

An Experiment in Teaching  
In Single-Teacher Schools  
In Rural Areas



NATIONAL COUNCIL OF EDUCATIONAL  
RESEARCH AND TRAINING

*An Experiment in Teaching  
In Single-Teacher Schools  
In Rural Areas*

*Studies and Researches in Rural Education*

**An Experiment in Teaching  
In Single-Teacher Schools  
In Rural Areas**

**D. V. CHICKERMANE**



**NATIONAL COUNCIL OF EDUCATIONAL  
RESEARCH AND TRAINING**

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## *Preface*

In rural education the problem of single-teacher schools assumes much importance in view of the large number of single-teacher schools spread over in small villages. A single-teacher school has to face some special problems which multi-teacher schools never encounter, and in view of this some special techniques of work and organisation have to be developed for single-teacher schools. The G.K. Institute of Rural Education undertook to experiment with a plan of work in this respect in 1962-1963 in the single-teacher school attached to it at Gargoti. The same plan was further tried out in twenty single-teacher schools round about Gargoti in 1965-66. This book gives an account of the results of the implementation of the plan in the twenty single-teacher schools.

Both these experiments, the first one on the single-teacher school at Gargoti, and the second on the twenty single-teacher schools in the Gargoti area were financed by the N.C.E.R.T. The G.K. Institute is deeply grateful to the N.C.E.R.T. for the liberal financial assistance given for implementing these projects. The Institute is also grateful to the educational authority of the Kolhapur District which readily agreed to place the twenty single-teacher schools, where the experiment was tried out, under the academic control of the G.K. Institute. This experiment could not have been conducted but for the willing cooperation of the Zilla Parishad of Kolhapur District, the inspecting officers of the Zilla Parishad and the twenty teachers in the single-teacher schools who wholeheartedly carried out the details of the scheme under the guidance of the G.K. Institute. I am personally deeply grateful to Shri M.G. Mali, the Coordinator of the Extension Services, who made a special study of the techniques of this plan and gave valuable assistance in implementing it in twenty schools in the extension area. I am also deeply grateful to Shrimati L.B. Save and Shrimati S.B. Odeyar, who rendered valuable assistance in implementing the scheme, analysing the data and preparing the final report.

Gargoti,  
28 August, 1966

D.V. Chickermane

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## *Introduction to the Problem*

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1        THERE HAS BEEN a rapid expansion of primary education in rural areas. As a result, the number of single-teacher schools has much increased during the past few years. The number is very nearly double of what it was ten years ago. This increase is due to opening new schools in small villages, where the population is less than four hundred. The bigger villages and towns have already been covered with schools. Hence there is not much room for expansion in these towns. For many years smaller villages have remained without schools. But with the introduction of compulsory education, the smaller villages got new schools and because of the small number of children within the age range of compulsion, the only type of school that could be given to these villages was the single-teacher school. Primary schools are staffed on the basis of enrolment and attendance. These figures are low in rural areas and do not justify more than one teacher for one school.

2 The single-teacher school presents to teachers and administrators some special problems, because in these schools one teacher has to manage four classes, while in other types of schools, one teacher is in charge of one class. When one teacher is in charge of one class, he has enough time to teach his class. But when one teacher has to manage four classes, he has to divide his time between these four classes. In these circumstances, a class in a single-teacher school gets less time than a class in a multi-teacher school. The teacher also in a single-teacher school has to devise means to keep the children engaged at work, when he is not teaching the class. These are the handicaps of a teacher in his school work.

3 A teacher in a single-teacher school has to face many difficulties besides these. The village in which he works is very small and educationally backward. People do not realise the importance of educating their children and the attendance in single-teacher schools is generally low. In many schools the attendance is never cent per cent. Usually it varies between thirty and forty percent of the enrolment which by itself is 50 to 60 percent of the total number of children of the school-going age. Irregular attendance is one of the causes of poor progress of rural schools. Parents keep children at home for domestic work or tending cattle. As they can often utilise the services of children for wage earning, they are not anxious to send their children to school.

4 The physical conditions of single-teacher schools are also far from satisfactory. Many schools have no buildings of their own and are housed in public places, as *chavdis* temples, dharamshalas. People visiting these places for private or official work keep on disturbing the work of schools. Those schools that have their own buildings are housed in rented buildings. These buildings were constructed as residential houses, but subsequently rented out to schools. Thus the buildings are unsuitable for school purposes. The rooms are small, ill-lighted and ill-ventilated. The mud flooring is uneven and gets damp in the rainy season. The mud walls are unplas-



tered and the roof leaks when it rains. It is difficult to imagine how the teachers and children can do their work in all types of weather in such conditions. It is only a very few fortunate villages that have constructed their own school buildings according to the departmental plans. In a recent survey of single-teacher schools in the Bhudhargad Taluka, it was found that out of fifty single-teacher schools, only two had well-constructed buildings and others were all housed in unsuitable premises.

5 The third difficulty which single-teacher schools have to face is lack of equipment. Many of the single-teacher schools have hardly any teaching equipment. Teaching equipment is supplied to schools by the educational authority of the area. It is mainly purchased in bulk and distributed to schools. As such bigger schools get most of the equipment and schools which are scattered in the remote parts of the region get very little equipment. Many single-teacher schools have few charts, apparatus or maps for teaching science or geography. Some of them do not have even blackboards. Some of the schools do not possess any kind of furniture. The argument, that these schools have no buildings of their own to store furniture, is often advanced and on this ground no valuable equipment is supplied to these schools. Teachers are also not very anxious to get equipment, because they are not keen on sticking to their jobs in these schools. Thus the schools continue to work in a neglected state. A recent survey of single-teacher schools in Bhudhargad revealed the appalling condition of these schools.

6 We have mentioned the difficulties of single-teacher schools under two heads, viz., teaching and physical. A teacher may not be able to do much in removing the physical difficulties of schools, because this requires both finances and public cooperation. The public and the department will have to provide funds for improving the physical condition of schools. The public in small villages is apathetic towards education and is not interested in paying for school impro-

vement. On the teaching side, however, a teacher can do much to improve the academic standards of single-teacher schools by adopting special techniques. He can devise methods by which children can be made to work and learn even when he is not teaching them. A teacher, who knows such techniques, can implement them in his schools and thus get good results in single-teacher schools. The problem which needs immediate attention is the improvement of single-teacher schools in teaching practices.

7 An experiment in this connection was undertaken in the local single-teacher school at Gargoti in the year 1962-63. The experiment, which was financed by the NCERT, was intended to draw up a detailed scheme of work in single-teacher schools. The plan of work and the techniques used in the experiment will be explained in the second chapter of this report. The school adopted for one year the experimental method. The other single-teacher schools in the area formed the control group. A set of tests was devised to evaluate the experiment. These tests were given to schools in the experimental and the control group at the end of the year. A comparison of the results revealed that the children in the experimental school were better informed and showed better progress than those in the control schools. A detailed report on this experiment was sent to the NCERT.

8 It was then pointed out that the success of the experiment can not be judged from one school. The school selected for the experiment had very fortunate circumstances. It has its own building, a trained teacher, close supervision and guidance from the institute conducting the experiment. Such conditions do not obtain in all the single-teacher schools. The question posed was whether the method devised for the experimental school can be extended to most of the other schools satisfactorily and whether in that case, the other schools would also respond with better results. It was, therefore, proposed that the experiment should be extended to a fairly large number of schools in a compact area and the results evaluated. The

compact area selected for this purpose was the primary schools extension services area of Gargoti. Fortunately the G.K. Institute was in charge of the extension services for primary schools at Gargoti centre and this area had in it twenty single-teacher schools scattered all over. They could be brought within the scope of the experiment and the results evaluated. The NCERT accepted this proposal and provided funds for the expansion of the experiment over twenty single-teacher schools in the Gargoti area.

## *Gargoti Plan of Work in Single-Teacher Schools*

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1 In the previous chapter the circumstances which led to the experiment on single-teacher schools, originally conducted in one school, being extended to twenty schools in the Gargoti area have been described. The plan of work, which was formulated for the local single-teacher school was tried out in twenty mofussil schools. It is now necessary to explain this plan in outline. Subsequent to the formulation of this plan, plans also were being drawn up elsewhere. Recently a plan of work for single-teacher schools, drawn up in Srinagar, and another also at Bhopal were shown to me. For convenience the plan of work that was tried out by the investigator will be known in this report as the "Gargoti plan." There is nothing special or extraordinary about this plan. The name given is intended to delimit the plan tried out at Gargoti from plans tried out or formulated elsewhere.

2 In any plan of work mere framing of the scheme is not enough. In fact the framing part of the scheme is not the material part, when compared with the actual implementation. Schemes can be framed without much difficulty. The time-table of single-teacher schools can be obtained and recast in any manner according to the design of the experimenter. Some of the schemes designed are nothing more than mere time-tables with varying quota of periods for the subjects taught in single-teacher schools. But the actual working of the schemes should be tested. It is only then that we can know what the handicaps of the scheme are and modify them accordingly. No scheme, however excellent it may be, can be accepted as workable unless it is tried out in a fairly large group of schools. It was on this ground that the Gargoti plan was first tried out in one school and then tried out in twenty more schools. Thus it went through two phases. The first phase was the local school and the second phase was the mofussil school.

