

Angela Little: Multigrade teaching: a review of research and practice

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CHAPTER 1: MULTIGRADE TEACHING: CONCEPT AND STATUS

Introduction

Multi-grade teaching refers to the teaching of students of different ages, grades and abilities in the same group. It is referred to variously in the literature as 'multilevel', 'multiple class', 'composite class', 'vertical group', 'family classes, and, in the case of one-teacher schools, 'unitary schools'. It is to be distinguished from mono-grade teaching in which students within the same grade are assumed to be more similar in terms of age and ability. However, substantial variation in ability within a grade often leads to "mixed-ability" teaching. There can also be wide variations in age within the same grade, especially in developing countries, where the age of entry to school varies and where grade repetition is common. This condition of "multi-age-within-grade" teaching appears not to have generated such universal recognition, perhaps because it occurs more often in developing than in developed countries. When references to multi-age teaching occur in the literature they usually describe educational settings in North America, where, because age and grade are congruent, the term is used synonymously with multi-grade teaching.

Several writers have pointed out that the first state-supported elementary schools in North America and Europe were un-graded. The school often consisted of one room only and one teacher taught basic literacy and numeracy to children from six to fifteen years of age. In the US the "death knell of the one room school was sounded" after a visit by the Secretary of the Massachusetts Board of Education, Horace Mann, to Prussia in 1843. On his return he reported that the first element of superiority in a Prussian school.. consists in the proper classification of scholars. In all places where the numbers are sufficiently large to allow it, the children are divided according to ages and attainments, and a single teacher has the charge of only a single class... There is no obstacle whatever... to the introduction at once of this mode of dividing and classifying scholars in all our large towns (Mann quoted in Pratt 1986)

Urban education administrators in the US were soon to recommend that schools be divided on the lines of age and grade, a development which was consistent with the division of labour in industry. The "principle of the division of labour holds good in schools, as in mechanical industry" (Bruck quoted in Pratt 1986). The model of mono-grade teaching, led by industrialisation and urbanisation, was to become a universal ideal in the late nineteenth and twentieth centuries and came to dominate the basis of school, class and curriculum organisation used by central authorities.

The persistence of the multi-grade reality towards the close of the twentieth century

Yet despite the ideal, the multi-grade reality has characterised hundreds of thousands of schools throughout the twentieth century and will continue to do so well into the twenty first. Although information about the extent of multi-grade teaching tends not to be collected on a regular basis, 1959 data were collected by UNESCO's International Bureau of Education (Table 1). Table 1 indicates the large number and proportion of teachers who were teaching in one- teacher schools in the late 1950s - some 20-40% in countries of South and Central America, 16% in India, 25% in Turkey and 15% in the USSR. The percentage of teachers teaching in one-teacher schools in some of the European countries was also extremely high - 47% in Spain, 23% in Luxembourg, 20% in France, 10% in Switzerland. Figures in the US and UK were lower - 2.9% in the USA, 3.6% in Scotland, 2.3% in Northern Ireland and 0.7% in England and Wales.

Comparable data for the late 1980s/early 1990s are not available. Data on multi-grade do not appear to be collected systematically by national and international agencies. Table 2 synthesises available information from a wide variety of sources on the current status of multi-grade teaching. It expresses the incidence of multi-grade teaching at the primary school level in different countries in the years for which the most recent data are available in a range of categories. In some countries the number and percentage of one and two teacher schools is available. In others we have only been able to locate data on the number and /or the percentage of schools which have multi-grade classes, or the number of classes within a system which are multi-grade. For one or two countries we have established how many teachers there are per school or the percentage of teachers

who teach multi-grade; and in one or two countries we have data on the percentage of students who study in multi-grade classes.

In India in 1986 over 300,000 schools were either one or two teacher schools. These represented more than 60% of all schools. The percentage of schools which have only one teacher schools is 29%, suggesting a near doubling of the 1959 percentage (cf Table 1). In Sri Lanka the percentages are lower. However the seven hundred schools which do have either one or two teachers are located in the most difficult environments in a country which has achieved near universal enrolment in primary school. In Malaysia too although the percentages appear small the multi-grade schools are located in those areas which are disadvantaged in several ways - Malay and Chinese schools in small villages and settlements and in the remote, secluded areas of Sabah; in the Tamil schools in rubber estates and the aboriginal schools in the interior and remote areas of Peninsular Malaysia.

In Peru the percentage of schools which are one-teacher schools is almost 40%. These schools are located in rural areas, predominantly in the Andean and Amazon regions of the country. In Zambia too the figure is high, at 26% in the mid 1980s. In Pakistan the average number of primary teachers per school was 2.3 in 1989 across the country, and only 1.9 in rural areas where the primary cycle spans five years. Multi-grade classes are common in the primary schools of the Pacific Islands. They are also common in the rural areas of industrialised countries. In the Northern territories of Australia for example 40% of schools have multi-grade classes. The comparable figure for France is 22% and Sweden 35%. In Wales 30% of primary schools had between one and four teachers in a primary cycle spanning seven years in 1976. In England more than 1,000 schools have enrolments of less than 50 students.

The gap between the multi-grade reality, teacher education and curriculum assumptions

Multi-grade teaching is probably more common than we realise or care to admit. Table 1 and columns 3 and 4 in Table 2 on one and two-teacher schools present only the extremes of the multi-grade reality. Any school with more grades (e.g. six grades of primary) than teachers (e.g. four teachers) must organise learning for some of its teachers and students along multi-grade lines. And yet few Ministries of Education, few Curriculum Development Agencies and few Teacher Education Institutions recognise this reality. The knowledge required to work effectively within it appears not to be transmitted via textbooks on curriculum and teaching methods, via syllabi, via teacher's guides, nor via the content and pedagogy of teacher training colleges or Universities. The knowledge required for effective multi-grade teaching is rendered illegitimate by those with a responsibility for training and supporting teachers in their work.

A brief review of standard texts on curriculum development illustrates the point. The selection was made from the library of the Institute of Education at the University of London, which houses one of the largest English language collections of texts on education. The literature which addresses primary schools tends to assume that same-

age class groups are the basic organisational units for which curricula are developed. There is no mention of multi-grade, multiclass or mixed-age teaching in a collection on *Aims, Influence and Change in the Primary School Curriculum*, edited by P.H.Taylor and published by the UK's National Foundation of Educational Research in 1975. More recently, Blenkin and Kelly (1987) write on *The Primary Curriculum: a process approach to curriculum planning*. Again there is no mention of multi-grade. A mono-grade structure appears to be the taken-for-granted form of organisation. An American textbook by Shepherd and Ragan (1982) refers to the "non-graded schools movement" in the US which had challenged nineteenth century American policy assumptions about the ideal organisation of learning and had encouraged de facto a multi-grade approach. However the impact of this movement in the US was shortlived and it is perhaps for this reason that Shepherd and Ragan make no reference to multi-grade teaching groups in their chapter on "curriculum delivery". In *Understanding the Primary Curriculum*, Boyd (1984), writing from an English perspective, makes no mention of multi-grade teaching but when discussing school-based curriculum development does mention the value of a flexible approach to the grouping of children. The problems of coping with special educational needs, ethnic differences, gender and new technology are addressed in the section on "curriculum issues" but the issues faced in multi-grade, multi-class and small schools do not warrant a mention. In view of the small proportion of schools in both the UK and the US in which multi-grade teaching occurs one can perhaps understand its exclusion from overviews of primary education organisation and curriculum, notwithstanding the fact that the issues are central to the needs of multi-grade teachers. However, it should be noted here that our review has barely scratched the surface of a Scandinavian literature on multi-grade teaching. Reports on the extent of multi-grade teaching in primary schools in Sweden by Malmros and Sahlin (1992) and in Finnish secondary schools by Laukkanen and Selventoinen (1978) suggests that multi-grade teaching enjoys a positive reception by many teachers, is adopted for pedagogical reasons and is seen as a fertile ground for the development of new curriculum ideas for all types of school, not simply multi-grade.

The exclusion of the discussion of multi-grade teaching, and the implicit assumption that most teaching occurs within a mono-grade organisation is the more surprising in texts which purport to focus on the conditions of schooling in developing countries. In 1986 the National Institute of Educational Research in Tokyo undertook a study of the elementary and primary school curriculum in the countries of Asia and the Pacific (NIER 1986). Although the information presented on class size indicates that multi-grade teaching is rather widespread none of the country reports makes specific mention of it. The text on India, Australia and Nepal includes sections on school organisation, methods of teaching and classroom management. None addresses the implications for these of the multi-grade reality. In other words it appears to be a "non-problem". Although the report on Pakistan mentions that one of the problems is a lack of trained teachers to handle multiple classes, this issue is not re-addressed in the account of teacher training. In his *Curriculum and Reality in African Primary Schools*, Hawes (1979) makes a passing reference to single teacher schools in his discussion of official education statistics. Class sizes in "deep rural" areas are often low and uneven, and

it is common to find small classes sharing a classroom, sometimes with a single teacher, sometimes with more than one but nearly always seated as a separate group with their own 'territory' and blackboard, for there exists a strange orthodoxy that a teacher with modest education and training 'cannot be taught to handle more than one class at a time'. (Hawes 1979:15)

Unfortunately Hawes neither explores the orthodoxy nor challenges it. Elsewhere he explores the problems of large class teaching, but not in relation to mixed-grade/age classes (Hawes 1978). The omission continues in Onwuka's (1981) edited collection on Curriculum Development in Africa and Grant's (1978) discussion of School Methods with Younger Children written for an African audience.

In general then it would appear that a mono-grade organisation of schools remains the taken-for-granted assumption of most of those who research and advise on curriculum development in both developed and developing countries. Multi-grade teaching is assumed either not to exist, or to do so but in such small measure that it defies attention, or to exist at the margins but to be non-problematic, or to be recognised as problematic but non-solvable - and therefore best not mentioned!

There are a few exceptions to this dominant educational literature. Although UNESCO does not collect routine statistics on the extent of multi-grade teaching within school systems globally, it has, since 1961, recognised that it is an educational condition in need of constant support and attention. The one-teacher school conference sponsored by the International Bureau of Education in 1961 and the International conference of Ministries of Education led to the establishment of unitary schools in Latin America (UNESCO 1961). Throughout the 1980s the Asia and the Pacific Programme of Educational Innovation for Development (APEID/UNESCO) discussed the continuing problems faced by multi-grade teachers (e.g. UNESCO 1981, 1982, 1988, 1989), especially in rural, isolated and sparsely populated areas. Their 1989 report confirmed many of the curriculum points raised above about the marginal, peripheral and anomalous status of multi-grade teaching and schools. The summary of experiences from Australia, Bangladesh, Peoples Republic of China, India, Indonesia, Republic of Korea, Malaysia, Maldives, Nepal, Pakistan, Philippines and Thailand confirmed that:

- primary curriculum documents and their associated lists of "minimum learning competencies" have not been specifically designed for use by teachers in multi-grade schools
- school plans, instructional materials and methodological guidelines are often difficult to apply to multi-grade teaching situations
- there is a shortage of support materials for teachers and individualised instructional materials for learners
- there is a need for more work on the kinds of continuous evaluation, diagnostic testing, remediation and feedback which would best assist multi-grade teaching

and added that

- although many teachers work in multi-grade teaching situations few countries have developed special teacher training curricula for pre- or in-service training. Teaching practice during preservice is invariably carried out in mono-grade schools
- teachers posted to teach in multi-grade schools "develop a sort of psychological alienation from the school"
- the educational system as a whole pays inadequate attention to the proper functioning of multi-grade schools through, for example, not filling vacant teaching positions in rural areas, the absence of systems of teacher accountability, a lack of basic physical facilities in these schools, lack of training for supervisors of multi-grade schools and a general "inattentiveness of education officers to the needs of these schools"

adapted from APEID (1989)

The purpose of this review is to draw together material from a range of multi-grade educational settings. The difficulties which we have faced in identifying and locating material and in having a modest amount of it translated reflects its status on the fringe of national systems of education, of national and international research and policy agenda and of information networks. It is an educational condition barely addressed in national policies of education, almost non-existent in the content of teacher education courses, ignored by national curriculum developers and located in the research journals which deal with matters rural or peripheral to the mainstream of educational debate. It is essentially a problem faced by teachers and students in peripheral rural areas unsupported and unrecognised by mainstream and centralised education systems. We are confident that our review has scratched only the surface of the total stock of written material and collective professional advice but recognise also that much of it has probably been written by teachers working in peripheral settings and that it remains at the periphery of networks of information dissemination.

