table 17.14 adds a new dimension to the study. In order to discover whether banded groups were set more differentiated tasks an exactly parallel study was undertaken in King John Comprehensive of R.E. and science lessons. Results for this school are pooled alongside those of the other eight schools already mentioned.

Moving to Figure 17.15 we can return to the main issue in this chapter: what levels of cognitive demand are made by classroom tasks? The Figure sets out the answer for schools outside the main sample. Drawing together threads we can see that:

	Yr. 1 mixed classes set	14.9%	higher	order	tasks;
while	a primary class set	11.6%	"	"	"
	a yr. 4 middle school class set	6 %	"	"	"
	a yr 4 'O' level class set	2 %	"	"	"
But,	banded classes in R.E. set	43 %	"	"	"
and	banded classes in science set	7 %	"	"	"

Comparatively, the main sample schools have done rather well. The discrepancy between the paucity of higher level tasks in most learning contexts and those in the R.E. banded situation is, in fact, due entirely to the skill of the head of the .R.E. department at Little John. A glance at the Appendix will reveal that three R.E. teachers were observed; but the head of department emerged as an outstanding setter of cognitively demanding tasks. This is a cause for some hope, since it suggests that teachers can learn to control the task-related learning in their classrooms and can improve their professional skills in this area.

Over all the schools and the teachers studied for task demand a total of 902 tasks were collected. Figure 17.16 breaks down these tasks into cognitive levels. While no single H category rises above 4.3% of total tasks, higher order tasks account for 13.6% of the overall total in the nine schools of the complete analysis, while commonest tasks remain low level ones:

L11	reinforcing and practising acquires skills	at 17.8%
L 4	copying or writing headings	at 15 %
L 3	drawing or colouring	at 12.6%

While it is reasonable pedagogically to spend a proportion of tasks in reinforcement and practice [and 17.8% does not sound an unlikely proportion], it is rather more questionable to note that pupils are spending 27.6% of task-related energies on copying and colouring.

Figure 17 .2

TASKS

Number of lessons observed, and tasks identified, by school and subject area

	Will Scarlet	Huntingdon	Robin Hood	Friar Tuck	Alan Adale	Total	Average number of tasks per subject lesson
RE - lessons - tasks	2 (5,6)	- -	4 (16,12,24,7)	4 (4,0,5,4)	-	10 (83)	8.3
French	4 (6,4,1,6)	5 (3,4,7,7,3)	4 (7,9,5,7)	4 (2,3,7,6)	4 (5,7,4,3)	21 (106)	5.0
Science	4 (3,3,3,3)	3 (3,4,6)	4 (11,6,5,4)	4 (2,4,5,5)	4 (6,2,6,6)	19 (87)	4.6
History	4 (6,8,5,3)	- -	4 (7,6,7,7)	2 (6,6)	- -	10 (61)	6.1
English	4 (5,2,5,2)	5 (2,6,2,2,1)	4 (4,7,5,3)	4 (3,8,1,4)	4 (2,2,3,3)	21 (72)	3.4
Mathematics	4 (4,8,2,4)	5 (1,0,3,2,1)	4 (3,5,3,2)	8 (1,1,1,1, 4,1,5,3)	4 (7,12,3,2)	25 (71)	3.2
Geography	4 (4,1,1,2)	- -	4 (1,3,4,3)	2 (2,3)	- -	10 (24)	2.4
Music	4 (6,2,3,3)	4 (4,7,6,2)	4 (6.6,3,5)	4 (2,4,6,3)	4 (7,3,4,7)	20 (89)	4.5
Integrated Studies	- -	9 (0,1,2,6,3, 1,6,6,5)	- -	- -	6 (1,3,2,1,1, 1)	15 (39)	2.6
Total lesson tasks	30 (116)	31 (106)	32 (203)	32 (111)	22 (103)	147 (640)	
Average number of tasks per lesson school by school	3.8	3.4	6.3	3.5	4.7	Overall an average of 4.3 tasks per lesson across all subjects and schools	

Figure 17.3 Tasks in the 5 schools of the main study

Will Scarlet

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL	
-	16	16	24	1	3	6	7	-	11	10	1	95	= 81.8%

H1	H2	H3	H4	H5	H6	TOTAL	
3	12	3	0	0	3	21	= 18.1%

TOTAL TASKS
116

Huntingdon

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL	
1	13	10	17	9	9	-	3	1	2	19	3	87	= 82%

H1	H2	H3	H4	H5	H6	TOTAL	
10	-	6	1	0	2	19	= 18%

TOTAL TASKS
106

Robin Hood

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL	
-	24	42	12	14	9	1	2	5	5	37	17	169	= 83.25%

H1	H2	H3	H4	H5	H6	TOTAL	
8	7	9	2	2	3	31	= 15.3%

TOTAL TASKS
203*

*3 tasks unclassified (1.4%)

Friar Tuck

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL	
-	8	7	26	14	14	3	-	2	1	23	3	101	= 91%

H1	H2	H3	H4	H5	H6	TOTAL	
2	1	2	2	3	0	10	= 9%

TOTAL TASKS
111

Alan Adale

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL	
-	17	12	20	10	7	2	1	2	2	13	1	87	= 84.5%

H1	H2	H3	H4	H5	H6	TOTAL	
3	2	-	-	1	10	16	= 15.5%

TOTAL TASKS
103

Figure 17.4 Tasks in RE

Will Scarlet

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	1	1	3		1	2	1			2		11

H1	H2	H3	H4	H5	H6	TOTAL
						0

Huntingdon

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL

H1	H2	H3	H4	H5	H6	TOTAL

NOT TAUGHT

Robin Hood

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	6	21	2		1					14	10	54

H1	H2	H3	H4	H5	H6	TOTAL
		0	1		3	4

Friar Tuck

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	2		5	2	2	1			1			13

H1	H2	H3	H4	H5	H6	TOTAL
						0

Alan Adale

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL

H1	H2	H3	H4	H5	H6	TOTAL

NOT TAUGHT

All 5 schools

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	9	22	10	2	4	3	1	0	1	16	10	78

= 95%

H1	H2	H3	H4	H5	H6	TOTAL
		1	0		3	4

= 5%

TOTAL TASKS
82

Figure 17.5 Tasks in French

Will Scarlet

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	1	4	6			2			1	1		15

H1	H2	H3	H4	H5	H6	TOTAL
		2				2

Huntingdon

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	1	4	4	5			2		1	2		19

H1	H2	H3	H4	H5	H6	TOTAL
2		3				5

Robin Hood

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	2		6	2	2	1			2	9		24

H1	H2	H3	H4	H5	H6	TOTAL
	1	3				4

Friar Tuck

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
		1	7	1	2	2				4		17

H1	H2	H3	H4	H5	H6	TOTAL
		1				1

Alan Adale

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	1	3	7	1	2	1	1		1	2		19

H1	H2	H3	H4	H5	H6	TOTAL

All 5 schools

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL	
0	5	12	30	9	6	6	3	0	5	18	0	99	= 88.7%

H1	H2	H3	H4	H5	H6	TOTAL	
2	1	9	0	0	0	12	= 11.3%

TOTAL TASKS
106

Figure 17.6 Tasks in science

Will Scarlet

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	8											8

H1	H2	H3	H4	H5	H6	TOTAL
	4					4

Huntingdon

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	3	2	2		2			1		1		11

H1	H2	H3	H4	H5	H6	TOTAL
		2				2

Robin Hood

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	4	4	3		1			5		4		21

H1	H2	H3	H4	H5	H6	TOTAL
	5					5

Friar Tuck

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	2	2	2		4			2				13

H1	H2	H3	H4	H5	H6	TOTAL
		1	1	1		3

Alan Adale

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	5	3	2		1			1	1	1		14

H1	H2	H3	H4	H5	H6	TOTAL
	2			1	3	6

All 5 schools

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL	
-	22	11	9		8			9	1	6	1	67	= 77%

H1	H2	H3	H4	H5	H6	TOTAL	
	11	3	1	2	3	20	= 23%

TOTAL TASKS
87

Figure 17.7 Tasks in history

Will Scarlet

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	4	5	4			1	1		5			20

H1	H2	H3	H4	H5	H6	TOTAL
1	1					2

Huntingdon

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL

H1	H2	H3	H4	H5	H6	TOTAL

NOT TAUGHT

Robin Hood

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	2	7		3	2				2		5	21

H1	H2	H3	H4	H5	H6	TOTAL
		1		2		3

NOT TAUGHT

Friar Tuck

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
		1	5		3					1		10

H1	H2	H3	H4	H5	H6	TOTAL
	1			1		2

Alan Adale

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL

H1	H2	H3	H4	H5	H6	TOTAL

NOT TAUGHT

All 5 schools

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL	
0	6	13	9	3	5	1	1	0	7	1	5	51	= 88.5%

H1	H2	H3	H4	H5	H6	TOTAL	
1	2	1	0	3	0	7	= 11.5%

TOTAL TASKS
61

Figure 17.8 Tasks in English

Will Scarlet

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
			1	1	1	1				3		8

H1	H2	H3	H4	H5	H6	TOTAL
2		1				3

Huntingdon

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
		1	3		3					4		11

H1	H2	H3	H4	H5	H6	TOTAL
2						2

Robin Hood

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	3	1			2					2	2	10

H1	H2	H3	H4	H5	H6	TOTAL
6	1	1	1			9

Friar Tuck

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	2		3	2	3					2		12

H1	H2	H3	H4	H5	H6	TOTAL
2			1	1		4

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	2		2	1	2							7

H1	H2	H3	H4	H5	H6	TOTAL
3						3

All 5 schools

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	7	2	9	4	11	1				11		3

= 66.6%

H1	H2	H3	H4	H5	H6	TOTAL
15	1	2	2	1	3	24

= 33.3%

TOTAL TASKS
72

Figure 17.9 Tasks in mathematics

Will Scarlet

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
		2	2				5			3		12

H1	H2	H3	H4	H5	H6	TOTAL
	6					6

Huntingdon

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	2		1				1			3		7

H1	H2	H3	H4	H5	H6	TOTAL

Robin Hood

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	1		1				2			8		12

H1	H2	H3	H4	H5	H6	TOTAL
		1				1

Friar Tuck

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	1	1	4							11		17

H1	H2	H3	H4	H5	H6	TOTAL

Alan Adale

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	5	5	6					1		7		24

H1	H2	H3	H4	H5	H6	TOTAL

All 5 schools

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	9	8	14				8	1	0	32		72

= 91.1%

H1	H2	H3	H4	H5	H6	TOTAL
	6	1				7

= 8.9%

TOTAL TASKS
79

Figures 17.10 Tasks in geography

Will Scarlet

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	1	1	2						2			7

H1	H2	H3	H4	H5	H6	TOTAL
	1					1

Huntingdon

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL

H1	H2	H3	H4	H5	H6	TOTAL

NOT TAUGHT

Robin Hood

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	2	7							1			11

H1	H2	H3	H4	H5	H6	TOTAL

Friar Tuck

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
		2	1								2	5

H1	H2	H3	H4	H5	H6	TOTAL

Alan Adale

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL

H1	H2	H3	H4	H5	H6	TOTAL

NOT TAUGHT

All 5 schools

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL	
	3	10	3		1				3	1	2	23	= 95.8%

H1	H2	H3	H4	H5	H6	TOTAL	
	1					1	= 4.2%

TOTAL TASKS
24

Figure 17.11 Tasks in Music

Will Scarlet

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	1	3	6		1				3			14

H1	H2	H3	H4	H5	H6	TOTAL

Huntingdon

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	4	1	4	1						6	2	18

H1	H2	H3	H4	H5	H6	TOTAL
			1			1

Robin Hood

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	4	2		9								15

H1	H2	H3	H4	H5	H6	TOTAL
2		2	1			5

Friar Tuck

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	1			9						5		15

H1	H2	H3	H4	H5	H6	TOTAL

Alan Adale

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	3	1	3	8	2	1				3		21

H1	H2	H3	H4	H5	H6	TOTAL

All 5 schools

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL	
	13	7	13	27	3	1			3	14	2	83	= 93.3%

H1	H2	H3	H4	H5	H6	TOTAL	
2		2	2			6	= 6.7%

TOTAL TASKS
89

Figures 17.12 Tasks in Integrated Studies

Will Scarlet

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL

H1	H2	H3	H4	H5	H6	TOTAL

NOT TAUGHT

Huntingdon

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
1	3	2	3	3	4				1	3	1	21

H1	H2	H3	H4	H5	H6	TOTAL
6		1			2	9

Robin Hood

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL

H1	H2	H3	H4	H5	H6	TOTAL

NOT TAUGHT

Friar Tuck

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL

H1	H2	H3	H4	H5	H6	TOTAL

NOT TAUGHT

Alan Adale

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
	1										1	2

H1	H2	H3	H4	H5	H6	TOTAL
					7	7

All 5 schools

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
1	4	2	3	3	4				1	3	2	23

=59%

H1	H2	H3	H4	H5	H6	TOTAL
6		1			9	16

= 41%

TOTAL TASKS
39

Figure 17.13

TASKS: <u>All tasks in all schools analysed by cognitive demand</u>

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL	
1	78	88	100	48	42	12	13	10	21	102	25	540	*
0.1	12.1	13.7	15.6	7.5	6.5	1.9	2.6	1.7	3.2	15.8	3.8	85%	lower level tasks

H1	H2	H3	H4	H5	H6	TOTAL	
26	22	20	5	6	18	97	
4.0	3.4	3.1	0.8	0.9	2.7	14.9%	higher level tasks

TOTAL TASKS = 640 (100%)

*3 tasks were unclassified due to lack of adequate information

Figures 17.14

TASKS: Teaching mode context of classroom tasks

Type of school (+ total tasks)	Whole class context	Groupwork Context	Individualized learning context
Tasks in five 1st year secondary mixed ability classes (640)	588 (91.9%)	36 (5.6%)	16 (2.5%)
Tasks in 4th year GCE 'O' level accelerated set (54)	54 (100%)	0 (0%)	0 (0%)
Tasks in 4th year middle school class (33)	24 (73%)	0 (0%)	9 (27%)
Tasks in a primary class (69)	51 (74%)	15 (21.7%)	3 (4.3%)
Tasks in secondary banded groups in science (85)	85 (100%)	0 (0%)	0 (0%)
Tasks in secondary banded groups in RE (21)	20 (95.2%)	1 (4.8%)	0 (0%)
Overall, all schools and contexts (902)	822 (91.1%)	52 (5.8%)	28 (3.1%)

Figures 17.15

TASKS: Numbers of tasks set in various types of classrooms broken down by levels of cognitive demand for comparison with the cognitive demand of tasks set in five 1st year mixed ability classes.

A 4th year GCE 'O' level accelerated set

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL	
-	-	2	13	6	10	1	6	-	2	12	1	53	= 98%

H1	H2	H3	H4	H5	H6	TOTAL	
1	-	-	-	-	-	1	= 2%

TOTAL TASKS
54

A 4th year middle school class

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL	
-	-	2	6	2	1	1	2	3	-	12	2	31	= 94%

H1	H2	H3	H4	H5	H6	TOTAL	
2						2	= 6%

TOTAL TASKS
33

A primary class

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL	
-	18	9	2	1	8	1	-	-	-	16	6	61	= 88.4%

H1	H2	H3	H4	H5	H6	TOTAL	
8	-	-	-	-	-	8	= 11.6%

TOTAL TASKS
69

Banded groups of secondary pupils learning RE

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL	
-	-	-	-	2	2	-	-	-	1	5	2	12	= 57%

H1	H2	H3	H4	H5	H6	TOTAL	
1	3	3	1	-	1	9	= 43%

TOTAL TASKS
21

Banded groups of secondary pupils learning science

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL	
-	11	12	14	-	10	-	2	13	3	13	1	79	= 93%

H1	H2	H3	H4	H5	H6	TOTAL	
-	3	2	1	-	-	6	= 7%

TOTAL TASKS
85

Figure 17.16

TASKS: ALL tasks from all sources broken down by cognitive demand

L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	TOTAL
1	107	113	135	59	73	15	23	26	27	160	37	776
0.1	11.9	12.6	15.0	6.5	8.1	1.6	2.5	2.8	3.0	17.8	4.1	86%
H1	H2	H3	H4	H5	H6	TOTAL						
38	28	25	7	6	19	123						
4.3	3.1	2.8	0.7	0.6	2.1	13.6%						

	Number	%
Total lower level tasks	776	86%
Total higher level tasks	123	13.6%
Unclassified	3	0.4%
TOTAL: ALL TASKS	902	100%

CHAPTER 18

SUMMARY AND DISCUSSION OF THE RESULTS OF THE RESEARCH

It will be recalled from Chapter 2 that the underlying purposes of the research were to investigate the nature of the learning which takes place in mixed ability classes and what happens to exceptional pupils within them, and to examine the appropriateness of the teaching strategies used in that context. Both of these concerns were to feed into the development of initial and INSET materials for the profession. This subject is taken up in the next and final chapter, and here the emphasis is on a summary of the data itself.

1. The mixed ability context

Mixed ability organization in schools is about treating pupils as individuals and complements ideals of social equality which prompted the rise of the comprehensive system. This has been articulated by heads and teachers not only in this research but in other studies too (Reid, 1982). What this means in practice is far from clear (H.M.I., 1978), since the social aims are not easy to elucidate. This woolliness is nicely demonstrated in an essay by one headmaster (King in Sands and Kerry, 1982); while another (Collier, in the same volume) attributes his retreat from mixed ability teaching to the twin problems of clarifying social ideals and then making them work in practice within the constraints of accepted school structures. The theoretical position of advocates of mixed ability teaching is that pupils in these classes, freed from the social stigmas and preconceptions which labelling confers, will be enabled to learn in contexts, and work independently on tasks, which are designed to match their own needs, abilities and aptitudes (Kelly, 1978). The role of the researcher is to discover whether and how this ideal is realized.

The present research facilitated a fairly detailed picture of the learning experiences of first year mixed ability classes in comprehensive schools and of the ways in which teachers react to mixed ability organization. This is reduced here to a thumb-nail sketch.

Mixed ability organization was found to be widespread in the comprehensive schools of our Headteacher questionnaire sample: 71% had mixed ability classes in the first year; but these were replaced by setting or streaming in most cases by year 3. Typical mixed ability lessons are predominantly conducted in a whole class teaching mode. This was true both for classes observed being taught by nominated able teachers during the twenty-one case studies of the preliminary investigations, and also for observations throughout the 230 lessons of the main study. In the main study, whole class teaching occupied 62.1% of teaching time. While teachers in the case studies claimed to use groupwork extensively, many so-called groups turned out to be friendship pairs of youngsters sitting together to perform independently tasks shared by the whole class (16.8% of teaching time). Covertly or overtly, therefore, 78.9% of teaching took place in a whole-class mode. This finding runs counter to the expressed intention of mixed ability classes. It leaves just 7% of teaching time for genuinely co-operative groupwork and 14.1% for individualized learning. In these two time periods the differentiated work required presumably by <u>all</u> pupils in a mixed ability class, and particularly by those with special learning needs (the bright, the slow learner and even the absentee who has missed link lessons), must be provided. Only about a fifth of class time is available for meeting the ideal of learning tailored to individual aptitudes then; and the predominance of whole class teaching in a mixed ability context must imply that work is aimed near or even below the average ability of the class. To do otherwise would be to leave many pupils intellectually stranded; and the evidence as to how this gravitation towards the mean comes about is given in following sections of this chapter.