3 Before outlining the plan it would be necessary to explain the basic assumption on which the plan is built up. These assumptions will help a clear understanding of the plan and also supply the reasons for special steps taken during the plan. The first assumption underlying the plan is that the single-teacher school is one compact unit formed by the four grades. These grades are not to be treated as independent classes, but only a group. Children in these classes form one unit. They come from the same area. The unit is so small that the children stay together, work and mix with one another, within and outside the school. Their classes are separated only by an imaginary wall. The children know what is taught in other classes. They overhear the work done in the neighbouring classes. Sometimes they visit these classes. As such, any method of teaching or plan of work introduced in the single-teacher school should take into account this peculiar situation. Grade I in a single-teacher school is not on a par with Grade I in a multi-teacher school. This group character of a single-teacher school should be preserved and fostered in any plan of work. The time-table should provide for group

work in which all the classes will share, also individual work in which only one class will share. In other words there should be a vertical division and each vertical division, known as a house, should consist of children from all the four grades. A house will have in it children from fourth grade, from third grade, second grade and first grade. The children will vary in age range, but the mean age for each house will be nearly the same. The second type of grouping will be horizontal in which each class will form a group. This kind of grouping will be known as grade grouping. The plan of work should be suitable for grade grouping, as well as house grouping. There will be some activities, which will be performed house-wise and there will be others, which will be performed grade-wise. Thus the grouping will ensure the character of a single-teacher school.

4 The second assumption regarding the programme of work in single-teacher schools pertains to the type of work to be done. The present tendency has been to emphasise academic teaching. A cut and dried time-table, rigidly fixing periods one after another, indicates the academic nature of work. The primary school stage is a stage of transition. Before the child comes to school, he lives in a free and pleasant atmosphere. He is free to move about and work according to his will. There is not much restraint on his freedom, except when he becomes a source of nuisance to others. From a free atmosphere, the child comes to the school. Here his freedom is curtailed and he is yoked to rigid classroom work. The change is sudden and rapid. This change deters many children from coming to school. It is, therefore, necessary to make the change to school work gradual. The programme of school work, in the beginners' classes, should be full of activities, sports, games, singing, garden work, play, excursions, dramatization, etc., so that the child will not feel that he is moving in an entirely alien atmosphere. His activities should become the vehicles of knowledge. Knowledge should come incidentally and gradually from these activities and there should be

some period available for systematization of this knowledge. We should not take the view that a single-teacher school is a place where a child should recite lessons and do sums. It should be looked upon as a place where the child will learn useful skills and get knowledge through games and sports and a variety of activities including craftwork.

5 The two basic assumptions underlying the plan of work for single-teacher schools have been mentioned above. The first relates to grouping and the second relates to activity programmes. The third assumption is related to the provision of individual work in the time-table. This forms a major part of the work in a single-teacher school. In a single-teacher school, unlike multi-teacher schools, one teacher has to teach four classes. This means that he can devote one-fourth of his time to teach one class. What are the children to do in the remaining three-fourths of the time available in the school time-table? Provision for individual work will be necessary to keep the pupils engaged during the remaining three-fourths of the time. This individual work will be in the form of assignments based on the work done in the class. Children will be engaged in individual work, in working out assignments, though the teacher is not present. This is a kind of training in individual work which has to be developed by gradual practice. The single-teacher school programme should include in it a fair amount of assignment work for pupils.

6 The fourth assumption underlying the Gargoti plan of work for single-teacher schools is related to the timings of schools. Children attending a single-teacher school of the age range of 7-11 are not accustomed to continuous work. Fatigue sets in very quickly. These children cannot hold their attention on any subject for a long time. A suitable time-table of work is necessary for efficient work in these schools. What should be the duration of the periods of work, recesses and school timings in single-teacher schools? These have to be fixed up taking into account the local circumstances. A hard and fast rule will not be applicable everywhere. The single-

teacher schools are located mostly in small rural areas. The working hours of rural people, who are mostly agriculturists, are morning and afternoon. The farmer avoids the midday heat for work. He uses it for rest. On the same analogy, the Gargoti plan required shift working of schools. There will be one session in the morning and the second session in the afternoon, leaving the midday as recess for rest. The duration of periods will be roughly one-quarter of an hour each, though rigidity is not insisted upon. The teacher will fix his duration, which may change according to the level of the classes and the type of work to be done. He is the only teacher in the school and there is no one to ring the bell. So he can adjust his timings to the type of work to be done.

7 The morning and afternoon sessions have some specific advantages. First, there is a long recess between the two sessions. A long recess will help to remove fatigue among children. The teacher also will have enough rest and leisure to write out the assignments for the afternoon sessions. In single-teacher schools provision of assignments for individual work is an essential part of the day's work and is necessary for the teacher to have some time when he can do his work. The midday recess will give him some time for preparing and presenting his assignments to his pupils. This is the second advantage. A third advantage is in respect of health. Children will get rest and sleep after their midday meals. They have not to work on full stomachs, as they would be required to do if there is one long session.

8 The four assumptions underlying Gargoti plan are summarised below :—

(i) The grouping of pupils in the single-teacher school should be house-wise and class-wise so as to maintain the unitary character of the single-teacher school.

(ii) The programme should consist of a variety of activities which will lead on to knowledge.



(iii) There should be provision for individual work through assignments.

(iv) The timings should eliminate the effect of fatigue and be adjusted accordingly.

9 On the basis of these principles, the Gargoti plan was drafted. The outline of the plan follows. It was implemented during the year 1962-1963. The Gargoti single-teacher school had on its rolls forty children taught by a trained teacher. The school had at its disposal one room supplemented by a small verandah and a few shady spots in the yard just outside the school. These also could be used for class purposes during fair weather. The school children were grouped into four grades. This was according to the school register. These grades were grade I, grade II, grade III and grade IV. The grading was supplemented by house grouping. Forty children were grouped into four houses. Each house was made up of ten children drawn up from all the four grades. Thus there were two types of grouping, grade grouping with the mean age of 8, 9, 10 and 11 respectively for grades I, II, III and IV. There was also the house grouping with the mean age of 9.5 years for each house. Each class and house had its elected leader. The seating arrangement was organised differently for both these patterns. For grade grouping each grade was assigned a semi-circular place in each corner of the room. The class had its blackboard leaning against the wall facing the class. For teaching purposes this type of seating arrangement was adopted in the school. But for house-wise distribution each house sat against a wall leaving an open space in the middle for activities. This formed a quadrangular type of seating arrangement. The children were given plenty of practice in changing from house distribution to grade distribution, so that the change would involve no disturbance in class work. Such changes would be frequently necessary in the course of the day's work. When the programme would be based on activities, house grouping would be necessary. But when the programme is based on teaching, class grouping

is necessary. Frequent interchange of these groupings would depend upon the type of work included in the time-table. But there would be a decided advantage by this double grouping, since the children of all the four grades would be brought together very closely and this close intercourse would promote a feeling of unity among the children.

10 Coming to the programme of work, the same could be taken under three heads. First, there would be activity programmes. The importance of including activities in a large measure in the programme of work of single-teacher schools has been pointed out. There will be such activities, as school cleanliness, storing water, health parades, prayers, assembly, news reading, and news writing, story telling and dramatization, gardening, clay work, paper work, games and sports. These free activities will be the vehicles of knowledge. Children will go out in the village and will see institutions and places of educational and commercial importance. These together with activities will supply the knowledge element of the course. This will be the second phase of the programme of single-teacher schools. Activities, by themselves, have little value, unless they lead on to teaching purposes. The class room teaching should make use of activities. This will lead on to the third aspect of assignments. Assignments are done by pupils when the teacher is engaged in teaching other classes. They are based on the matter taught. In a programme of single-teacher schools, these three aspects, activities, knowledge and assignments, are linked into one unit, one leading on to the next. Activities will lead on to knowledge and knowledge will lead on to assignments. Activities will be done by houses and teaching and assignments by grades.

11 The school timings in the model single-teacher school were arranged on the principles which have been explained earlier. There was a double shift. The first session lasted from 7-30 A.M. in the morning to 10-30 A.M. The second shift started at 3 P.M. and continued till 5-30 P.M. There was thus a long recess of four and a half hours, from 10-30

A.M. to 3 P.M. In the morning session children worked on activities. They were grouped house-wise. In the afternoon session children worked class-wise and they did such school subjects as arithmetic and language. During these periods, the teacher would engage a class for a short time since he had to distribute the whole hour of 60 minutes allotted to the subject between four classes. Accordingly the remaining period in the hour was utilised by children for assignments. In the afternoon teaching and assignments went on simultaneously. When one class was being taught by the teacher, the other three classes were busy with assignments. Thus there was an alternation between teaching and assignments. The assignments were supervised by the class leader. The teacher wrote them on the blackboard well in advance.

12 Let me enumerate the activity programme of the morning. The first activity with which the school work began was school cleanliness. The school had no servant and cleaning the school room and the verandahs and the premises was done by the students and the teacher as their work. This was consistent with the practice followed in basic schools where the department had discontinued employing servants. This item was not intended to economise school expenditure, but to train the children in self-reliance, inculcate in them dignity of labour and to educate them in the importance of cleanliness in maintaining health. This activity was followed by school assembly and community singing. The prayers, used for community singing, changed every week. They were written on the blackboard and read by students. The prayers were drawn from songs and hymns composed by saints of well known reputation. The substance of the prayer was explained after the recital. The prayers were recited individually and in chorus. The prayers served many purposes. There was the devotional aspect, reading practice, music and singing and an acquaintance with the literature of the language. The students were expected to learn the prayers by heart.