CHAPTER 2: LESSONS FROM DEVELOPING COUNTRIES

Introduction

Five innovations in multi-grade teaching over the past two decades in developing countries are presented in this chapter. The first two experiences, from Zambia and Colombia, have addressed the multi-grade reality of rural primary schools directly. The Zambian experience is less than ten years old and relatively small-scale. The Colombian experience spans three decades and is large-scale. Both have involved external agencies and support from the government mainstream. The third experience, from Peru, describes the multi-grade reality found especially among indigenous communities and the recent involvement of NGOs in teacher education programmes oriented towards multi-grade teaching. The fourth, from Sri Lanka illustrates how some solutions to the problems faced by the multi-grade teacher are being offered on a small scale through

the recognition that even mono-grade classes contain very wide differences in achievement and that a single grade may be conceived as a multi-grade context. The final experience draws on innovations in rural primary education in several countries. Project Impact began as a radical reform of primary education in Indonesia and the Philippines and expanded subsequently to Liberia, Malaysia, Bangladesh and Jamaica. Although not oriented exclusively to the problems of multi-grade classes, many of the features of the innovation offered solutions to them.

1.0 Zambia: teacher education and support for multi-grade schools

The 1984 education census returns in Zambia indicated that 800 of the 3008 primary schools were "ungraded" (i.e.26%), meaning that although the full cycle of primary education consisted of seven grades these schools offered only four. These ungraded schools had fewer teachers than grades, small enrolments in each grade and were located in remote and sparsely populated areas.

Much of rural Zambia is sparsely populated. In 1990 the population density was 11 persons/sq.km. In 1980 this figure was even lower - 7.5 persons/sq.km. 1990 figures for India and China, by contrast, are 260 and 118 respectively. Although the population growth rate of 4% between 1980 and 1990 is among the highest in Africa the rate in some areas is low and declining, with implications for the pattern of provision of education and other social services.

While a majority of children attending primary school in urban areas completes seven years of primary education, the percentages are smaller in rural areas where enrolment in an ungraded or incomplete school represents a terminal educational experience. A particular problem faced in many of these incomplete schools is the small enrolment of children in each grade. The problem is essentially one of resources - rural communities in sparsely populated areas too impoverished to contribute to the physical development of a school, and the high costs of providing teachers to teach each grade separately. Two solutions have been adopted (Lungwangwa 1989). The first, tried out in 50 of the 800 schools, is a biennial intake in which students enrol in grade 1 only every second year. The second is the use of multi-grade teaching in which two or more grades are taught simultaneously.

Multi-grade teaching was introduced to a number of Zambian primary schools in rural areas in the mid 1980s as part of a consciously formulated "project" supported by the Ministry of General Education and Culture and the Swedish International Development Authority. It started from a very small base in four schools in Mkushi district and was extended to a further 40 schools in 1986 and 50 in 1987. It was argued that multi-grade teaching would enable small schools with low enrolments in each grade to upgrade themselves to complete grade 7 primary schools without requiring additional classrooms and teachers.

In-service training courses in multi-grade teaching were developed and mounted by the Malcolm Moffat Teachers' Training College (MMTTC). Others "inputs" to the project

consisted of language and maths texts and exercise books, follow-up seminars, inspection, evaluation and the incorporation of multi-grade teaching as part of the regular preservice teacher training programme.

Three alternative approaches to curriculum organisation and teaching appear to have been promoted by the MMTTC.

the common timetable option : where all children learn the same subject in a given timetable period, but each grade group follows its own work, according to its own work programme and grade level

the subject stagger option: subjects are staggered on the timetable so that grade groups learn different subjects in the same period. Subjects which require high teacher-pupil contact are matched with those requiring little

the subject grouping option: subjects are presented to all grade groups together at the same time. Some subjects eg music, art, religious knowledge and social studies lend themselves well to this option.

An evaluation of the four pilot schools and the College's involvement in teacher's training was undertaken by Lungwangwa (1989). The evaluation addressed :

- the extent to which the multi-grade system had enabled all children in a school catchment area have access to the full primary level programme
- the costs of this form of provision
- the role of the teacher and the nature of his pedagogical activities in a multi-grade school
- the impact of multi-grade teaching on the cognitive achievement of students
- the impact of this form of teaching in promoting independent and self-directed habits of study
- the internal efficiency of multi-grade schools
- the impact of multi-grade teaching on the participation and performance of girls
- the perceptions of multi-grade teaching held by participants, parents of students and the wider local community
- the impact that the introduction of this system has had on the attitudes and mores of the local community (Lungwangwa 1989:13-14)

The College

The Malcolm Moffat Teacher Training College (MMTTC) is the Zambian-designated institution for the formal in- and pre-service training of multi-grade teachers. Keen support was lent to the idea of multi-grade teaching by the principal, the vice-principal and the multi-grade "coordinator", the first two persons having had some prior exposure to it in Australia in the 1970s. Despite the obvious enthusiasm of these key individuals a number of problems have been encountered in the implementation of the training programmes. Lungwangwa's (1989) review notes that

(i) By 1988 the multi-grade teacher education course had not been well integrated into the mainstream programme for teacher preparation. Since most members of staff had

themselves no experience of multi-grade there was anxiety and a general lack of enthusiasm for it.

(ii) multi-grade training has enjoyed the status only of an extra-curricula activity since its inception and has been timetabled to occur during the "last few days before teaching practice commences"

(iii) Because of its lack of formal status students do not take it seriously (and)...see it as a filler not as an important component of their training.. there are no examinations in multi-grade teaching ..(and it).. is resented because it is considered to be a preparation to teach in the remotest parts of the country, a situation they would like to avoid at any cost

(iv) The four lecturers involved in the multi-grade programme feel "overstretched" because their teaching loads are already full. They feel that the absence of special remunerations and formal training in multi-grade affects their recognition and status

(v) A scarcity of resources in the schools restricts what the trainees can do during their multi-grade teaching practice. "Independent learning" is seen by staff to form the basis of multi-grade teaching and this, in turn, rests of the availability of learning resources.

Despite these perceived constraints, however, college staff believes that multi-grade teaching can have some positive outcomes. It can enhance independent learning, it encourages teachers to adopt pupil-centred approaches to teaching, it facilitates revision of materials covered in earlier grades, it increases pupil interaction and contributes to the country's objective of universalising basic education.

The Schools

The four pilot schools were visited and evaluated in line with the points noted above. We present here just two of the four cases, contrasting in several respects.

The Mwape primary school

Mwape Primary School was established by Jesuit missionaries in 1945. Between 1945 and 1963 children who completed the grade 4 and who wished to continue their primary education enrolled in grade 5 at the Chingombe mission boarding school, some 75 km. away. Few students continued because of the distance and the annual boarding fees. In 1964 the Mbosha school was established at a closer location and it was estimated that about 5 children proceeded to grade 5 each year between 1964 and 1984. However few of these remained beyond the end of grade 5 because of the boarding costs, and between 1970 and 1984 only three students who began their education at Mwape succeeded in graduating from grade 12.

The introduction of multi-grade teaching has resulted in increased enrolments although migration out of the area and the greater attractiveness of another primary school

(where children receive free uniforms) has led to increases smaller than might have been expected. By 1988 45 boys and 43 girls were enrolled, compared with 17 boys and 16 girls in 1983. In 1988 the school served 10 villages.

There are two teachers. One teaches grades 1 and 2 in the morning and 3 and 4 in the afternoon. The other teaches grades 5, 6 and 7 as a combined class. The teachers expressed concern over lack of resources and workload. Requests from them for a third teacher had gone unheeded. Because formal lessons were taught during both the morning and afternoon, creative work, practical skills and production unit activity has been displaced. Despite these constraints the teachers were pleased to report that of eight students who sat the grade 7 examination in 1987 four had qualified for grade 8.

The school-community relationship was not particularly strong and no contribution had been made by the parents towards the rehabilitation of school buildings

Kalombe Primary School

The Kalombe school experience has been a little different. The school, which currently serves four villages, was established later than Mwape, in 1965, and between then and 1984 those children who proceeded to grade 5 attended a school 19 km away. The weekly boarding fees prevented most children from proceeding and the Kalombe school was regarded as a "dead end" by most parents. After the introduction of multi-grade teaching, enrolment increased rapidly, from 123 in 1985 to 204 in 1988. However the numbers in each grade are now large enough to justify a mono-grade structure were adequate numbers of teachers available. One of the reasons for the increased enrolment has been in-migration, due mainly to a resettlement scheme. Parents expressed the view that the provision of upper primary grade schooling, made possible through the multi-grade teaching, had been one of the attractions of settling in the area.

There are three teachers in the school, two of whom were trained teachers and had specialised in multi-grade teaching. However they recalled that their multi-grade training consisted of two weeks practice in 1984 which, though valuable, was inadequate. They felt a need for more in-service training in multi-grade teaching and felt that the concept of multi-grade teaching should be introduced to all teachers as part of the normal pre-service training. The system of multi-grade teaching had been implemented "vigorously" and the recommended methods had been tried out. Teachers felt that the 'common timetable' and 'subject stagger' approaches had been the most useful, partly because of the large numbers of students involved. Unfortunately the volume of learning resources had not kept pace with increased enrolments, making the idea of "independent" learning difficult to implement. Increased enrolments were also creating pressure on desk and seat space. In general the teachers felt that the present enrolment justified their school being upgraded to a mono-grade 'complete' primary school. Its continued classification as a multi-grade institution, they felt, led to too great a workload for the teachers.

Teachers felt that with multi-grade teaching students were better prepared for self learning after they had left school. It was felt that multi-grade teaching contributed

greatly to the mastery and enduring impact of basic skills, an interesting perception which could warrant further investigation. The progression rate from grade 7 to 8 , of 12.5% in 1987 was of a level similar to the national average.

In contrast to Mwape the school-community relationship is very strong. A very strong parent-teacher's association has built a shelter for grades 1 and 2 and a brick house for the third teacher. The PTA maintains the classroom block to a very high standard and is raising money for another classroom. At the same time the community is aware of the pressures under which the three teachers work and cited instances of low proficiency of children in reading. They are aware that if more teachers were provided they would be expected to build more teachers' houses and raise money for additional classrooms. This prospect was viewed positively.

Summary

Mwape and Kalombe are just two of the schools studied and their experiences are rather different. The increases in enrolment in both schools have been impressive though the average class size of each of the seven grades in Mwape remained too small to develop a mono-grade teaching structure. In Kalombe the increases in enrolment justified a switch to mono-grade teaching. Whereas Mwape is experiencing a degree of out-migration, with students attending another school where the incentives are higher and parents are shifting their homes in search of better farming lands, Kalombe has benefited from the in-migration of children and families generated through a resettlement scheme. Perhaps it is this difference in orientation, the former "out" and the latter "in", which has contributed to the very different levels of support offered the respective schools by the community - rather low in Mwape and high in Kalombe. Teachers in both schools were enthusiastic about multi-grade teaching, perceived that it had learning benefits and were keen to receive further training. At the same time all teachers felt that multi-grade teaching created a heavy workload and was compromised by a failure of resources to keep pace with increases in enrolment. In Kalombe the numbers were now such that they could justify a changeover to a mono-grade system, the dominant system in Zambia.

