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The Classroom Environment Study

This study is concerned with the findings of the first phase of a very substantial inquiry that seeks to investigate the teaching and learning practices that occur in Victorian classrooms. The study as a whole extends beyond the work of describing the context of the teaching and learning of mathematics and science in our schools, since in the second phase it will examine relationships between key teaching and learning practices and educational outcomes measured in terms of student achievement and attitudes. In the third phase attempts will be made by means of inservice education programs to change the way in which teachers behave in the classroom, and then to examine the effects of these changes in teacher behaviour on what students do as well as on their performance. Each phase of this study is part of a sequence, and it is evident from the first report that it would have been unwise to embark on an experimental investigation in the third phase without having previously carried out the first and second phases concerned with the description of teaching practices and the correlation of those practices with educational outcomes. It is important to recognize that not only is the first phase of this study an initial stage of a substantially larger investigation, but it also opens up a new and necessary field of inquiry in Australian education.

In summarizing the findings of the first phase of the investigation being undertaken, and that part of the study which has been completed, it will not be possible to indicate which behaviours of teachers should be noted and followed, but only to show the range of teaching practices that occur in Australian classrooms at different levels of schooling.

The Survey

In the first phase of the Classroom Environ-

ment Study, a Teacher Survey Questionnaire was administered to four samples of teachers in Victorian schools during the third school term in 1980. Since the study was primarily concerned with the teaching and learning of mathematics and science, only mathematics and science teachers were included in the samples. The survey was designed in order to obtain information on the views of samples of teachers of mathematics at Year 2 and Year 5 in the primary school, and teachers of both mathematics and science at Year 8 in the secondary schools. The study was limited to Victorian schools, because it will only be possible to undertake the subsequent observational work in schools in the Melbourne metropolitan area. Consequently the sampling procedures were planned to select schools with a probability proportional to size at the first stage of sampling, and at the second stage of sampling to obtain information from all teachers at a chosen school, who were within the defined target population. The response rates from teachers and schools of all types were good, and replies were received from approximately 80 per cent of the teachers in the designed samples.

Teacher Characteristics

The first major finding was the difference between the teachers in the government schools and the teachers in the Catholic schools in the emphasis that they placed on the broad educational aims of schooling. Teachers in the government schools tended to view as more important the societal aims of schooling concerned with helping to equip students with the skills and attitudes which would enable them to take their places effectively and competently in society, fitting them to make choices of occupational roles and to live harmoniously in the community. Teachers in the Catholic schools tended to view as more important that the purposes of primary and secondary education were to foster the development of the children's individuality and independence enabling them to discover their own

talents and interests, to find a full enjoyment of life in their own way, and to arrive at their own attitudes towards society.

Whether the views expressed by the teachers in the samples in this regard were consistent with the acknowledged policies and goals of both the Victorian Education Department and the Catholic Education Office in Victoria is not known and, while the differences between the two systems were not large, it is of some interest that the two groups of teachers would appear to have expressed different views of the aims and goals of education.

In the teaching of mathematics at the Year 2, Year 5, and Year 8 levels, the most important curricular aims of teachers were quite clearly those associated with the development of basic skills in computation and the use of common measures. The second most important aim was concerned with the development of an ability to apply mathematical ideas and skills to real-life situations. Whether the former should remain an important aim of mathematics teaching at a time when calculators are so readily available is an unresolved question. In the teaching of science, the emphasis that teachers considered should be placed on the development of skills in practical investigation, including the use of laboratory equipment, was only marginally below that concerned with the acquisition of a basic knowledge about a wide range of scientific concepts.

Mediating Influences

The evidence obtained from the survey, that approximately 30 per cent of students at the Year 2 level and 40 per cent of the students at the Year 5 level were in composite classes in Victorian primary schools, leads to the question of whether this is an appropriate arrangement for effective teaching. Is it a practice that is forced upon schools out of a desire to hold the size of classroom groups of students at an agreed-upon level, or is it a situation that arises

Issues and Practices in Australian Schools

Margaret Batten

The stated intention of the 1980 Schools Commission report on schooling for 15 and 16-year-olds was to 'raise and explore secondary schooling issues' and to 'facilitate discussion of the issues and encourage action continuously to adapt schools to the future' (Schools Commission, 1980:70); the document also contained a request for 'less debate and more monitoring of what is effective in particular places with particular students' (Schools Commission, 1980:23).