13 The prayers were followed by the roll call. The roll call figures were recorded in a table on the blackboard and

provided practice in arithmetical operations. The roll call was followed by news-reading. News of importance was written earlier by the teacher on a specially designed blackboard. An outline map of India was drawn by the side of the news. The outline map covered half the blackboard and the other half was kept blank for writing the news. The news item was located in the outline map so that the children could know where the news occurred. The news reading served a means of introducing some topics from social studies.

14 The above activities were followed by health parades. Children were required to clean their teeth with the tooth powder prepared in the class as an activity. They washed their faces, clipped their nails, and then proceeded to the small plot of the school garden. They worked on these plots. The plots were about ten feet by ten feet. Each house had a plot assigned to it. Children grew on it leafy vegetables which grew rapidly within a month. All the operations on the plots, such as digging, levelling, sowing, manuring, watering, etc., were done by the children. The harvest was also gathered and the products sold among students themselves. The gardening activity provided plenty of materials for arithmetic, nature study, and weather data in geography.

15 After the gardening activity students assembled in class or in the open space outside the classroom for group activities. There will be some story telling by the teacher with proper intonation and gestures. The story would be dramatised later by pupils. There would also be discussions on some topics of general information. The topic will relate to health and hygiene or some geographical or historical subject. The classes will be listening to discussions which will be common to all classes. Thus the morning session will be utilised mainly for activities and group work. These activities will be the basis of knowledge to be taught in the afternoon session. On Saturday, which is a half-working day, the children will go out for visits and excursions to neighbouring places in the village. These excursions will also provide

enough materials for classroom discussions and teaching. The excursion will be properly planned well in advance and children will be prepared with all necessary details for these excursions before visiting these places. The points to be noted and observed at the time of the visit would be given to children before going out.

16 The afternoon session is to be utilised mainly for class work. There will be two long periods of the duration of one hour each. The first period will last from 3 P.M. to 4 P.M. and the second period from 4 P.M. to 5 P.M. Each of these periods would be broken up into four smaller units of fifteen minutes each. The teacher will engage a class roughly for fifteen minutes and the remaining time of forty-five minutes would be used for the assignments. During that time the teacher will be engaging other three classes by rotation. The first hour will be utilised for arithmetic and the second hour for language. Assignments to be done, when the teacher is not teaching, would be written on the board before the class work starts. For this purpose extra blackboard space would be necessary. This would be provided for each class. There may be one or two roll up blackboards on which assignments could be written in advance. The wall space may be got painted and used for assignments. Some wooden blackboards, painted on both sides, may also be kept in spare so that they could be used for assignments. The class leader would supervise the assignments and the teacher may also visit frequently the classes to see that assignments go on properly. The work done by the children during the assignment period would be checked by the teacher and also the class leaders in the evening when the school is about to close for the day. After the two periods children will play games in the open space available for the school.

17 This in short is the outline of the Gargoti plan which was tried out in one academic year in the local primary single-teacher school. The same plan is now being extended to

twenty schools in the Gargoti area. Hence some details of the plan have been given. In the next chapter we shall consider the sample that was used for the experiment. In the fourth chapter we shall be reverting to the details of this plan as it was being implemented in the twenty schools.

## *Description of the Schools Taken for the Experiment*

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**1** IN THE PREVIOUS two chapters an idea of the experiment, its purpose and procedure has been given. In this chapter a brief description of the sample of single-teacher schools used in the course of this experiment is given. The description will give the readers an idea of the conditions in which many single-teacher schools work in small rural areas. A person experimenting on single-teacher schools should have a clear grasp of conditions of these schools. Many persons, who are accustomed to see schools in big towns and cities, picture the single-teacher school as a school of the same category as the city schools possessing all the facilities available to them. But the single-teacher schools lack several of the essential facilities available to city schools. There is difficulty of transport, housing facilities, medical care, water supply, recreation facilities, marketing, etc. These schools are located mainly in very small villages.

2 A map showing the area in which the twenty schools are located is given below (Figure 1). The twenty schools are shown in dots.

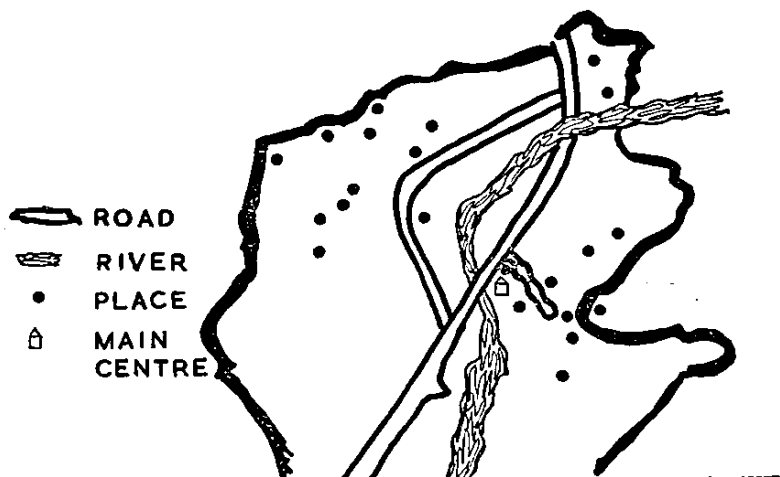


Fig. 1. Map of the Experimental Area

It will be seen that these schools are scattered around Gargoti within a radius of about ten miles. This area is known as the Extension Area of Gargoti. The whole area consists of fifty schools forming a compact block. The schools are assisted by the extension authority and this experiment of single-teacher schools was treated as part of extension work. The schools are under the control of the Zilla Parishad of Kolhapur and the B. D. O. of Gargoti. As such they are supervised by the educational officers of the Z.P. also. For purposes of experimentation, the Z. P. kindly left the academic control of these twenty schools to this institute. It was thus possible to organise a definite programme of work in these twenty single-teacher schools. The teachers in these schools were given orientation about the methods of single-teacher schools and in addition they were called to Gargoti every month for chalking out a plan of work for the month concerned. The plans were evolved by mutual consultation. Proformas for entering the details of the day-to-day work were supplied to schools and they were discussed in the monthly meetings.



Day to day diaries of work done and the assignments given were also kept by the teachers.

3 The first point that may be considered in respect of these schools is the village in which they are located. It has already been stated that the villages are very small and the population of these villages is thin. The table given below shows the frequency of population in these villages.

TABLE 1. POPULATION OF THE VILLAGES WHERE THE EXPERIMENTAL SINGLE-TEACHER SCHOOLS ARE LOCATED

<i>Cl. Int.</i>	<i>Frequency</i>	<i>Cumulative frequency</i>
700-799	1	20
600-699	2	19
500-599	3	17
400-499	3	14
300-399	1	11
200-299	10	10
Total	20	

It will be seen from the table given above that nearly half the number of villages (ten out of twenty) have a popu-

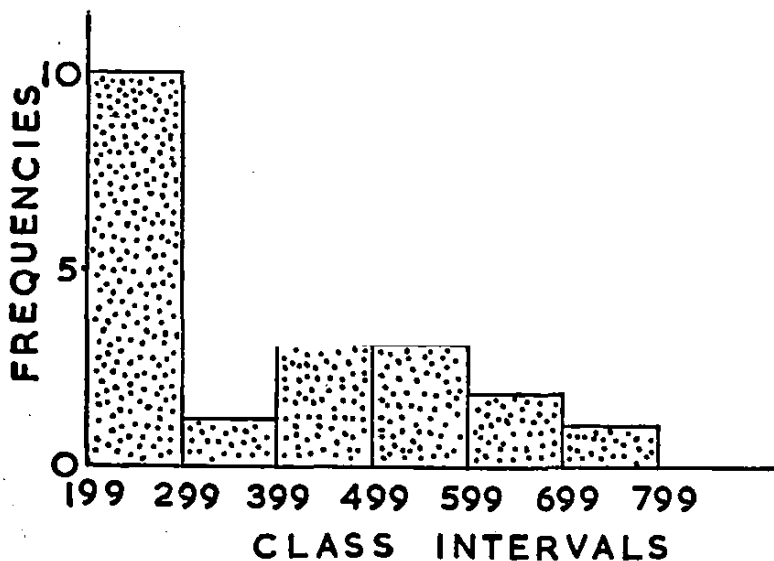


Fig. 2. Histogram showing the Population of the Twenty Villages Selected for the Experiment.

lation below 300. The remaining ten schools are located within the range of 300 to 800. The number of villages with a population of less than 500 is 14, *i.e.*, seventy per cent of the total number of villages selected for experimental work. A histogram showing the position of the population in these villages is given above.

The mean population of the group is 400, while the median population is 300. The curve which may be drawn upon the histogram in Fig. 2 above is highly skewed positively, showing a crowding at the lower end of the distribution. The small population of the villages is both a handicap and an advantage to the teacher. People in these villages are generally poor and do not have resources to give donations to the school for building or equipment required for the school. They are often indifferent towards the progress of schools. The only advantage for the teacher is that the village is a small compact unit and he can, if he is competent enough, influence the villagers.

4 Some details about the teachers working in these schools are given below. According to the policy laid down by the department of education, many of these schools are staffed by trained teachers. There are only four schools where untrained teachers work. However, the teaching experience of these teachers in single-teacher schools was very little. The table given below shows the teaching experience of these teachers in these twenty schools.

TABLE 2. TEACHING EXPERIENCE OF TEACHERS WORKING IN SINGLE-TEACHER SCHOOLS

<i>Cl. Int.</i>	<i>Frequency</i> <i>Years of Teaching</i>	<i>Cumulative Frequency</i>
5-5.9	1	20
4-4.9	0	19
3-3.9	1	19
2-2.9	7	18
1-1.9	5	11
0-0.9	6	6
<b>Total</b>	<b>20</b>	

It will be seen from the table that six teachers had experience of less than one year, while eleven teachers had worked in single-teacher schools for less than two years.