2.0 Colombia: Escuela Nueva

In rural Colombia students receive, on average, 1.7 years of schooling, compared with 3.8 years in urban areas (Colbert, Chiappe and Arboleda 1993). In 1985 the transition rate of students from first to second grade was just 45 per cent in rural areas, with repetition rates in these two grades averaging 20%. Compared with schools in urban areas the quality of rural education has been characterised by a greater use of passive pedagogy, the use of inappropriate urban-biased curricula, lack of educational materials, rigidity of calendar, and a lack of community involvement. Underpinning all of these is a multi-grade reality of school organisation insufficiently supported by teacher training and materials. A number of efforts to address these problems have been made over the years, beginning in the 1960s with the implementation of the unitary school, an idea promoted by UNESCO in 1961. In 1967 the Colombian government decreed a unitary

school system of one-teacher schools in sparsely populated rural areas. Between 1967 and 1974 a number of approaches were adopted, but the diversification of approach to the problems of the rural school, "each responding to different aspects of the problem", led to a lack of consensus on strategy and "universalisation fell short" (Colbert, Chiappe and Arboleda 1993).

In 1975 Escuela Nueva - the New School programme - was organised in an attempt to address the problems of rural education which persisted in spite of the unitary school approach. A number of accounts of the development of this programme are available (eg Colbert, Chiappe and Arboleda 1993, Colbert and Arboleda 1989, Colbert 1987 and Colbert and Mogollon 1977). This account is based on Colbert et al 1993.

By 1992 Escuela Nueva included 17,000 schools. It provides "active instruction, a stronger relationship between the school and the community, and a flexible promotion mechanism adapted to the lifestyle of the rural child". It comprises four main components - curriculum, training, administration and community relations. The programme assumes that the rural schools involved in the programme are multi-grade and that innovations in the curriculum and teacher training need to be organised with this type of school in mind. Student self-instruction, flexible promotion, learning centres and teacher training are central to the multi-grade strategy. These are described below.

Study Guides, Flexible Promotion and Learning Centres

The self instruction study guides are developed for children from grades 2 to 5 in four basic curriculum areas (natural science, mathematics, social studies and language). The guides adopt a method which promotes active learning, cognitive skills, discussion, group decision-making and the development of application skills within the local environment. The guides contain sequenced objectives and activities. Because the student follows the work at his/her own pace the schools operate a system of "flexible promotion". Hence students do not repeat grades. They are promoted to the next grade of work when they have mastered the present objectives and activities.

The study guides reflect both the national curriculum and regional and local adaptations. The national material are developed and printed centrally. The regional and local adaptations are developed by teachers during training courses and are produced using simple technology. The printing of the core study guides is done nationally. The study guides are used by groups of two to three children at a time and facilitate the work of the teachers required to work with several grades in the same classroom. Conventional textbooks tend not to facilitate self instruction.

Learning Activity Centres in each school complement the study guides. Materials to be used in the four basic curriculum areas are housed within the centre and students are guided to specific activities and observations based on these materials by the study guides. School libraries complement the study guides and the learning centres and contain reference material, dictionaries, textbooks and children's literature. The cost is low - a library of 100 volumes costs US\$225.

In-service teacher training is an integral part of the New School strategy. Each teacher attends three in-service workshop over a period of one year, with a series of follow-up workshops thereafter.

The first workshop initiates the teacher in the basic concepts and methods of the programme, the purpose of involving students in the organisation of the school, the use of learning centres and group work in the organisation of learning, and the mobilisation of community resources for the development of the school. All these objectives are written up as self-study units in a teacher's training manual and the teachers follow these, engaging in active learning, in exactly the same manner as children will follow their guides in the classroom.

The second workshop is on the use and adaptation of children's study guides. This workshop takes place only after the school has been reorganised and the community mobilised. During the workshop teachers study the children's materials and learn how to use them for multi-grade teaching and "flexible promotion". Sets of materials for the children's use are delivered to the teachers during the workshop. The third workshop focuses on the role of the school library as a complement to the study guides and learning centre. The teachers receive the books for the library at the end of the workshop.

The follow-up workshops are organised monthly to "exchange ideas, analyse problems and discuss results". Over time these local non-formal workshops became formalised into "microcentres", described as

a participatory experience where teachers could evaluate, create, enrich their own experiences, innovate, criticize, analyse and carry out projects for the improvement of the school and the community (Colbert et al 1993:59)

Demonstration schools also play an important role in training. During the initiation workshops teachers visit a school which is implementing the curriculum approach effectively and which is operating as an effective community centre. Both the microcentres and demonstration schools maintain a horizontal training network and are regarded as a "decentralised, in-service, low-cost mechanism to maintain quality in the process of going to scale" (p 59).

Stages in Going to Scale

Since 1975 three stages of development of the programme have been observed. These have been described as 'learning to be effective', 'learning to be efficient' and 'learning to expand'.

stage 1: learning to be effective: this stage occurred between 1975 and 1978 when the programme was implemented in 500 schools in three regions. During this stage materials for teachers and students were designed, administrative and financial arrangements put in place, administrators and teachers trained, delivery systems

organised, materials reproduced and distributed, the programme implemented and initial evaluation conducted. The Agency for International Development (AID) provided financial support.

stage 2: learning to be efficient: this stage occurred between 1979 and 1986 when the programme was extended to 8000 schools. Training courses which had been developed during the first phase were replicated at the national level and the teacher's manual and childrens' study guides reproduced. Revised versions of the training courses and self study materials were developed and a core team established within the Ministry of Education. During this stage the Colombian government adopted the Escuela Nueva strategy as its policy for the universalisation of rural primary schooling throughout the country. A variety of sources - government, the Interamerican Development Bank, the Coffee Grower's Federation, the Foundation for Higher Education and the World Bank - provided financial support.

stage 3: learning to expand: the third and current phase began in 1987 and was planned to include 27,000 schools by 1992. By this stage the Escuela Nueva movement was no longer a programme; it was now the declared official policy of government embodied in a national plan. New forms of organisational capacity were built at national, department and school cluster level.

Programme Evaluation

Colbert et al report the results of the evaluations which have been conducted on the programme to date. Rodriguez (1978) suggested during the first stage that there was no difference in the levels of creativity of children in multi- compared with mono-grade rural schools, but the self esteem of both boys and girls was higher. More recently Rojas and Castillo (1988) report that a majority of teachers believe that the New School is superior to other types of traditional rural school. Students in New Schools performed better on tests of socio-civic behaviour, self esteem and some subjects in some grades.

In short, it has been suggested that the New School system responds successfully to the needs of the rural child in Colombia because:

- it offers a multi-grade approach that permits provision of complete primary schooling where incomplete schooling exists

- one or two teachers can handle five grades in the same school

- it involves administrative agents and communities as well as children and teachers

- the learning strategy adopted encourages active, creative, participatory and responsible learning

- through their participation in the school government children learn civic and democratic behaviour

- children learn at their own pace using self instructional materials

- there is no grade repetition: promotion to the next objective or grade is progressive and flexible. Children can study at school and at home. They can continue to help their parents at

home while studying
materials are affordable - one set is shared among three children and each set lasts several years. The content of the materials reflects a national curriculum and can also include regional and local adaptation
teachers are facilitators: they guide and orient learning. Teacher workshops employ a pedagogy similar to the one they will use in their classrooms
the inservice training of the teachers is local, replicable and permanent

(adapted from Colbert et al 1993)

We return to the results of the evaluation again in Chapter 3.

3.0 Peru: Indigenous schools

Thirty nine percent of primary schools in Peru are one-teacher schools (Tovar 1989). One-teacher schools occur in rural areas, predominantly in the Andean and Amazon regions. References to multi-grade teaching and multi-grade schools occur very infrequently in the Peruvian educational literature. Where they do appear reference is usually made to the prevalence of one-teacher schools over multi-teacher schools, rather than multi-grade teaching as opposed to mono- grade teaching. In rural areas multi-grade teaching is the norm for most schools, be they multi-teacher schools or one-teacher schools. Figures for the number of teachers per primary school nationally are 2.2 and for the Amazon region 1.5 (Chirif 1991:47).

While the provision of primary schooling for children in rural areas has increased over the 1980s, this has been achieved through an increase in the number of one- and two-teacher schools. In the case of the one-teacher school, a teacher can be faced with an age range from 3/4 up to 15/16 years, divided into nursery grade (initial) and six grades.

Besides their rural location, a number of other factors influence the multi-grade school. These include:

an absence of teacher training. One-and two-teacher schools, located in the most remote rural areas, are considered very low-prestige schools and are allocated the lowest qualified teachers. In the Andean Department of Apurimac, more than 85% of teachers in one-teacher schools have no teaching qualifications (Zuñiga 1989); in the Tambo region in the Central Rainforest, one-teacher schools are staffed by local teachers who have only some years of primary schooling plus a few summer vacation courses. Here class sizes reach 75 students (Heise 1987).

a lack of resources. Rural multi-grade schools are very poorly equipped, not only in terms of the fabric of the school itself but in terms of text books and other educational materials, which in some schools do not exist at all. This poses serious constraints for the teacher who becomes entirely dependent on the blackboard, on which it may be barely possible to write.

cultural and linguistic diversity. In both the Amazon and Andean regions, which have large indigenous rural populations, there is a high cultural and linguistic diversity. Consequently, multi-grade teachers are faced with the task of teaching a monocultural and monolingual

Spanish curriculum to indigenous children, who, in many cases, are completely monolingual and monocultural. The cultural and linguistic backgrounds of the teachers are often distinct from those of their students.

This is the situation which exists in many areas and was heavily criticised in southeastern Peru by a wide range of institutions and NGOs working in education:

The lack of teacher training hinders the use of adequate teaching methodologies, which becomes an acute problem when the teacher is working in a one-teacher school where the student population utilise a diversity of mother tongues depending on their ethnic affiliation (CAAAP 1992:13).

Faced with this situation, a multi-grade teacher will often divide the students into two groups. The first, grades 1 and 2, comprise the mono-lingual mother tongue students and the second, grades 3 to 6, comprise students with at least some understanding of Spanish. Given that each grade contains students who are repeating the grade and students new to the grade there may be considerable variation in ability within each grade.

Teacher Education

Teacher training colleges (Institutos Superiores Pedagógicos) show little concern for training new teachers to cope with multi-grade classes. This reflects the orientation of teacher training in Peru and the single training curriculum towards teaching in well equipped urban schools where there is one teacher per grade. Not only is this type of school in the minority but within the education system it is the most prestigious and the most lucrative. The most highly qualified and experienced teachers aim for an urban posting in a Mestizo area where, like themselves, the students are Spanish speaking.

In contrast, the least prestigious schools - rural, indigenous one-teacher schools - receive a high percentage of teachers with no training and many such schools find it difficult to get teachers at all. Mestizo teachers arrive with no methodological orientation for multi-grade teaching and no ability to communicate with their mono-lingual students. This situation is linked to the general abandonment and lack of concern for rural regions, in particular those with a high indigenous population. This abandonment encompasses education in general and indigenous education in particular.

Nevertheless, there is a growing concern for improving the quality of primary school education for indigenous peoples in Peru, which has taken the form of a Ministry of Education directive instructing all Instituto Superiores Pedagógicos to offer training courses for indigenous teachers in intercultural bilingual education. The new courses, however, are designed to encourage teachers to adapt the content of the existing 6 grade curriculum, with its rigid system of grade promotion through formal exams. It does not encourage the development of new styles of pedagogy and classroom organisation which would enhance the task of the multi-grade teacher. The training on these new courses is primarily concerned with developing a satisfactory methodology for teaching Spanish as a second language.

The national curriculum as it stands today provides the possibility for 'unitary' teaching. That is, the curriculum is presented in terms of textbooks for each grade comprising lesson plans and structured in such a way that certain subjects or themes appear through all grades with appropriate levels of ability. However a study in indigenous Amazon schools has shown that teachers appear to lack the ability to organise the official curriculum in terms of thematic units. They work instead with each grade independently and may be dealing with several different topics with several different grades simultaneously (see Gasché et al. 1987).

The following example from a primary school in the Arakmbut community of San Jose presents a contemporary multi-grade teaching reality in an indigenous area. The primary school is run by two lay-missionary Spanish speaking teachers with no formal teaching qualifications and illustrates the labour intensity of teaching common in many multi-grade schools. The two teachers had divided the students into one class of Initial, Grade 1 and Grade 2, while the other comprised Grades 3, 4, 5 and 6.