These statements about the role of education within the social framework of the 1980s engendered the idea of a study which would identify the educational issues of current importance to the community and the ways in which schools were responding to these issues.

Principals' Perspectives

A classification of 26 educational issues was developed, with two categories: Organization (containing issues relevant to management and teaching) and Curriculum (containing issues relevant to personal development and social development). A questionnaire containing the classification was sent to an Australia-wide sample of 400 principals from primary and secondary, government and non-government schools. The task required of principals was three-fold: first, to identify the issues of major current importance in their schools (up to four issues in the Organization section and up to six issues in the Curriculum section, plus any other important issues that were not included in the classification); second, to describe some of the current practices in their schools that exemplified their priority issues; and third, to identify any educational issues of potential importance to their schools and possible constraints on their implementation.

Table 1 lists the issues in order of perceived importance and the percentage support given by principals to each issue. The next stage of the analysis involved grouping the responses of principals according to school level, system, size, and location; a simple screening device, the Oppenheim (1966) nomograph, was used to determine the significance of the differences in percentages. Percentage differences that reached the five per cent level of significance numbered ten in the school level grouping, six in the school system grouping, two in the school size grouping, and one in the school location grouping.

There were so few percentage differences of consequence in the size and location groupings that these factors were omitted from further analysis. The higher number of percentage differences of consequence in the level and system groupings seemed to justify further investigation of the effects of these factors on principals' responses.

Further analyses showed that there were a greater number of significant differences in level and system responses to Cur-

riculum issues (10 out of 17) than to Organization issues (2 out of 9), and that level rather than system was the differentiating factor in most cases.

The three issues that did evoke markedly different responses from the systems were Moral Education (a difference of 70 per cent), Pastoral Care (33 per cent difference), and Development of Personal Identity (21 per cent difference); all these issues were given much stronger support by the non-government than the government school principals.

The major areas of difference between principals on the grounds of level may be summed up in the following way.

- 1 *Primary.* Two areas emerged as being of greater importance to primary school principals than secondary school principals. The first area concerned the acquisition of foundation learning skills (Communication Skills, Basic Skills, Enquiry and Processing Skills) and was given particular emphasis by primary principals in government schools; the second area of special interest to primary principals was centred on the issue of Integrated Studies, and for primary government school principals this co-ordinated approach to curriculum planning was allied to the importance of a co-operative approach to learning on the part of students (the Co-operative Learning issue).
- 2 *Secondary.* The acquisition of learning skills was not as important to secondary as to primary school principals, although the three issues concerning these skills were ranked among the top five curricular issues for both government and non-government secondary school principals. The distinguishing feature of the secondary principals' response pattern was a concern to associate the curriculum more closely with the activities of the world outside the school bound-

aries. Preparation for the World of Work was an issue of prime importance to all secondary principals; and the principals from the government sector gave particular support to the issues of Technology in Education and Special Social Competencies.

School Practices

The last page of the principals questionnaire allowed space for principals to write brief descriptions of 'practices in your school that exemplify priority issues'. The school practices selected for further investigation were those that seemed to have something to contribute in one of the areas identified as important by secondary school principals. Seventeen schools were visited in four states: nine Government, four Catholic and four Independent schools. There were ten schools in other states or in remote country areas that were contacted by telephone to find out more about the school practices their principals had described.

The criteria adopted for evaluating successful practice in the 27 schools were derived from the Schools Commission's (1980) report, which suggested that schools should cater for the personal and social needs of students by (1) valuing the whole age group, thus increasing the confidence and competence of all students, and (2) relating knowledge to life, so that students will leave school with knowledge and skills that apply to a wide range of settings in the world.