The mean of the teaching experience is 1.9 years and the median is 1.8 years. A histogram showing the years of teaching experience is given below in Fig. 3.

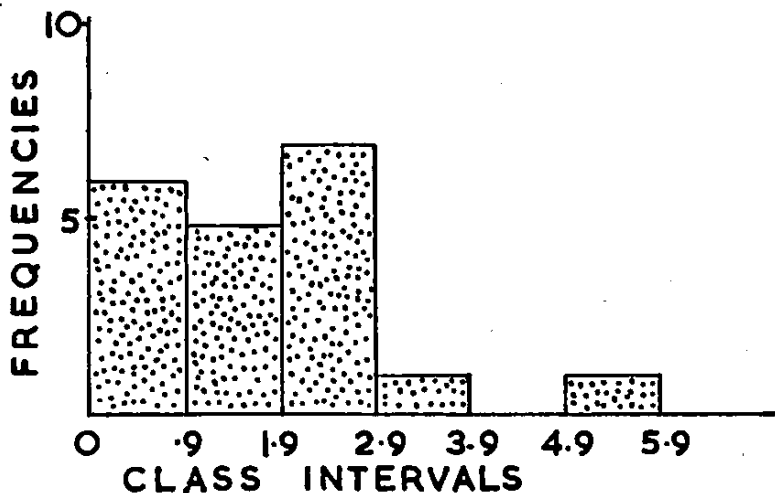


Fig. 3. Histogram showing Years of Teaching Experience of Teachers.

Teaching experience is an important factor in single-teacher schools where the pattern of work differs from that in multi-teacher schools. Persons lacking in teaching experience will hardly be able to manage the class efficiently. From the data given in table 2, the teaching experience of the twenty teachers working in single-teacher schools, it will be seen that most of them are not very experienced. The reason for this is obvious. The bulk of teachers appointed in single-teacher schools want to leave the school as early as possible, because the conditions in these villages are hardly congenial. The teachers have to face a number of difficulties, regarding housing, water supply, marketing, etc. and as a result there are frequent changes in the staff of single-teacher schools.

5 Another important point which may be considered in the case of single-teacher schools is the building in which

the school is housed. Many of the buildings are unsatisfactory from the point of school work. Generally these buildings can be classified under three heads, *viz.*, (i) owned buildings, (ii) public places like temples and *chavdis* and (iii) rented buildings. Many single-teacher schools are housed in the second type of buildings, such as temples and *chavdis*. In small villages the only place which is readily available for holding the school is the temple or the *chavdi*. It is fairly spacious and is situated in a central place. No rent needs to be paid. Rented buildings are not available in small villages, because there are few landlords who will construct buildings for hire. Owned buildings are practically out of consideration because the matching contribution cannot be collected in small villages. The school committees have to raise funds to match government share and this they cannot do because the villages are too poor to raise the contribution. As such many of the schools have to suffer inconveniences from frequent visitors. Devotees come to temple often and ring bells. The villagers come to *chavdis* for revenue matters or other official work. These constant visitors disturb the working of schools.

6 Out of the twenty single-teacher schools which were selected for experimentation, seventeen were housed in public buildings, one had its own building and the remaining two were housed in rented buildings. The school which had its own building was the best in the lot. It had a small compound round it. The name of this village is Malwadi. This school building was a *kaccha* building constructed by the villagers through locally available materials. The condition of the seventeen public buildings in which the schools were housed was not satisfactory. The work of single-teacher schools depends to a large extent upon the seating arrangement made for the four classes. It is necessary to have separate accommodation for seating the four classes. The four groups should be close to one another, so that the teacher can supervise the classes efficiently. Such a position did not obtain in many of the schools. Let us take, as an illustration, a typical

school housed in a temple. There was only one room ; in the middle of the room was located the full-size idol of Maruti. Maruti is a popular deity and attracts a large number of devotees. The classes were seated round the idol in four lines. The teacher took a place behind the idol. The idol, being full size, obstructed the view at the rear. Children seated at the back of the idol had neither lighting nor ventilation. Many other buildings such as *chavdis* were of almost the same pattern. A part of the *chavdi* was used for the four classes. The condition of rented buildings, which numbered only two, was very unsatisfactory. They were verandahs of houses. The families who lived in these houses let out the verandahs. The verandahs were enclosed by walls which prevented light and ventilation. The flooring of these buildings was uneven with pits here and there. The conditions of buildings has been given in a little more detail, to give the readers an idea of the housing accommodation of the single-teacher schools. Good buildings are an aid to good work, and unsatisfactory buildings produce an uncongenial atmosphere for school work.

7 Here we may consider the location of the villages and the transport facilities available to them. In this respect villages can be grouped under three categories. The first category would consist of villages connected by main roads with bus facilities. Such villages would have a daily public transport vehicle to go to Gargoti and return. These villages would be in a more favourable condition, than those which are away from the main road. As against these, there would be a second group of villages which are connected by a temporary road. This road would be fit for transport only in fair season. In the monsoon, it would be too muddy for even cart transport. The third group of villages would have no road, permanent or temporary. There would be footpaths, tracks in the fields and hill-paths. Many of these would be unworkable in the rainy season. In the twenty villages taken for experimentation, three villages fall under the first category. These villages could be approached by an all-weather good

road. Five villages fall under the second category. These are connected by a *kaccha* road workable only in fair weather. Four villages are connected with no roads and are accessible only by footpaths, or hill tracks. Communications with bigger villages or towns become very difficult, if not impossible, in the monsoon. The river which divides the area into two parts also presents insuperable difficulties of travel in the rainy season when it becomes flooded and the water level rises rapidly, preventing river transport. This point has been mentioned because transport facilities and good roads is one of the essential needs of villages and the absence of these leads to backwardness of these villages.

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## *Progress of the Experiment*

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**1** IN CHAPTER I the sample used for the experiment has been described and in Chapter II the plan of work that was proposed to be tried out in the experiment has been outlined. According to this plan twenty single-teacher schools in the extension area formed the experimental group. These were all the single-teacher schools in the extension area. As against these, grades I-IV in the multi-teacher schools formed the control group. The object of the experiment was to find out whether the children in the experimental schools showed the same or lower results than the children in the control group. In the year before the experiment a common plan of teaching had been tried both in the multi-teacher and single-teacher schools and the performance of children in the single-teacher schools was distinctly lower than that of the children in the multi-teacher schools in the corresponding grades. Hence a new plan of work was introduced in the single-teacher

schools and this plan has been explained in chapter II of this report.

2 The experiment, which was conducted for one year, can be described under the following heads :—

(i) Monthly meetings of teachers in single-teacher schools to discuss the implementation of the plan and to prepare the working plan for the month concerned.

(ii) The maintenance of daily record of work done by teachers in schools in accordance with the plan given to the teachers.

(iii) Visits of the Research Assistant and the inspecting staff of the department periodically to check up and guide the work in progress.

(iv) Evaluation of the progress of children by periodical tests specially designed for the purpose.

(v) Final examination taken by the children in the experimental group along with the children in the control group.

3 The monthly meetings of teachers formed an important item in the implementation of the programme. These were held in the first week of every month, commencing from July 1965 and ending with April 1966. All the teachers in the twenty schools invariably attended the meetings. The object of meeting was to take a stock of work done in the previous months and draw up a plan of work for the month in question. The teachers drew up a plan for the next month on the basis of the syllabus and also a plan of activities drawn up by the department. The plan was divided into two parts. The first part consisted of activities which were to be done on a group-wise basis. These related to gardening, health parade and school cleanliness.

4 The programme for combination of academic subjects with activities formed the second part. The primary school



syllabus taught at present for grades I-IV comprises mainly of three subjects. Of these the first is the mother tongue. There is a departmental reader which is prescribed for each grade. The plan here was to fix up the number and titles of lessons to be covered in the month. The second subject was arithmetic. The arithmetic syllabus covered numeration, notation, simple operations in the four fundamental operations in grades I & II. In the third grade children learnt metric tables and compound operations involving the use of metric measures. The fourth grade pupils learnt simple vulgar fractions and direct proportion. The monthly programme covered the relevant portion to be done in Arithmetic in the class concerned.

5 A different plan, however, was adopted for teaching social studies. This is the third subject taught in single-teacher schools. The first two subjects, arithmetic and mother tongue, were taught gradewise. Each grade had its different subject matter. Each grade sat separately and worked on the portion in the syllabus taught. Assignments were also given on the unit taught and they were done by that class independently. Assignments for different classes were different. Social Studies and General Science for these classes, were, however, taught to the combined unit of all the four grades. This subject came to be known in the syllabus as General Information. General Information was not taught separately for each class. It was treated as a common subject for the whole single-teacher school. For instruction in this subject, all the four classes were combined and general information was given. We can give here some illustrations of how General Information was taught. This method has been criticised at some of the discussions on the single-teacher school programme. Hence I think that my stand on this point should be made clear. People have often urged that the syllabus in general information varies for different grades. The syllabus of Grade I is different from that of Grade II and that of Grade II from that of Grade III, and of Grade III from that of Grade IV. In such a situation many persons

find it difficult to understand how the requirements of the syllabus of different grades could be met by a combined class.