The day began with maths and the lesson proceeded in a pattern familiar to the students: Grades 3 and 4 children watched and waited while the teacher wrote fractions on the blackboard for both grades to do together and a sentence explaining what had to be done: "order the fractions according to increasing number, then into decreasing number". The teacher read out this instruction, reminded them of similar work they had been doing the previous day, and then left them to copy everything on the board, including the written instructions, into their exercise books. The teacher then turned her attention to Grades 5 and 6. Once they had been given their work she walked back across the classroom to the group copying the fractions and began to call them to the board one by one to complete fractions. The other children watched and copied so that at the completion of the lesson all the children had perfect answers.

In the second classroom in San Jose the Grade 2 had settled down to copying and completing 2 X table multiplications from the blackboard which kept them occupied for an hour. Meanwhile, Grade 1 worked with the teacher from a colourful poster of a huge grand piano, repeating words which were printed below in Spanish. While the teacher focused most of her attention on this language lesson, she was at the same time overseeing the work of the four Initial Grade students who were restlessly copying over and over again the four words which she had written into their jotters in cursive script

(Aikman 1994, Appendix C).

So, despite the possibility of "unitary" teaching prescribed by the national curriculum, the teachers continue to organise their work as though they were teaching mono-grade. They move continually from one discrete group of students studying one subject to another group, often engaged on a completely different lesson.

NGO teacher training programmes

Where schools have no supervision and local authority and training college staff never visit, personnel from educational institutions and training colleges have no idea of what it is like to teach in a school in an indigenous community (Heise 1987). Moreover, they have little experience of poorly equipped multi-grade classrooms, as their experience pertains mostly to the relatively privileged urban settings surrounding the training colleges. An exception to this situation, however, can be found in some of the NGO teacher training programmes set up specifically for training indigenous bilingual intercultural teachers in the Amazon region. These include programmes such as the Programme for Intercultural Bilingual Education in the Alto Napo River; the Bicultural and Bilingual Experimental Education Project for the Ashaninka of the River Tambo run by the Amazon Centre for Anthropology and Applied Practice (CAAAP); and the Association for the Development of the Peruvian Rainforest (AIDSESP) and the Instituto Superior Pedagógico de Loreto (ISPL) programme for training indigenous teachers in intercultural bilingual education.

These programmes acknowledge multi-grade teaching as an integral and important characteristic of the teaching situation in rural schools. Because these programmes have been set up specifically for indigenous teachers, one- and two-teacher schools, lack of teaching materials, lack of formal training, absence of supervision and distance from urban centres become central foci of the programmes. Multi-grade indigenous community schools are not considered remote and low prestige. Furthermore, solutions to the neglect in these schools and communities are sought at the local level and in the schools themselves.

The AIDSESP/ISPL Teacher Education Programme

The AIDSESP/ISPL programme has been designed by and for indigenous Amazon teachers working in communities with the same linguistic and ethnic background. An important part of the training course is the production of a new primary curriculum by the trainee designed to suit the indigenous communities and their particular situation. This includes a new pedagogical approach to multi-grade teaching, methodology and classroom practice. It is in multi-grade classrooms in small one or two-teacher schools that the trainee will be most free to introduce and trial his/her new curriculum during the final three years of this training course. Over this period the trainee will carry out teaching practice with on-site support and supervision from a local team of trainers comprising educators, anthropologist, linguists and community members. Unlike other training courses the NGO programmes emphasise the importance of the college coming to the trainee rather an overwhelming emphasis on in-college work.

The new curricula which students on the AIDSESP/ISPL course are each developing focus on problems and issues which are significant for the indigenous community and avoid 'fragmenting the indigenous reality and view of the world by dividing knowledge into discrete subjects' in a manner alien to the society (see Trapnell 1990; 1991). Similarly, they aim to avoid fragmenting students into discrete autonomous grades which

do not reflect the way children learn within their indigenous society and makes poor use of both student and teacher ability and potential.

Though there is still very little direct reference to multi-grade teaching in the reports and articles concerning these new NGO programmes, they break from the centralised, graded and highly authoritarian primary teaching methods and rigid curriculum propagated by the Ministry of Education. This break suggests that in the future multi-grade teaching may be given more explicit recognition in teacher training in both NGO and Ministry of Education programmes, and that multi-grade classrooms may be recognised as a new potentially rich learning context rather than an unavoidable setback.

4.0 Sri Lanka: Approaching multi-grade via multi-level teaching

Sri Lanka has a highly developed system of education and enrolment in the primary cycle is near universal. However several types of social and economic disadvantage remain and multi-grade schools are associated with some of these. Multi-grade schools are most likely to be found in remote rural areas where access is difficult, population sparse and the living conditions for teachers unattractive. They are to be found in both the Sinhala-speaking and Tamil-speaking rural areas. In some types of disadvantaged areas, for example, the Tamil-medium schools in plantation areas, shortages of qualified teachers mean that multi-grade teaching is the norm. Government policy which indicates that there should be a minimum of 3 teachers per school, however small, is sometimes not implemented. Even then, with a five-grade national curriculum some grades will be treated as multi-grade. Although the percentage of one-teacher schools has decreased from 5.6% in 1986 to just 2% in 1991, the percentage of schools where there are multi-grade classes will be far higher - estimated to be 24% in 1986 (Abhayadeva 1989). Many small schools cover more than the five grades of primary, sometimes six, sometimes eight. A UNICEF report, written in 1987 commented such schools generally cater to disadvantaged populations in rural areas whose earnings are low and unstable... In addition to paucity of teachers, such schools have inadequate physical facilities, equipment, books and are neglected by the education system in regard to maintenance, repair and supervision. They remain in a state of suspended animation. They are charged with providing education to over a quarter of million children.. Since there are only one or two teachers per school of five grades, no teaching occurs for many children over large portions of the year (Ratnaike 1987)

The national primary school curriculum in Sri Lanka is oriented towards mono-grade schools. A number of changes have been introduced recently to the content of the grade 1 and 2 curriculum, in recognition of the low levels of basic number and language skills with which many children in disadvantaged areas enter primary school. However, these changes continue to be framed within the assumption that primary schools are organised on mono-grade lines. The organisational realities facing the multi-grade teacher are not readily addressed in the formal guidance of the primary school syllabus, teachers' guides, textbooks, pre-service and in-service training. The following notes from the author's field diary illustrates the problem

an unannounced visit to a tea estate school. The school has 163 children enrolled in grades 1 to 6 and two female teachers. The principal teacher has nine years experience and has followed her formal training through the distance mode. She lives in the estate. The other teacher travels daily by bus from a small town ten miles away. The bus is infrequent and usually late. Already it is 8.30 am and the school has been in session officially for one hour. Grade 1 children sit quietly outside the one-roomed school under a shed-like construction with no roof. The morning sun forces them to take shelter on a lower terrace under a roughly constructed thatched enclosure. None of the grades has been set any work and the children sit expectantly, their unopened books in neat piles in front of them. The enrolment register has been checked. This morning one hundred children have turned up for school, an attendance rate of just 61%. Although we wish to spend fifteen minutes or so with the teacher discussing a recent inservice training which she attended recently, we suggest that the students be set some work before we do so. She moves quickly around the grade groups crammed inside the single classroom and grade 1 outside, giving instructions, opening books, writing exercises on the blackboard. Three male monitors, apparently self-appointed, dart around the six groups, distributing verbal punishment here, physical punishment there. A grade 3 girl takes an envelope out of her satchel. It contains small picture cards of animals and flowers. Two boys snatch one each, a squabble ensues, the monitor intervenes, peace is restored and they await more attention from the teacher. The grade 2 children have been set language work. One child reads out one or two words from the set book, the others repeat in unison. All the grade 2 children have a language book, distributed as part of the government's free text book scheme. Although all participate in the chant, and although all are holding a copy of the relevant book, not all are reading the words. It is enough to hold the book and repeat the chant.

The male kangani stands outside looking in. He is an elderly man paid to shepherd the children one and half miles from the estate line-room where they live, through the tea fields to the school and back home each day. He is paid Rs 250 (£4) a month by the parents for this work. His stick is poised, ready to intervene should the class room become too unruly.

By 9.00 the bus has arrived and the second teacher joins us. We discuss various activities and suggestions made during the recent in-service seminar on health. Both teachers had also attended an in-service training course for teaching methods in the lower primary grades. One two hour lecture had been devoted to multi-grade teaching. What could they remember from it? They remembered a discussion about introducing a topic common to all grades. For example the topic could be fruits. After introducing the topic different grades of children could be asked to engage in different activities based on this common theme. For example grade 1 children could talk in small groups about the fruits they eat; grade 2 could write out single names of fruit and compare fruits in different ways; grade 3 could compare fruits for their vitamin value.

Although it was clear that the in-service seminars had generated ideas in the minds of the teachers it was more difficult to judge whether these were being transacted at the classroom level. They had made a large number of learning and teaching aids at the in-

service training sessions and were able to produce these from the store cupboard to show us. But none was in use during the one and a half hours of our visit.

Teachers may be encouraged at in-service seminars to experiment with ideas about multi-grade teaching. However this expectation is paradoxical. Those teachers who find themselves in schools which force them to adopt multi-grade methods are not only teaching in the most disadvantaged economic and social conditions, but they are themselves the most disadvantaged teachers in terms of education, level of training , status and, often, social background. All support from the central curriculum and administration authorities is based on an assumption of mono-grade organisation. Curricula are developed with an image of a relatively well-educated and trained urban teacher in mind. The adaptation of national curriculum materials, the reorganisation and structuring of timetables and groups, the creative use of space and the management of time are challenges which the lesser educated and lesser trained person is expected to confront and master. The more educated and trained teacher simply works within the norm and is not expected to make major intellectual adaptations.

In recent years, two developments, one stemming from the National Institute of Education, and the other from the Ministry of Education, have acknowledged the pedagogic value of multi-grade organisation. However, their approach to it has been via the needs of mono-grade teachers and the recognition that there are multiple levels of ability within single grades.

National Institute of Education: the development of multi-grade and multi-level teaching strategies

One approach to multi-grade teaching is to link it with the ideas of multi-ability or multi-level teaching .The general idea is that there are very wide differences in competency in the basic skill areas of language and mathematics even within a grade in the dominant mono-grade structure. In a useful paper on the development of multi-grade and multilevel teaching strategies developed at the National Institute of Education, Abhayadeva (1989) underlines the point that the multi-grade teaching strategy should be

a feature even in regular situations with a teacher per grade... (and that) a single grade with multi-levels could be conceived as operating in a multi-grade context (Abhayadeva 1989)

She supports her case with reference to data on language and mathematics competency at entry to and at the end of grade 1. Using data from a large-scale survey of competencies she constructs a distribution of competency in writing movement coordination and concepts of quantity for a class of 40 students. Competency levels are assessed at five levels of mastery.

Table 3 suggests that there is a wide distribution in both skills among those who enter grade 1. Although the range of variation reduces a little as children reach the end of their first grade of schooling, in the sense that larger numbers approach mastery on this

particular skill, the variation remains marked. In principle the majority of children who reach the end of grade 1 should have achieved mastery or close to mastery in these skills. In practice less than half are doing so in the maths competency.