The pastoral care programs introduced in a number of schools gave particular emphasis to the social and personal development of students by building their confidence and fostering a caring attitude between teacher and student, and between student and student. The reading programs found in many schools were designed to increase both the confidence and com-

Table 1 Rank Order of Organization and Curriculum Issues

Organization	Support (%)	Curriculum	Support (%)
School Aims and their Achievement	70	Basic Skills	65
Pastoral Care	63	Communication Skills	56
Professional Development of Teachers	63	Development of Personal Identity	54
Discipline and Control	55	Enquiry and Processing Skills	51
The School and the Community	38	Preparation for the World of Work	43
School Autonomy	28	Education of Disadvantaged Students	34
Assessment & Credentials	28	Core Curriculum	34
Alternative Organizational Arrangements	23	Physical Education	33
Training for Administrators	15	Moral Education	33
		Education for Leisure	28
		Co-operative Learning	25
		Technology in Education	23
		Education of Gifted Children	23
		Special Social Competencies	20
		Contemporary Society and Social Change	17
		Integrated Studies and Courses	16
		Multicultural Education	15

petence of students, particularly when students were given sustained individual attention either within the classroom or outside it with a sympathetic and supportive helper.

A school which introduced a core curriculum for Years 7-10 in close consultation with parents, ex-students and current students was making a deliberate effort to equip its students during the years of compulsory schooling with knowledge and skills that they could apply when they left school in a wide range of settings. Any practice that actively sought to establish closer links with the community in which the school was based was endorsing the second Schools Commission principle, relating knowledge to life for the students concerned. One example of such a practice was the development of a major community resource on a reclaimed portion of school land, which involved students, parents, teachers, and community members in a joint effort spread over several years; another example was the Youth Education Advisory Committee, a co-operative venture between careers teachers in six schools working in conjunction with employers and other representatives from the local community.

The Transition Education and Alternative courses offered at Years 10, 11 and 12 were based on both principles. By providing alternatives to students not attracted by or likely to benefit from the traditional academic curriculum in their senior years they were equipping the students with useable skills for the worlds of work and adult life, and by giving them experiences of success in areas that were important to them they increased their confidence and strengthened their self-image.

Common Elements in Successful Practice

From the school practices observed in the fourth stage of the study it was possible to identify a number of factors, recurring in a variety of educational situations, that characterized successful practice. These common factors or elements were related to program (what happened), process (how it happened), and personnel (who was involved). Fifteen elements were identified under these three headings:

Program: (1) continuity; (2) program to match needs; (3) provision of alternatives.

Process: (4) detailed planning; (5) need for time; (6) regular meetings; (7) follow through; (8) flexibility of operation; (9) unexpected outcomes; (10) recognition of achievement.

Personnel: (11) staff cohesiveness; (12) identification with programs; (13) involvement in the decision-making process; (14) use of personnel from allied fields; (15) whole school community co-operation.

See page 6 for details of the report on this project which is ACER Research Monograph No 22.

Introduction of Optical Mark Reading and Scoring Services

The ACER has recently purchased a Longines Optical Mark Reader (OMR), which can reliably scan between 500 and 1000 single-sided student answer sheets in less than an hour. Responses and identification details marked on to specially printed answer sheets are translated by the reader into data which can then be rapidly scored by computer. Therefore, if you haven't time to do the clerical work, but you

- have developed multiple-choice tests of your own, and would like to know a lot more about these tests than merely the students' scores
- have a large number of achievement tests to score
- would like to give a range of survey or diagnostic tests to one or more groups of students
- would like to have a variety of types of feedback from administering ACER-stocked tests (such as the Progressive Achievement Tests, Mechanical Reasoning Test, Otis-Lennon School Ability Tests, and so on) to your students
- would like to survey your students' occupational interests or values, and have both individual profiles and group summaries provided,

you should write to **ACER OMR Services** for a copy of the *ACER OMR Services Information Booklet* which describes the range of scoring and reporting services that will be available from the beginning of 1984. The *ACER OMR Services Information Booklet* includes samples of the specially-designed answer sheets and types of reports generated by the system, in more detail than the illustrations provided here.

The most basic information provided to users of the scoring and reporting service will be lists of names (or identification numbers) together with scores achieved on a test or group of tests. The lists can be organized in any designated grouping of respondents, and may be in order as supplied, in alphabetical order, in order of ID numbers, or in rank order according to scores.

In addition to the actual scores achieved a variety of other options for individual results may be requested, for example

percentage correct, percentile rank and/or stanine for previously normed tests, and percentile rank and/or stanine with the group tested if the group is sufficiently large. For certain tests, inventories, and batteries, individual student profiles can be printed.