It comes as no surprise, therefore, to discover that teachers in the preliminary case studies saw among the disadvantages of mixed ability teaching the problem of 'getting the level right', of teaching a class unit when such wide discrepancies of ability might exist within it, and the amount of time needed to produce a range of resources appropriate for all the pupils. Bright pupils were felt to be easier to identify but harder to keep working at a fast pace or on work of adequate standard. Slow learners, though unlabelled, were in practice more conscious of their shortcomings by the relatively superior academic performance of other pupils; and they needed a disproportionate share of teacher time.

Typical classroom organization in mixed ability lessons involved a whole-class introduction to the day's theme. A task or tasks were then set; and once the majority were occupied the special needs of exceptional pupils could be dealt with. Usually the task was common to all pupils; though teachers in the preliminary case studies alleged that, once pupils were occupied, differentiated work was provided for those with special needs. Almost no evidence of this was found in the main study. Towards the end of the lesson pupils were, typically, called back together to consolidate and share what had been covered.

Some subjects probably lend themselves more readily than others to a mixed ability organization. The case-studies highlighted some hostility to mixed ability among mathematics and language teachers, even among those judged as effective by university tutors. The life-philosophy of some R.E. teachers and the nature of the subject matter may predispose this group to retain mixed ability classes (Kerry 1979). There is a slight suggestion that some degree of interdisciplinary approach (combined science, humanities, integrated studies, etc.) is more appropriate for curriculum in a mixed ability context.

Problems of class management, or simply of administrative provision of equipment, may be highlighted in mixed ability classes. Where groupwork, differentiated tasks, or even several different activities are in progress at once proportionately more time has to be spent by the teacher in class and at the preparation stage to ensure that everything is to hand and the lesson runs smoothly. This may go some way towards an explanation of the predominance of management level teacher talk reported in a later section of this chapter. Pupil behaviour, however, is often reported by teachers, in this and other research, to be improved by a mixed ability organization; and the absence of ghettos of disruptive slow learners is usually identified as the main cause. However, some research in progress (Dooley, 1982) does show how widespread is time-wasting in the form of minor deviance such as irrelevant pupil talk or excessive noise chatter which disturbs others.

Teachers in mixed ability classes need to be more effective in catering for individual needs than in other forms of organization: they must be sensitive to the range of pupils' needs, able to structure work at several levels simultaneously, and capable of motivating a range of pupils. Nevertheless, many teachers and heads of department interviewed during the preliminary case study phase of the research demonstrated by their responses that they viewed learning as a content-based activity: the acquisition, memorization and regurgitation of factual material. The analyses of the oral and task components of lessons in the main study went a long way towards confirming this as the widespread teaching philosophy - even where it remains unexpressed. To avoid pupils becoming too disparate in the quantity of knowledge gained, teachers often used a 'topic' basis for the curriculum, 'zeroing' to a new topic for everyone when the most able had progressed too far in content beyond the least able. The same philosophy permeated the semantics of teacher and headteacher language: bright pupils should be given quantitatively 'more work' to do; the less able 'do not cover as much ground' as the rest.

Few schools (and no individual teachers) studied made systematic attempts to identify and provide special work for the pupils at the extremes of the ability ranges. Questionnaires mailed to headteachers in 1976/77 and again three academic years later suggested that mere consciousness of the needs of exceptional pupils had wrought surprisingly little change in how they were treated, (Kerry 1981 and 1982).

Nevertheless, teachers were able to identify both slow learners and bright pupils in their classes. In the main study teachers selected able pupils according to certain cognitive criteria on a Class Profile Instrument. They were also able to articulate their perceptions of, and cues or pointers to, exceptional pupils: bright pupils were characteristically articulate, keen to answer questions, alert, curious, enthusiastic, independent, resourceful and quick to understand work and complete tasks; slow learners were slow workers, scoring poor marks, lacking confidence and initiative, low on concentration and interest, and in constant need of attention. These two groups of pupils present in a class alongside a wide range of 'middle band' pupils caused the teachers organizational and pedagogical problems. Thus, mixed ability teaching was widely recognized as a constellation of advanced teaching skills; yet little initial or in-service training was provided on this theme, and teachers saw themselves as working the problems through on a daily basis in the classroom. This paucity of in-service work, and a general pessimism about coming to grips with the needs of exceptional pupils, were being exacerbated by a deteriorating economic situation, in which adequate resources were unavailable (Reid 1981).

All the points made in this analysis of a regional investigation have been largely supported by the contemporary national enquiry by the N.F.E.R., recently published (Reid, 1982, passim).

2. The cognitive demand made by the oral components of lessons in five first year mixed ability classes

It was hypothesized at the beginning of this thesis that to investigate the extent of cognitive stimulation in mixed ability classes it would be necessary to record units of oral transactions, i.e. instances of teacher talk, teacher questions and pupil response/contact/initiations, and to categorize these using a pre-ordained system of the kind described in Chapter 6. This proved to be both possible and instructive.

Teacher talk in the five schools of the main study, across all curriculum areas except French, proved to be primarily concerned with management. Broken down by subjects, management talk as a proportion of all talk transactions, ranged from 57.2% in history to 70% in mathematics. On a school basis, three out of five schools exhibited a tendency for management categories to predominate when teacher talk was analysed (61.2% at Friar Tuck, 67.4% at Robin Hood and 69.6% at Alan Adale).

French was exceptional in that management talk units made up slightly less than half the total teacher talk units (46.3%). At Will Scarlet (46.2%) and Huntingdon (47.1%) management talk did not occupy quite such a central position as at the other three schools.

When teachers were not managing during talk transactions they were generally giving information. Information-giving talk ranged from 25.9% of analyzed units in science to 51.4% in French. Two schools were especially high on information-giving talk across the curriculum: Huntingdon at 48.7% and Will Scarlet at 49.8%. In the two locations high management talk was traded for increased information-giving.

Teacher talk transactions at level 2 (T2 concepts, explanations) were rare, averaging just 4.6% of talk transactions across all schools; and level 3 talk was non-existent in all schools except Will Scarlet (0.07%). Looking at individual subjects, highest occurences of T2 transactions occurred in science and made up 6.9% of teacher talk units in that subject. In other curricularareas the figure ranged from 5.8% in history to 1.9% in mathematics.

Moving to teachers' questions, the picture is not dissimilar. It was hypothesized that the cognitive level at which a teacher question was pitched would determine the quality of pupil-thinking in response. This was largely borne out by an analysis of pupil responses (described below). Yet few higher order questions were asked. Those falling to the four higher order categories of the coding scheme numbered just 252 out of a total of 6,925 questions asked in the five main study schools: 3.6%. Of the remainder, 75.6% were of the kind designed to test recall or simple comprehension, while 20.8% had to do with classroom management.

In questioning, patterns did not vary enormously from school to school; but while Q1,Q2 categories (i.e. the lower order ones) were making up about 75% of all questions in all five schools, teachers in only two schools (Will Scarlet at 8.7% and Robin Hood at 10.1%) asked any number of higher order questions at all. While cognitive stimulation of pupils through teacher questions is clearly lacking across the board, in three of the sample schools it was practically non-existent. In view of the estimate that teachers ask more than

200 questions a day and about 1½ million in a career, it is a frightening waste of energy in what is clearly a crucial skill area which absorbs a good deal of learning time.

As has been suggested, the rather negative signals about the value of higher level thinking put out through teachers' talk and questions were reflected in pupil contacts, responses and initiations. 18,963 transactions by pupils were analysed. In every school except Friar Tuck (26.1%) the majority were of the social kind (C), rather than to do with learning - up to 60.3% in Robin Hood. There can be little doubt that this kind of transaction is valuable and necessary (Kempa, 1980) to keep alive classroom life and sustain relationships. Of the transactions which had directly to do with learning most were at a data level (R1), concerned with factual information (range: 25.3% in Robin Hood to 47.9% at Friar Tuck). If teachers' higher order questions (Q3,4, 5 and 6 together) are compared with pupil higher responses (R2,R3 together) we find as follows:

	Q3,4,5,6 as % of all questions for that school	R2,R3 as % of all R categories for that school
Robin Hood	10.1%	6.6%
Will Scarlet	8.7%	9.5%
Huntingdon	3.4%	5.9%
Alan Adale	0.4%	0.3%
Friar Tuck	0.2%	0.1%

On the face of it, though the relationship is not quite linear, it would seem that there is a conncection between higher order questioning by teachers and higher order responding by pupils. Common sense dictates that this is not surprising. Clearly the rule is that (as in the case of Alan Adale and Friar Tuck) an absence of higher order cognitive demand leads to an absence of higher order cognitive response. The figures suggest, however, that teachers who use higher order questions more frequently and appropriately will improve their pupils' quality of thinking as determined by their level of responses.

An examination of oral contributions to lessons by teachers and pupils has suggested, then, that higher order cognitive transactions are relatively rare events in first year mixed ability classes. In the next section of this chapter we shall consider another way of perceiving the figures concerning these higher order transactions. For the moment, it is sufficient to remark that if bright pupils are recognized by teachers to be present in their classes, as they are, in 3 of the 5 study schools then provision for their learning is notable by its absence/through the most characteristic feature of the classroom - the spoken word. Earlier it was argued that even average pupils of this age are beginning to think abstractly, and experts in the remedial field have shown that slow learners of this age also benefit from stimulation through cognitively demanding material. The teachers in our main sample, with no exception, paid scant heed to these considerations.

3. An alternative model for conceptualizing the oral transactions in mixed ability classrooms

Before leaving our review of classroom oral transactions set out in section 2 of this chapter it is worthwhile to explore a model of teaching and learning which has become explicit through the research data. Many different ways can be found to describe the role of the teacher and the process of teaching/learning. Youngman (forthcoming) takes a job analysis approach; others have speculated more about the teacher as decision-maker, or about behaviour modification. Teaching, on the evidence we have here, consists of three main processes: managing, informing and stimulating.[1] This process model of teaching is simple; but a useful one for initial and in-service training because activities can be quickly and easily categorized into it. In the present research it would work as follows.

1) The word stimulating here is used in the sense of higher order cognitive stimulus, not in the simpler sense implied eg by stimulus-response. An alternative expression might be "challenging" - but I have retained the idea of stimulating thought, as I have used the same concept in other published works.

In the category system for oral transactions in lessons adopted by this research managing involves teacher talk at a management level, T0; teachers' management questions, Q0; and pupil responses and contacts at a management level, i.e. categories R0 and C. Informing is represented by the categories of the analysis system T1, Q1, Q2 and R1. All categories dealing with higher level thinking (T2, T3, Q3, Q4, Q5, Q6, R2, R3) may be counted as the activity of stimulating.

Figure 18.1 shows all the transactions of all kinds (except those which are labelled RW - these do not really lend themselves to this analysis and are few in number anyway) divided into the three groups: management, information, stimulation.

Figure 18.1

Proportions of Classroom Transactions Concerned with Managing, Informing and Stimulating

	Managing (T0, Q0, R0, C) total transactions all teachers		
Will Scarlet	3,450		
Huntingdon	3,858		
Robin Hood	3,640		
Friar Tuck	4,152		
Alan Adale	6,438		
	21,538		53.7%
	Informing (T1, Q1, Q3, R1) total transactions all teachers		
Will Scarlet	3,162		
Huntingdon	3,646		
Robin Hood	1,985		
Friar Tuck	4,101		
Alan Adale	4,048		
	16,942		42.2%
	Stimulating (T2, T3, Q3, 4, 5, 6, R2, R3) total transactions all teachers		
Will Scarlet	561		
Huntingdon	393		
Robin Hood	452		
Friar Tuck	91		
Alan Adale	141		
	1,638		4.1%
		40,118	100%

It will be seen from this Figure that, in the present research, 53.7% of all the transactions had to do with the managing process. Informing consumed 42.2% of the teaching/learning transactions. Only 4.1% of all transactions (just 1,638 out of a sizeable 40,118 recorded) were given to the process of stimulating higher level thought.

If teachers could become more self-aware about which of the dimensions of the process model of teaching they were operating within at any given moment it might serve to promote more teaching/learning activities which rose above the mere acquisition of factual knowledge.

4. The cognitive demand made by the tasks set in five first year mixed ability classes

In this research all 640 tasks set to pupils in the classes of the main study have been analysed using an emergent category system. This system enabled the researcher to classify tasks into high or low cognitive levels and to sub-divide tasks at each of the two levels into types according to carefully structured descriptions. Thus task analysis was able to paint a picture both of the cognitive demand made on pupils by classroom tasks and also to give a fairly clear idea of the balance between task types used in the classes studied.

Most tasks were undifferentiated, being set to all pupils in a whole class context. In all 91.9% of tasks were set in this way. Of the 5.6% of tasks set to groups and 2.5% to individuals only one was aimed specifically at catering for a pupil perceived as bright or slow by the teachers of that pupil's class.

Due to lack of detailed information three tasks of the 640 were unclassified using the ACT proforma. Of the rest, 85% (i.e. 540) were lower level cognitive tasks, and 14.9% were at a higher level.

The three commonest tasks were L11 (practising tasks) at 15.8%, L4 (copying tasks) at 15.6%, and L3 (drawing or colouring tasks) at 13.7% of all tasks

Teachers of integrated studies set almost ten times more higher-level tasks (41% of all integrated studies tasks) than teachers of geography (4.2%)or R.E. (5%). English (33%) and science (23%) were also well represented at the higher levels.

The most obvious conclusion to be drawn here is that few tasks are capable of catering specifically for individuals because of the whole class context in which they are set; indeed, they are clearly not set with this intention. However, pupils may be stimulated to higher level thinking by as many as 14.9% of all classroom tasks set. Though a higher level task need not necessarily provoke a high level cognitive response, analysis of photocopies of pupils' task responses suggest that pupils do recognize and respond to the level of task demand signalled by the teacher.

Though the nature of many of the tasks set is somewhat time-wasting on the one hand, or clearly reflects the teachers' already expressed predominant concern for content-based learning on the other, pupils in this study gained proportionately more cognitive stimulation through classroom tasks than they did through talk transactions. Nevertheless, this research does suggest quite strongly that the skill of task setting might be a high priority for in-service and initial training courses. Once again, the pattern of task-setting discovered here suggests that teachers have not yet found ways to match the ideal of pupil learning tailored to individual needs in mixed ability classes to the realities of catering simultaenously for thirty pupils of widely differing abilities.

5. Provision for pupils perceived as exceptional: bright pupils and slow learners

The research went on from painting a general picture of relatively little cognitive stimulation for all pupils in the studied classes to consider the implications of this for the able and less able. Since so few oral transactions or tasks were aimed specifically at these groups, the general findings take on an increased significance. However, because teachers were able to identify bright pupils and slow learners and were prepared to do so, it was possible to discover whether these groups were treated or behaved differently from the remaining middle band youngsters in the class. By recording the names of pupils who were involved in R categories of verbal transactions some breakdown could be made of these pupils' involvement in lessons. A number of interesting findings emerged from this analysis.

In coping with these two disparate groups of pupils teachers in the preliminary case studies hinted that, because the symptoms of their problems are similar (both require increased teacher attention), they tended to view them as one group of exceptional pupils. This discovery was borne out by the main study in so much as at all five schools the exceptional pupils engaged in more transactions with the teacher than did the middle band pupils in these schools. The result was significant.

It might have been expected that bright pupils should have more higher level transactions with teachers than other pupils. In fact, this was so in two schools: Will Scarlet and Robin Hood. The differences in scores between the two groups of pupils were statistically significant at the 0.01 level in each. In the case of the other three schools higher level transactions were virtually non-existent.

In all five schools boys tended to have more transactions with teachers than girls; but the differences between the two groups were not significant in any one instance. Perhaps girls are more passive, less disruptive, or less extrovert at this age and so seek less attention or, in the busy and competitive world of the classroom, are simply offered less.

Apart from the results at Will Scarlet and Robin Hood schools, which show that aware teachers may go some way to catering for individuals needs in mixed ability classes, these findings confirm the overall picture concerning the paucity of differential stimulation for exceptional pupils in these contexts.

6. Cognitive life of classrooms in other educational settings

It was obviously beyond the scope of this already sizeable research operation to look in detail at verbal transactions and tasks in classes organized differently from our sample of first year comprehensives. However, very small-scale studies (too small for generalization) were conducted to see whether and how these two learning media were handled in other educational contexts. A primary class, a middle school class and a G.C.E. 'O' level accelerated set were scrutinized.

In the primary class with its integrated timetable verbal transactions were characterized by the C category (60% of all transactions). If the process model of teaching (described in Section 3) involving the activities of managing, informing and stimulating is applied to the primary class, the following result is obtained:

	PRIMARY AND	5 MAIN STUDY CLASSES
MANAGING	77%	53.7%
INFORMING	17%	42.2%
STIMULATING	6%	4.1%

Thus managing is even more central to the primary context than the secondary one.

When classroom tasks in the primary class were analysed their context was less whole class dominated than in the classes of the main study.

	PRIMARY AND MAIN	STUDY CLASSES
WHOLE CLASS	74 %	91.9%
GROUPWORK	21.7%	5.6%
INDIVIDUALIZED LEARNING	4.3%	2.5%

Groupwork is, as might have been expected, more prevalent in the primary school.

Task demand showed a marked similarity between primary and main study classes:

	PRIMARY AND MAIN	STUDY CLASSES
LOW LEVEL	88.4%	85%
HIGH LEVEL	11.6%	14.9%

Commonest primary tasks were L2 (18%) administrative tasks and L11 (16%) reinforcing tasks. The only kind of higher level tasks set were imaginative or empathic ones (H1).

The middle school class studied contained pupils of equivalent age to those in the main sample. This school operated a timetable based on subject lessons taught by subject specialists. Verbal transactions were again dominated by managing and informing, with almost no examples of higher order transactions in the T,Q or R categories. The patterns varied from subject to subject, but overall closely mirrored those of the secondary school main sample.

Task demand was also low:

	MIDDLE AND MAIN	STUDY CLASSES
LOW LEVEL	94%	85%
HIGH LEVEL	6%	14.9%

As in the primary school H1 tasks made up the total of higher level tasks. Individualized learning was commoner in this middle school context than in the main sample or the primary school.

	MIDDLE,	MAIN SAMPLE	AND PRIMARY CLASSES
WHOLE CLASS	73%	91.9%	74%
GROUP WORK	0%	5.6%	21.7%
INDIVIDUALIZED LEARNING	27%	2.5%	4.3%

One might have hypothesized that verbal transactions in a G.C.E. 'O' level accelerated set would have included a sizeable number at a higher cognitive level compared with the other educational settings studied. In practice only the history teacher asked a lot (11%) of higher order questions. But T2 and R2 categories featured more prominently in all subjects than in the main sample and other study schools. Thus:

Percentage of T2 transactions (as a proportion of all transactions) occurring in 'O' level set and main sample classes, analysed by subject.