Table 3 Distribution of competency in writing and mathematics, grade 1, Sri Lanka

Competency level	Writing movement	Writing movement	Quantity	Quantity
	<i>at entry</i>	<i>end of gr. 1</i>	<i>at entry</i>	<i>end of gr. 10</i>
<i>not started mastery</i>	0	0	1	0
<i>started mastery</i>	2	0	16	5
<i>halfway to mastery</i>	24	8	18	18
<i>close to mastery</i>	10	20	4	8
<i>mastery</i>	4	12	3	9

source: Abhayadeva 1989

Abhayadeva (1989) suggests that these data have several implications for organising or grouping children:

for example there are 32 (24+8) halfway to mastery at entry to year 1 and at exit.. and there are 30 (10+20) at close to mastery level and another 16 (4+12) who have mastered. According to the data those at halfway to mastery would be struggling to copy shapes of letters while those who have mastered would copy (or write) letters with ease. Competency levels in quantity show that for more than half .. learning activities should be geared at a lower level.....a multi-grade organisation .. . would be beneficial. ... some of these students would need more than one year, 18-24 months or perhaps even longer to attain competency in a given grade specific curriculum. Sri Lanka has approached almost full enrolment at Year 1. However grade repetition is found at each grade level with year 2 having the second highest rate of repetition. The cumulative effect of learning problems mostly caused by the necessity to adhere to a grade-wise curriculum is revealed by continuing repetition rates which has reached its highest in primary for year 4. Grade repetition and the accompanying sense of failure leads to early school dropouts. It becomes difficult to maintain the momentum reached by achieving full enrolment at school entry. Perhaps a non graded approach where all children need not necessarily be transferred to the next grade at the end of the year, will help certain children to overcome some of the learning problems encountered due to

competency level.. a flexible approach which reaches out to different and parallel competency levels in adjacent grades would require reorganisation of the graded structure at least in the first two or three years of the primary school.

It is clear from this that a multi-grade approach is being advocated for children at the beginning of the primary cycle. In other words, teachers in mono-grade schools are being urged to reorganise their work along multi-grade lines, rather than the reverse.

The practical steps which have been taken to date to effect some of these ideas include the establishment of a pilot project in 20 schools carried out by the Primary Education Project of the National Institute of Education in schools under the UNICEF-assisted programme for quality development of primary education, the long term objectives of which include exploring the possibility of using multi-grade teaching in "normal" classrooms and in large mono-grade schools and incorporating the experiences in a guide for teachers, and to introduce multi-grade teaching as a component of pre-service and in-service education.

We will return to some of the practical recommendations in chapter 4.

The Ministry of Education's Plantation Sector Education Development Programme (PSEDP): Self-Study materials and Graded Learning

Since 1987 the Ministry of Education in Sri Lanka has run a programme of support to primary education in the tea and rubber estates. Until fairly recently estate schools had been managed and "owned" by plantation companies. They were connected with the National Ministry of Education through a grant-in-aid system in which schools were subject to an annual inspection and award of grant based on academic achievement. During the 1970s these schools and their teachers began to be "taken-over" by the state and incorporated fully into the state system. In 1984 there were 558 estate schools, with a total of 63,389 students and 1148 permanent teachers. Thus the average student-teacher ratio was 55:1. A large proportion of the schools were one-teacher schools.

A programme of special support began in 1987, supported in part by the Swedish International Development Authority. This programme was designed to upgrade the estate schools, most of which covered the first six grades. The objectives were to increase enrolment and to improve the quality of education. Although the majority of schools are in fact multi-grade, the student population in many of the estate catchment areas was such that if universal enrolment in primary was achieved then a mono-grade structure would be entailed, provided that a sufficient number of teachers could be recruited and appointed. Hence priority attention was given to stimulating enrolment and attendance among the school-age population, stimulating the supply of teachers to teach in the Tamil -medium and upgrading teacher performance through inservice training and on-site support from teacher educators. To have started from the multi-grade reality and to have tried to cope with it in the early stages would have been unwise, for it would have distracted attention away from the more fundamental problems facing children in the estate community - large numbers of children dropping out from

primary, too few teachers and too many untrained teachers. Gradually, and as some of those problems are being met, more attention is being given under the programme to appropriate pedagogy in groups of 40-50 children, through the development of self-study materials and the encouragement of a graded and individualised approach to the learning of reading, both of which can support multi-grade teaching as well as multi-ability within mono-grade structures.

In 1993 PSEDP embarked on a programme of development of self study materials in the Tamil language for use by students in years 3-5 of the primary cycle. The idea for this programme arose out of a number of concerns expressed by the teachers and teacher educators of PSEDP:

shortage of teachers, lack of additional learning material and variation in comprehending ability of the learners, especially in the primary cycle, are (a) few of the reasons of slow achievement in language and mathematics. Also due to these factors slow learners or low ability groups were generally left behind and at the other extreme the learning needs of fast learners or high ability groups are not catered for. This situation leads to the necessity of identifying and developing learning material which would make learning interesting and encourage the learner to face challenges in learning (PSEDP workshop report 1993)

The development of the materials involved a number of well planned steps and a methodical built-in evaluation of the materials before their mass production. The steps were as follows

Step 1 A 5-day workshop was held at a school, organised by a teacher educator from the Ministry of Education and a resource person from the National Institute of Education. The other resource persons were the teachers themselves who identified problem learning areas in language and maths, designed preliminary materials, tried them out in the school in which the workshop was being held, revision and grading of achievement level.

Step 2 The materials were then tried with a large sample of children in plantation sector schools. An assessment format for the try-out was devised, experienced teachers trained to conduct the try-out and data collected is analysed by and with the teachers who have conducted the try-out. The analysis was conducted in terms of the percentage of children who gained correct answers, plus a listing of the different types of error made those who gained incorrect answers.

Step 3 On the basis of the analysis the materials are revised by the teacher educators and teachers. After revision the materials are typeset, mass produced and laminated for durability of use. Several hundred self study "cards" have been produced to date.

Graded and Individual Approach in Learning to Read

The second example within the PSEDP is the development of a graded approach to reading. A teacher educator involved in the scheme described the idea and the follow through

We had been talking for some time about reading skills. All the teacher supervisors in the group agreed that the reading ability was low. When we discussed the problem with the teachers they always said, simply, "children are not interested, they do not have the ability" . Teachers never seem to acknowledge that they can improve their practice.

We decided to send formats to every school and asked them to do compulsory evaluation of reading... each child was graded A-E. We specified the criteria. We then asked the teachers to use the Tamil reader and other story books. We discovered, after the first assessment, that there were some children in the upper classes who were extremely weak in their reading. The teachers had not been giving them any remedial activity. We suggested that they should ask these children to go back to the year 1 and year 2 reader.

When asked whether she thought that the testing per se was responsible for the improvement in reading standards or whether the intervention comprised a number of elements the teacher educator explained

As supervisors we showed an interest in the reading and showed the teachers how to do their own evaluation using the criteria... We started the evaluation in June (1993). Some teachers have done the evaluation three times, others four times by now (February 1994). We believe that if change is coming about it is because of several things. We are helping the teachers become aware of the individual difference in levels of reading skill. We think that the testing itself may be having a motivating effect on the students and the teacher. We are suggesting that story books as well as the official reading book be used with the children. We are supplying schools with extra reading material through our mobile library. And of course we ourselves are showing an interest in the reading abilities of the children. All of these things are happening at the same time. We cannot say which is the most important factor. But we are using the teachers' assessments of the levels judged against the criteria.

Although the teacher-educator and her colleagues requested all the schools in the areas for which they were responsible to do the compulsory testing, they decided to "study in a systematic way the improvement in 10 schools, selected randomly".

Some of our results are as follows: In school 1 there have been three testings. The percentage with A grade increased from 0% to 21% ; the percentage with E grade decreased from 35% to 7%. In a second school there were five year 5 children who could not read at all.. we started them off with the year 1 book.. after 6 months two of the five got their promotion to year 6 ; they were able to read at the year 5 level.. The other three did not reach the level and will repeat the year.. but they will catch up. In another

school we found that when we tested in March there no D's and quite a few A's , but when we retested in June, we used a different book but of about the same level, not the set Tamil reader. This time there were no A's.. we felt that the children had been memorising the set book and were unfamiliar with reading anything that was outside the set book. We recommended the use of story books as well as the set book. We are helping them find the extra books through our mobile library.

This is a grassroots example of teachers and teacher educators working together to identify differences in the pace at which children in the same grades are learning. Traditionally, reading is taught through whole grade groups reading out aloud from the same text; the set text is often the only book available in the classroom and the home. The identification of individual differences in reading has been an eye-opener for many teachers, especially those who are untrained. The realisation that additional reading materials can be developed at low or no cost and that supplementary story books can be made available on loan is transforming the work of the teacher and the learning experience of the student.

Although neither the self study materials nor the reading project arose primarily out of a need to find solutions to the problems facing the multi-grade teacher, clearly the materials and approaches being developed are appropriate for both the multi-grade and the mono-grade teacher.

5.0 The IMPACT System of Mass Primary Education

During the early 1970s the Regional Centre for Educational Innovation and Technology (INNOTECH) , based in Quezon City in the Philippines, devised a radical approach to rural education. Known originally as the "No more schools" concept, it proposed to replace schools, textbooks, teachers and grades with learning centres, self-instructional materials, peer, tutor and community support and instructors responsible for the management of learning among groups as large as 150-200 students. Over time the concept became better known as Instructional Management by Parents, Community and Teachers (IMPACT). The innovation began in the Philippines and Indonesia, where it became better known as Proyek Pamong. It subsequently spread as an idea to Malaysia (INSPIRE), Jamaica (PRIMER), Liberia (IEL) and Bangladesh (IMPACT).

The rationale for the "No More Schools" concept and the components of a new system for the delivery of education are presented by Cummings (1986). The original rationale was based on the educational conditions facing much of South-east Asia in the early 1970s one-half of rural children in Southeast Asia do not complete more than 4-5 years of school and , due to a projected rapid population growth rate, this situation is likely to worsen. Shortage of classrooms, considered one of the major causes of the low educational attainments of rural youth, is unlikely to improve because overstrained national education budgets will not be able to fund many new places at existing unit costs. The inflexibility of conventional school schedules, which causes children to miss lessons, fall behind, and eventually dropout, is another reason for low educational attainment. Thus to improve rural education, a new delivery system needs to be devised

with a more flexible schedule and lower student costs. Since teachers make up 80-90% of unit costs in conventional schools, such costs can be reduced by increasing the student-teacher ratio and supplementing teacher supervision with assistance from students, parents, and community resources. Self instruction, relying on programmed instructional materials, can be another means to reduce costs and, moreover, enable greater flexibility in scheduling individual learning. (Cummings 1986:6)

Although there is no explicit reference to multi-grade teaching in the rationale, many of the schools which were subsequently to participate in the innovative system were multi-grade schools with fewer teachers than grades. The greatest early success of the project was experienced in central Kalimantan and Sabah, island provinces of Indonesia and Malaysia, where one-teacher primary schools were common and where teachers experienced difficulty in using the conventional texts and materials designed with the mono-grade primary school in mind. As we shall see below the components of the delivery system could be adapted to the multi-grade school.

System Components and Principles

Although the details of delivery programmes were developed in the field and were to take on a different form in different settings there were some common elements. The original "no more schools" concept envisaged a delivery system based around personnel, instructional materials and instructional organisation :

Personnel

- in place of the conventional teacher, an instructional supervisor able to manage up to 200 primary students
- community members, enlisted on a voluntary basis, to provide instruction in particular life skills
- primary-school graduates, provided modest pay, to give courses in reading and other academic subjects
- parents to take responsibility for motivating their children and monitoring their progress

Instructional material

- the use of modular instructional materials, with many of these materials being self-instructional to allow children to proceed at their own pace
- instructional radio programme sessions to supplement the written material

Instructional organisation

- the primary mode of learning was to be self-paced, individual instruction under the guidance of tutors and the instructional supervisor. This mode could be supplemented, where appropriate, with group sessions
- a simplification of organisational procedures with no specific age required for entry to the community centre, few set class periods during the day, no prescribed schedule for completing modules, and no individual grades maintained other than a record of completed modules

Over time, and as delivery systems were worked out in detail in different settings, several principles of the IMPACT system began to emerge, expressed here by two of those intimately involved in the development of the idea in Indonesia and the Philippines

The subject of education is children of primary school age

the Impact system is .. open in character; it does not close off the opportunity to the children to study although they may have dropped out of primary school.. all children of primary school age can effectively follow the primary school curriculum from the start until they finish.... school dropouts do not stop learning. They can go on studying till they finish and gain the elementary school certificate.