6 It may be pointed out here that the syllabus for these grades is not exclusively different as it is often made out to be. It is possible that there might be some variation in the syllabuses as adopted in the different states. But the hard core of the syllabus will be very nearly identical. It is the primary stage of education. In this State it is called the lower primary stage. During this stage children pick up facts from the environment and try to get acquainted with them. There might be social institutions, as the post office, bank, Panchayat, bus stand, or local industrial workshops, as weaving sheds, smithy sheds and the farm. We want the children to know these things and also get a general idea of the village, taluka, district, state and the country. The syllabus is thus, more or less, concentric.

7 The same is the case with General Science—Health and Hygiene is our primary concern at this stage. We want the children to know the simple rules of cleanliness and sanitation and prevention of infectious diseases. These also form a concentric unit. Thus we can take up some common diseases of the rainy season, typhoid and cholera, and trace the causes, remedies, preventive measures connected with them. This amounts to children's common experience. Hence we can take up the subject in the common class and children in the upper grade will contribute their experiences and the information on the subject will be gradually built up.

8 The practice adopted for teaching general information in the single-teacher school was to give instruction to the whole combined unit, not separately to each class. The defence that can be offered for this arrangement is both educational and administrative, educational in this sense that such a procedure helps to build up concepts from the very beginning. The idea of infectious diseases and sanitation slowly develops as the subject is tackled even amongst children of lower classes. We need not be sacrosanct or rigid about

the bounds of the syllabus, so far as the subject of general information is concerned. It does not matter if children in grades I & II know something about infectious diseases along with children in grades III and IV. Their concepts about infectious diseases, health and sanitation will grow. At first their notions may be hazy. But the matter will clear up as the children hear of these things later on.

9 The administrative question is that of expediency. A teacher can teach arithmetic and language, separately for each class and he can draw up assignments in these subjects. Children will be working on these assignments when the teacher is teaching in the neighbouring class. But for general information it is difficult to draw up assignments. In language and arithmetic, assignments can easily be given. These will be generally sums, copying of words and sentences, filling blanks, matching tests. But in general information the question of assignment is difficult. Hence the most convenient arrangement is to have a combined class for the subject. There is a specific advantage for this arrangement. Even children in lower grades possess much more general information than their counterparts in multi-teacher schools. Thus general information forms a group activity.

10 I have stated above (para 3) that the monthly plans specially mentioned the house-wise and class-wise work. However, the idea behind the dichotomy is not to treat these as separate water-tight compartments. One flows into the other. House-wise activities are done on house basis, *i.e.*, by groups. These are (i) cleanliness and health parades, (ii) daily roll call, (iii) daily recital of prayers and community singing, (iv) gardening work, (v) games and physical exercises, (vi) dramatization of stories in readers or other stories specially told for the occasion, (vii) discussion of topics of general information with the use of maps, bulletin boards and news boards, (viii) sometimes clay-work also would be included in craft work.

11 These activities were to be related to class work. They are not to be treated as independent units. This is the key to

the whole programme. No activity of any kind would remain as an isolated activity. Some of the illustrations taken from actual school work, will show how the activities would come to be related to actual school teaching. Take, for instance, the daily prayer and community singing. This was one of the items in the daily routine taken first at the beginning of the day's work. The teacher wrote the poem on the blackboard in bold characters, so that students could read them. The hymn was selected from the devotional songs of such Marathi saints as Ramdas, Tukaram, Dnyandeo and others. The names of these saints are known in every household in Maharashtra and their songs are on the lips of every one, adult or child. These verses are recited by children while reading from the board. They are sung in chorus and some account of the life of the saint and his works is also given by way of introduction to the song. The songs are changed every week. It will be thus seen that the daily prayer served to reinforce reading, singing and history.

12 Another illustration can be taken from the daily roll call. The daily roll call was taken by counting the number of children loudly as 1,2,3, and so on. The counting was done by children from grades I and II. Counting was done both class-wise and house-wise. Then the count was entered on the blackboard and totalled up. It is totalled up vertically, house-wise and horizontally class-wise as shown below.

#### Roll Call for Monday, 8 August 1966

<i>Class</i>	<i>House Wise</i>				<i>Total</i>
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	
I	4	3	2	2	11
II	3	2	2	4	11
III	2	1	1	2	6
IV	2	2	2	2	8
<b>Total</b>	11	8	7	10	36

The totals horizontally and vertically agree. This totaling serves as a concrete example of arithmetical operations for children in grades II and III.

13 Reading important news items formed one of the items in the daily routine. The teachers were advised to make a proper selection of news items. Those items which concerned India were to be selected, preference being given to items concerning the district. The news would be written in bold characters on the school blackboard. The writing should be clear and legible, even for children in grades I and II. The news item was to be located in the map alongside the board. The news would be read by teachers pointing to its location on the map. Schools were to have their outline maps to locate the news. News reading would serve as an item in social studies and general information.

14 These items have been mentioned in chapter II while outlining the Gargoti plan of work in single-teacher schools. Here the same items are referred to as part of the monthly plan of work given to schools. Hence there is bound to be some repetition but in a different context. A monthly plan of work would include the following:—

- (a) Details of the community song for the month
- (b) Details of the news items proposed to be included
- (c) Gardening work appropriate to the season
- (d) Story telling and dramatization to be done in the course of the month
- (e) Visits and excursions to be organised on the half working day and its educational implications.

These would form part of the morning programme. The afternoon programme would include teaching and assignments. So far as language teaching is concerned, the number of lessons to be done during the month would be fixed. These would be selected from the readers prescribed for the grades. In arithmetic the portion relevant to the syllabus was to be covered.

illustrations being taken mainly from gardening and other projects to be organised in the school.

15 The last period was reserved for games for children. Simple games which did not require much equipment were to be organised. In this connection a list of games and stories to be dramatized has been included in the Marathi book on single-teacher school published by this Institute. This book was to be utilised as the source book by teachers implementing the scheme in their schools. While drawing up the plan, this book was constantly referred to for methodolgy and matter. I had also drawn up some years back an activity scheme of work popularly known as *Conspectus of Correlated Teaching* for grades I-IV. The Marathi copy of this book was also taken as the reference book for spotting out the activities to be organised in the single-teacher school.

16 The second item in planning and implementation of the programme was the maintenance of daily worksheets by teachers. The proforma for such a worksheet was given to teachers. However, the proforma was not treated as rigid or mechanical. It was to serve as a skeleton in which the teachers would enter details of work done. The details would pertain to the following three items : (a) Activities organised on the day or in course of the week. This would include activities in the subject of general information as well. (b) Matter to be taught in languages and arithmetic on the day, (c) Assignments to be given and some indication of these assignments.

The first two have been dealt with in sufficient detail earlier. We may now refer to the third item, assignments, at some length.

17 The choice of assignments is perhaps a very important item of work in the programme of single-teacher schools. On assignment depends the smooth working of single-teacher schools, particularly when the teacher is engaged in teaching the four classes in consecutive order. If the assignment pro-

gramme is not adequate or satisfactory, children are likely to become idle when the teacher is away and create a disturbance. Hence great care needs to be bestowed on the assignment programme. The assignment should satisfy some conditions. These are as under:—

(i) They should not be too difficult. They should be such that children can work on them individually without taking much help from others. (ii) They should not lead to monotony and drudgery. No doubt much of assignment work will be of the nature of drill work. But even drill work can be made interesting by introducing novelty and variety in it. Monotony will defeat the purpose of the assignments. They should yield pleasure and satisfaction of independent work to children. (iii) The assignments should be related to the actual work done in the class room in the week so that the assignments will have some meaning for the children. They will provide necessary application exercises for the work done. (iv) Assignments in languages may be of the nature of filling in blanks and rewriting completed sentences, or they may take the form of new type tests; yes-no type questions, multiple-choice questions, rearrangement of disarranged sentences so as to make sensible meaning and matching tests. (v) So far as arithmetic is concerned, the assignments will generally be of the nature of sums for drill work on processes and rules taught in the previous period. It may be applications of the four fundamental rules for grades I and II, and operations as applied to compound numbers and fractions in grades III and IV.

These were the specific points which were taken into account while selecting the assignments. The teachers should keep a note of the assignments given to classes in their daily diary.

18 . A reference may be made here of the gardening activity that was organised in all the single-teacher schools. It has been mentioned earlier that some kind of craftwork

training is necessary in grades I—V, both as a medium for teaching and motivating pupils. Gardening, perhaps, is the only craft which is suited to rural conditions. It is liked by the villagers and cooperation is given by them for craftwork. Children see gardening in their environment and perhaps do some gardening at home also. They possess tools for gardening at home. The villagers have a great liking for agriculture craft. Hence efforts were made by all the teachers in the single-teacher schools to secure small plots for gardening. In the single-teacher schools pupils who work in the garden are young and not many. Hence much land is not required for gardening. Two or three plots of about ten feet by ten feet would provide adequate work for all the groups on the craft in the rainy season. A calendar of gardening work was also drawn up for these schools for the whole year. Where some kind of water facility was available, the work extended even after the monsoon. The main crop grown was leafy vegetable crop, such as Methi, Rajjira, etc. These vegetables grow rapidly and can be harvested in about a month's time. Thus there is no question of long waiting periods. The same plot can be used over again for another crop and children can raise two or three crops in the rainy season. The leafy vegetable to be taken will be rotated. Many of the schools had no plot of their own. So they had to persuade persons in the neighbourhood to allow the use of some area from their garden for their children. This saved the trouble of fencing and keeping watch.