	'O' LEVEL SET	MAIN SAMPLE
R.E.	7%	1%
French	3%	0.7%
Science	14.4%	2.4%
History	19%	2.0%
English	11%	1.9%
Mathematics	8%	0.6%
Geography	9%	0.7%

Percentage of R2 transactions (as a percentage of all transactions) in an 'O' level set and main sample classes analysed by subject.

	'O' LEVEL SET	MAIN SAMPLE
R.E.	8%	0.4%
French	12%	4.8%
Science	3%	2.1%
History	11%	2.9%
English	3%	1.3%
Mathematics	11%	1.1%
Geography	8%	1.8%

In this setting, where able pupils are selected out for special appropriate treatment, cognitive demand has risen measurably - overall by a factor of 7.6 in the case of T2 transactions and by a factor of 3.9 in the case of R2 transactions.

Tasks in the 'O' level set were . exclusively in a whole class contêxt. Task demand was low: 98% at the low level and 2% at a high level. Commonest tasks were L4 (copying) at 13% and L11 (reinforcing) at 12% of the total. This reflects the sizeable amount of note-taking from the blackboard and practising of answering techniques to examination questions undertaken by this group. Thus task demand does not match verbal demand in cognitive terms, and these selected able youngsters were asked to carry out even fewer high level tasks (just <u>one</u> during the study period) than all other youngsters studied!

A very brief study of science and R.E. lessons in banded classes across the age and ability range in a comprehensive school suggested that an able teacher was capable of setting up to 43% of higher order tasks.

These additional studies, while confirming that the basic findings of this research paint an accurate picture of classroom life in a variety of settings, thus show up differences between schools and methods of organization which would repay more detailed comparative study using the kinds of methods described here.

7. Present findings: their relationship to other researches

What has emerged from this study is a story of the low levels of cognitive demand made by teachers in mixed ability classes. These low levels are characteristic of both verbal and task transactions. However, 'low' is, in effect, a comparative term. There are few researches which throw light on pupils' learning by attempting to assess the cognitive demand of teaching processes; and no agreement about what constitutes an 'optimum' or even an 'acceptable' level of cognitive stimulation. In this respect the work of Brown and Armstrong (1979) is particularly interesting. Their findings in a higher education setting (already quoted in ch. 5) suggested that verbal transactions of a higher order reached the 20% level of frequency. Clearly such higher level transactions needed to be linked to existing knowledge and thought-forms. These links are forged through the intervening lower order transactions. The debate about relative proportions of high and low orders could be extended: what is clear is that the measurement is, of itself, a pointer to whether pupils in general are being stimulated and (in the present context) to whether able pupils in particular are being stretched. The present research has suggested that in mixed ability classes an average of 10% higher order transactions in lessons fails in these intentions, and that an improvement will be brought about only through teacher awareness of classroom skills and processes involved in what has been labelled stimulation. What is more important in these findings is that many teachers studied here showed no awareness and precious little skill in this crucial area of teaching effectiveness. The study is borne out by the only other sizeable research programme with pupils of similar age (though within a single subject discipline): that by Eggleston (Dreyfus and Eggleston 1977). Eggleston found similar emphasis on factual transactions in all branches of secondary school science teaching, but went a stage further in using cluster analysis in identifying teaching styles. His style 1 teachers kept the classroom initiatives but were characterized by the challenge of questions addressed to the pupils. Style 3 teachers also kept intellectual engagement high but were more pupil-centred in approach. By contrast, style 2 teachers were fact-dominated (Eggleston, Galton and Jones 1976). However, even problem-solving was often construed in ways which were convergent rather than divergent so that risk-taking in lessons was minimized even by the most challenging teachers. The present research has suggested (chapter 16) that cognitive graphs of invididual lessons may be more helpful in raising awareness and improving teaching performance than models which centre on generalized teaching styles.

There is nothing in the literature of mixed ability research to suggest that teachers are becoming more aware of the need to stimulate pupils or of ways in which cognitive stimulation can take place. The most recent work (spanning the mid1970s and reported in Reid et al 1982) confirms this view. The authors conclude that most provision for the able child is through open-ended worksheets, but report on a widespread dissatisfaction among theprofession with able child provision (eg op. cit. pp 123,124). The problem is summarized as follows:

> ... the major disadvantages reported by teachers are of lowered attainment among more able pupils, difficulties experienced by the less able and increased burden on teachers in terms of producing or locating suitable resources.

While it has been pointed out (in ch. 5) that the Banbury Report could play down these problems (Newbold 1977) provided that the criterion of judgement used was examination performance (which itself relies more on regurgitation than on higher level cognitive skills), one must regard the research evidence of these two largest research projects about mixed ability teaching (this and the NFER study) as giving out the same messages.

Turney has summarized the failure of teachers to stimulate through effective questioning (1975, see ch. 5), and his survey of research paints a similar picture back to the turn of the century.

The view is no more encouraging if we turn our spotlight from verbal transactions to classroom tasks. While Bennett's (1981) work on tasks is incomplete and tentative, and while it is dealing with much younger pupils, it does still highlight problems of co-operative work by pupils, (cf. also the works already cited by Kempa, and also by Galton et al.). Dooley fouud that time on task by pupils was dependent on the teacher's class management skills, with levels as low as 11-14% for poor class managers. Most tasks recorded in this research are undifferentiated and set in a whole-class context, an observation borne out by Reid et al.

So questions need to be raised about the appropriateness of teaching mode used in a majority of mixed ability classes. The underlying philosophy of mixed ability teaching emphasizes the treatment of each child as an individual, the practice highlighted here and elsewhere (HMI 1978) reveals almost no individualized learning taking place. The opportunities to diagnose and cater for the needs of the most able, and of pupils with specialized deficiencies such as low reading age, are being lost in the cut and thrust of large and busy classrooms. Child (1981) is right to point out that a number of commonly adopted schemes of work such as Nuffield Science are based on a Piagetian-style progression from the concrete to the abstract. What he fails to note in his otherwise excellent summary of Piagetian implications for classroom practice (op.cit. pp 150.151) is that few teachers travel the whole road. The profession has allowed itself to become adept at a reductionist approach to content which fails to elicit higher order processes such as analysis, hypothesis and evaluation. The road to improvement can come only through the path of in-service training.

8. The research: its effectiveness and shortcomings

No research project is perfect, since all research is conducted within a context of human idiosyncracy. In the present case, with hindsight, it is possible to point to both strengths and weaknesses.

The strength of this investigation has been in the completeness of the picture which it has painted of levels of cognitive stimulation in the lessons observed. The design of the research instrument was such that no area of cognitive life was omitted from it. While studies of questioning or explaining have enormous value in themselves, and while task analysis and degrees and quality of pupil participation in lessons are under-researched areas, this overview has made liberal use of the insights of others in order to give a rounded picture of classroom life as it is lived in first year mixed ability classes. It has looked at relatively privileged schools: which means that any shortcomings brought to light cannot simply be dismissed as the result of impoverished socio-economic background of institution or participants. It has covered a range of teacher experience and curriculum concerns.

There is no doubt that, in the best of all worlds and free from constraints of time and money, the research could have been widened and deepened. Further replication studies would serve to confirm or temper the overall picture painted here of mixed ability classes. Detailed studies of individual subject areas would have been useful in drawing out implications for specialist teachers. More extensive comparative studies would have helped those who might wish to make value judgements about mixed ability as compared with other forms of classroom organization.

Within the research as conducted, it would have been useful to have been able to have taken objective measures of pupil IQ and attainment to set against the teachers' perceptions. This was adamantly refused by the participating schools. One small incident highlighted this possible area of weakness: at Robin Hood a girl pupil was regarded by the researcher as appearing extremely able, yet teachers did not perceive her in this way. On a follow-up visit, after the study period, it transpired that the girl's parents had removed her from the school into private education because they believed her talent was undervalued there.

The research seems to have exposed considerable areas of weakness in the quality of teaching in comprehensive schools. To that extent it will be viewed with scepticism by some. This, however, is neither a strength or a weakness; simply a hazard of the objective student's striving after scientific accuracy.

9. Some conclusions and recommendations

While a variety of messages and implications have been articulated throughout this research report, the most important conclusions from the study of mixed ability classes in the main sample are summarized and some implications are suggested:

... using an appropriate analysis system it is possible to monitor the cognitive demand made by teacher talk

... by use of tape-recorder and/or transcript teachers could quickly learn how to code their own talk for cognitive demand,

... alternatively, teachers working for short periods in pairs could do this for each other as part of an in-service exercise,

... analysis of teacher talk for the present study reveals that little of this major classroom activity is directed to stretching or stimulating pupils' cognitive responses

... thus teachers might do well to reconsider their classroom talk with a view to strengthening the stimulation aspects of it at the expense of some importing of factual knowledge

... in particular, a disproportionate amount of teacher talk activity is used up in managing classes, and ways should be sought to streamline classroom administrative and organizational procedures

... similarly, teacher questions can be analysed by others or by the teacher himself

... by means of this consciousness-raising process teachers may train themselves or be trained to ask more higher order questions designed to elicit higher level cognitive responses from pupils

... pupil responses in the classes studied tended to be at a low cognitive level

... there is some evidence to suggest that higher cognitive demand by teachers leads to higher cognitive responses by pupils

... use of a coding system such as the one in this study, combined with analysis of tape-recorded lessons, would aid teachers in seeing this process at work in their own classes and would be a useful in-school INSET activity,

... there is a case for increasing teacher awareness of the quality of pupil thinking in responses or initiations, and for teachers to learn to signal to pupils that quality responses involving higher level thought processes (even incorrect ones) are valued

... classroom tasks can also be subjected to cognitive analysis using a coding scheme which could be used by teachers themselves

... a majority of tasks in the present study were at a low cognitive level

... most of these classroom tasks were set to the whole class without regard for the range of aptitude or ability of the individual pupil

... there is some evidence in the study that pupils recognize and respond to higher level demands in tasks when these are made by the teacher

... once more, the potential for in-service training in setting tasks and responding appropriately to them is considerable

... these conclusions and implications suggest that teachers should use techniques of self-analysis to become increasingly responsible for their own professional progress

... this research has also suggested that teachers are over-influenced by a content-view of knowledge, and that balance between content acquisition by pupils and the developing of their thinking skills needs to be redefined

... the study suggests that, while these conclusions hold true for mixed ability classes in general, insufficient attention is paid to the needs of those pupils who are perceived by teachers to be bright or slow learners

... to be true to the mixed ability philosophy, less attention should be given to whole class teaching methods and more to differentiated work in groups or to individualized learning

... teachers' verbal transactions need to be such as to stimulate the most able in the class

... teachers may under-rate the cognitive abilities of many pupils whose basic skill deficiencies would lead them to be perceived as slow learners

... bright pupils, slow learners and middle band individuals need classroom tasks more carefully matched to their specific needs, aptitudes and level of progress

... mixed ability organization is thus rarely matched by what might truly be described as mixed ability teaching

... school-based and regional in-service courses need to be more aware of teaching skills such as effective questioning, effective explaining, the identification and handling of exceptional pupils, the cognitive needs of the adolescent and the role of the teacher in setting and responding to classroom tasks.

APPENDICES

Item 1. Teacher Education Project Mixed Ability Teaching Research Package:
refers to chapter 4 of the text.

Item 2. The Sherwood Project Research Instruments, comprising:

- Class Profile Instrument
- Teachers' perceptions of able and less able
- Lesson observation record sheet

Item 3. Tasks set to pupils in the study schools:
refers to chapter 17.

Item 4. THE BIBLIOGRAPHY.

TEACHER EDUCATION PROJECT CO-ORDINATED CASE STUDIES

MIXED ABILITY TEACHING : RESEARCH PACKAGE

CONTENTS

(NB In some packs a Head Teacher Interview Guide is included for information. This document is NOT FOR USE).

SUMMARY OF ACTION NEEDED BY RESEARCHER

A. MIXED ABILITY CASE STUDIES

☐ (1) Select an effective teacher of mixed ability classes.

☐ (2) Arrange to observe one of his/her lessons (using the Lesson Observation Guide).

☐ (3) Interview the teacher (using the Teacher Interview Guide).

☐ (4) Interview the teacher's Head of Department (using the Head of Department Interview Guide).

B. MANAGEMENT AND CONTROL CASE STUDIES

☐ ☐ (1) Select two student teachers - one a good class manager and one who lacks management and control skills.

☐ ☐ (2) Watch each of these students at work (using the Management and Control Study instrument).

☐ ☐ (3) Ask a supervising teacher in the school(s) to complete a Study instrument for each of the students selected.

☐ C. FINALLY - RETURN all completed instruments to the Co-ordinator

TEACHER EDUCATION PROJECT CO-ORDINATED CASE STUDIES

MIXED ABILITY TEACHING : RESEARCH PACKAGE

CONTENTS

A. MIXED ABILITY CASE STUDIES

(1) Lesson Observation Guide

(2) Teacher Interview Guide

(3) Head of Department Interview Guide

B. MANAGEMENT AND CONTROL STUDY

(1) Student teacher observation and interview instrument (Four copies).

(NB In some packs a Head Teacher Interview Guide is included for information. This document is NOT FOR USE).

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☐ C. FINALLY - RETURN all completed instruments to the Co-ordinator

<u>Address for return</u>

Trevor Kerry
Project Co-ordinator
School of Education
Nottingham University
University Park
NOTTINGHAM
NG7 2RD

Telephone Number - (0602) 56101 Extension 2697

<u>Date for return</u>

30 April 1977*

(* If students are out on teaching practice in the Summer Term please try to return the schedules by 31 May 1977.)

THE TEACHER EDUCATION PROJECT IN THE UNIVERSITY OF NOTTINGHAM

MIXED ABILITY TEACHING : RESEARCH PACKAGE

NOTES FOR GUIDANCE AND GENERAL INSTRUCTIONS

Contents of the Package:

(1) LESSON OBSERVATION GUIDE

(2) TEACHER INTERVIEW GUIDE

(3) HEAD OF DEPARTMENT INTERVIEW GUIDE

School of Education, Nottingham - Note to Tutors

Parts of these General Instructions (namely (vi) and (vii) apply to tutors in the Nottingham School of Education only. These parts are placed in parentheses).

General Instructions

(i) If possible choose a school you know well.

(ii) It would be advisable to try to spend the whole day in school when using these documents.

(iii) Extreme tact is needed when introducing the exercise to the school. Emphasis should be place on the Project's aims to solicit the views and describe the experiences of practising teachers so that these can be influential in the training of student teachers.

(iv) Choosing a teacher: use your knowledge of schools to choose an interesting department where the staff have clearly given a great deal of thought to mixed ability teaching.

(v) Arrangements should be made in advance to watch the selected teacher at work (using the Lesson Observation Guide), and to carry out the teacher interview (using the Teacher Interview Guide) as soon as possible after the observed lesson.

Arrangements also need to be made to interview the Head of Department in which the observed teacher works - unless the teacher is himself the Head of Department. In the latter case, the Head of Department interview should be conducted immediately following the teacher interview and using the same respondent.

NB Because of the lengthy nature of the interviews you are urged, whenever possible, to observe the lesson of someone WHO IS NOT A HEAD OF DEPARTMENT. In this way no single teacher need be overburdened by contact with you, the researcher.

(vi) (Nottingham School of Education only)

(Head Teachers of schools in which you are operating have been informed of the project and requested to co-operate. The Project has LEA backing. In due course the Head Teachers of all schools in which the Mixed Ability Research Package is used will be asked to participate in an interview also. Feedback of results to Head Teachers will be carried out through our projected Summer Term Conference).

(vii) (Nottingham School of Education only)

(Tutors on the School of Education staff in other subject areas than your own will possibly be carrying out a similar exercise to your own in the same school. Where tutors are linked to differing subject departments (eg Geography and Maths) no problems will arise. However, in Science there may be a Biology tutor supervising and researching in the same school as a Chemistry tutor, therefore

NB The school's Head of Science should be interviewed ONCE ONLY. Please liaise over this. If there are any problems consult the Project Co-ordinator).

(viii) Please allow yourself adequate time in the school to carry out the research effectively; set about the task sufficiently far from the end of term so that re-arrangements can be made if the initial ones fall through.

(ix) Please read all parts of the Mixed Ability Research Package and instructions prior to making any arrangements to visit schools.

FINALLY

Throughout these documents every effort has been made both to give scope for teachers to answer freely at intervals, and elsewhere to respond briefly to specific questions aimed at discovering some information in a more precise manner. However, use your judgement during the interview to identify anything of interest and if necessary insert probes of your own if you feel the schedule, in a particular interview, is missing important pieces of information.

Remember (a) you can always use the blank left-hand pages. Everything you write will be read.

(b) Please press for as much specific information as possible.

Ultimately teachers' views and experiences will be most useful when we come to look at training procedures if they can indicate what can be done to train students effectively. Consequently "Mixed ability teaching can only be learned in the classroom" is a valid statement, but less helpful than an indication of, say, what teachers can do to help students learn the craft.

THE TEACHER EDUCATION PROJECT IN THE UNIVERSITY OF NOTTINGHAM

MIXED ABILITY TEACHING: MAT/LO

LESSON OBSERVATION GUIDE

I.D.No. ....

Observer: ....

Observer's school/
college/university: ....

Please return to:

Trevor Kerry,
Project Co-ordinator,
School of Education,
Nottingham University,
University Park, Nottingham, NG7 2RD.

Leave blank

TEACHER EDUCATION PROJECT : CO-ORDINATED CASE STUDIES

MIXED ABILITY TEACHING : LESSON OBSERVATION GUIDE

INSTRUCTIONS

Please read the whole Lesson Observation Guide before proceeding.

The teacher you have elected to watch is one who is identified as an effective teacher of mixed ability classes. You are asked to observe a complete lesson, to fill in the Guide, and then to interview the teacher using the Teacher Interview document.

The Lesson Observation Guide is divided into Parts A, B and C.

PART A (DETAILED DESCRIPTION OF THE LESSON)

Answer the five general questions at the beginning. Then describe the whole lesson in as much detail as possible, so that anyone not present could reconstruct its major features from your notes. Highlight aspects of your lessons which you consider to typify the teacher's effectiveness. You can add any other information at your discretion.

PART B (TEACHER'S COMMENTS ON THE LESSON)

(1) Make it clear to the teacher that you are going to discuss his views and procedures with respect to mixed ability teaching generally a little later (using the Teacher Interview Guide), but that to start with you are interested in the teacher's comments on the lesson. The teacher may wish to tell you things about the lesson itself. Invite his free comment on the lesson and record this in B1. NOTE: Questions 2 and 7 in part C also require a teacher response, which can be solicited at this point.

(2) Finally, ask if he has any concluding comment on the lesson and, if he has, record it in B2.