Learning material are based on the current primary school curriculum

learning materials.... are based on the approved curriculum of the school system. The fact remains that the students of IMPACT schools are still governed by the requirements of the system such as the successful passing of official examinations

The essence of education is the learning process

Education in the IMPACT system, through the intermediary of modules will encourage children to learn by themselves. There will be a minimum of exhortation. Instead, the process will throw the child right into situations that will require him to learn by himself

Learning can take place anywhere

learning (takes place) anywhere - not only in the classroom. The attitude that dropouts inevitably will cease to learn, or that graduation terminates the learning process is contrary to this principle and, therefore, must be changed.... the school building is merely the centre of learning from where guidance, material and resources may be derived. In the countryside where the dropouts and adults may have easy access, learning posts are established

Multiple Entry and Exit

The principle of multiple entry and exit will help solve the problem of dropouts by meeting them half-way, by literally allowing students to enter when they wish or when it is most proper for them, and to leave at the most opportune time.. and obtain the elementary education certificate

Progress based on mastery and individual speed

Children will not be forced to proceed at a pace beyond their capacity and readiness. On the other hand they will not be hindered when they are ready and capable. This principle recognises the concept of individual differences quite realistically. The children learn by themselves and pacing is individual. The basis of progress is mastery

Education is a socialising process and leadership training

Children of today are citizens of tomorrow.... group learning is a primary mode of learning. ..Older ones act as tutors or "programmed teachers" to the younger ones. In peer groups children assist each other

Education is the responsibility of parents, the community and the government

.. teachers are not the only source of education...the acceptance of the responsibility of education by parents, the community and the government is crucial.. in the conventional school system, the participation of the community is chiefly financial... In the IMPACT system, community participation is more substantial and technical. Parents are encouraged to monitor their children's progress, to assist them through tutoring in their studies if they are capable

The teacher as the manager of the learning process

the teacher's duty is to direct and manage the learning process.. the teacher will no longer do much direct "teaching". She will be expected to exercise a different role - that of managing all the resources of the school, all the sources of education and ensure that the children is benefited maximally - hence the designation "Instructional Supervisor" (Respati and Mante 1983 : 9-14)

Although these components and rationale underpinned the early "no more schools" concept, the specific objectives and components of innovations varied from place to place. Cumming's summary (1986:19) suggests that the objective of improving education quality was common to all six projects, whereas that of lowering the unit cost of schooling was common to Philippines, Liberia and Bangladesh, but not Indonesia, Malaysia or Jamaica . The shift in the teacher's role to instructional supervisor and manager of the students learning through self-instructional modules characterised the programmes in the Philippines, Indonesia, Liberia and Bangladesh but not Malaysia and Jamaica. In Jamaica and Malaysia greater emphasis was placed on the development of instructional guides and aides. All the countries divided class groups into small groups but they varied in the extent to which they encouraged cross-age and peer tutoring, programmed learning and differential pacing.

In terms of the challenges facing those who work with the multi-grade teacher two features of the IMPACT experience stand out. The first is the quality of materials, which was particularly high in the Malaysian and Liberian cases. Of the Malaysian materials Cummings (1986:85) writes

a teacher with a minimum of preparation could successfully fill virtually every classroom minute with interesting and attractive activities. The teaching guide tells the teacher what to prepare before class; how, in the first few minutes, to recall old material; and how, in the next 20-30 minutes, to present new material. For the remainder of the period, the teacher is able to lead slow learners through a special drill with attractive instructional

aids while the other students work on self-instructional worksheets. The instructional kit also provides periodic tests.

The second is the preparedness of the teachers and their support team to innovate in school organisation and classroom management.

In the Indonesian experiment, one is especially impressed with several of the innovations affecting classroom management. In the lower grades in all the experiments, students tended to proceed at more or less the same pace under the management of their teacher. However, in the upper grades, as the students turned to self-instructional modules two problems emerged: boredom and differential pace...the first innovation developed was peer-group learning, wherein three to six students at the same grade level would form a group to study modules together.. modules were revised to assign distinct roles to a peer-group leader.. the position of group leader could rotate among the members. While these innovations alleviated boredom, differential pacing remained a problem. As the Indonesian project team became more familiar with the principles of mastery of learning, they began to introduce pre- and post-tests for each module and to insist that no group could move on to a new module until all members had achieved 90% on the post test... fast learners manifested a more helpful attitude towards those in difficulty, and the overall cooperative spirit in classrooms was considerably enhanced.

(Cummings 1986:86)

Conclusion

These five experiences of multi-grade teaching in developing countries have a number of common themes. They all address educational problems in disadvantaged rural settings with low populations. All have involved teacher training in the techniques of multi-grade teaching at the local level. Some have succeeded in having multi-grade recognised by government as a legitimate area of enquiry for teacher educators and teacher trainees at national level. Others rely on the support of NGOs and teachers self-help groups. The issue of cost has not been a dominant theme in any of the examples. The multi-grade strategy has involved a number of components besides teacher training. The design, reproduction and distribution of large quantities of self-study materials to support individual, peer and small group learning; a system of evaluating learning progress and achievement; and forms of internal school and class organisation which establish routines for students independently of the teacher appear to be among the characteristics of effective multi-grade teaching and learning.

CHAPTER 3: RESEARCH EVIDENCE

Introduction

Several summaries of the advantages and disadvantages of multi-grade teaching in developed and developing countries are available (eg Pratt 1986, Miller 1991, Thomas and Shaw 1992, APEID 1989). These tend to stress a different range of positive and

negative outcomes, reflecting in part the variety of human and financial resource contexts in which different educational systems operate.

In industrialised countries much of the debate about multi-grade vs mono-grade arises in the context of rural depopulation among communities which have already achieved universal enrolment in primary education. The policy objective lying behind the research is often the reduction of costs and the closure of small schools. Those who advocate cost-savings highlight the high costs of keeping small multi-grade schools open, the cost-efficiency of transporting children to adjacent schools and, sometimes, the negative achievement and social effects of multi-grade on students. Those who resist the policy stress the role of the primary school in the life of the community in general as well as the benefits, especially social, for the children who study in a multi-grade structure. Sometimes the debate is pedagogic; sometimes economic. Members of the teaching profession discuss ideal ways of organising all schools and not simply those serving low and declining school-age populations. In the discussion multi-grade teaching is presented as a powerful pedagogical tool for promoting independent and individualised learning. In England and Wales for example the 1966 Plowden report was influential in encouraging "vertical grouping" as an alternative to "horizontal grouping", especially across the first three grades of primary education. The pedagogical argument was based on the possibilities for social development as well as peer and cross-age learning among children aged 5-7 years.

In Newfoundland and Labrador in Canada the debate is contemporary. Some argue that multi-grade classrooms are exciting and challenging arenas for learning, and potentially viable sites for high quality education; while others cast multi-grade classrooms as "unfortunate remnants and reminders of times past" in which children cannot possibly receive an education equal in quality to that provided in mono-grade classrooms (Mulcahy 1993). In Sweden, the general attitude to multi-grade is positive and many primary schools appear to be adopting multi-grade teaching out of choice. The heads of the 35% of primary schools which engaged in multi-grade teaching in 1987/8 reported a range of initial motivations for multi-grade teaching. Forty four per cent said that their initial motivation was purely educational, 35% purely resource-oriented and 20% a mix of both educational and resource reasons (Malmros and Sahlin 1992).

The general debate in the literature from industrialised countries is usually couched in terms of multi-grade vs mono-grade. Furthermore, because there is a high degree of congruence between age and grade in educational systems in industrialised countries the terms multi-age vs mono-age appear regularly in the literature on multi-grade teaching.

In developing countries the debate also arises in the context of rural education and small populations, but these are often school-age populations which are growing rather than declining. General population growth and increased participation in schooling among communities which have not yet achieved universal access to primary education give rise to schools which tend to be located in areas where access to the next school is difficult, where facilities are already extremely limited and to which teachers generally do

not wish to be posted. Because children tend to enter school at different ages and because promotion from grade is often non-automatic, there is often a lack of congruence between age and grade. The characteristics of comparison groups vary. Sometimes comparisons are made with mono-grade schools, sometimes only rural mono-grade schools, sometimes with schools which purport to be mono-grade but which have fewer teachers than grades and sometimes with schools where there is only one teacher for all grades.

Only rarely does the debate arise in developing countries as part of an educational discussion amongst the teaching profession about the ideal way to organise all schools rather than those serving children in difficult rural areas. In general, multi-grade is viewed by the teaching profession as a second-class solution to educational problems which beset disadvantaged communities. Cost-savings often feature in the discussion, though usually in response to questions raised by agencies external to the country which are considering lending or aiding educational development. And in contrast to the cost arguments rehearsed in North America and Europe, multi-grade is often presented as a strategy for rather than against cost-saving.

In the sections which follow the findings from industrialised countries will, generally, be separated from those from developing countries. Wherever possible the broader policy and educational context of the research will be noted. The majority of research studies located for this review focus on the cognitive and non-cognitive outcomes of multi-grade teaching for students and on the costs of multi-grade.

Cognitive Outcomes

North America

Evidence from North America on the cognitive outcomes of multi-grade compared with mono-grade suggests that children perform no better and no worse in multi-grade classes. Pratt (1986) reviewed thirty experimental studies conducted between 1948 and 1983 in the United States of America and Canada. In view of the high degree of congruence in North American schools between age and grade the "multi-grade" classes were described as "multi-age" classes. All the "multi-age" classes contained a range of 2-3 years and the achievement variables studies were usually reading and mathematics scores on standardised tests. Pratt notes that many of the studies suffer from imperfect control of differences between teachers and schools which elected or rejected multiage grouping. Too few of the studies reported sufficiently complete data to allow more than a counting procedure for summation of the results. (Pratt 1986:113)

Of the 30 studies reviewed 13 showed inconclusive results, 10 favoured multiage classes and 5 favoured monoage classes. However, eight of these studies were doctoral dissertations which, Pratt argues, are likely to be relatively rigorous in their design. Five of the 8 generated "inconclusive results, 1 favoured mono-grade and 2 multi-grade. Miller (1991) confirms this general picture with a review of 21 studies from the US which suggested that students in multi-grade classes performed as well as students in mono-

grade classes. The reviews of neither Miller nor Pratt contextualise studies in time or place.

England

Rather less research on multi-grade and mono-grade teaching has been reported from England. In a study conducted shortly after the publication of the Plowden Report advocating vertical grouping, Mycock (1967,1970) compared the academic achievement of children in two vertically grouped "infants schools" with two which were horizontally grouped. She found no difference between the groups in terms of vocabulary growth, reading accuracy and mathematical skill. Ford's (1977) review of the effects of multi-grade on cognitive development would confirm this. Both Mycock and Ford do, however, find differences in favour of multi-grade on a range of socio-emotional factors which will be referred to in the next section.

Further research was stimulated in the 1980s in response to a survey of primary education in England published in 1978 by Her Majesty's Inspectors (HMI). This survey was carried out at a time when a fall in the numbers of children entering primary school had led a number of schools to adopt vertical grouping. The HMI report (1978) highlighted a number of problems with this type of class organisation and suggested that 9 and 11 year old children achieved more highly in mono-grade than in multi-grade classes. They also suggested that teachers in mixed-grade classes were less able to judge the ability levels of students and to match tasks to these levels.