**19** The third item in the implementation of the programme was the monthly meetings of the supervisors of the scheme. Before the scheme was implemented cooperation of the departmental officers was sought. The inspecting staff of the department agreed to help us by seeing that the plan was properly implemented. They would look to the work of teachers whenever they paid visits to the single-teacher schools. They would attend the monthly discussion meetings organised for these teachers and take part in these. They would also offer their suggestions in executing the programme. This



assistance of supervising officers was the valuable part of the implementation of the scheme.

**20** The monthly visit of the research staff supplemented the discussions held each month. These visits were arranged every month to guide and supervise the work of the teachers. The following points were noted in these visits : (i) How house-wise and class-wise distribution of children worked in these schools, (ii) The check-up of the activity programme to be carried out in the morning. These activities included roll call, community singing, health parades, news reading and dramatization of stories. The research staff would demonstrate how these activities could be utilised for teaching purposes. (iii) The check-up of the afternoon programme of teaching assignments. The assignments given would be scrutinised and directions given for improving them. A proforma of points to be seen at these visits was drawn up in consultation with the teachers.

**21** Besides these regular supervisory visits, special visits were also arranged for evaluation of work done. The evaluation programme will be discussed in the next chapter. In all, three evaluation tests were given during the year. The first of these was in the first term in October, the second was given in January and the third and the last in April. The first two were got cyclostyled, while the third was a standardised test, specially constructed for the fourth grade by this institute. As a standardised test, norms were available for comparison with the achievements of children. For holding these tests, children from neighbouring schools were brought together at some central place near their school. Teachers also came with the children. This occasion was also utilised for discussions on the progress of the work done.

**22** Out of the five points mentioned earlier, I have so far discussed three points, viz., (i) monthly meetings for planning of work, (ii) daily worksheet and diaries to be maintained by teachers, (iii) periodical visits of research staff for supervision, evaluation and guidance.

The remaining two points, internal evaluation and external evaluation will be taken up in the next chapter. A specimen of the plan of work translated into English has been given in Appendix I for the information of the readers.

## *Evaluation of the Experiment*

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1        SO FAR AN outline of the experiment with reference to the procedure followed, the sample selected, instructions given and supervision done has been given. Equally important is the evaluation of the experiment. The effectiveness of the experiment can be judged only by the evaluation of the results. When the experiment was conducted over one school at Gargoti, a scheme of evaluation had been adopted and a series of tests had been given to children in the experimental schools and the schools in the control group. The results of tests had been statistically compared. Besides the final tests, a series of evaluation tests had been given to the schools in the experimental area as well and these tests had also served the purpose of evaluating the experiment. Now this experiment is an extension of the same experiment for a larger group of schools. We have taken in the group twenty single-teacher

schools instead of one. Naturally, therefore, the techniques of evaluation followed in the previous investigation will have to be followed in the present investigation as well, but on a larger scale. This has been done and this chapter will give an outline of the technique of evaluation followed.

2 The purpose of school work is accepted as the harmonious development of the child. This is too wide a term and will have to be delimited to some specific field in which harmonious development is sought and achieved. Two objectives among other are often cited. One is the development of wholesome attitudes to work and social relations. The other is the development of mind or knowledge aspect. Development of attitudes cannot be measured in quantitative terms. We have to resort to rating scales for measuring attitudes. Knowledge aspect can be measured by achievement tests given to children, both in the experimental and the control schools, and a comparison made.

3 Measurement of attitudes was not included in the previous evaluation scheme, nor is it intended to be included in the present scheme. There are several cogent reasons for this. We did include in our scheme several items which aimed at developing wholesome attitudes among children. The daily cleanliness programme, the cooperative group work, crafts were all expected to develop wholesome attitudes. Such items were not included in the programme of work of control group of schools. Hence any measurement programme would not help in comparison. It will be agreed that certain attitudes were developed among children in single-teacher schools, but no efforts had been made for developing such attitudes in other schools. Hence no effect could be seen in the control group.

4 Measurement, therefore, would be possible for those items which were common to both types of schools and these were knowledge items. These were confined to academic

teaching. The single-teacher schools adopted a special type of programme of teaching, suited to their special circumstances and it was therefore necessary to compare the progress of children in both types of schools on a common test and thus test the efficiency of the special methods adopted for single-teacher schools.

5 Evaluation can be subjective and objective. Subjective evaluation is done by the participants and observers in the experiment. The teachers who adopted the scheme in twenty single-teacher schools were the persons who could judge the value of experimental programmes. These persons had worked in single-teacher schools and had adopted different methods in the past. The change in the programme was also implemented by them. Naturally, they could, by their experience say whether the new scheme compared more favourably with their old methods. The second type of personnel who watched the experimental school was the inspecting staff of the educational authority of the area. Their opinion on the scheme would also be an indication of the efficiency of the experiment. A third group of observers would be the teachers in the neighbouring schools. The teachers in the single-teacher schools were not isolated from other neighbouring schools. These teachers met in conferences where teachers from other schools also attended. There were joint and group conferences and the schemes adopted in the single-teacher schools came to be discussed at these conferences on a number of occasions. As such it was possible for all teachers to discuss the schemes and study their impact. The various procedures adopted in single-teacher schools were discussed by multi-teacher schools and some of these came to be introduced in multi-teacher schools also in corresponding grades.

6 The opinions of these teachers who implemented the scheme and who discussed it in their conferences carry weight

in the scheme of evaluation. Accordingly their views were evaluated by a check-list. The details of the scheme were given to the teachers and they were required to give their opinion on the two points, whether the detailed scheme was workable in single-teacher schools or not and whether it was an improvement over the existing pattern or not. The details of the scheme referred to the following points:—

(i) The grouping pattern, (ii) the seating arrangements for the grouping pattern, (iii) organisation of activity programmes including community singing, *safai*, roll call, news reading, gardening, story-telling and dramatization, (iv) the fifteen minutes' duration period, and the recesses, (v) the teaching programme, (vi) the assignment pattern, (vii) games and sports activities.

7 The opinions of teachers who implemented the scheme were that the scheme was workable and would produce better results. They accepted it as better than the chaotic conditions, where there were no other methods except those of adopting the practices tried out in multi-teacher schools. The teachers have actually realised that the single-teacher school is capable of producing better results if all potentialities are fully exploited. These potentialities are:—

(i) Individual attention possible due to small numbers. Each grade has about seven to eight students and the teacher is in close contact with these children. He knows each child intimately and can adapt his teaching to suit the needs of pupils.

(ii) Grouping bigger and younger children together has a great advantage for the youngsters who rely upon the older children.

(iii) An activity programme of teaching specially suits the age group and is capable of retaining children in these schools. This is not possible in schools with a purely bookish

programme. With advantages of correlation, where possible, it provides motivation to children and helps them to retain knowledge.

(iv) Another great advantage that was noticed in the implementation of this programme was self-reliance and habits of independent work which developed through assignments. These helped to accelerate the students' mastery over the matter taught and in addition released them from the monotony of home work. Much home work is not necessary in grades I—IV and many homes in rural areas do not offer congenial conditions for home work.

8 These are some of the specific advantages which accrue from the work of single-teacher schools and they outweigh the disadvantages. The close proximity of the four classes which provide for mutual help between older and younger children and a healthy spirit of cooperation and social life is an excellent feature of the single-teacher schools and all these features have come prominently to the notice of the teachers during the conduct of this experiment.

9 Now coming to the second part of the evaluation programme, objective evaluation, it may be stated that this was done by specially designed tests and administered to children in the single-teacher schools. The internal testing was supplemented by an external departmental examination. The internal tests were administered as under :—

First test October 1965 ; Second test, December 1965 and the third test, April 1966.

Each of these tests was constructed on the same lines as adopted for the single-teacher school experiment in 1962-63. They were graded tests of one hundred items, starting from simple items which were within the reach of Grade I and increasing with difficulty so as to test the abilities of children in Grade II, Grade III and Grade IV. All the four grades

would take the same test, but children in each grade would attempt so far as they would be able to do. Some may attempt the first eight questions, while others, fifteen and still others, twenty-five. The tests were given only to Grades III and IV who could understand the questions and give answers. The first two tests were cyclostyled, while the third one was printed. The first two were different from those used in the first experiment conducted in 1962-63, though modelled on them. The third, printed one, had been used in the previous experiment. This test had been designed and constructed as a standard test for grade IV in 1961. It had been administered to five hundred children in Grade IV. It is printed in three parts :-

- (i) Language ability, 35 items
- (ii) Arithmetical ability, 30 items
- (iii) General information, 35 items

Total 100 items, time allotment is one hour and twenty minutes for each part.

The same test was taken by children in Grade IV in some schools in the control group so as to facilitate comparison.

10 The second part of the external evaluation programme is the external annual examination taken by all the fourth graders. This examination is conducted by the educational authority of the area and a common paper is set. The assessment of papers is also arranged by the educational authority. The educational authority regards the fourth grade examination as a kind of public examination and screening has to be done for admission of children to secondary schools or upper primary classes. It is also the terminal point of the age range of compulsory education in this state. This test, therefore, was taken by children in single-teacher schools along with other children. The test is also divided into three parts, as Language, Arithmetic and General Information, each.



part carrying 100 marks. This test would provide a valid means of comparing the achievements of children in the fourth grade of all schools.

11 Since the same children took the three tests, Test I, Test II and Test III, it was possible to calculate the product moment coefficient<sup>1</sup> of correlation between these tests. This coefficient of correlation serves as a measure of reliability of the test and indicates the equivalence. The product-moment coefficient of correlation ( $r$ ), between the three tests is given below. Subscripts indicate the tests in their serial order.

$$r_{1.2} = .9 ; \quad r_{1.3} = .9 ; \quad r_{2.3} = .9$$

The coefficients of correlation given above indicate a high degree of correlation between the three international tests and lead on to their reliability.