PART C (QUESTIONS ABOUT THE LESSON)

This asks for your perceptions of specific aspects of the lesson you have observed. You must, therefore, be familiar with these questions before beginning your observation of the lesson.

NB Questions 2 and 7 require a teacher response.

In addition, you may wish to raise with the teacher other matters or to seek clarification in order to answer questions 1-7 from Part C. If so, you will need to be aware of this before the teacher is required to leave you for other commitments, and so prior acquaintance with the questions is important. Use the left-hand blank sheets for recording points you raise and replies to them.

Many people will find it preferable to scribble rough pencil notes on this document during the lesson and then to write up their observations from these notes later. Writing up should be completed while the lesson is still fresh in the memory!

Leave blank

Remember that the purpose of the enquiry is to watch skilled practitioners of mixed ability teaching at work and to see what happens during their lessons; so your questions to the teacher should reflect a tone of enquiry and clarification. Please avoid any hint that you are sitting in judgement on his or her performance.

After the discussion with the teacher of the questions in Part C he or she may wish to make some comment on the questions or on the whole observation process. Return to the space B2 to record this.

AS SOON AS POSSIBLE proceed to use the Teacher Interview Guide with this teacher; and also the Head of Department Interview Guide if the teacher is a Head of Department .

SUMMARY

(1) Watch the teacher teach a lesson

(2) During the lesson fill in, as far as possible, section A and section C. (Use rough pencil notes initially and write up later).

(3) After the lesson, ask the teacher the questions in B1, C2, C7 and B2 and any other questions you wish to put.

(4) Go through the Teacher Interview Guide with the same teacher.

(5) Write up this document from your pencil notes where necessary.

(6) Return the completed document to the Project Co-ordinator.

YOUR HELP IS MUCH APPRECIATED.

TEACHER EDUCATION PROJECT

MIXED ABILITY TEACHING

LESSON OBSERVATION GUIDE

This guide is intended for use in the observation of experienced teachers teaching mixed ability classes. It should be used before the interview covered by the guide called "Teacher Interview". Tutors are requested to do the following three things:-

A. Write a detailed description of the lesson in such a way as to give a person who was not present a good idea of what took place. Your description should convey, amongst other things, information about teaching strategies, learning environment and learning effectiveness.

B. Ask the teacher for his or her comments on the lesson after it has taken place and record these. It is important to obtain the teacher's reaction to the lesson before discussing it (B1). If the teacher would like to add any further comment after discussion (eg of any of the questions in part C) these concluding comments should be recorded in B2.

C. Answer the questions at the end of this document. Tutors are asked to familiarise themselves with these questions before observing the lesson. You might like to ask the teacher about some of these points and provision is made for his or her comments on the page opposite to the questions. NOTE that the teacher's comment is requested in question 2 and question 7.

Confidentiality

It might be helpful to indicate to the teacher that confidentiality will be maintained in regard to the information in this document and an identification number only will be used.

Remember

1. The questions in part C relate to the lesson observed and more general discussion will be taken up in the Teacher Interview guide.

2. The Teacher Interview Guide should also be used with the teacher observed, and that interview should follow as soon as convenient after the observed lesson.

IDENTIFICATION NUMBER ____

A DETAILED DESCRIPTION OF THE LESSON

Describe the lesson in such a way as to give a person who was not present a good idea of what took place. Your description should convey, amongst other things, information about teaching strategies and the learning environment.

Subject being taught ______________________ Class ________

Topic ____

Length of lesson ___________________________

Nature of classroom (eg open plan classroom, science laboratory)

____

(Continue on back of sheet if necessary).

TEACHER'S COMMENTS ON THE LESSON

1. Comments before discussion

Suggested lead in

"There are a few things about the lesson which I would like to ask about, but before I do that I would be interested in any comments you might have, eg how did you feel about the lesson and are there any aspects you would like to draw to my attention?"

2. Comments after discussion

To be used after discussing any of the questions in part C or any other point directly related to this particular lesson

"Is there anything else about the lesson which you would like to say? It may be that something else has emerged from the discussion that you think needs comment".

C QUESTIONS ABOUT THE LESSON

Tutors should be familiar with these questions before observing the lesson and might wish to clarify some points during discussion with the teacher. Provision is made for his or her comments about the questions at the relevant point or under Part B 2 above.

1 How were the following teaching modes used, if at all, during the lesson:

(a) whole class teaching

(This is intended to cover situations in which the teacher operates with the class as a whole, talking to them, engaging in discussion, asking questions or allocating common tasks to the pupils even if these are then worked on individually).

(b) group work

(group work includes groups organised by the teacher for a specific task such as discussion of a controversial topic or the carrying out of a project or an investigation; it also includes groups formed by pupils to discuss a common problem).

(c) individualised learning

(this covers situations in which some or all of the pupils take the initiative individually in deciding what to do and work at it at their own pace eg selecting a card from a resource package and proceeding with the work outlined on it, more or less independently of what other pupils are doing).

2 (a) If the pupils were working in groups for the whole or part of the lesson, ask the teacher the criteria used to form these groups.

(b) If you wish to make any comment, from your observations, about group formation do so here:-

3 Did the use of these modes throw light on any problems of management associated with them, if so how did the teacher cope with these problems?

4 What kinds of resources were being used during the lesson?
(eg textbooks
worksheets
blackboard
audio-visual equipment
subject-related equipment such as science equipment or language laboratory)

Please specify.

5 How were these resources used? eg by the teacher or by individual pupils, for what purpose and what was the result?

6 Did the use of these resources throw light on any problems of management associated with them; if so, how did the teacher cope with these problems?

7 Children's concentration spans vary considerably but most teachers expect pupils to maintain task-orientation most of the time. Often the pupil especially needing attention is the deviant pupil. Were there any such cases evident in the lesson?

Ask the teacher for his or her comment on these cases.

8 Was there any other feature of the lesson which was especially noteworthy?

THE TEACHER EDUCATION PROJECT IN THE UNIVERSITY OF NOTTINGHAM

MIXED ABILITY TEACHING: MAT/TI

TEACHER INTERVIEW GUIDE

(I.D. No. ....)

Observer ....

Observer's school/
college/university:

....

Please return to:

Trevor Kerry,
Project Co-ordinator,
School of Education,
Nottingham University,
University Park,
Nottingham, NG7 2RD.

Leave blank

TEACHER EDUCATION PROJECT : CO-ORDINATED CASE STUDIES

MIXED ABILITY TEACHING : TEACHER INTERVIEW GUIDE

INSTRUCTIONS

The Teacher Interview Guide is laid out in such a way that you can almost follow its wording in talking to the respondent. A sheet of general instructions appears on the front of the Guide, and appropriate specific directions are given at various points. Please read all these instructions and the whole Guide carefully before setting out to interview the respondent.

The Teacher Interview is designed to be conducted with the teacher whose lesson you have selected to observe and record on the Lesson Observation document. It amplifies that record BUT the questions here do NOT relate solely to the lesson observed but to the WHOLE of the respondent's mixed ability teaching experience.

In sections 1-4 and section 8 emphasis is placed on gaining the teacher's spontaneous reaction to the matter under discussion in the section concerned. This is important before beginning to probe about the details highlighted in that section.

In sections 5-7 free response answers are invited. It might be necessary to ask for more detail in order to make answers clear, and interviewers must exercise judgement about this.

The following points are worthy of note:-

SECTION 1 (SPECIAL POINTS OF EMPHASIS)

This is a "warm-up" section, serving to start conversation but to allow the respondent to say the things uppermost in his/her mind about mixed ability teaching without specific prompts from you. Allow conversation to develop, and don't rush on if the discussion is tentative at first. Allow the respondent enough periods of silence to serve as "thinking time". At the same time do not dwell too long on any one point, try to list the different points being made. Some or all of these will be taken up in detail later.

SECTION 2 (OBJECTIVES)

First try to elicit the teacher's own objectives in his/her own words. Some may not produce four; accept the first four from those who can, and use your judgement about when to proceed with those who cannot. Read the teacher's own list back to him in order for him to (a) rate their importance and (b) suggest his extent of achievement. Then go through a similar process for objectives (e), (f) and (g).

SECTION 3 (ORGANISATION OF LEARNING)

Again the teacher's views are sought first, informally and as explicitly as possible. Then proceed with the more structured questions. Read to the teacher the definitions provided under 3(a).

Leave blank

SECTION 4 (ASSESSMENT)

The section begins with an open question and continues in (a) with another. Proceed as in section 3 and then go on to the structured questions.

SECTION 5 (SLOW LEARNERS AND BRIGHT CHILDREN)

The whole of this section allows free response by the teacher. Try to record illustrative examples of problems, and of children described as being at either of the two ends of the ability range. It may be necessary for you, in this section, to ask supplementary probing questions in order to amplify points made by teachers about children whom you do not know.

SECTION 6 (DISCIPLINE)

A free response is encouraged, though it may be necessary for the interviewer to follow up leads given to the teacher with probing questions and requests for examples of clarification.

SECTION 7 (DEMANDS ON TIME)

Allow the respondent time to develop an answer to the question before enlarging upon appropriate examples to illustrate the points made.

SECTION 8 (ASSISTANCE AND SUPPORT)

Follows the now familiar pattern of open question followed by a request for specific information.

SECTION 9 (ATTITUDES)

This is an important part of the interview because it explores factors at the heart of mixed ability teaching. Make notes on the back of the previous sheet if the teacher supplies information which cannot be coded.

SECTION 10 (TEACHER PREPARATION)

Again, allow time for the teacher to say all that is in his mind. Help the teacher to formulate the responses in ways that will be useful as suggestions for training procedures. Avoid imprecise or ambiguous statements.

SECTION 11 (ANY OTHER COMMENT)

This open question may provide information about what teachers see as important but which the interview structure omits. Record in as much detail as you can any concerns expressed by the teacher.

SECTION 12 (INTERVIEWER'S COMMENTS)

(a) Record here anything else you wish to say about the interview in order to clarify or enlarge upon what has been said above.

Leave blank

(b) Use this space to express your own views about the means by which it would be possible to improve the training of Postgraduate Certificate students to handle mixed ability classes. In particular, thoughts may have occurred to you arising out of your use of the Lesson Observation and Teacher Interview Guides. If you observe and interview more than one teacher you may wish to use this section on only one of your completed documents.

YOUR HELP IS MUCH APPRECIATED

Leave blank

TEACHER EDUCATION PROJECT

MIXED ABILITY TEACHING

TEACHER INTERVIEW GUIDE

This instrument is intended for use in association with the "Lesson Observation Guide" and relates to teachers experienced in teaching mixed ability classes. The interview should be carried out after the lesson has been observed and as soon as is convenient following that observation. The answers to the questions given here should not relate to the particular lesson observed but should express the views of the teacher more generally and arising from his wider experience.

At this stage in the Project we are seeking leads on things which might be especially significant in successfully teaching mixed ability classes. With this in mind it is believed that the tutor should conduct the interview in such a way as to preserve the teacher's spontaneity in talking about what he is doing. The format then is a semi-structured one.

In each section a possible wording has been suggested for the question. The tutor might wish to vary this to suit the particular situation and his or her own style. Instructions in relation to each section have been given in parentheses.

Confidentiality

It might be worthwhile before the interview to assure the respondent that this interview is confidential to the Teacher Education Project, and that the identity of respondent and school will not be divulged in any published material, nor to colleagues in the teacher's own institutions.

NB If the teacher wishes to talk on an item at greater length than the allocated space suggests, use the left-hand blank sheet for additional comment.

Leave blank

Code Number ______________________ (leave blank)

School ______________________

Subject ______________________

1 SPECIAL POINTS OF EMPHASIS

"As you know the Teacher Education Project is concerned to develop and test ideas and materials which will help to equip students as adequately as possible for teaching in schools. One area of special attention is mixed ability teaching. We are observing a number of experienced people teaching mixed ability classes and my observation of your lesson was part of that. We are also interested in the views of those experienced teachers about mixed ability teaching. It might be that you are teaching some mixed ability classes and some other classes: in discussing these questions could you try to concentrate your thoughts on your work in the mixed ability context?

How long have you been teaching mixed ability classes? [ ] years

(Record the answer in the appropriate space above).

What do you think a teacher has to do to be successful in mixed ability teaching?"

(Just list the main points at this stage and take them up in more detail later).

Leave blan

OBJECTIVES

(Record what the teacher says in his or her own words under some or all of (a), (b), (c) and (d). Do not try to force this into the wording of (e), (f) and (g). Obtain ratings for importance and extent of achievement for each one given and then ask about (e), (f) and (g)).

"What is it you are trying to achieve in your teaching which is especially related to mixed ability teaching?"

"How do you rate each of these in importance?"

"How well do you feel you are achieving each of them?"

Objectives	Importance			Extent of Achievement		
	Essential	Important	Not important	Considerable	To some extent	Very little
(a)	—	—	—	—	—	—
(b)	—	—	—	—	—	—
(c)	—	—	—	—	—	—
(d)	—	—	—	—	—	—

"There are some statements of objectives often given for mixed ability teaching which are slightly different from the ones you have given. I wonder how you rate these in importance, and whether you see yourself as achieving them?"

(The interviewer should now put to the teacher objectives (e), (f) and (g), first asking for an importance rating and then for a rating of achievement).

	Importance			Extent of Achievement		
	Essential	Important	Not important	Considerable	To some extent	Very little
(e) to provide equal educational opportunities for all pupils	—	—	—	—	—	—
(f) to encourage pupils to become more independent in their thinking	—	—	—	—	—	—
(g) to facilitate social development	—	—	—	—	—	—

Leave blank

OBJECTIVES

(Record what the teacher says in his or her own words under some or all of (a), (b), (c) and (d). Do not try to force this into the wording of (e), (f) and (g). Obtain ratings for importance and extent of achievement for each one given and then ask about (e), (f) and (g)).

"What is it you are trying to achieve in your teaching which is especially related to mixed ability teaching?"

"How do you rate each of these in importance?"

"How well do you feel you are achieving each of them?"

Objectives	Importance			Extent of Achievement		
	Essential	Important	Not important	Considerable	To some extent	Very little
(a)	_	_	_	_	_	_
(b)	_	_	_	_	_	_
(c)	_	_	_	_	_	_
(d)	_	_	_	_	_	_

"There are some statements of objectives often given for mixed ability teaching which are slightly different from the ones you have given. I wonder how you rate these in importance, and whether you see yourself as achieving them?"

(The interviewer should now put to the teacher objectives (e), (f) and (g), first asking for an importance rating and then for a rating of achievement).

	Importance			Extent of Achievement		
	Essential	Important	Not important	Considerable	To some extent	Very little
(e) to provide equal educational opportunities for all pupils	_	_	_	_	_	_
(f) to encourage pupils to become more independent in their thinking	_	_	_	_	_	_
(g) to facilitate social development of pupils	_	_	_	_	_	_

Leave blank

ORGANISATION OF LEARNING

"I would like to ask you now how you go about seeking to achieve these goals.

What do you find are the most effective methods of teaching in your mixed ability classes?"

(List these briefly seeking the teacher's ideas. If he or she refers to any of the sections (a) to (e) in this context record the reactions to these points at this stage also. When the teacher has offered his or her views, then ask about any of the aspects (a) to (e) not already covered.)

(a) Methods of Teaching

"Can I now ask you about some particular methods of teaching?

How often do you use whole class teaching and individualised learning?"

By whole class teaching I mean situations in which you operate with the class as a whole, talking to them, engaging in discussion, asking questions or allocating common tasks to the whole class even if these are then worked on individually.

Individualised learning covers situations in which some or all of the pupils take the initiative individually in deciding what to do and work at it at their own pace, eg selecting a card from a resource package and proceeding with the work outlined on it, more or less independently of what other pupils are doing.

"Do you use:-

(i) whole class teaching — often occasionally never
(circle as appropriate)

(ii) individualised learning — often occasionally never
(circle as appropriate)

(iii) "Have you any comment on the value of these teaching methods in mixed ability classes?"

"In the next section I want to ask in more detail about your use of group work."

Leave blank

(b) The Nature of Group Work

"Many teachers tell us that theyuse 'group work' as a teaching method, but no agreed definition of group work exists and it is difficult to compare what they tell us about it. Can you help us to clarify the phrase by saying which of the following kinds of group you use in your own teaching? In mixed ability classes do you use groups in which:-"

	often	occasionally	never
(i) the pupils sit together but work on individually assigned tasks	___	___	___
(ii) the pupils sit together working simultaneously on similar tasks	___	___	___
(iii) the pupils sit together and work on a common task in which the contribution of each individual is nevertheless clearly identifiable	___	___	___
(iv) the pupils sit together and work on a common task in which the contributions of individual pupils are NOT clearly identifiable	___	___	___
(v) the pupils remain in the same group for just one or two lessons at the most	___	___	___
(vi) the pupils remain in the same group for the duration of a project or scheme of work	___	___	___
(vii) the pupils remain in the same group almost permanently throughout a school year	___	___	___

(c) Size of Groups

What is

(i) the largest ______ (no of pupils)

(ii) the smallest ______ (no of pupils)

group size you normally use?

Leave blank

(d) Criteria for Grouping

"Having discussed what is meant by group work could you tell me whether, in your classes, pupils are ever grouped on the basis of ability, friendship, common work interests, or social mix, again using the often, occasionally, never rating?"

	often	occasionally	never
(i) ability	___	___	___
(ii) friendship	___	___	___
(iii) common work interests	___	___	___
(iv) social mix	___	___	___

(v) do you use any other basis for grouping? (specify) ______________________

(vi) if the children are grouped by ability, are they aware of the ability groups? NO ___ YES ___

(e) Resources

"Can you tell me if, and how, you make use of the following in your mixed ability teaching?"

(i) textbooks

(ii) worksheets

(iii) audiovisual equipment

(iv) blackboard

(v) other resources (please specify)

(vi) "Are there any special problems relating to the management of resources in mixed ability classes?"

Leave blank

(f) Pacing

"As the pupils progress through the programme you have in mind for them what influences your decision to move from one topic or section to the next?

"Do you allow some or all pupils to pace themselves and make individual decisions to progress from one topic to the next; if so which pupils, and how often?"

Leave blank

(g) Consolidation of Learning

"Do you find the need to undertake systematic consolidation of learning from time to time?"

NO ___

YES ___

"If so, what procedure do you use?"

Leave blank

ASSESSMENT

"Assessment, its purpose and methods, are important issues in education generally. What are your views about its place in mixed ability teaching?"

(Record these. If they relate to aspects (a)-(c) below use those sections for the purpose).

(a) Objectives

"What objectives do you have when you are assessing the progress of your pupils?"

(b) Grading

(i) Do you assess the progress of pupils by comparison with that of other pupils? — often occasionally never (circle as appropriate)

(ii) Do you assess the progress of pupils by comparison with their own past performance? — often occasionally never

(iii) Do you assess the progress of pupils in terms of their own ability? — often occasionally never

Leave blank

(iv) Do you assess the performance of pupils against some objective standard? NO ___ YES ___

If so, what standard do you use?