The findings of the HMI were accepted uncritically by Government Ministers and used as a basis for national policy which rejected mixed-age classes as an acceptable form of classroom organisation (Bennet, Roth and Dunne 1987). Nonetheless, falling rolls continued and "headteachers found themselves in the invidious position of having to implement mixed-age organisation because of falling rolls despite educational and political pressure not to do so" (Bennet et al 1987:43). However, as Bennet et al point out

it is always dangerous to base policy on the findings of one study since no piece of research is perfect, and the HMI survey was no exception. Four methodological problems are apparent

1. No attempt was made to differentiate between different kinds of mixed-age class; classes with a few children of a different age group from the majority were treated in the same way as classes containing equal proportions of children of three or four age groups

2. Achievement scores were found to be significantly poorer in inner-city schools but HMI did not indicate whether there were more mixed-age classes in such schools. If there were, the link between mixed-age and achievement may not in fact be caused by mixed-age classes

3. Assessments of the match of task and child were based on the judgments of a large number of HMI. Questions must therefore be raised about the consistency of such judgments and the criteria used

4. Doubts must also be raised about the validity of the standardised tests used given the marked differences in curriculum which children follow...The extent to which the items of any test will match the actual curriculum taught will therefore vary widely

(Bennet et al 1987:43)

This study by Bennet et al study focused on the extent to which teachers were able to cater for the extremes of ability within their classes. The study examined in detail whether teachers in 12 mixed-age and 9 mono-age classes could provide suitable learning tasks for the three highest and three lowest ability children in their class. They found that teachers in all the classes tended to direct the content, level and pace of work towards the average, and, in consequence underestimated the abilities of the high attainers were overestimated those of low ability. Although this finding confirmed a trend identified for some teachers in the HMI report it refuted the claim that teachers in mono-grade classes behaved differently.

Colombia

In chapter 2 the characteristics of Colombia's Escuela Nueva - the New School programme - were described. Its key features are a multi-grade organisation allowing flexible, rather than automatic promotion, a rural-oriented curriculum and instructional materials designed for self study and individualised learning. An evaluation conducted in 1987 by the Ministry of Education in Colombia examined the achievement of grade 3 and grade 5 students in Maths and Spanish among a sample of 3,033 students drawn from 168 Escuela Nueva and 60 traditional rural schools. The "traditional" schools are described as mono-grade, following a national curriculum, providing no special attention to slow learners and not stimulating the students through special materials (Psacharopoulos, Rojas and Velez 1993, Colbert, Chiappa and Arboleda 1993). The mean scores showed that the grade 3 Escuela Nueva students scored higher in Spanish and Maths. Grade 5 students scored more highly in Spanish, but there was little difference in Maths. However, as Psacharopoulos et al (1993) point out, differences in gross means can disguise the effect of a wide range of factors on school achievement. The data were then reanalysed using an education production function in which a number of student, family, school and teacher characteristics were examined. These characteristics were

student - age, gender, repeater, works, hours watching TV

family - economic level of region, books at home, TV and radio at home, homework help

school - type of school, student-teacher ratio, electricity access, number of supervisory visits

teacher - gender, years of experience, educational background, residence and pay

Several of these factors had independent effects on achievement scores. For example, the scores of male students were higher than those of females in Maths; females performed better than males in Spanish; repeaters scored lower than non-repeaters. University graduate teacher had higher scoring students; so too did those teachers who resided at the school. Nonetheless, taking all these factors into account, the effects of school type on the achievement of students - i.e. whether the student was enrolled in an Escuela Nueva or a traditional school - remained strong.

While the results of the analysis are compelling, several methodological puzzles remain. The first is the issue of "repeating". One of the variables in the model is repetition, and data are produced on repetition for both the Escuela Nueva students and "traditional school" students. The authors do not explain what repetition means in the context of Escuela Nueva where students work through self-instructional materials at their own pace. The second is the issue of comparison. Although the composition of teachers and grades in the traditional schools was not described by the authors, it appears that the comparison group consisted of students from at least three different types of school (i) unitary schools, with just one teacher for all grades, (ii) mono-grade schools, with one teacher for each grade, and (iii) schools with fewer teachers than grades (Velez personal communication). However, the analysis has not separated the groups in this way, and it seems important to know whether the benefits of multi-grade remain when compared with all three types of traditional school. Third, and related to the first, is the issue of selectivity of the students in the samples. Because Escuela Nueva enables students to advance on the basis of mastery of module learning units rather than an assessment across a whole year, students advance at different rates. One student may spend sixteen months covering the modules equivalent to grade 3 while another may spend only seven months covering the same work (Velez, p.c.). Advancement is determined by unit mastery. Certainly the higher average age of the Escuela Nueva students classified as grade 3 and grade 5 students is consistent with this possibility. We are not told how the Escuela Nueva mastery assessment system operates, but we do know in general that mastery-oriented schemes of assessment require higher levels of performance from each child than the norm-referenced assessments which characterise much internal school assessment. Is it possible then that the average achievement of students entering a new grade in the traditional schools will be lower than that of Escuela Nueva students because of the nature of the assessment? This is a fascinating possibility which deserves further exploration, not only because of its implications for the evaluation of Escuela Nueva and other multi-grade systems, but also because of its implications for assessment and achievement within primary education systems more generally.

Indonesia

A study of the Indonesian "small schools" project, designed to help multi-grade teachers, is reported by Bray (1987). He reports that of 1,300 primary schools in Central Kalimantan, 460 have only one to three teachers. Self-study materials were developed

for grades 4 to 6 and other types of material were developed so that adult volunteers could work with some children, releasing the teachers to work with children with particular difficulties. He reports that "the project students performed better in most subjects than did other students" (Bray 1987:43). However the study is not referenced and we do not know the characteristics of the comparison group.

Other studies from Indonesia also report achievement gains arising from multi-grade teaching. A 1975 evaluation of Proyek Pamong, described in Chapter 2, compared the performance of seven Proyek Pamong schools with seven "control" schools in rural communities similar to those served by the Pamong schools. Students were compared on conventional district inspectorate tests and block tests linked with self learning modules. Before the experiment began there were no differences in performance between the two groups. Not surprisingly the Proyek Pamong students performed better on the block tests. Grade 4 students performed better on conventional tests designed by the district educational administration, and grade 5 students performed no worse (Proyek Pamong 1975). However a thorough analysis of several Pamong evaluations some years yielded inconclusive results (Thiessen quoted in Cummings 1986). At the same time Cummings notes that

With hindsight it is apparent that the tests used in many of these studies, being based on the conventional curriculum, did not adequately test the material taught on the PAMONG schools. Also, teachers in both PAMONG and non-PAMONG schools were known to manipulate scores

(Cummings 1986: 90)

Philippines

Positive results from the Philippines Project IMPACT were reported frequently (eg INNOTECH 1978) but Cummings (1986:89) cautions readers to interpret the results with care. He raises questions about the background characteristics of the comparison non-IMPACT schools and students. The educational and socio-economic levels of the students attending IMPACT schools were generally higher than those of students in the non-IMPACT schools and the teacher characteristics more favourable. The cognitive achievement scores were generally higher for grade 4 students but showed no differences for students in the higher grades.

Non-cognitive outcomes

Much of the evaluation research referred to above also examined a range of non-cognitive outcomes of multi-grade teaching, including friendship patterns, self-concept and esteem, social development, work and school attitudes and civic behaviour.

North America

The non-cognitive outcomes examined in Pratt's (1986) review include children's friendships, self concept, altruism and attitude to school. Summarising the studies on friendship patterns he notes

the general picture that emerges.....is one of increased competition and aggression within same-age groups and increased harmony and nurturance within multiage groups

Overall he claims that social-emotional development of children is either accelerated in multi-age groups or shows no difference. He located fifteen studies between 1948 and 1983 which studied the effects of multi- and mono-age grouping on socio-emotional variables, most commonly self-concept and attitude towards school. Nine of the 15 favoured the multi-age groupings, none favoured the conventional grouping, while 6 were inconclusive. Reviewing in more detail the 7 doctoral theses he finds that 3 favoured the multi-age groups while 4 yielded inconclusive results. Miller's review (1991) also indicates a number of favourable outcomes of multi-grade teaching. Citing his previous review of 21 "quantitative studies" he claims

in terms of affective measures...multi-grade students out-performed their single grade counterparts at a statistically significant level.

He also reviews a number of "qualitative studies" which do not include comparisons with mono-grade schools. Among the positive benefits of multi-grade he cites social interdependence, independence, community involvement, self-reliance and cooperation. Ford's (1977) review lists a number of claims which have been made for multi-grade, among them

a greater sense of belonging and confidence; relationships with a wider age range of children; well adjusted personality; good work attitudes and high aspirations; better teacher-student rapport; low stress; stronger self concept of older, slower students; and better personal and social development

However she challenges a number of these through reference to studies mainly from the US, but also from the UK. She claims that the research findings are mixed on the reduction of anxiety levels, friendship patterns, and on personal and social adjustment. She confirms support for more positive self concepts and greater self-esteem, benefits from a lengthened teacher-pupil relationship, more positive attitudes to school and better attitudes to work. However she also points out that there are important differences between the UK and the US practices of multi-grade which can influence findings. For example UK multi-grade classes tend to cover a wider age range than in the US, and pupils in UK multi-grade classes tend to spend more years with the same teacher.

England

Although Mycock's (1967) study of two vertically and two horizontally-grouped infants classes in England did not show any difference in measures of cognitive achievement, there were a number of differences in socio-emotional development. Children in the vertically-grouped classes experienced less stress on admission to school and a greater speed of socialisation into the school culture, a greater range of social interaction, better work attitudes, a closer and more secure relationship with the teacher and higher levels of aspiration on specific learning tasks.

Colombia

The Colombian studies referred to above also examined the effects of Escuela Nueva on measures of creativity, civic behaviour and self-esteem. Early evaluations had credited the programme with positive effects on self-esteem and civic behaviour, but had found no difference between students in the Escuela Nueva schools and the traditional schools on measures of creativity (Colbert et al 1993). The more complex analysis of the same data performed by Psacharopoulos et al (1993) confirmed the positive effect for civic behaviour and null effect for creativity but not the positive effect for self-esteem. The factors which seemed to affect creativity positively were whether a student was older, had work experience, had not repeated a grade, had a TV at home, and was taught by a male teacher with higher pay, years of experience and who lived in the school. The factors which seemed to affect self-esteem positively were whether a student was older, female, a non-repeater, access to more books at home, was taught by a teacher without a university degree or by a teacher who lived in the school.

Indonesia

Cummings summarises the research from the Proyek Pamong experience in Indonesia and cites a study of the effects of Pamong on study habits, self confidence, initiative and cooperation. Although the study reported significant positive effects Cummings suggests that the analysis was flawed, making it difficult to draw confident conclusions about the effects of Pamong on the attitudes of students. Bray's (1987) brief account of the Kalimantan small schools programme suggested that children in multi-grade small schools working with self-instructional and programmed material, were more self reliant than children in mono-grade schools.

The APEID Studies

The UNESCO/APEID study referred to earlier synthesised findings from country reports on multi-grade from twelve countries in the Asia and Pacific Region. The study listed four advantages of multi-grade teaching situations, all of them non-cognitive:

- students tend to develop independent work habits and self study skills
- cooperation between different age groups is more common resulting in a collective ethics, concern and responsibility

- students develop positive attitudes about helping each other
- remediation and enrichment activities can be more discreetly arranged than in normal classes

(APEID 1989:5)

It is clear from the country reports that these advantages represent the views of conference participants and are not grounded in systematic study. At the same time it is important to note that they stress the non-cognitive advantages and make no claims for the cognitive. This is consistent, in general, with most of the findings reported above, save perhaps those of Escuela Nueva, which claims superior cognitive outcomes for multi-grade schools. The claims about independent study, cooperation and socio-civic behaviour attract some support from a few studies in the US and Colombia. However in general, systematic data on non-cognitive outcomes from multi-grade settings in developing countries are so few that it is difficult to substantiate the APEID claims through an appeal to the findings of research.

Thomas and Shaw's (1992:11) summary of the effects of multi-grade draws on some of the studies above but also includes studies from India, Pakistan, and Togo. Although their generalised claims are a little incautious, few could disagree with the gist of their concluding lesson although somewhat scanty, the evidence emerging from the developed and developing worlds leads to the conclusion that multi-grade schools are just as effective as single grade schools in educating students. In some cases, students have attained higher levels of achievement in academic subjects as well as in social-civic indicators than their single grade counterparts. Peer tutoring, repetition, self learning and improved opportunities for socialisation are important ingredients for success. More importantly students in multi-grade classes "learn to learn".