Of interest to most teachers will be the diagnostic information that is contained in the optional tables of 'distractor analyses' for each group — that is, the percentage of students selecting each response to each item — **and the response analyses that can be provided for individuals.** These lists show each respondent's identification, which items he or she answered correctly, and which response was given for each item answered incorrectly.

So — why not consider finding out more about your students, and much more about your tests?

How to use the service, and what it will cost

To use the Scoring and Reporting Service you will have to complete the appropriate order form, use special answer sheets designed for the OMR, and ensure that these are properly filled in and packaged. An account and examples of all the procedures you will have to follow is included in the *ACER OMR Services Information Booklet*. Costs for using the Service will of course vary according to the number and length of the tests or inventories you want scored for each student, and to the reporting options you select. As a guide, alphabetic lists of students in class groups, together with their total and subtests scores on a test containing up to 60 items, and tables of means and standard deviations on the test and subtests, can be provided for about \$1.00 per student. Further costing details will be available on request, and quotes will be given for more specialized applications of the Service.

For those who are interested in more statistical aspects of a test or tests, means and standard deviations by group and for all students tested can be reported, as can skewness and reliability indices and correlations between sub-tests, tests, scales etc. Frequency distributions and histograms of scores achieved can also be provided for groups containing sufficient numbers of respondents.

Computers and ACER tests

Test users are reminded that it is an infringement of copyright to do an act over which the copyright owner (or exclusive licensee) has an exclusive right without the appropriate licence, that is, permission. Therefore, if the users of ACER material wish to reproduce a literary work published by ACER, they should obtain the licence of ACER, as the owner of the copyright in the work or as the exclusive licensee. In the

context of computer usage reproduction of a literary work may include its programming and storage within, or printout from a computer.

In considering any requests for licences, the ACER will attempt to assist with the beneficial use of computerisation without compromising the standards and rights that have been established over a number of years.

Early School and Diagnostic Materials

A selection of materials for use at the pre-and-early school levels and with older students to assist in diagnosis and remediation.

Materials

- 1 Basic Skills Curriculum Guide**
Teaching Resources 1977
Range: Pre-school - Year 3 +
Presents activities in the motor, cognitive, prereading, language and math skill areas.
- 2 Boehm Resource Guide for Basic Concept Teaching**
A. Boehm, Psychological Corporation, 1976
Range: Pre-school - Year 1 +
Program for the development of basic concepts.
- 3 My World: A handbook of Ideas**
A. Curtis & S. Hill, NFER, 1978
Range: Pre-school +
Activities for social and emotional development.
- 4 Perceptual Skills Curriculum**
J. Rosner, Walker Educational, 1973
Range: Pre - Year 2 +
Four programs covering visual-motor skills, auditory-motor skills, general motor skills and the introduction of letters and numerals.
- 5 Vanguard School Program**
J. Robinson & B. Schmitt, Teaching Resources, 1970
Range: Prep - Year 2 +
Program for perceptual and motor training.
- 6 Frostig Program for the Development of Visual Perception**
M. Frostig, Follett, 1972
Range: Years 1-6 +
Focuses on visual-motor co-ordination, figure-ground perception, perceptual constancy, perception of position in space, and perception of spatial relationships.
- 7 Helping Children Overcome Learning Disabilities**
J. Rosner, Walker Educational, 1979
Text - discusses readiness skills and learning disabilities.

Tests

- 8 Purdue Perceptual Motor Survey**
E. G. Roach & N. E. Kephart, Charles Merrill Publishing Co., 1966
Range: Prep - Year 3 +
- 9 Early Learning - Assessment and Development**
A. Curtis & M. Wignall, Macmillan, 1981
Range: Prep - Year 1 +
- 10 Boehm Test of Basic Concepts**
A. Boehm, The Psychological Corporation, 1970
Range: Prep - Year 2 +
- 11 Children's Understanding of Reading Language**
M. Kemp, Nelson, 1983
Range: Prep - Year 1
- 12 Mathematics Evaluation Procedures K-2**
ACER, 1980
Range: Prep - Year 4 +
- 13 Early Detection of Reading Difficulties**
M. Clay, Heinemann, 1979
Range: Years 1-2 +
- 14 Newman Language of Mathematics**
A. Newman, Harcourt Brace & Jovanovich (Aust.), 1983
Range: Year 4 +

Further details on the above are contained in *ACER Annotated Catalogue of Educational Tests and Materials* or return the form below for more information from ACER Advisory Services.