(v) How often do you make this kind of assessment? often occasionally never
(circle as appropriate)

(vi) Do you write a grade on pupils' work? often occasionally never

(c) <u>Marking</u>

"To what extent do you <u>write</u> a comment on pupil's work?"

(i)	extensive comments	often	occasionally	never
(ii)	brief comments	often	occasionally	never
(iii)	Do pupils mark their own work?	often	occasionally	never
(iv)	Do you mark pupils' work in class?	often	occasionally	never
(v)	Do pupils mark each others' work?	often	occasionally	never

5 <u>SLOW LEARNING AND BRIGHT CHILDREN</u>

(a) <u>Range of attainment</u>

"Can you indicate the widest range of attainment to be found within any single class which you teach?"

(b) "Do you have any particular problems caused by the presence of pupils at the extremes of the ability range in your mixed ability classes?"

"If so, what would you say these problems are and how do you deal with them?"

(i) slow learners

(ii) bright children

Leave blank

DISCIPLINE

"Do you find that there are any problems of management and control especially associated with teaching mixed ability classes?"

DEMANDS ON TIME

"Do you find that mixed ability teaching is excessively demanding on your time?

NO ___

YES ___

"If so, could you indicate the ways in which this is so?"

ASSISTANCE AND SUPPORT

(a) "What kinds of assistance and support do you feel to be necessary to teachers of mixed ability classes?"

(b) "Do you make use of the following sources of help?"

	often	occasionally	never
(i) technician	___	___	___
(ii) secretary	___	___	___
(iii) local advisers	___	___	___
(iv) teachers' centres	___	___	___
(v) in-service courses	___	___	___
(vi) other (specify)	___________		

(c) "Do you have any comment on the usefulness and availability of the sources of help in (b)?"

Leave blank

ATTITUDES

(a) "What would you say is your attitude to mixed ability teaching?"

(circle as appropriate)

(i) very favourable | favourable | neutral | unfavourable | very unfavourable

(ii) (If the teacher finds didficulty in using the five categories above to define his attitude, allow a free comment and record this response here:):-

(b) "Has your attitude to mixed ability teaching changed since you began to use it?"

NO ___

YES ___

(c) "If it has changed, in what direction has it changed?"

more favourable　　　less favourable

(circle as appropriate)

(d) "What would you say is the reason for this change?"

(e) "What do you like <u>most</u> about mixed ability teaching?"

(f) "What do you like <u>least</u> about mixed ability teaching?"

TEACHER PREPARATION

"What, in your view, can a classroom teacher do to help a student learn how to teach mixed ability classes effectively?"

Leave blank

ANY OTHER COMMENT

"Do you have any other points which you would like to make about mixed ability teaching?"

"THANK YOU FOR YOUR HELP"

INTERVIEWER'S COMMENTS

(a) Write here any further information about the interview which may be of interest.

(b) Write here any suggestions you have about the training of student teachers for mixed ability teaching, particularly those arising out of the interview.

THE TEACHER EDUCATION PROJECT IN THE UNIVERSITY OF NOTTINGHAM

MIXED ABILITY TEACHING: MAT/HOD

HEAD OF DEPARTMENT INTERVIEW GUIDE

I.D. No. ....

Observer ....

Observer's school/
college/university:

....

Please return to:

Trevor Kerry,
Project Co-ordinator,
School of Education,
Nottingham University,
University Park,
Nottingham, NG7 2RD.

TEACHER EDUCATION PROJECT : CO-ORDINATED CASE STUDIES

MIXED ABILITY TEACHING

HEAD OF DEPARTMENT INTERVIEW GUIDE

INSTRUCTIONS

The purpose of this interview is to provide background information about schools where mixed ability teaching is taking place. In this case the respondent will be the Head of Department to which the teacher you have already observed and interviewed belongs, except where the latter is also the departmental head. Where teacher and Head of Department are the same person then you should use BOTH the Teacher Interview Guide and the Head of Department Interview Guides with that person (though the situation is not ideal- see General Instructions on salmon coloured paper).

The Head of Department Interview Guide also furthers the Project's aim of seeking the views of classroom teachers about effective mixed ability teaching and how student teachers can be helped to master the craft.

This Guide is divided into ten sections. Feel free to scribble on the blank left-hand pages any additional comments you wish to make.

SECTION 1 (INTRODUCTION)

Seeks to discover the present position regarding mixed ability teaching in the department by means of two closed questions and one open question.

SECTION 2 (DEPARTMENTAL MEETINGS)

Two factual questions (a) and (c) are supplemented by a request for information about the content and nature of departmental meetings (b). Give the Head of Department adequate time to say what he wishes to say before proceeding to (b) (i), (ii) and (iii).

SECTION 3 (RESOURCES)

This is a long but important section containing some quickly administered factual questions and some requests for comments, opinions or descriptions of procedures. With the open questions allow plenty of time for response and use the left-hand pages for recording things which cannot be fitted into the space allowed. You may need to formulate some probing questions of your own (eg under 3h) in order to discover what the Head of Department does about some aspects of resource management.

SECTION 4 (METHODS OF TEACHING)

Read the three definitons (of whole class teaching, group work and individualised instruction) to the respondent. Then put the question (a) to him one part at a time, Again, record his free comments or any other information on the left-hand page if necessary.

SECTION 5 (HOMEWORK)

A fairly open section which both seeks certain kinds of information but also allows (under (d)) the Head of Department to make his views about homework known.

SECTION 6 (ASSESSMENT)

It is important to allow the Head of Department time to respond freely to parts (a) and (b) before asking for more specific information in part (c).

SECTION 7 (RECORD KEEPING)

A straightforward factual section, but the respondent's comments, if any, can be recorded at the foot of the page.

SECTION 8 (BENEFITS AND PROBLEMS)

Try to collect as detailed a picture as possible, first of the benefits which mixed ability teaching has brought to the Department and then of the problems that have materialised. It will probably be necessary to use the left-hand page for additional comment.

SECTION 9 (TEACHER PREPARATION)

Allow the Head of Department time to say all that is in his mind. Help him/her to formulate responses in ways that will be useful as suggestions for training procedures. Try to get details of specific issues rather than generalisations.

SECTION 10 (ANY OTHER COMMENT)

This open question may provide information about what experienced and senior teachers see as important in mixed ability teaching, but which the interview structure omits. Record in as much detail as you can the Head of Department's responses. Use your judgement to elicit here anything you feel to be important which has not emerged under the sections above.

Leave blank

(Code No ______________________)

Subject Department ______________________

School ______________________

INTRODUCTION

"In order to assist in the preparation of students for teaching the Teacher Education Project is seeking to gain an accurate picture of the schhols in which these students will later teach.

It is important for students to realise that they will generally be part of a sizeable department and to understand how such departments operate. I would like to ask you about your department, its decision-making policies, and methods of operation, with reference to one aspect in which the Project is especially interested, namely mixed ability teaching".

"What is the current position in your department with respect to mixed ability teaching? Eg

(a) in which of the years 1 to 6 is the subject taught in fully mixed ability classes?

1 2 3 4 5 6 (circle as appropriate)

(b) is your use of mixed ability teaching in the subject increasing or decreasing?

increasing decreasing (circle as appropriate)

(c) what is the reason for such change?

DEPARTMENTAL MEETINGS

"In relation to making decisions about issues such as this one on mixed ability teaching I suppose departmental meetings play an important part".

(a) How frequently do you hold meetings of the staff in your department (tick as appropriate).

(i) once per week ____

(ii) once per two weeks ____

(iii) once per month ____

(iv) once per term ____

(v) other (please specify)?" ______________________

Leave blank

(b) "Can you say what kinds of activities or discussions take place during your staff meetings?"

(Allow time for response. If the head of department omits any of the items below ask about its place in staff meetings and record his comments).

(i) discussion of policy

(ii) curriculum planning

(iii) preparation of resource materials

(c) "Are departmental meetings held in school time?

NO ___

YES ___

RESOURCES

"One matter which is of considerable concern to departments within a school is the provision of resource materials for teaching".

(a) "Do you use any national or commercial teaching schemes for mixed ability classes?"

NO ___

YES ___

(b) "Do you use materials produced at your school or at a Teachers' Centre?"

NO ___

YES ___

(c) "How did your department go about making its decisions and formulating its policy in this matter?"

(d) "What were the reasons for your choice?"

(e) "If you use national or commercial schemes for mixed ability teaching

(i) which ones do you use?

(ii) how successful are they?

(iii) did you modify them in any way and, if so, how?"

Leave blank

(f) "How do you use the following kinds of resource material in your department, if at all, for mixed ability teaching?"

(i) textbooks

(ii) kits or learning packages

(iii) audiovisual equipment

(iv) worksheets

(v) others (science equipment, language lab, etc)

(g) "Is there a core of resource material which all pupils must satisfactorily complete?"

NO ___

YES ___

Record the Head of Department's comments here.

(h) "Do the resource materials provide opportunities for individualised learning for the following kinds of pupils:-"

slow learning — NO ___ YES ___

bright children — NO ___ YES ___

those pupils wishing to pursue independent but related lines of inquiry — NO ___ YES ___

Record the Head of Department's comments here.

(i) "If your department produces its own resource material for mixed ability teaching how much sharing between members of staff is involved in this production?"

Leave blank

(j) "What would you say are your main problems about resources for mixed ability teaching?"

(k) "Would you say the quantity of resource material for use in individual lessons is adequate for all pupils?"

NO ___

YES___

(l) "Teachers often say that, whilst many resources exist, access to them is difficult."

"Are there any problems of access to resource materials in the classrooms in which your department teaches mixed ability classes?"

NO ___

YES___

"If there are such problems would you indicate what they are?"

Leave blank

METHODS OF TEACHING

"What is your view about the use of various methods of teaching in order to achieve your objectives with mixed ability classes eg whole class teaching, group work and individualised instruction?"

whole class teaching is taken to mean situations in which you operate with the class as a whole, talking to them, engaging in discussion, asking questions or allocating common tasks to the whole class even if these are then worked on individually.

group work includes groups organised by the teacher for a specific task such as discussion of a controversial topic or the carrying out of a project or an investigation; it also includes groups formed by pupils to discuss a common problem.

by individualised learning I mean situations in which some or all of the pupils take the initiative individually in deciding what to do and work at it at their own pace eg selecting a card from a resource package and proceeding with the work outlined on it, more or less independently of what other pupils are doing".

(a) "Have you any comment on the value of these teaching methods?"

(i) whole class teaching

(ii) group work

(iii) individualised learning

Leave blank

HOMEWORK

"What is your department's policy about homework in relation to mixed ability classes eg:

(a) to whom is it given

(b) how often

(c) what kind

(d) are there any problems?"

ASSESSMENT

"Can we talk a little about the place of assessment in mixed ability teaching and the ways in which pupils' work is assessed?"

(a) "What objectives does your department use when assessing the progress of the pupils?"

(b) "What are the methods used to assess the progress of pupils?"

Leave blank

(c) "There are some specific methods I would like to ask about in relation to the work of your department in mixed ability teaching."

	often	occasionally	never
	(tick as appropriate)		
(i) "Does your department assess the progress of pupils by comparison with that of other pupils?"	___	___	___
(ii) "Does your department assess the progress of pupils by comparison with their own past performance?"	___	___	___
(iii) "Does your department assess the progress of pupils in terms of their own ability?"	___	___	___

(iv) "Does your department assess the performance of pupils against some objective standard?"

NO ___

YES___

(v) "How often does your department make this kind of assessment?	___	___	___
(vi) "Does your department write a grade on pupils' work?"	___	___	___

RECORD KEEPING

"Allied to the kinds of assessments which are made is the question of what records of pupil progress are needed."

(a) "Does your department keep a record of the progress of all pupils apart from records kept by individual teachers?"

NO____

YES___

(b) "If so, how frequently is this up-dated?"

monthly (tick as appropriate) ___

once per term ___

other (please specify) ________________________________

(c) "If there is a departmental record is it readily accessible to each teacher?"

NO ___

YES___

Leave blank

BENEFITS AND PROBLEMS

(a) "What, in your view, have been the benefits of mixed ability teaching in your department?"

(b) "What, in your view, have been the problems of mixed ability teaching in your department?"

TEACHER PREPARATION

"What, in your view, can teachers like yourself do to help students on teaching practice learn how to teach mixed ability classes?"

ANY OTHER COMMENT ABOUT MIXED ABILITY TEACHING

"Is there any other comment you would like to make about mixed ability teaching?"

THANK YOU FOR YOUR HELP

THE TEACHER EDUCATION PROJECT

MIXED ABILITY TEACHING

HEAD TEACHER QUESTIONNAIRE

Background information

You will by now be aware both of the existence of the Project, and of its intention to hold a half-day conference for headteachers (see letter of invitation enclosed). So far the Project has been gathering information about mixed ability teaching and about classroom management and control skills. Student teachers, qualified teachers and heads of department have all been involved in our research into these subjects. It is appropriate, therefore, to extend the scope of our discussions about matters of professional concern to headteachers, who have an excellent over-view of the work which goes on at their schools at all levels and in all subjects. We are inviting you not only to come to the conference but to fill in this questionnaire, the findings from which will be used as a starter to our conversations on that occasion. Your co-operation will be greatly appreciated.

The content of the questionnaire

The questionnaire falls into 4 sections.

A. Type of School

B. Mixed Ability Teaching

C. Exceptional Children

D. Training Teachers

All headteachers are asked to fill in sections A, C and D. Section B applies only to heads of those schools where there is some mixed ability teaching.

Wherever it has been possible to collect data quickly, by means of simple tick lists, this policy has been pursued in order to save you time.

Elsewhere the structure of the questions is open. You are invited to respond freely. Use the back of the sheets to write additional comments, or add sheets if you wish. Everything you write will be read, and will be of interest.

The questions themselves are self explanatory, and the few instructions that are necessary are printed in the text.

Return of questionnaire

We hope to process the questionnaire in time for our conference date, and therefore it is important that it should be returned in good time if possible.

DATE OF RETURN Tuesday 31st MAY 1977

ADDRESS FOR RETURN

Trevor Kerry
Project Co-ordinator
School of Education
Nottingham University
University Park
Nottingham, NG7 2RD

CONFIDENTIAL. Individual schools will not be identified in any discussion of the data obtained from an analysis of this questionnaire.

TEACHER EDUCATION PROJECT: MIXED ABILITY TEACHING

HEAD TEACHER QUESTIONNAIRE

School:

(Code no.)
please leave blank

(In this section indicate your answers by means of a tick where appropriate. You are invited to use the left hand blank pages to make comments additional to those for which space is provided.)

SECTION A. TYPE OF SCHOOL.

Please complete all the questions in this section.

1. Which of the following designations apply to your school

(a) comprehensive ☐

(b) direct grant ☐

(c) grammar ☐

(d) secondary modern ☐

(e) sixth form college ☐

(f) tertiary college ☐

(g) voluntary aided ☐

(h) other, please specify

____

____

____

2. Age range

from ☐ years to ☐ years

3. (a) Number on roll ☐

4. Is the school

(a) single sex - boys ☐

(b) single sex - girls ☐

(c) mixed ☐

5. If the school is <u>comprehensive</u> was it

(a) comprehensive from its inception ☐

(b) formed from an existing grammar school ☐

" " " " secondary modern school ☐

" " " " direct grant school ☐

" " " " independent school ☐

(c) formed in some other way (specify) ____________________

(d) Please indicate the date from which your school first used comprehensive organization 19____

6. Are there any special features of your school which you wish to describe, or pecualiar problems which it has to face?

SECTION B. MIXED ABILITY TEACHING

7. Please tick the column to show the extent of mixed ability teaching in your school. For example, if maths. is taught in mixed ability groups for the first two years tick the 1st year and 2nd year squares and leave the rest blank.

	1st year	2nd year	3rd year	4th year	5th year	6th year
Maths.						
Physics						
Chemistry						
Biology						
Combined Science						
English						
French						
German						
History						
Geography						
Humanities						
Classics						
Religious Studies						
Other subjects please specify (1)						
(2)						
(3)						
(4)						
(5)						

Additional comments (add anything here to amplify the above, e.g. "setting commences in English at Christmas of the third year" or "remedial pupils withdrawn for half their time from first year mixed ability groups".)

8. Describe briefly when and how mixed ability teaching was introduced into your school.

9. How are pupils assigned to mixed ability classes?

10. How is pupils' progress monitored and recorded in mixed ability classes?

11. So far as you can foresee, how will mixed ability teaching develop in your school? (For example, is it likely that in some subjects mixed ability will extend to older age-groups; will things stay as they are; or are there signs that some of your colleagues may wish to see less mixed ability teaching in their subject?)

12. What, in your view, have been the benefits of mixed ability teaching in your school?

13. What, in your view, have been the problems of mixed ability teaching in your school?

14. Have you any other comments you wish to make about mixed ability teaching?

SECTION C. EXCEPTIONAL CHILDREN

Please answer all the questions in this section. Most can be answered quickly, by putting a tick in the appropriate box.

15. SLOW LEARNERS

Which of the following does your school possess or use:-

	YES	NO
(a) a specialist Remedial Department catering for the slow learners	☐	☐
(b) visits by specialist teachers of slow learners	☐	☐
(c) complete withdrawal of slow learners into separate classes	☐	☐
(d) withdrawal into remedial classes for reading only	☐	☐
(e) withdrawal into remedial classes for specific subjects other than reading (specify which subjects)	☐	☐

Have you any other comments you wish to make about teaching slow learners?

16. BRIGHT CHILDREN

Which of the following does your school possess or use:

(a) Courses or special classes for children with unusual talents in

	YES	NO
(i) mathematics	☐	☐
(ii) sciences	☐	☐
(iii) English/foreign languages	☐	☐
(iv) music	☐	☐
(v) arts and crafts	☐	☐
(b) courses or special classes with specifically vocational objectives	☐	☐
(c) specifically graded activities for bright children within mixed ability groups	☐	☐
(d) extra homework for bright children	☐	☐

Have you any other comments you wish to make about teaching bright children?

17. Describe any procedures used to identify slow learners and bright children on their entry into the school:
(Mention use of primary school reports, formal tests, teacher appraisal, etc.)

(a) slow learners

(b) bright children

SECTION D. TRAINING TEACHERS

18. What, in your view, should be done to train student teachers to teach mixed ability classes effectively? (Mention in particular anything you think experienced teachers can do to help students develop these skills during teaching practice.)

19. What, in your view, should be done to train student teachers to develop effective management and control of their classes? (Again, mention in particular anything you think experienced teachers can do to help students learn management and control skills during teaching practice.)

20. In the light of your experience with probationer teachers is there any other suggestion you would make about preparing students to teach effectively in schools?