One may conclude that when programs are correctly implemented, students may attain higher achievement levels and improve social skills. But students in multigrade schools which fail to adopt effective pedagogical techniques tend not to perform as well as their counterparts in single grade schools. The lesson to be drawn from this is that in order for a multi-grade school work well teachers must master and use effective teaching practices, be supported through training programs, and have appropriate texts and materials at their disposal.

The Costs of Multi-grade

The high costs of maintaining small multi-grade schools in North America and Europe has often been used as a rationale for closing down small schools. The costs of transporting, and sometimes boarding students at mono-grade schools are offset by substantial savings on teacher and ancillary staff costs and maintaining buildings and lands. The need to reduce costs often leads to the closure of the multi-grade school. In developing countries, on the other hand, the cost argument is rather different. Multi-grade schools are presented as way of offering cost-savings, especially in situations where school-age populations are growing. As Thomas and Shaw (1992:8) point out

among the most obvious costs of setting up a multi-grade classroom are: furnishing and equipping the classroom, and providing self-learning materials and textbooks. Gains can be expected in terms of increased efficiency of the system resulting from lower repetition and dropout, and more efficient use of human and capital resources. It would not be unusual for expenditures in a multi-grade school to result in higher costs per student but lower costs per graduate, thus resulting a cost-efficient option. The approach becomes cost-effective when it results in increased achievement

The few studies of the costs of multi-grade have almost always been conducted in the context of foreign-funded support for education and most appear to indicate that multi-grade is not a high-cost strategy for rural schools, especially when compared with mono-grade schools in similar settings (eg Cummings 1986:91-92 Psacharopoulos et al 1993:275, Colclough with Lewin 1993:130-2,138). Psacharopoulos et al (1993) point out that the quality benefits of the Escuela Nueva programme were achieved at a unit cost per student just 5-10% higher than those in traditional rural schools. They urge a degree of caution in interpreting this result, and point out that a full cost study has not yet been carried out. The cost of teacher training in the Escuela Nueva programme for example was three times higher than traditional teacher training. However, the question that must always be borne in mind when evaluating results and comparing within and across countries is the nature of the comparison, both in the short and the long-run. For example, should the cost and quality benefits of multi-grade in the Escuela Nueva programme be compared with traditional rural primary schools in Colombia, or with schools in urban centres? (Colclough with Lewin 1993:138). Or should the benefits of multi-grade be compared with the outcomes for children not attending school at all, a possibility which, in some countries, remains distinct.

CHAPTER 4: IMPLICATIONS

Introduction

The research literature on multi-grade teaching is unanimous on at least one of its conclusions. For children to learn effectively in multi-grade environments teachers need to be well organised, well resourced and well trained, as well as holding positive attitudes to multi-grade teaching. Yet, as we have seen in previous chapters, many teachers who find themselves teaching in a multi-grade environment are frequently under-resourced, and are often the most under-educated and under-trained teachers in a national teaching force. In this chapter various pointers to action to improve the effectiveness of multi-grade teaching are drawn together. Four documents are particularly useful in this respect. Collingwood's (1991) "Multiclass Teaching in Primary Schools" is a handbook prepared with and for teachers in the Pacific region, with support from the UNESCO Office for the Pacific States. It is extremely well presented and could be adapted for use with teachers in many countries. Abhayadeva's (1989) account of a pilot project in Sri Lanka, carried out with assistance from UNICEF, sets out a number of pointers to action which have emerged at the classroom and teacher level. The UNESCO/APEID (1989) synthesis of country reports also offers advice, at this level, but goes further and sets out implications for curriculum planning at the district and

national levels. This multi-levelled approach is also adopted in Thomas and Shaw's (1992) "Issues in the Development of Multi-grade Schools". Since there is a degree of overlap in the lengthy recommendations which are made in the four documents they will be summarised and synthesised here in the form of questions and possible answers, a format which may be useful both in work with policymakers and practitioners, and in defining developmental research work in this area. To these will be added additional points which arise from the case-studies and research studies presented in chapters 2 and 3.

Although we could start with a series of questions for the teacher in the classroom and work out from there, those initiatives which have had far reaching and lasting effects on the multi-grade classroom appear to have mobilised initiatives and received support from district and national level authorities. Experience suggests that the multi-grade teacher cannot, and indeed should not, be expected to solve the problems of the multi-grade classroom alone. Hence, the list begins with questions for the national-level policymaker.

National Level

1. What is the extent of multi-grade teaching in the country? In what types of schools , and in what locations, is it prevalent?
2. Do the enrolment projections and costs of provision suggest that multi-grade teaching will continue in many schools?
3. What are the qualifications and educational backgrounds of the teachers who teach in multi-grade settings? What are the conditions under which they work?
4. Do nationally-prescribed pre- and in-service teacher training programmes (both face-to-face and distance) include content on effective teaching in multi-grade settings? Do they include content on effective teaching more generally e.g. self-study, peer learning, planning and organisation, alternative ways of grouping students for learning assessment skills?
5. Is multi-grade teaching a recognised field of specialisation in teacher training institutes?
6. Is there provision in nationally prescribed teacher training curricula for the practice as well as the theory of teaching in multi-grade settings? Are there model schools practising multi-grade teaching?
7. Have multi-grade techniques been considered for use in mono-grade settings?
8. Are there material and professional incentives for teachers in multi-grade schools in difficult locations? (eg salary supplements, housing, training opportunities, promotion prospects?)

9. Have attempts been made to structure the content of the national curriculum and all associated curriculum materials (e.g. syllabi, teachers guides) in a way that supports multi-grade teaching? (e.g. integrated subject matter, i.e. teaching the same subject at different conceptual levels; or a modular curriculum, i.e. allowing the student to proceed at his/her own pace through learning modules.) Have such attempts attracted serious support from national-level research and curriculum institutions over a period of time?
10. Have self-study materials been developed for extensive parts of the curriculum? Do these incorporate self-correction and feedback? From which age /grade can they be used? Could textbooks be designed to support self-study? Are textbooks and self-study materials available to students in adequate numbers?
11. Could national-level learning assessment schemes (e.g. minimum levels of learning (MLL), minimum levels of competency (MLC) be used to support the development and structure of curriculum suitable for the multi-grade setting? Do such schemes have implications also for the mono-grade classroom?
12. Have or could adequate resources been allocated to libraries and other materials necessary to support self-learning?
13. Is it practical/feasible to use radio/TV in support of the multi-grade teacher, both in the classroom and in the community i.e. as a tool for student learning in the classroom, and a means of mobilising community support for this way of organising schools and classrooms?
14. Is there an adequate budgetary commitment from government to support multi-grade schools?
15. Is there an understanding among national-level professionals and administrators of the cognitive and non-cognitive benefits of multi-grade teaching? Does more research need to be conducted?
16. Is there an effective mechanism for the regular supervision, monitoring and evaluation of multi-grade schools? Are supervisors supported in their work through training and through materials developed by/with them? Are supervisors expected to "police" as well as to "professionally guide" principals and teachers? If so, how are they expected to handle the conflicts inherent in the duality of the role?
17. What are the recruitment criteria used to select supervisors of multi-grade schools? Do they have any experience of teaching at the primary level, let alone multi-grade primary? How might they gain this experience? What steps might be taken to promote into multi-grade supervisory positions those teachers who demonstrate prowess in this work?

Regional/District Level

Systems of education vary in the division of roles and responsibilities between national and sub-national levels of administration. Consequently many of the questions listed above may apply equally to policymakers and practitioners working at the regional or district levels. The following may also apply.

1. Are there mechanisms in place at the regional and sub-regional levels which can support the pedagogy of multi-grade teaching? Are there resource centres where teachers can meet and share experiences? Are there regular and frequent newsletters developed by multi-grade teachers for multi-grade teachers? Are there local radio networks and/or distance learning schemes which can support the teacher in the field?
2. Are there generally held guidelines on effective multi-grade teaching? Are guidelines developed with teachers on the timetabling of multi-grade teaching?
3. Are there administrative tasks which face the multi-grade teacher in difficult areas which could be handled more effectively by local education offices e.g. arrangements for delivery of materials, building repairs, monthly payments?
4. Are there ways of supporting horizontal linkages between schools so that teachers may learn from each other in situ, visiting and working in each other's schools, combining schools for cultural and sports events, competitions etc?
5. Are there ways of stimulating horizontal linkages with local community members so that assistant teachers and volunteers can support the work of the multi-grade teacher?
6. Are professional and regional level staff aware of changes at the national level which support the multi-grade teacher? (e.g. through changes in curriculum teacher training , criteria for promotion etc?)
7. Are there promotion and repetition policies at the regional level which are sensitive to the organisation of multi-grade classes?

Teacher/Classroom Level

1. Are teachers aware of the different ways of organising the multi-grade classroom? (eg subject staggering, subject grouping, common timetable, integrated day?) Are teachers able to discriminate between optimal ways of organising the teaching of different subjects?
2. Are teachers given guidance on syllabus coverage across the day, week, term, school year in multi-grade settings?

3. Are teachers familiar with the pedagogic advantages (both cognitive and non-cognitive) of multi-grade teaching? Are teachers able to convince parents of the advantages?
4. Are teachers able and willing to encourage self-study and peer learning in multi-grade settings? Do teachers have access to enough high quality materials for self-study and peer learning? Do teachers have the possibilities of creating their own materials for self-study and peer learning?
5. Do teachers have access to effective and practical means for assessing learning outcomes in multi-grade settings on a regular basis? Do those assessments enable teachers to set learning tasks of an appropriate level for students on an individual basis?
6. Are teachers aware of the variety of ways of grouping students for learning (e.g. whole class, subgroups, pairs, individuals?) and of different criteria for subgroups e.g. by achievement, interest, friendship?
7. Have teachers established classroom routines so that learning may continue even in the absence of the teacher (e.g. through the use of student monitors and access to self and group-learning activities?)
8. Are teachers sensitive to alternative ways of using space and arranging resources inside and outside the classroom for multi-grade groups?
9. Are teachers able to request support from higher levels of authority for problem-solving in relation to multi-grade teaching?

Summary

The questions above may be regarded as a checklist of use in both assessing the present status and support for multi-grade teaching, and stimulating discussion at different levels of the education system about improved ways of supporting the teaching of the multi-grade teacher and the learning of the multi-grade student. As well providing a useful framework for dialogue between policy-makers and practitioners, each could also usefully provide a framework for further developmental research.

The questions pitched at the level of the teacher and the classroom are particularly amenable to action research by teachers and teacher educators. Action research is distinguishable from other types of research in a number of ways. Action research is a form of self-reflective enquiry conducted by educational practitioners to understand practice and improve it. It may be undertaken by an individual practitioner or undertaken collaboratively. It involves the definition of a problem and the trying-out of an idea with a view to changing or improving a local or immediate situation.

The questions pitched at the level of the regional or national authorities are also amenable to action research by practitioners and policymakers working at this level. In

practice however few have the time, resources, skills and interest in conducting the type of research which has implications which go beyond their immediate and local environment. In such situations "outside" researchers can play a useful role, especially where "insiders" are interested in seeing the research conducted. Research may usefully be seen as an extension of the process of dialogue.

It is also important to understand that not all useful research is executed quickly, nor are research results immediately applicable. Reluctant national authorities may sometimes need evidence provided by long term evaluation research of the kind reported in the Escuela Nueva programme if they are to promote national level reform. Teacher education institutions may need a critical mass of staff members who have conducted longer term research on multi-grade teaching and associated strategies (e.g. self-study, peer-learning), or who have direct experience of working in these settings, if they are to carry conviction with teacher trainees about this way of organising learning.

Teacher education institutions and university departments of education are members of national and international academic and professional hierarchies which legitimise some types of knowledge as more valuable than others. It is symptomatic of both these hierarchies that the realities facing the multi-grade teacher world-wide barely warrant a mention in national and international education research agenda, in priorities attached to training scholarships, in books about the problems of education, in manuals on effective teaching, in information and dissemination networks and in teacher education curricula. This review and the research it will hopefully support in the future are an attempt to reverse this trend.

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