12 Reliability is a necessary factor in schemes of evaluation. It is necessary for any test used for evaluation purposes to be reliable. There are several methods of computing the reliability of a test. It is not proposed to adopt all these methods. The one method commonly used is that of split-half method. Another method is that of parallel equivalent tests. The three tests, referred to above, given in October, December, and April, were treated as parallel tests and we have noticed a high correlation between these three tests. The split-half method of computing reliability was also made applicable to all these three tests and we found that the reliability coefficient for these three tests by the split-half method was as high as .9.

13 For purposes of comparison, only Grade IV has been chosen. There is a reason behind the choice of the topmost class for evaluation purposes. It is for this class that we get a departmental test for comparison. The school authorities

hold an external test only for Grade IV and a pass in this test entitles a boy to go to the higher Grade V. The testing of Grade I-III is only internal. The annual examination is held by the headmaster of the school and promotions to a higher class are a normal feature. This should be so in the one-teacher school where we regard that all the four classes form one unit and an external test should be given only when the boy goes out of the fourth grade. Even when a boy is backward in any subject, in Grades I, II and III, the teacher should be able to make up the deficiency in the higher class and it should not be necessary for a child to repeat the year unless he is very backward in all the subjects. It is a common experience that when a child is detained in a lower grade, he will leave the school. Parents are not quite willing to allow him to continue in the same grade. Hence I have taken the results of Grade IV only for comparison.

14 The statistical constants used in the course of evaluation are now described. These can be classified as under :—

(1) The means, medians and standard deviations of the internal tests taken on Grade IV of single-teacher schools under experiment. Three tests, one in October, one in December, 1965 and one in April, 1966, were administered to all the fourth graders in single-teacher schools. The results of these tests could be compared. These tests were designed on the type of short answer tests and scoring could be done with a fair amount of ease and accuracy.

(2) The second group of statistical constants would be the means and standard deviations on the test III which was administered to fourth-graders in the experimental schools and also the schools in the control group. The local schools at Gargoti formed the control group. These children took the internal test no. III, which was given to them in April, 1966, along with the children in the single-teacher schools. These tests, as has been already pointed out, were printed and had

been given on a previous occasion to single-teacher schools and their norms were available for comparison. With these results it was possible to compare the achievements of fourth graders in single-teacher schools under experiment on a common test, vis-a-vis, the achievement of fourth-graders in local schools who formed the control group. The significance of the difference between the means would indicate the effectiveness of the method adopted in single-teacher schools.

(3) The third set of statistical constants would pertain to the external annual examination conducted by the school authorities. The children in the experimental schools, as well as, children in the control group schools appeared at a common annual examination which decided their promotion to higher classes. The results of this examination in three subjects, viz., mother tongue, arithmetic, and general information were obtained for the control group of schools as well as for the experimental schools and these results were compared. The significance of the difference between the mean scores of these results (reduced to percents) would indicate the superiority of one group or the other or their equality.

The comparison could be effected on two separate tests, one an internal common test given by me to both the groups, control and experimental, and the second on an external annual examination taken by children in schools, in both the control and experimental groups. These statistical constants and their interpretation are discussed below in serial order.

15 The data in connection with the three internal tests is given in table 1 on page 46.

16 From table 1 the following facts become clear :-

(1) The means of the three tests are very nearly equal within limits of sampling error. The children showed the same achievement in all the three tests.

TABLE 1. STATISTICAL CONSTANTS OF THE THREE INTERNAL TESTS ADMINISTERED TO FOURTH GRADERS IN SINGLE-TEACHER SCHOOLS UNDER EXPERIMENT DURING THE YEAR 1965-66.

<i>Name of the Statistical Constant</i>	<i>Test I</i>	<i>Test II</i>	<i>Test III</i>
Number (N)	118	97	96
Mean (M)	62	61	58
S. D.	19	18	18
Median (Med)	64	64	58
Standard Error of the Mean	1.8	1.8	1.8
Skewness of the Distribution	-.3	-.5	0
Coefficient of Variation	30.6	30	31

(2) The means are very high. The maximum score for each test was 100. The mean score for each test was as high as 60. This indicates that the children in the single-teacher schools showed a high standard of performance in these three tests.

(3) The standard deviations of these distributions, within limits of error, are the same. Thus the variability between these three distributions is equal. This fact is further borne out by the coefficient of variation, which is also very nearly the same for all the three distributions.

(4) The first two distributions are slightly skewed, skewness being negative. The third distribution is normal. The negative skewness indicates that there are more pupils at the upper end than at the lower end. Thus in the first

N. B. The following formulas were used in computing these constants :-

$$\text{Standard error of the Mean} = \frac{\text{S. D.}}{\sqrt{N}}$$

$$\text{Skewness of the Distribution} = \frac{3 (\text{Mean} - \text{Med.})}{\text{S. D.}}$$

$$\text{Coefficient of Variation} = \frac{100 \times \text{S. D.}}{M}$$

two tests children who scored more than the mean crowded at the upper end.

In general the figures lead us to conclude that children in the fourth grade in the single-teacher schools showed a high standard of achievement in the three tests that were given. If 35 is taken as the passing mark for each test, it was found that in test I three children out of 118 scored less than 35. In the second test 8 children out of 97 scored less than 35, and in the third and final internal test, six children out of 96 scored less than 35. Thus according to the present standards of passing, the result can be accepted as more than ninety per cent. I have already explained the reliability and objectivity of these tests and hence these results indicate a real superiority of the performance of children in the single-teacher experimental schools.

17 The second set of statistical constants which were calculated for purposes of evaluation are discussed now. These were based on the performance of children in the experimental schools and the control schools on a common test administered by me. The common test selected for the administration was the third test. The control group of schools consisted of schools at Gargoti other than the experimental single-teacher school at Gargoti. The children who took the test in the control group of schools numbered 103. The statistical constants of the third test administered to this group as well as the experimental group are given in table 2 on page 48. The Statistical Constants of the experimental group are taken from table 1 above.

18 The table leads to the following conclusions :-

(1) The mean score of the experimental group is higher than that of the control group by 23 marks, while the median score is higher by 25.5. The difference in both these cases is very high. The standard error of the difference between the two means is 2.5 and the critical ratio is more than 10. The obvious conclusion is that the difference

TABLE 2. STATISTICAL CONSTANTS FOR COMPARING THE PERFORMANCE OF THE EXPERIMENTAL GROUP AND CONTROL GROUP ON A COMMON INTERNAL TEST GIVEN TO BOTH GROUPS

<i>Statistical Constants</i>	<i>Experimental Group</i>	<i>Control Group</i>
Number (N)	96	103
Mean (M)	58	35
S.D.	18	18
Median (Med)	58	32.5
Standard Error of the Mean	1.8	1.8
Skewness	0	Plus .4

The difference between the two means in 23 and the standard error of the difference is 2.5

between the two groups—the experimental and the control—is due to significant steps taken in methods in the two types of schools. Efforts were made to bring out fully the potentialities of single-teacher schools and these conscious efforts have shown a significant difference between the achievements of these two groups.

(2) The variabilities of both these groups are the same.

(3) Whereas the experimental group tends to be normal, the control group tends to be positively skewed. The positive skewness indicates crowding at the lower end. This means that a larger number of children get fewer marks and crowd at the bottom of the distribution. If we take 35 as the passing mark of the score, we will find 47 children below 35 in the control group as against six children in the same position.

19 The marked difference between the experimental group and the control group becomes clearly visible if percentile curves (ogives) for these two distributions are

drawn. The ogives for both the distributions are given in the figure below.

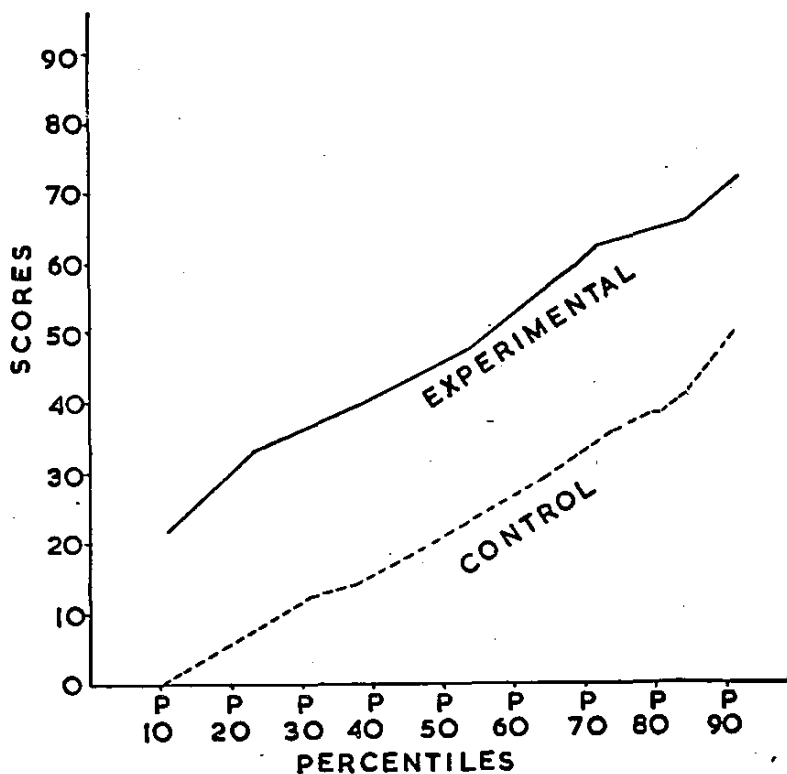


Fig. 1. Percentile Curves of Experimental and Control Groups on Internal Tests

The graph drawn in thick line represents the percentile scores of the experimental group and the graph drawn in dots represents the percentile scores of the control group. The difference between the two curves is very big. The difference is a clear indication of the superiority of the children in the single-teacher schools as against the children in the control group of schools.