THANK YOU FOR YOUR HELP

THE SHERWOOD PROJECT

TEACHER INTERVIEW SCHEDULE

TEACHER
EDUCATION
PROJECT

THE CLASS PROFILE INSTRUMENT

The children

From the class list will you pick one name in response to each of the following questions:

Which pupil is:

the most able:	
the least able:	
the most original thinker:	
the least original thinker:	
the most creative:	
the least creative:	
the child with the largest vocabulary:	
the child with the smallest vocabulary:	
the main contributor to class discussion:	
the child who contributes least to class discussion	
the child with the most potential academically:	
the child with the least potential academically:	
the child with the best overall marks in your subject:	
the child with the worst overall marks in your subject:	
the child with the longest concentration span:	
the child with the shortest concentration span:	
the most logical thinker:	
the least logical thinker:	
the most numerate:	
the least numerate:	
the most abstract thinker:	
the most concrete thinker:	

In our previous researches teachers have told us they think of
3 types of pupils in their classes: the bright, the slow and the middle band.
How would you describe in your words

(a) a typical bright pupil

(b) a typical slow learner

(c) a typical middle band child

(<u>To researcher</u>: record especially any names dropped.)

LESSON SEGMENT	CONTEXT	PROCESS	OUTCOME	PROCESS	OUTCOME
TIME IN MINS	TEACHING MODE	TEACHER TALK	PUPIL RESPONSE	TASKS SET	PERFORMANCE ON TASKS
—					

Tasks recorded in the five main sample schools

TASKS set to first year pupils at Will Scarlet School

Religious Education

Lesson 1.

W	L 2	1. Read Worksheet together
W	L 4	2. Copy title from worksheet into exercise books
W	L 7	3. Homework: learn the following words and their meanings (already given) for a test next time: Moses, Elijah, Naboth, religious, obey, famine, quarrel, omen, adviser
W	L 11	4. Complete questions on worksheet provided
W	L 6	5. Pupils finishing work early given books to read.

Lesson 2.

W	L 8	1. Spelling test on words supplied in previous lesson
W	L 4	2. Copy question 1 from worksheet supplied
W	L 3	3. Draw a picture relating to the question
W	L 4	4. Copy qustion 2 omitting biblical references
W	L 11	5. Complete worksheet for homework
W	L 7	6. Learn the work on the worksheet for test next lesson.

French

Lesson 1.

W	L 4	1. Put heading in exercise books
W	L 3	2. Draw a clock face
W	L 4	3. Copy times onto clockfaces with appropriate French captions from blackboard
W	L 4	4. Write in vocabulary books list of words e.g. aujourd'hui, arriver, jouer, une amie etc
W	L 2	5. Louise to operate slide projector showing visuals to to match stage reached in audiovisual course
W	L 7	6. Homework: Longmans AV course p 46, questions 1 - 10; learn new words and phrases of time for test next lesson.

Lesson 2.

W	L 11	1. Match pictures to simple French sentences
W	L 10	2. Fill in missing French verbs to sentences supplied, from a selection of verbs given by the textbook
W	H 3	3. Write three French sentences on a given theme - to be done in rough books
W	H 3	4. Homework: finish the story started in rough books, still in rough.

Lesson 3.

W	L 3	1. Copy words into vocabulary books e.g. rentrer, attraper etc.

Lesson 4.

W L 4 1. Copy sentences into rough book e.g. 'Quelle est la date de votre anniversaire?'

W L 4 2. Copy and complete responses e.g. 'La date de mon anniversaire est le ....'

W L 4 3. Copy French dates from board

W H 3 4. Make given sentences negative by adding 'ne ... pas'

W H 3 5. Write negative responses to given questions

W L 7 6. Homework: revise this work for test tomorrow.

Science

Lesson 1.

W L 2 1. Read worksheet for lesson

W H 2 2. Work through tasks on worksheet

W L 2 3. Pack away equipment.

Lesson 2.

W L 2 1. Collect equipment

W H 2 2. Work through tasks on worksheet

W L 2 3. Pack away equipment.

Lesson 3.

W	L 2	1. Collect equipment
W	H 2	2. Do fresh series of tasks on chromotography similar to those of lesson 2
W	L 2	3. Pack away equipment and books.

Lesson 4.

W	L 2	1. Collect equipment
W	H 2	2. Work through tasks on worksheet
W	L 2	3. Homework: fix chromatograms in your exercise books.

History

Lesson 1.

W	L 4	1. Put heading in exercise books: 'The Great Pyramid of Cheops'
W	L 3	2. Draw pictures of the inside and outside of the Great Pyramid
W	L 3	3. Colour the drawings
W	L 2	4. Read jumbled sentences from worksheet
W	L 10	5. Decide on the correct order of the sentences
W	L 10	6. Homework: finish any of the above tasks not already completed.

Lesson 2.

W	L 2	1. Philip gives out textbooks
W	L 4	2. Write title of today's work in exercise books
W	L 2	3. Read text of worksheet
W	L 10	4. Answer first ten questions on the worksheet
W	L 2	5. While teacher goes over the answers to the ten questions, pupils jot any answers they haven't got right or completed.
W	L 10	6. Homework: finish the ten questions if necessary
W	H 1	7. do question 11
W	L 3	8. copy or trace a funeral mask.

Lesson 3.

W	L 4	1. Copy a section from textbook
W	L 7	2. Learn the copied material
W	L 4	3. Put the heading: 'Egyptian writing'
W	L 3	4. Copy the Egyptian characters from text
W	L 10	5. Carry out tasks on the worksheet.

Lesson 4.

W	L 8	1. Carry out test on worksheet
W	H 2	2. Look at a picture of a maze in the textbook: trace your way out
W	L 3	3. Colour a maze picture and stick it in your exercise book.

English

Lesson 1.

W	L 11	1. Make corrections (given by the teacher) to punctuation test set last lesson
W	L 7	2. Play a game to help memory
W	H 6	3. In exercise books, choose the part of a given book you like bset; explain what happened and why you liked it
W	H 6	4. Choose an important character from the book - say what you found interesting about him/her and why
W	H 6	5. Homework: finish uncompleted work.

Lesson 2.

W	H 3	1. Homework: make up sentences where several words begin with the same letter (i.e. alliterative) to describe the following:- fire, a calm lake, a snake, a thunderstorm, any angry bull, and several items of your own choice
W	L 12	2. Homework: find one or more newspaper headlines using the alliterative technique ready for the next lesson.

Lesson 3.

W	L 5	1. Individual pupil reads out homework on alliteration
W	L 6	2. Class reads paragraph from textbook
W	L 4	3. Copy down rules about making paragraphs

W L 11 4. Write an account of how one spends Christmas day using separate paragraphs e.g.

paragraph 1. Christmas tree
2. Christmas day - morning
3. - afternoon
4. - evening

W L 11 5. Homework: complete unfinished work.

Lesson 4.

W H 1 1. Write a serial story called 'The Great Adventure' using chapters and paragraphs (A sample scheme is given in detail)

W H 1 2. Homework: continue the task.

Maths

Lesson 1.

W H 2 1. Find out how many ways you can split a section of geo-board in half using one unbroken line

W H 2 2. Look at the drawings made and delete the non-congruent shapes

W H 2 3. Homework: look at the congruent ways of cutting the board in half and see what you notice about them

W L 11 4. Homework: write an account of today's work and the definition of congruent

Lesson 2.

W H 2 1. Find out if you have a right-angled isoceles triangle

W H 2 2. Find out if you have an equilateral right-angled triangle

W	L 4	3. Write a heading in your exercise books and copy down these binary numbers
W	L 8	4. Double all the binary numbers (revision)
W	L 8	5. Double all the answers (still revision)
W	L 8	6. Change these binary numbers to base 10 (revision)
W	L 8	7. Change these base 10 numbers to binary (revision)
W	L 3	8. Homework: draw the following shapes in your books - square, rectangle, isosodes triangle, parallelogram, rhombus and trapezium.

Lesson 3.

W	L 8	1. Draw a bar chart to illustrate the data given on the board (revision)
W	L 11	2. When finished task 1, find the means of given sets of numbers.

Lesson 4.

W	L 4	1. Write the heading 'Investigating tables of values'; copy down the tables
W	H 2	2. Deduce the rules and use them to complete the tables
W	L 11	3. When finished, complete additional examples 5,6 and 7
W	L 3	4. When finished, copy down hexagons in a row (as on blackboard).

Geography

Lesson 1.

W	L 4	1. Put heading and date
W	L 3	2. Copy the diagram on the worksheet
W	L 11	3. Answer the questions on the worksheet
W	L 2	4. Pack away apparatus.

Lesson 2.

W	H 2	1. Answer questions on worksheet.

Lesson 3.

W	L 4	1. Write a heading in rough book: 'Grid References'. (Class about to work on worksheet but many do not understand and the work never actually gets started).

Lesson 4.

W	L 10	1. Read a passage about 'Water from Reservoirs'. Fill in the missing words from those supplied.
W	L 10	2. Copy the passage into your exercise book with correct words inserted.

Music

Lesson 1.

W	L 4	1. Copy sentence from blackboard
W	L 4	2. Copy fresh heading
W	L 4	3. Copy continuous prose passage (with some words omitted) from blackboard
W	L 10	4. Fill in the missing words (from information just supplied in lesson)
W	L 4	5. Label the drawings of instruments on worksheets (from instructions given)
W	L 3	6. Homework: colour the drawings of the instruments.

Lesson 2.

W	L 2	1. Two pupils to give out exercise books
W	L 10	2. Homework: fill in the blanks in prose passage on worksheets.

Lesson 3.

W	L 6	1. Listen to 'Flight of the Bumblebee'
W	L 4	2. Homework: copy information and diagrams from worksheets into exercise books
W	L 3	3. Colour the diagrams.

Lesson 4.

W	L 4	1. Homework: copy out paragraph and diagrams from worksheet
W	L 10	2. Fill in the missing words; and
W	L 3	3. Colour the diagrams.

TASKS set to first year pupils at Huntingdon school

French

Lesson 1.

W	L 4	1. Copy French sentence from board
W	H 1	2. Devise a cafe scene in groups; some act as customers and one as the waiter
W	H 1	3. Perform the cafe scene.

Lesson 2.

G	H 3	1. In pairs, pracise ordering a meal
W	L 5	2. Whole class sings French song
W	L 11	3. Do actions to correspond with words of the song
W	L 8	4. Homework: revise unit 3 work from your exercise books.

Lesson 3.

W	L 8	1. Debbie counts in French from one to 12
W	L 3	2. Draw six clock faces
W	L 3	3. On the clock faces draw in times given by teacher in French
W	L 3	4. Draw six more clock faces
W	L 3	5. Put on more times from the French
W	L 4	6. Copy down French for the days of the week
W	L 4	7. Copy down French expressions for time.

Lesson 4.

W	L 5	1. Chorus reading from OHP transparencies
W	L 5	2. One pupil only reads from transparencies
W	L 5	3. Class repeat phrase from tape recorder
W	L 2	4. Two pupils give out books
W	L 4	5. Pupils copy heading into books
W	H 3	6. Make up a timetable in French
W	H 3	7. Complete the timetable.

Lesson 5.

W	L 5	1. Class read aloud from OHP transparency
W	L 10	2. Teacher lists lessons in French, with some letters missing e.g. HIS.O.RE, M..IQUE; pupils have to complete the words
W	L 11	3. Multiple choice questions from textbook, matching pictures to French sentences.

Science

Lesson 1.

W	L 4	1. Write title in exercise books
W	L 6	2. Watch demonstration experiment
W	H 3	3. Homework: write about the energy changes which take place when you switch on a washing machine.

Lesson 2.

W	L 9	1. Follow circus of ten experiments
W	L 3	2. Draw diagram of each set of apparatus
W	L 11	3. Write down what happened when you conducted the experiment
W	L 2	4. Pack away equipment.

Lesson 3.

W	L 2	1. Move classroom furniture
W	L 6	2. Watch demonstration
W	L 3	3. Draw a diagram of the apparatus
W	L 4	4. Copy down what happened
I	H 3	5. Chris finishes and is set a problem
W	L 2	6. Pack equipment away.

English

Lesson 1.

W	L 11	1. Complte dictionary exercise
W	L 11	2. Answer questions from textbooks in one or two words.

Lesson 2.

W	H 1	1. Describe how you would make a trolley to race with Spit Nolan
W	L 3	2. Draw your trolley; label it clearly

W	H 1	3. Describe a race in which you come second to Spit
W	L 6	4. Read silently the extract from the story of Spit Nolan
W	L 6	5. Homework: finish reading the passage and
W	L 4	6. make a list of difficult words in it.

Lesson 3.

W	L 4	1. Put a heading
W	L 6	2. Listen to teacher read an extract.

Lesson 4.

W	L 4	1. Copy from blackboard examples of direct speech
W	L 11	2. Work examples on blackboard.

Lesson 5.

I	L 11	1. Individual pupils give short prepared talks on their hobbies.

Maths

Lesson 1.

W	L 4	1. Copy down sums into back of exercise books.

Lesson 2.

Nil

Lesson 3.

W L 11 1. Carry out task from worksheet

W L 2 2. Two pupils collect tracing paper

W L 8 3. Homework: revise for test.

Lesson 4.

W L 11 1. Complete examples from textbooks

W L 2 2. Monitors collect materials.

Lesson 5.

W L 11 1. Homework: complete examples from textbooks.

Music

Lesson 1.

W L 2 1. Amanda gives out folders

W L 4 2. Teacher dictates notes on rhythm

W L 11 3. Teacher asks pupils to write down notation for a rhythm clapped

W L 5 4. Pupils sing.

Lesson 2.

W	L 4	1. Teacher dictates notes
W	L 11	2. Children find notes on recorder
W	L 11	3. Children play sequences of notes on recorders
W	L 2	4. Pupils pack up equipment
W	H 4	5. Homework: how is an upright piano different from a grand piano?
W	L 12	6. Find out how a piano works, and
W	L 12	7. when it was invented.

Lesson 3.

W	L 3	1. Pupils draw recorders
W	L 4	2. Copy notes onto recorder drawings
W	L 11	3. Practise playing various notes on recorder
W	L 11	4. Practise playing simple tune on recorder
W	L 2	5. Pupils collect equipment
W	L 4	6. More copying from blackboard.

Lesson 4.

W	L 11	1. Pupils practise simple tune
W	L 2	2. Pupils collect equipment.

Integrated Studies

Lesson 1.

Nil

Lesson 2.

W H 1 1. Pupils perform playlet.

Lesson 3.

W H 1 1. Pupils prepare scene at market with stall holder and customers

W H 1 2. Pupils act playlets.

Lesson 4.

W L 6 1. Pupils read over a passage supplied

W L 4 2. Write a heading

W H 3 3. Say how you read off grid reference

W L 4 4. Copy and label ten different symbols from an O.S. map

W L 5 5. Individual pupils read out answers for checking

W L 4 6. Homework: finish the task.

Lesson 5.

W L 11 1. Pupils asked to answer questions such as 'In which centuries are these years? 86 AD, 914 AD, 1331 AD' etc; and 'Name a date in the following centuries: 15th, 18th, 21st" etc.

I	L 12	2. Several pupils sent to resources centre to read additional information on topic
I	H 6	3. Chris set to write a book review.

Lesson 6.

W	L 11	1. Complete questions on dating unfinished last time.

Lesson 7.

W	H 1	1. Shut eyes for five minutes and think out a story on the theme 'Getting Lost'
W	L 5	2. Valerie tells her story so far
G	H 1	3. In pairs, one pretends to be a mirror, the other someone looking in it
W	H 1	4. Each pair puts on a brief act
W	H 6	5. Homework: write a page of dialogue between a medieval farmer and a modern farmer
W	L 2	6. Pack away equipment.

Lesson 8.

W	L 6	1. Observe film strip
W	L 6	2. Look especially for selected items (listed by teacher)
W	L 5	3. Reading around class from filmstrip captions
W	L 11	4. Write answers to questions relating to filmstrip content
I	L 3	5. Chris (finished early) is given task of drawing soil profile
W	L 2	6. Pack away equipment.

Lesson 9.

W	L 2	1. Class move furniture
G	L 1	2. Tim and Craig set to write six reasons why they must not run around the classroom (following misbehaviour)
W	L 6	3. Pupils watch demonstration experiment
W	L 10	4. Pupils write up what they have seen
W	L 3	5. Pupils draw experimental apparatus.

TASKS set to first year pupils at Robin Hood School

Religious Education

Lesson 1. Individual pupils/small groups set to research specific areas about the theme Brazil i.e.

G	L 12	1. housing problems in Brazil and how to solve them
G	H 6	2. designing better houses
G	L 3	3. making animals and people for the display
G	L 12	4. finding out about agriculture and industry
G	H 6	5. comparing their clothes with ours
G	L 12	6. customs and festivals
G	L 12	7. the Indians of Brazil
G	L 11	8. newspaper reporters write about the work of other groups
G	L 3	9. mounting work for displays
G	L 12	10. finding out about food and drink
G	L 11	11. writing to Oxfam to describe class's work
G	L 12	12. description of main cities of Brazil
G	L 11	13. letters to Unicef and Legoland
G	L 2	14. make lists of materials needed to complete display
G	L 12	15. find phone numbers of Radio Nottingham and Radio Trent to appeal for materials
	L 2	16. Adrian collects exercise books

Lesson 2. Continued project work about Brazil:-

G	L 3	1. compiling a scrapbook
G	L 3	2. making a collage
G	L 3	3. paint models
G	L 3	4. make tower block from cardboard boxes

G	L 3	5. sketch frieze onto wall
I	L 12	6. Adrian looks at slide-set
I	L 3	7. Nigel draws diagrams
G	L 2	8. Several pupils cover desk before painting
I	L 12	9. Nicola looks through books for picture stimulus
G	H 3	10. Two pupils use information from Oxfam
I	L 11	11. Helen interviews other groups
	L 2	12. Pack equipment away.

Lesson 3.

G	L 3	1. Three pupils finish model
G	L 11	2. Two pupils compile reporters' folder
I	-	3. Other individuals complete last week's tasks
I	L 11	4. Julie writes about slide set
G	L 11	5. One group makes a tape
I	L 3	6. Paul draws and paints map
I	L 12	7. Helen recounts foods eaten by the rich
I	L 3	8. Susan does painting of Brazilian customs
I	L 3	9. Guy paints rich people
I	L 11	10. Nigel writes about slide set
I	L 3	11. Pauline paints a Brazilian festival
G	L 2	12. Robert and James set up a model
I	L 11	13. Julie writes about the slide set
I	L 3	14. Ian makes a collage of a tower block
I	L 3	15. Richard paints poor people
G	L 3	16. Two pupils make collage of poor housing
G	L 3	17. Two pupils look for twigs to make model trees
I	L 11	18. Nigel writes about life in Brazil

G	L 3	19. Several pupils fix trees in model
I	L 4	20. Nigel does fair copy of work for display
G	L 11	21. Two more pupils write about life in Brazil
G	L 3	22. Two pupils make fencing for display
I	L 3	23. Paul draws a map
	L 2	24. Pack equipment away.

Lesson 4.

W	L 4	1. Put a heading
W	L 11	2. Write an account of what we did in 'Brazil' project
W	H 6	3. Say whether you think it was worthwhile
I	L 3	4. Cheryl draws map of Brazil
W	L 11	5. Homework: read over what you've written in class
W	L 6	6. Pupils who finish asked to read quietly
W	L 11	7. Homework (future): to prepare a verbal report on your part in the project to give to the class.