INFORMATION FORM

TO: Advisory Services Division
ACER
P.O. Box 210
Hawthorn, Vic. 3122 Telephone (03) 818 1271



Please send more information on the following -

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Name/School.....

Address.....

..... Postcode.....



Advisory Services Publications

The ACER distributes tests, books and curriculum materials from a wide range of publishers including itself and every effort is made to give professionals a wide range of quality materials to choose from. A professionally staffed advisory service unit is maintained to assist those wishing to obtain research information and to help in choosing appropriate evaluation instruments for various purposes. As there is only one ACER for the whole of Australia its three advisory service staff are in great demand and advice is provided therefore in various documents. Advisory publications are described below:

Set: research information for teachers

is a subscription publication specifically designed to facilitate the communication of research findings to teachers. It comprises two packets per year of fifteen documents about research emphasizing practical implications. Write for subscription details and descriptive literature.

Curriculum Materials Review Reports

ACER organizes reviews and trialling of certain curriculum materials and publishes the Review Reports in a series of the same name. There are 45 reports available. A list of Review Reports and individual reports can be had on request.

Advisory 'Bulletins' Charts & Leaflets

Advice about tests, books and resource materials is contained in documents of varying formats on various topics and for various audiences. A sample set will be sent on request.

ACER Newsletter

Primarily reporting ACER completed projects, this document is now mailed (free of charge) to all educational institutions in Australia (and some overseas) three times each year. Individuals may apply to go on the mailing list.

Annotated Bibliographies of Tests

Bibliographies on certain specialist topics have been prepared to assist those searching for instruments particularly for research projects or clinical use. A list of currently available Bibliographies will be supplied on request.

Catalogues

A range of catalogues of tests and materials for various members of the helping professions are produced each year. These are:
ACER Annotated Catalogue of Educational Tests and Materials, ACER Psychological Catalogue, ACER Speech Pathology Catalogue, ACER Personnel Catalogue. There is also the ACER Educational Catalogue with brief details, mostly component parts and prices. All of these except the Annotated Catalogue are available free on request. The Annotated Catalogue is available on subscription.

Annotated Booklist

The ACER Annotated Booklist is prepared approximately twice yearly to summarize ACER's book publications. Copies of the booklist are free on request.

from an interest in vertical grouping and a wish to establish more flexible classroom structures? It is possible that the setting up of composite classes places a greater burden on the classroom teacher, but if so this is clearly not recognized in Victorian schools because class sizes are approximately the same at both year Year 2 and Year 5 levels for both non-composite and composite classes.

The different teaching arrangements that are in operation in Victorian schools are of some interest. The use of specialist teachers to assist with the teaching of mathematics in approximately 10 per cent of mathematics classes at all three year levels would seem to indicate that some recognition is being given to the provision of remedial teachers. However, the practices of providing more than one teacher where the teachers take the whole class, but at different times, in one mathematics class out of 40 and one science class in 25, are perhaps open to question. While there was little evidence available from the survey of streaming practices in schools, there was some evidence that teachers of higher year levels were more likely to view the students in their classes as being of lower ability than most students in their age group.

Allocated Time

One factor that is known to have a significant influence on student learning is the amount of time allocated to the learning of mathematics and science in the classroom. However, it was of some surprise to learn from the Teacher Survey Questionnaire, that not only were there sizable variations in the average time allocated to mathematics across the year levels, with approximately 240 minutes per week at Year 2, 270 minutes per week at Year 5, and 225 minutes per week at Year 8, but there were very striking variations within each year level. At Year 2, the allocated time ranged from 120 minutes per week to 420 minutes per week. At Year 5, the time made available ranged from 120 minutes per week to 540 minutes per week, and at Year 8, from a minimum of 86 minutes per week to a maximum of 600 minutes per week. These differences in time allocated for teaching mathematics might be expected to give rise to very significant differences in level of student performance in mathematics, and perhaps to substantial differences between class groups in attitudes to the learning of mathematics. It is necessary to consider whether the needs of students are such as to warrant these wide differences in time allocated to the learning of mathematics or alternatively whether the disparities arise from differences in the perceptions of classroom teachers or school administrators with regard to the relevance of mathematics and its importance in relation to other subjects in the school curriculum.