French

Lesson 1.

W	L 11	1. Answer exercises from textbook
W	L 11	2. Listen to tape in French and join picture to sentence on worksheet
W	L 5	3. Class read in chorus
W	L 2	4. Class move furniture
W	L 11	5. Practise 'un' or 'une' by asking each other questions in small groups
W	L 4	6. Copy questions from blackboard, along with possible (multi-choice) answers

W	H 3	7. Homework: complete several brief exercises from textbook including making up some brief conversations.

Lesson 2.

W	L 6	1. Listen to tape-recording in French
W	L 5	2. Repeat accurately what you hear
W	L 11	3. Listen and do action to illustrate the meaning
W	L 4	4. Copy from blackboard some questions in French
W	H 3	5. Make up some questions of your own
W	H 3	6. Write answers to the questions
W	H 2	7. Do crossword
W	L 11	8. Homework: read sentences in textbook and tick appropriate picture in each case
W	L 2	9. Pack away equipment.

Lesson 3.

W	L 6	1. Read a book for two minutes till teacher is ready
G	L 11	2. Practise questions and answers from text in pairs
W	L 11	3. Write questions and answers into cartoon bubbles on worksheet
W	L 11	4. Homework: complete page 11 in textbook, and
W	L 11	5. read over all the questions and answers we've done so far.

Lesson 4.

W	L 4	1. Put heading
W	L 4	2. Copy list of words from board
W	L 10	3. Then complete French sentences

W L 4 4. Write new heading and copy question on worksheet

W L 10 5. Find and fill in the correct answer

W L 4 6. Write out a list of months in French from blackboard

W L 7 7. Learn this list.

Science

Lesson 1.

W L 2 1. Move furniture

W L 3 2. In groups, make a chart of the water cycle

W L 11 3. Write down where water comes from

W L 9 4. Look at some and write down what colour it is

W L 9 5. Look at it through a microscope

W L 9 6. Use indicator paper to find its Ph

W L 11 7. Write down how to find Ph

W L 4 8. Put a heading

W L 3 9. Draw a chart like the one on the blackboard

W L 11 10. Fill results of your experiments into charts

W L 2 11. Pack away apparatus.

Lesson 2.

W L 6 1. Listen to instructions

W L 2 2. Collect apparatus

W L 9 3. Carry out experiments and observe

W L 11 4. Write up results in books

W L 3 5. In each case, draw the apparatus

W L 2 6. Pack away apparatus.

Lesson 3.

W	H 2	1. Plan which stain you are going to try to clean
W	H 2	2. Control for material, quality of detergent etc.
W	H 2	3. List the questions we want answers to in the exercise books e.g. a) does the temperature make a difference? b) which detergent is best? c) is biological powder better?
W	H 2	4. Formulate some questions of your <u>own</u>
W	L 9	5. Carry out the experiments.

Lesson 4.

W	L 4	1. Put a heading
W	H 2	2. Record all the evidence you can think of for the presence of air
W	L 3	3. Draw 12 squares
W	L 4	4. Convert your squares into a wind-speed chart, copying from the textbook.

History

Lesson 1.

W	L 3	1. Trace outline maps, one of Roman and one of modern Britain
W	L 12	2. Compare maps
W	L 10	3. Record towns which appear on both maps
W	L 3	4. Underline forts in green, main roads in red
W	L 2	5. Collect project work together for display
W	L 5	6. Individuals read work aloud to class
W		7. Homework: complete unfinished work.

Lesson 2.

W L 2 1. Susan gives out textbooks

W L 6 2. Look at pictures in textbooks

W L 3 3. Trace or copy either a Fort or a Villa

W L 3 4. Colour the diagram and make a key

W H 3 5. Homework: answer these questions:-
- a) describe the defences of a fort
- b) if each block accomodates 80 - 100 men, how many lived in a fort?
- c) how can you identify a centurion's quarters?
- d) why is this villa called a courtyard villa?
- e) which rooms were unheated and why?
- f) what room is missing from this plan and why, do you think?

I L 12 6. Three pupils sent to research alone in reference books on finishing work.

Lesson 3.

W L 3 1. Draw a diagram of a villa or a fort

W L 10 2. Write about a villa or a fort

W L 12 3. Find out the use of each room and give examples

I L 12 4. Helen (on finishing) to find out about women in Roman times

I L 12 5. Guy and Robert to find out about Roman building methods

W H 5 6. Homework: write half a page to explain what innovations and changes the Romans made in Britain

W L 7. Homework: finish any work not completed.

Lesson 4.

W	L 6	1. Read silently from textbooks
W	L 5	2. Individuals read aloud round class
W	L 3	3. Write or draw pictures to show dangers and problems of living in Roman times
W	H 5	4. Write a letter from the Emperor telling the people of Britain why the Romans have decided to leave
W	L 3	5. Draw four pictures of things which declined when the Romans left Britain
W	L 12	6. Homework: find out what you can about Anglo-Saxons and the ship from Sutton Hoo; and
W	L	7. complete any unfinished work.

English

Lesson 1.

W	L 2	1. Class browse in library and choose reading books
W	L 11	2. Write an exact account of a candle burning (just watched)
W	H 1	3. Write a description which is sensitive, or a poem or a shape poem
W	H 1	4. finish the task.

Lesson 2.

W	L 2	1. Change books in class library
W	L 6	2. Look at picture while teacher reads story
W	H 4	3. Listen again and try to account for why the writing conveys the impression of the activity
W	L 6	4. Listen to another reading by the teacher

W L 11 5. Write a newspaper-style account of a fire

W H 1 6. Write a story with a moral: e.g. 'there's no smoke without fire'

W H 1 7. Homework : finish the task.

Lesson 3.

W L 2 1. Choose books from class library

W L 3 2. Colour picture words

W H 3 3. Make up some of your own

W H 1 4. Make up a shape poem on themes like 'fat','mirror' etc

W H 1 5. Homework: continue making up shape poems.

Lesson 4.

W L 12 1. Look through library books for examples of signs and symbols in advertising

W H 2 2. Answer these questions:
a) give 3 examples of how animals communicate with one another
b) give 3 ways that human bodies communicate thoughts and feelings
c) what is the main method of human communication?
d) how have people passed messages over long distances?
e) draw a collage of everyday signs and symbols

W L 12 3. Homework: collect examples of signs and symbols and copy them into your books.

Maths

Lesson 1.

W H 3 1. Examples of four rules to work in head

W H 3 2. Do examples from textbook

W L 11 3. Homework: spend 20 minutes on more examples from textbook.

Lesson 2.

W L 4 1. Write down questions from board

W L 11 2. Answer these questions (e.g. 1/10 - 1/10)

W L 11 3. Answer to more questions (e.g. 2 1/3 - 1 3/4)

W L 11 4. Do examples from textbook

W L 11 5. Homework: more examples of dividing factors.

Lesson 3.

W L 2 1. Two pupils give out exercise books

W L 8 2. Complete test from blackboard (revision)

W L 11 3. Do examples from textbook.

Lesson 4.

W L 8 1. Compute 3 2 (and other revision questions)

W L 11 2. Homework: twenty minutes.work on examples from textbooks.

Geography

Lesson 1.

W L 3 1. Trace maps and contour lines.

Lesson 2.

W	L 3	1. Stick together sections of 3-D map
W	L 2	2. Pack away equipment and clean floor
W	L 3	3. Homework: finish the task.

Lesson 3.

I	L 6	1. Cheryl to read to herself a section of textbook
W	L 3	2. Class continues its sticking of model
W	L 3	3. Homework: colour appropriate contours in the correct colours
W	L 2	4. Pack away equipment.

Lesson 4.

W	L 3	1. Half class continue with models
W	L 3	2. Remainder write about crofters from textbook (copying, drawing, colouring)
W	L 10	3. Make notes about farming on the croft.

Music

Lesson 1.

W	L 3	1. Copy four shapes
W	H 3	2. Think of a sound to fit each shape
W	H 1	3. Make up a noise for each shape
W	H 3	4. Make up two new sounds and shapes

W	L 5	5. Class sing together
W	L 5	6. Listen to tune on piano, then put hands up when you spot it on the record.

Lesson 2.

W	L 5	1. Clap in rhythm
W	L 2	2. Pupils get out equipment
W	L 5	3. Class play instruments according to instructions
W	L 3	4. Copy instruments from blackboard
W	L 2	5. Richard gives out songbooks
W	L 5	6. Class sings.

Lesson 3.

W	L 2	1. Pupil gives out instruments
W	L 5	2. Class plays instruments
W	H 1	3. Listen to music and think about its mood.

TASKS set to first year pupils at Friar Tuck school

Religious Education

Lesson 1.

W	L 2	1. Pupil gives out textbooks
W	L 4	2. Write down the Commandments in your exercise books
W	L 5	3. Individual pupils read aloud
W	L 7	4. Memorize the 10 Commandments.

Lesson 2. None

Lesson 3.

W	L 2	1. Pupils distribute textbooks and writing books
W	L 4	2. Write a heading
W	L 10	3. Make notes on the story (just told) of Moses
W	L 4	4. Copy notes from blackboard
W	L 6	5. Read on in the story when notes finished.

Lesson 4.

W	L 4	1. Copy map of Egypt
W	L 5	2. Individual pupils read aloud from text
W	L 6	3. Homework: read through remainder of the book of Exodus, and
W	L 4	4. Note down any difficult words.

French

Lesson 1.

W	L 5	1. Individual pupils read around the class
W	L 11	2. Homework: "complete exercise from textbook if you don't find it too difficult".

Lesson 2.

W	L 4	1. Copy down French expressions in vocabulary books
W	L 11	2. Work through questions in textbook, practising the phrases: who is? where is?
W	L 11	3. Complete further exercise from textbook.

Lesson 3.

W	L 6	1. Look at pictures in textbook while the teacher reads French captions
W	L 11	2. Complete exercise from textbook
W	L 7	3. Homework: to learn the rules and procedure for using 'de', 'du' etc
G	H 3	4. Pupils ask each other to tell the time in French
W	L 4	5. Copy down words in vocabulary books
W	L 7	6. Homework: learn the new vocabulary for next lesson, and
W	L 3	7. make a model clock ready to practise expressions of time.

Lesson 4.

W	L 4	1. Copy down words into vocabulary books
W	L 4	2. Put a heading
W	L 4	3. Copy out forms of various verbs
W	L 4	4. Write in exercise books answers (already discussed) to three questions from textbook
W	L 6	5. Read ahead silently in French story if writing finished
W	L 4	6. Copy words into vocabulary books.

Science

Lesson 1.

W	H 5	1. Carry out tasks on worksheet
W	L 6	2. Homework: read questions on the worksheet ready for next lesson.

Lesson 2.

W	L 6	1. Watch demonstration experiment on freezing and boiling points of water
W	L 9	2. Carry out own experiments in groups
W	L 4	3. Copy information from blackboard
W	L 2	4. Pack away equipment.

Lesson 3.

W	L 4	1. Copy notes from blackboard
W	L 3	2. Copy diagrams
W	H 3	3. Write a sentence to explain how and why experiment in diagram works
W	L 12	4. Look up and read about 'expansion' in textbooks
W	L 6	5. Watch demonstration experiment.

Lesson 4.

W	L 6	1. Watch demonstration experiment
W	L 3	2. Draw diagrams of experimental apparatus
W	H 4	3. Answer questions set by teacher: a) why did the water in tube A go up slower than that in tube B? b) why did the water in tube B go <u>down</u> before it started to go up?
W	L 9	4. Carry out experiment
W	L 2	5. Pack away equipment.

History

Lesson 1.

W	L 4	1. Put a heading
W	H 2	2. Use the alternative answers in the textbook to complete the paragraph: 'My advice to Duke William is.....'
W	H 5	3. Give reasons for your choice of answer
W	L 4	4. Copy list of Kings/Queens of England

W	L 4	5. Copy list of 'Events of English History' from textbook
W	L 6	6. Those who have finished to do silent reading from textbook.

Lesson 2.

W	L 6	1. Read designated section of textbook
W	L 6	2. Read a second section of textbook
W	L 4	3. Put a heading
W	L 3	4. Copy diagram from blackboard
W	L 4	5. Make a list of jobs done by priests in middle ages (from textbooks)
W	L 11	6. Describe a diocese, and the work of bishop and archdeacon (using textbook).

English

Lesson 1.

W	L 4	1. Copy information about commas from blackboard
W	L 11	2. Use worksheet to practise use of commas
W	L 2	3. Collect worksheets and textbooks.

Lesson 2.

W	L 4	1. Put a heading
W	L 11	2. Complete practice exercises from worksheets
W	L 6	3. Silent reading from textbooks
W	L 5	4. Individual pupils read around the class
W	L 4	5. Put a heading

W H 4 6. Answer questions from blackboard e.g. "Is it worse to be colour blind from birth or to lose the sense of colour in later life? Why" and "If you were to become colour-blind now which colours would you miss most?"

W H 5 7. Homework: an additional question, viz "Emma's 'great red flush', 'rusty red freckles' and 'great, thick almost white eyelashes like a cow's' could be made more attractive. Write a sentence about each of these features making them sound attractive

W L 2 8. Pack away worksheets and textbooks.

Lesson 3.

W L 6 1. Listen while the teacher reads.

Lesson 4.

W L 5 1. Pupils read aloud around class

W H 1 2. Write essay on the title 'once upon a Midnight Dream'

W L 6 3. Listen to teacher reading a passage

W H 1 4. Homework: complete the essay already started in the lesson.

Maths

Lesson 1.

W L 11 1. Complete examples from textbooks.

Lesson 2.

W L 11 1. Complete examples from textbooks.

Lesson 3.

W	L 11	1. Complete examples from textbooks.

Lesson 4.

W	L 11	1. Complete examples from textbooks.

Lesson 5.

W	L 11	1. Complete examples from textbooks
W	L 4	2. Copy down heading
W	L 11	3. Complete examples from textbooks
W	L 4	4. Copy down rules and exercises.

Lesson 6.

W	L 11	1. Complete examples from blackboard.

Lesson 7.

W	L 2	1. Some pupils give out worksheets
W	L 4	2. Write a heading
W	L 11	3. Complete examples from worksheets
W	L 11	4. Homework: complete first worksheet if necessary; or
W	L 11	5. complete second worksheet.

Lesson 8.

W L 11 1. Complete examples from worksheet

W L 3 2. Copy diagram from blackboard

W L 4 3. Copy notes from blackboard.

Geography

Lesson 1.

W L 3 1. Complete shading and labelling of Banda maps according to teacher's instructions

W L 12 2. Find locations of a number of places (The Wash, English Channel etc.) from Atlas and transfer to Banda maps.

Lesson 2.

W L 4 1. Copy down dictated notes

W L 3 2. Copy drawing of fishing boat labelling its characteristic features

W L 12 3. Homework: find out from books or by other means what kinds of fish are caught in the middle waters.

Music

Lesson 1.

W L 5 1. Play notes on recorders according to instructions

W L 5 2. Speak rhythms in chorus.

Lesson 2.

W L 5 1. Play notes on recorders according to instructions

W L 5 2. Repeat rhythms in chorus

W L 5 3. All sing

W L 2 4. Individual pupils pack away equipment.

Lesson 3.

W L 5 1. Play notes on recorders according to instructions

W L 11 2. Play notes, reading music from textbook

W L 5 3. Speak rhythms in chorus

W L 11 4. Play notes from blackboard

W L 11 5. Read notes in rhythm with teacher

W L 11 6. Play notes for finger practice.

Lesson 4.

W L 5 1. Play notes on recorders according to instructions

W L 11 2. Play notes, reading music from textbook

W L 5 3. Read notes aloud in rhythm.

TASKS set to fist year pupils at Alan Adale school

French

Lesson 1.

W	L 4	1. Copy French phrases from blackboard
W	L 3	2. Draw clock faces
W	L 4	3. Copy French phrases under clock faces
W	L 11	4. Complete task from worksheet (fill in missing French words)
W	L 6	5. Look at pictures in French magazine.

Lesson 2.

W	L 6	1. Read silently passage on verb 'etre' from text
W	L 7	2. Learn the verb 'etre'
W	L 5	3. Repeat verb together as class
W	L 10	4. Complete worksheet tasks
W	L 4	5. Put date/heading
W	L 3	6. Trace pictures
W	L 11	7. Complete exercises from textbook.

Lesson 3.

W	L 8	1. Complete short revision test of vocabulary
W	L 3	2. Trace over Banda maps in specified colours
W	L 4	3. Put place names onto maps (transfer/copy)
W	L 2	4. Pack away/tidy classroom.

Lesson 4.

W L 4 1. Copy words into vocabulary book

W L 4 2. Put heading/date

W L 4 3. Copy questions in French from blackboard.

Science

Lesson 1.

W L 2 1. Collect apparatus required

W L 4 2. Carry out experiment according to instructions

W L 11 3. Make notes on what happened during experiment

W L 2 4. Put apparatus away

W L 4 5. Copy notes from blackboard

W H 5 6. Answer questions from blackboard:
"How would you describe a) filtration,
b) evaporation, c) distillation and d) chromatography?".

Lesson 2.

W L 3 1. Draw graphs from given data from example on blackboard

W L 10 2. Homework: think of three different animals and make notes about how each moves (e.g. horse, dog, snake etc).

Lesson 3.

W	L 6	1. Look at wall-chart and film of animal movement
W	H 2	2. Answer question from worksheet
W	L 2	3. Set up and run projector for own studies
W	L 2	4. Return apparatus
W	H 5	5. Answer question from workbook
W	L 9	6. Carry out experiment from workbook.

Lesson 4.

W	L 3	1. Draw four stages of frog reproduction from workbook provided
W	H 6	2. Answer question from workbook (page 9)
W	L 3	3. Draw a diagram of an egg
W	H 6	4. Answer question from workbook
W	L 2	5. Bring an egg to the lesson next week
W	H 6	6. Homework: finish off task set.

English

Lesson 1.

W	H 1	1. Homework: Choose a colour (except white); write down the ideas it represents and its relationship to your personality
W	L 4	2. Homework: copy poem into exercise book.

Lesson 2.

W	L 5	1. Read poems aloud round class
W	L 6	2. Listen to teacher reading from story book.

Lesson 3.

W	L 6	1. Listen to teacher read from 'English Through Experience'
W	L 4	2. Put a heading
W	H 1	3. Homework: write under the heading 'Portrait'.

Lesson 4.

W	L 2	1. Move furniture into new positions
W	H 1	2. Perform mimes, one or two at a time
W	L 2	3. Return furniture to appropriate positions.

Maths

Lesson 1.

W	L 3	1. Individual pupil draws on blackboard as instructed
W	L 2	2. Individual pupils give out equipment
W	L 3	3. Cut out card shapes
W	L 3	4. Join shapes as shown
W	L 4	5. Copy table of shape names and properties from blackboard
W	L 11	6. Homework: find shapes named on table and count faces, edges, corners to be filled in on table
W	L 2	7. Pack away and clean up litter.

Lesson 2.

W	L 4	1. Put heading
W	L 3	2. Stick information sheet into exercise books
W	L 3	3. Draw cuboid shape
W	L 4	4. Copy diagrams from blackboard
W	L 4	5. Put heading
W	L 11	6. Make a chart of class members' means of transport to school
W	L 11	7. Draw a bar-chart of this information
W	L 11	8. Write answer to factual question
W	L 4	9. Put headings
W	L 11	10. Draw bar-chart from figures provided
W	L 9	11. Roll die to investigate probability
W	L 4	12. Copy down work for next lesson.

Lesson 3.

W	L 2	1. Select SMP card you are on
W	L 11	2. Answer questions involving simple measurement of angles etc
W	L 2	3. Pack up cards and exercise books.

Lesson 4.

W	L 11	1. Work through questions on SMP card
W	L 2	2. Individual pupils collect equipment.

Music

Lesson 1.

W	L 7	1. Pupils to learn names of notes (given)
W	L 2	2. Individual pupil to give out recorders
W	L 5	3. Class play recorders, following music in textbook
W	L 5	4. Read aloud rhythm
W	L 11	5. Play recorders using music in textbook
W	L 2	6. Collect equipment
W	L 6	7. Listen to recorded music.

Lesson 2.

W	L 4	1. Copy information from blackboard
W	L 5	2. Class sing carols
W	L 3	3. Class does breathing exercises.

Lesson 3.

W	L 5	1. Class to play short sequences on recorder according to instructions
W	L 11	2. Class to play from music in textbook
W	L 5	3. Pupils mouth rhythms aloud
W	L 5	4. Pupils sing.

Lesson 4.

W	L 5	1. Read rhythms out loud (or clap)
W	L 4	2. Put a heading
W	L 4	3. Copy notes into exercise books
W	L 2	4. Chris to give out recorders
W	L 5	5. Class to play notes as instructed
W	L 11	6. Class to play from score
W	L 6	7. Listen to recorded music.

Integrated Studies

Lesson 1.

W	H 6	1. Homework: answer question from work booklet (q.2) and give reasons for your answer.

Lesson 2.

W	H 6	1. Answer questions from work booklet using library resource material
W	L 2	2. Individual pupil to do errand
W	L 12	3. Michael to discover the date when fabric was first woven.

Lesson 3.

W	H 6	1. Answer questions from work booklet
W	H 6	2. Homework: try to complete work from booklet.

Lesson 4.

W H 6 1. Pupils answering questions from work booklet.

Lesson 5.

W H 6 1. Pupils answering questions from work booklet.

Lesson 6.

W H 6 1. Pupils answering questions from work booklet.

Tasks recorded in the three comparative-study schools

For the sake of completeness and comparison tasks set in Little John, Maid Marion and the Sheriff were also recorded. The pages which follow list these tasks.

TASKS: Analysis of tasks set in a primary school class over a two week observation period.

Lesson 1.

G L 11 1. Complete measuring tasks from maths cards

G L 11 2. Centicubes - cover shapes and count cubes

G L 11 3. Area - on graph paper draw round shapes and count squares within them.

Lesson 2.

W L 2 1. Check your work against personal timetables

W L 2 2. Complete any unfinished tasks

W L 2 3. Put work into correct sequence

W L 2 4. Number the pages in order

W L 2 5. List contents of folder

W L 12 6. Use reference books to finish incomplete work

W L 2 7. Individual pupils to get out equipment

W L 3 8. Do physical exercises as instructed.

Lesson 3.

W L 6 1. Watch TV programme

W L 2 2. Individual pupils to arrange furniture

G L 11 3. Complete measuring tasks from maths cards

G L 11 4. Complete centicube cards

G L 3 5. Make a plan of a model house

G L 3 6. Draw ground plan of model

G L 3 7. Build the model

G L 3 8. Draw rough plans not to scale.

Lesson 4.

W	L 11	1. Work out areas of groundplan of model house
W	L 2	2. Individual pupils run errands
W	H 1	3. Design your ideal house of the future
W	L 11	4. Describe this house in writing
W	L 3	5. Draw the house.

Lesson 5.

W	H 1	1. Continue work on your ideal home
W	L 11	2. Continue centicube activities
W	L 2	3. Boys move furniture.

Lesson 6.

W	H 1	1. Continue work on ideal homes
I	L 12	2. Individual pupils use reference material.

Lesson 7.

W	H 1	1. Continue work on ideal homes
W	L 6	2. If finished,read books till others catch up
W	L 5	3. Individual pupils read to teacher
W	L 2	4. Pack up equipment
W	L 2	5. Move furniture
W	L 3	6. Make model wall with cement (in turn).

Lesson 8.

W L 6 1. Read silently

W L 11 2. Complete arithmetic from blackboard

W L 12 3. Finish any uncompleted topic work etc.

W L 2 4. Move furniture

W L 2 5. Pack away equipment.

Lesson 9.

G L 11 1. Complete workcards e.g. on area, perimeter

G L 12 2. Complete topic work

G L 3 3. Make contents page and cover for topic work

G L 11 4. Complete centicube workcard to number 19

W L 2 5. Fill in record sheet of work completed.

Lesson 10.

W L 12 1. Continue topic work

I L 4 2. Individual pupil copies from textbook

W L 2 3. Pack away equipment.

Lesson 11.

W L 2 1. Move furniture

W L 11 2. Work from core unit (basic skills)

I L 12 3. Continue topic work

W L 6 4. Listen to story told by teacher

W H 1 5. Use imagination to write about life in the Mills

W H 1 6. Write about 'Living in Georgian Times' from information given.

Lesson 12.

W H 1 1. Continue task 6 above

W L 2 2. Pack away equipment.

Lesson 13.

G L 11 1. Work through part of core unit

W H 1 2. Finish writing a story

W L 11 3. Continue centicube workcards

W L 3 4. Make a cover for work

W L 6 5. Watch T.V. programme.

Lesson 14.

W L 11 1. Continue core unit (basic skills)

W L 2 2. Record progress on record sheet

W L 7 3. Learn spellings

W L 4 4. Practise handwriting

W L 6 5. Read silently.

Lesson 15.

W L 6 1. Watch film

W L 6 2. Read silently

G L 3 3. Continue making model houses.

TASKS: Analysis of tasks set in a middle school 4th year class, broken down by subject area.

Maid Marion School.

Religious Education.

Lesson 1.

W L 3 1. Draw a picture of Buddha

W L 11 2. Write (from previous discussion) about the things a Buddhist takes to the temple.

Lesson 2.

W L 4 1. Copy from blackboard.

French

Lesson 1.

W L 4 1. Copy down French words for days and months

W L 7 2. Memorize these words.

Lesson 2.

W L 8 1. Test on words memorized last time

W L 5 2. Individual pupil reads aloud

W L 6 3. Listen to teacher read aloud.

Lesson 3.

W L 4 1. Copy words into vocabulary book.

Lesson 4.

W L 4 1. Copy verb from blackboard.

Science

Lesson 1.

G L 9 1. Carry out experiments from worksheets.

Lesson 2.

W L 11 1. Complete table about forces

W L 9 2. Carry out experiment according to instructions

W L 9 3. Record observation and results.

Lesson 3.

W L 11 1. Write up last lesson's experiments

W L 11 2. Draw a graph of the results.

English

Lesson 1.

W L 11 1. Rehearse previously memorized parts for an Assembly

W L 4 2. Making 'display copies' of work previously completed.

Lesson 2.

W H 1 1. Write a murder story according to instructions given.

Lesson 3.

W L 5 1. Individual pupil reads aloud from board

W H 1 2. Start writing another story.

Maths

Lesson 1.

I L 11 1. Work through examples on SMP cards.

Lesson 2.

I L 11 1. Work through examples on SMP cards.

Lesson 3.

I L 11 1. Work through examples from blackboard to pradise technique (just explained) of solving simple equations

I L 11 2. Continue SMP cards.

Lesson 4.

I L 11 1. Continue SMP cards.

Lesson 5.

I L 11 1. Continue SMP cards.

Lesson 6.

I L 11 1. Continue SMP cards.

Humanities

Lesson 1.

I L 12 1. Continue individual topic work (e.g. on World War II, Russion Revolution, China etc - all with theme of 20th century).

Lesson 2

I L 12 1. As above

Lesson 3.

W	L 4	1. Copy notes from blackboard
W	L 3	2. Fill in information on outline map supplied
W	L 8	3. Complete test (one word, data level answers) on work from last lesson.

TASKS: Analysis of tasks set in a G.C.E. 'O' level acceleration set, broken down by subject area.

Sheriff School

Religious Education

Lesson 1.

W L 6 1. Watch slide series (information).

Lesson 2. Nil

Lesson 3. Nil

French

Lesson 1.

W L 8 1. Write answers to revision questions already gone over orally in the lesson.

Lesson 2.

W L 11 1. Complete tasks from worksheet, practising object pronouns

W L 5 2. Read aloud around class.

Lesson 3.

W L 6 1. Listen to teacher tell story in French.

Lesson 4.

W L 8 1. Work orally through past exam paper (revision).

Lesson 5.

W L 11 1. Pupils give instructions to teacher who uses them to draw an imaginery town.

Lesson 6.

W L 4 1. Copy down idiomatic phrases

W L 5 2. Individual pupils read aloud round class.

Lesson 7.

W L 4 1. Write dictated notes on when to use imperfect and perfect tenses.

Lesson 8.

W L 4 1. Write words into vocabulary books

W L 5 2. Individual pupils read aloud round class..

Biology

Lesson 1.

W L 6 1. Watch demonstration experiment.

Lesson 2.

W L 8 1. Work orally through past exam paper.

Lesson 3.

W L 4 1. Copy down dictated notes.

Lesson 4.

W L 4 1. Copy down dictated notes.

Chemistry

Lesson 1.

W L 4 1. Copy down dictated notes.

Lesson 2.

W L 4 1. Copy down dictated notes.

Physics

Lesson 1.

W L 6 1. Watch demonstration experiments.

History

Lesson 1. Nil

Lesson 2. Nil

Lesson 3.

W L 8 1. Oral revision test.

Lesson 4.

W L 6 1. Listen to pupil essays read aloud by teacher

W L 5 2. Individual pupils read aloud round class.

English

Lesson 1.

W L 8 1. Test on spellings previously learned in preparation

W L 4 2. Copy down notes from blackboard on grammatical points.

Lesson 2.

W L 4 1. Copy down list of spellings to learn

W L 12 2. Homework: find the meanings of the words

W L 7 3. Homework: memorize spellings and meanings.

Lesson 3.

W L 4 1. Copy examples of good answers to exam questions from blackboard.

Lesson 4.

W L 4 1. Copy examples of good answers to exam questions from blackboard

W L 6 2. Listen to teacher reading from text.

Lesson 5.

W L 4 1. Copy example of a good answer to an exam question from the blackboard

W L 6 2. Liten to teacher reading from text.

Lesson 6.

W	H 1	1. Homework: practice at 'O' level essay title
W	L 6	2. Listen to teacher reading from text
W	L 5	3. Individual pupils read aloud round class.

Lesson 7.

W	L 6	1. Listen to teacher reading from text
W	L 5	2. Individual pupils read aloud round class.

Maths

Lesson 1. Nil

Lesson 2.

W	L 11	1. Complete examples in exercise books
W	L 11	2. Complete more examples from textbook
W	L 11	3. Finish this exercise.

Lesson 3.

W	L 11	1. Complete examples from textbook.

Lesson 4.

W	L 11	1. Complete examples in exercise books
W	L 11	2. Homework: additional similar exercises.

Lesson 5.

W L 11 1. Complete examples from textbooks.

Lesson 6.

W L 11 1. Complete examples from textbooks.

Lesson 7.

W L 11 1. Complete examples from textbook.

Geography

Lesson 1.

W L 10 1. Make notes from textbooks

W L 3 2. Draw diagrams from textbooks.

Lesson 2.

W L 10 1. Make notes from textbooks

W L 3 2. Draw diagrams from textbooks.

Lesson 3.

W L 6 1. Watch filmstrip.

Lesson 4.

W L 11 1. Practise map-reading using scales, references, bearings etc.

Lesson 5.

W L 4 1. Copy down dictated notes.

Lesson 6.

W L 8 1. Work over past exam paper orally.

TASKS: Analysis of tasks set in science at King John School

(pupils in broad bands)

Class 1T (a slow group) Teacher Mr. P.

Lesson 1.

W	L 3	1. Make three charts, by cutting pictures from catalogues and sticking them onto black card
W	L 4	2. Ask teacher how many joules is given/used by objects in pictures
W	L 11	3. Write simple sentences according to teacher's instructions.

Lesson 2.

W	L 4	1. Copy paragraph from blackboard
W	L 10	2. Fill in missing words.

Lesson 3.

W	L 6	1. Watch demonstration experiment
W	L 4	2. Copy notes from blackboard
W	L 3	3. Draw a diagram (from board)
W	L 6	4. Watch demonstration experiment

Lesson 4.

W L 2 1. Move furniture

W L 6 2. Watch demonstration experiment

W L 8 3. Carry out revision test (yes/no answers)

W L 4 4. Copy paragraph from board

W L 10 5. Fill in missing words (provided in random order)

W L 3 6. Copy diagrams from blackboard

W L 11 7. Mark neighbour's test paper.

Class 2N (a bright group) Teacher Mr. H.

Lesson 1.

W L 4 1. Copy from blackboard

W L 10 2. Fill in missing words

W L 3 3. Measure growth on experimental plants

W L 6 4. Watch demonstration experiment

W L 3 5. Draw diagram of apparatus

L 2 6. A pupil to run errand

W L 9 7. Carry out experiment according to instructions.

Lesson 2.

W L 3 1. Measure growth on experimental plants

W L 6 2. Watch demonstration experiment

W L 11 3. Jot down chemical name for water

W L 9 4. Carry out experiment to find out what metals (of those supplied) react with water to remove oxygen

W L 11 5. Homework: write account of two demonstration experiments, and

W H 2 6. Write an explanation of why cold water produces a slower reaction.

Lesson 3.

W L 9 1. Carry out experiment

W L 2 2. Pack away equipment

W L 11 3. Record results of experiment

W L 11 4. Homework: write up own experiments and results; and

W H 2 5. Draw conclusions about which metals remove oxygen from water.

Lesson 4.

W L 2 1. Move furniture

W L 9 2. Carry out experiment according to verbal instructions; (test a range of acids against a range of metals to find which produce hydrogen and the rate of reaction)

W L 11 3. Write up results of experiments as a grid

W L 2 4. Pack away equipment.

Class 2W (a middle band) Teacher Mrs. W.

Lesson 1.

W L 9 1. Watch demonstration experiment

W L 11 2. Write results of experiment in exercise books

W L 6 3. Watch demonstration experiments

W L 4 4. Pupils copy from OHP transparencies into books

W L 12 5. Homework: find out when, where and how radium, helium and sodium were discovered; write a paragraph about each.

Lesson 2.

W	L 9	1. Carry out experiments to see if iron takes oxygen from copper, lead and zinc oxides
	L 2	2. Individual pupil sent on errand
W	L 9	3. Carry out a second round of experiments, using zinc in place of iron
W	L 2	4. Pack away equipment.

Lesson 3.

W	L 9	1. Carry out experiments previously started
W	L 9	2. For those who've finished, additional but similar experiment
W	L 9	3. Second additional experiment for fast finishers
W	L 2	4. Pack away equipment
W	H 3	5. From experiments and demonstrations of last two lessons work out a table of reactivity of metals
W	H 3	6. Homework: finish the reactivity tables; and
W	L 8	7. Revise for a test next week.

Lesson 4.

W	L 9	1. Carry out two experiments
W	L 2	2. Pack away equipment
W	L 11	3. Write up accounts of experiments
W	L 6	4. Watch demonstration experiment
W	L 11	5. Write account of demonstration experiment.

Class 1A (a slow band) Teacher Mr. C.

Lesson 1.

W	L 6	1. watch demonstration experiment
W	L 9	2. Carry out a new experiment
W	L 4	3. Copy notes from blackboard
W	L 3	4. Draw diagram from blackboard
W	L 9	5. Carry out second experiment
W	L 4	6. Write dictated notes.

Lesson 2.

W	L 6	1. Watch demonstration experiment
W	L 11	2. Individual pupils record result of demonstration experiment
W	L 4	3. Copy notes from blackboard
W	H 2	4. Homework: think out what is special about air if copper can only use up some of it.

Lesson 3.

W	L 3	1. Copy diagram from blackboard
W	L 4	2. Copy notes from blackboard
	L 2	3. Individual pupil sent on errand
W	L 6	4. Watch demonstration experiment
W	L 4	5. Copy more notes
W	L 3	6. Draw diagram.

Lesson 4.

W	L 2	1. Read over teacher's comments on marked work
W	L 3	2. Copy labels onto diagram (following blackboard picture)
W	L 4	3. Copy notes from blackboard /dictation
W	L 4	4. Copy more notes
W	L 11	5. Add a sentence or two of your own to the notes
W	L 4	6. Put heading
W	L 3	7. Draw diagram
W	L 3	8. Homework: colour the diagram; and
W	L 11	9. Write up experiment from pre-dictated rough notes; and
W	H 4	10. explain what has happened in your own words.

Religious Education

Class 1. Teacher Mrs. A.

W	H 3	1. Homework: write down 10 Christian beliefs which affect everyday living in G.B.
W	H 2	2. Homework: look for evidence in Bibles to prove Jesus existed
W	H 2	3. Pupils answer questions, each from separate workcard
W	H 2	4. Homework: List five statements which describe what Christianity is
W	H 3	5. Homework: write down any incident which takes place outside church which exemplifies Christianity at work
W	L 12	6. Find 3 biblical references to show that Christians should love and care for one another
W	H 3	7. Give three examples of how we in this country show that the Christian principles illustrated affect our everyday lives

W L 11 8. Write in exercise book a sentence to the effect that we live in a caring society

W L 6 9. Listen to recording of 'Day by Day'

W H 6 10. Homework: think about this question:Is there a difference between Christianity and churchianity?

W L 6 11. Listen to teacher reading aloud

W H 4 12. Pupils write answers to: Who am I?
What am I doing here?

Class 2. Teacher Mr. B.

W L 11 1. Write about changes between schools of 100 years ago and those of today (based on slides viewed)

W L 11 2. Write the story of David and Jonathon

W L 12 3. Visit local church and find answers to questions on worksheet

W L 11 4. Write in style of newspaper report about one of plagues in Egypt (just read about)

W L 10 5. Write about the job of seers as healers (using information supplied in textbook).

Class 3. Teacher Mrs. C.

W L 5 1. Pupils read aloud around class

W L 11 2. Pupils answer questions from textbook:
8 at comprehension level
2 at data level

W L 5 3. Pupils read aloud around class

G H 1 4. Groups prepare and perform 5 minute playlet.

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