Information was also obtained on teacher practices in the setting of homework and the amount of time expected for mathematics homework per week. At the Year 2 level, 25 per cent of teachers set home-

work for the students and the median time expected to complete the homework set by these teachers was 32 minutes per week. At the Year 5 level, 52 per cent of teachers set homework for their students and expected, as a median value, that their students would take 58 minutes per week to complete this work. At the Year 8 level, 84 per cent of mathematics teachers set homework and expected that approximately an hour and a quarter (73 minutes) per week would be required to complete this work. However, at the Year 8 level, slightly less than half of the science teachers set homework (47 per cent) and expected that this work would require approximately an hour (58 minutes) per week. The gradual increase in the proportion of teachers setting mathematics homework across the year levels from Year 2 to Year 8 is not surprising, not is the increase in time expected per week. However, it is of some interest that such a high proportion of Year 2 and Year 5 teachers set homework, but that such a low proportion of Year 8 science teachers set homework. It is clear that the setting of homework is a question about which teachers differ markedly. Whether policies and practices in this area should be decided at the system, school or individual teacher level is unclear. What is evident is that in Victorian schools there are widely different views on both the importance of mathematics in the school curriculum and the importance of homework as a contributing factor towards the successful learning of mathematics. Two questions that must be considered are whether some students are being disadvantaged in their later education as a consequence of the policies and practices of individual teachers and schools, and whether some students develop a negative reaction to the learning of mathematics as a consequence of excessive time given to the study of this subject.

Teaching Practices

A further area in which there were wide

differences between teachers in Victorian schools is concerned with assessment practices. At all year levels under survey and in both mathematics and science, there were some teachers, approximately five per cent, who never assessed the performance of their students by awarding marks. There were also substantial proportions, 40 per cent at Year 2, 27 per cent at Year 5, 6 per cent at Year 8 in mathematics, and 22 per cent at Year 8 in science, who only assessed student performance between one and five times per year. On the other hand there were some teachers who gave a test every couple of lessons, a practice that was more common in mathematics than in science, and significant numbers of mathematics teachers at Year 8 level (40 per cent) who assessed student performance once a fortnight.

Moreover, it is of some interest to note that significant numbers of secondary school mathematics teachers (44 per cent) and science teachers (66 per cent) stated that they did not provide any feedback and corrective procedures to their students after testing. At the primary school level, practices associated with feedback and corrective procedures were more frequently practised as was subsequent retesting to determine whether deficiencies had been remedied. The evidence presented would seem to indicate that teachers hold widely differing views about the relevance and importance of assessment as well as about whether corrective procedures are effective in order to increase learning. It is to be expected that further reports from this investigation will not only provide information which is complementary to that presented here, but will also tell something of the consequences of the different teaching and learning practices for increasing student achievement.

ACER Research Monograph No. 21, *The Context of Teaching and Learning* by A. M. Fordham has full details of this study.

ACER Publications

Books

Issues of the Eighties: Principals' Perspectives and School Practices by Margaret Batten (ACER Research Monograph No. 22).....\$7.50

Periodicals

Bibliography of Education Theses in Australia: A List of Theses in Education Accepted for Higher Degrees at Australian Universities and Colleges in 1981 Compiled and edited by Margaret A. Findlay and Penny Martin.....\$13.00

Tests

*Work Aspect Preference Scale**

- Question Booklet.....per 10 \$3.00
- Profile Sheet..... 20
- Machine-scorable Answer Sheet..... per 10 \$2.50
- Score Key.....\$1.20
- Manual.....\$9.00
- Specimen Set (Excluding Score Key).....\$9.75

* NSW purchasers may only obtain specimen sets of this material in the first instance. Further supply is subject to the user obtaining prior approval of the Department of Industrial Relations (NSW).