20 The second set of statistical constants are based on the results of an external test taken by both the groups, viz., the experimental group and the control group. This external test was the annual examination conducted by the educational authority of the area. Common printed papers were set by this authority for the annual examination of grade IV in all schools in the Kolhapur district. The results of the external test were collected for the fourth-graders of the control group and also for the experimental group of single-teacher schools. The statistical constants are given in Table 3 below.

TABLE 3. STATISTICAL CONSTANTS FOR THE EXTERNAL TESTS TAKEN BY THE EXPERIMENTAL GROUP AND THE CONTROL GROUP.

<i>Statistical Constant</i>	<i>Experimental Group</i>	<i>Control Group</i>
Number (N)	79	106
Mean (M)	52	42
S.D.	11	14
Standard Error of the Mean	1.1	1.3

It will be seen from the table given above that the mean of the experimental group is higher than the mean of the control group by ten marks. The standard error of the difference between the means is 1.7 and the critical ratio is 6. It is therefore clear that in respect of the external test also, the experimental group has shown better results which are statistically significant.

21 The difference between the two distributions—the experimental group and the control group—would be clearly visible if the distributions were shown in the form of ogives. Accordingly the ogives of these two distributions are given in figure 2 below.



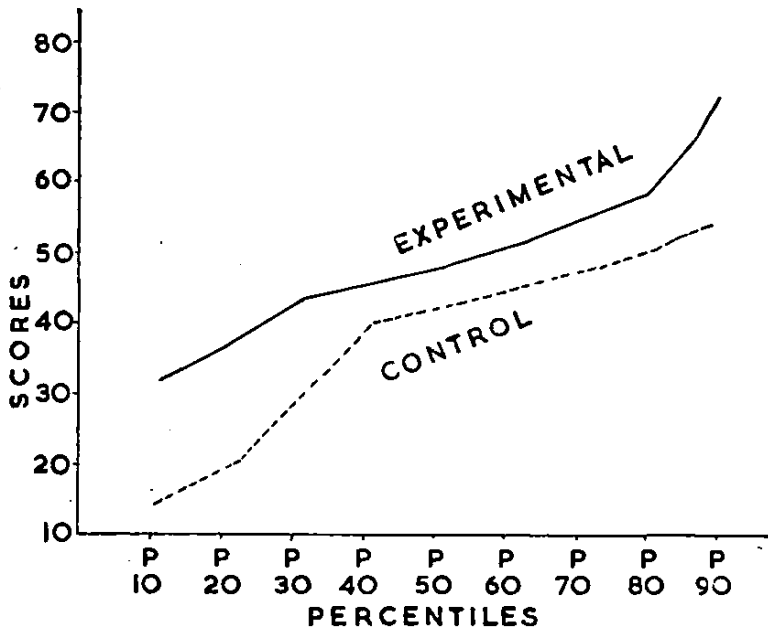


Fig. 2. Percentile Curves of Experimental and Control Groups of External Tests.

The ogives clearly show the difference between the two distributions. We notice that the ogive for the experimental group is much higher than the ogive for the control group. There is clear and marked difference between these two ogives.

22 From the evidence so far supplied, both internal and external, we are led to conclude that the experimental procedure has worked well in the single-teacher schools where it was tried out and has shown results better than those of multi-teacher schools following the traditional pattern. This has confirmed our previous findings with reference to the single-teacher school (Jawahar Bal Bhavan) at Gargoti, where the experiment was tried out in 1962-63. This also shows that the single-teacher school possesses certain potentialities, which if properly exploited, can give results better than those of multi-teacher schools.

## *Summary and Recommendations*

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1 In the previous five chapters description of the object of this experiment, the sample over which this experiment was conducted, the technique that was followed in the course of the experiment and an appraisal of the experiment have been given. In this chapter a summary of the work done and the main recommendations arising out of this experiment are given, and the lines along which further work can be undertaken are indicated.

2 The single-teacher school faces several problems of organisation of work, teaching methods, etc., in view of its peculiar nature. In such schools one teacher has to teach four classes simultaneously, unlike the multi-teacher schools, where one teacher teaches only one class throughout. The villages in which single-teacher schools are located, are small and according to the policy of the educational administration, a

school with forty pupils, teaching upto grade IV, is to be managed by one teacher only. Owing to the introduction of the universal, free and compulsory education, the number of single-teacher schools has recently shot up, since most of the new schools opened are located only in small villages which did not possess schools before. In rural areas the number of single-teacher schools is more than 60%.

Accordingly an experimental programme of work for single-teacher schools was undertaken by the G. K. Institute in 1962-63. This programme was implemented in the Gargoti single-teacher school attached to this institution. After the conclusion of the experiment, which lasted for one academic year, a report was submitted to the NCERT who had sponsored the experiment. It was then pointed out that the experimental programme was to be extended to a larger number of schools and evaluated on a rural sample in its natural setting. Accordingly this experiment was undertaken. The object of this experiment was to extend the programme tried out in the Gargoti school in the year 1962-63, to twenty single-teacher schools in the extension area of Gargoti centre and evaluate the programme.

3 The technique of experiment consisted in implementing the programme tried out in the Gargoti school in the twenty single-teacher schools in the Gargoti area. The plan consisted of the following essentials :—

(i) Grouping of children on class-wise and house-wise basis. The former grouping was intended for activities and the latter for teaching.

(ii) Separate patterns of seating arrangements for house-wise and class-wise grouping. Seating arrangements in a single-teacher school are of material importance, in as much as they are conducive to smooth working.

(iii) A programme of activities to be organised in one session of the school preferably the first session when

the school is held in the morning. This programme of activities included craftwork also, gardening being selected for craftwork.

(iv) Trying to correlate activities with the day to day teaching of school subjects. Lines of correlation will be indicated in the programme of work.

(v) Arithmetic and mother tongue will be taught class-wise in the second session, while general information will be taught as a group-wise activity for the whole single-teacher school.

(vi) The duration of a period of work will ordinarily be fifteen minutes. When activities require a longer duration, two periods will be taken up continuously. There will be a long recess in the midday, when children can avoid the midday heat for their work and also get sufficient rest and sleep to refresh themselves.

(vii) In the afternoon session when class-wise work goes on teaching will be alternated with assignments. The children will be busy with assignments, when the teacher is engaged in teaching other classes. The assignments will be written on the blackboard, well in advance, and the work will be supervised by class leaders. The assignments will be checked in the evening or the next day.

(viii) The half working day in the week will be utilised for a properly planned excursion in the village as a part of the instructional programme.

(ix) Efforts will be made to preserve the integral character of the single-teacher school as one unit and exploit many of its advantages to promote efficient work in the school.

4 The sample selected for this experiment formed the compact group of twenty single-teacher schools in the Gargoti extension area. The schools are small and the villages have a mean population of 400. The number of pupils in the schools

varied from 30 to 40 in a school. Most of the villages could be approached only by a hilly track or a footpath in fields and were cut off in the monsoon by a flooded river. Most of the schools were housed in public buildings as *chavdis* and temples, one or two having their *kachha* buildings constructed from locally available materials. One or two were housed in rented buildings. The conditions of the schools housed in public buildings were far from satisfactory.

5 The experimental procedure consisted of giving the monthly programme of work to teachers who met once a month in the first week. The programme was in fact drafted by them. This programme was drawn up on the plans indicated and contained the details mentioned above, teaching being divided activity-wise and subject-wise. The teachers were also required to maintain worksheets and daily diaries to record the activities organised and the assignments given. These were supplemented by the visits of the research staff, extension coordinator and educational officers of the area.

6 The evaluation of the experiment is the most important feature of this experiment, because an evaluation depends on the efficiency of the experiment. In this programme arrangement was made for evaluation, both internal and external. The internal evaluation consisted of the personal opinions of the teachers who worked on the scheme, the inspecting officer of the department and the teachers from the neighbouring schools who discussed the experiment at conferences. Their opinion was elicited on two points, viz, whether the different items included in the experimental programme were practicable and workable or not and secondly, whether they formed an improvement over the previous pattern of working. The general consensus of opinions was that the items were workable and formed an improvement over the previous pattern of working in the single-teacher schools.

7 The external evaluation consisted of three parts. The first part was the periodical evaluation of work done through

short new type tests. Three such tests were administered, one in first term, one in the second term and the third in April, at the conclusion of the experiment. The first two were cyclo-styled and third was printed. The tests were continuous, increasing gradually in difficulty, to be taken by the whole group. They were drawn up on the same lines as the tests which were given in the original experiment in the year 1962-63. The third test was specially devised for standardising the achievements of children in grade IV. The three tests showed between themselves a high correlation and also consistency as measured by the split-half correlation technique. The tests showed a high standard of performance, the mean being 60 for the tests. This highly indicates the superiority of children.

8 . For purposes of comparison the experimenter had taken local schools which followed the traditional pattern as the control group. Third test was administered to both the experimental schools as well as the control group schools. The means have showed significant difference in the achievements of the experimental and control group. The experimental group appears to be for superior to the control group. The difference between the two means is ten times its standard error and this difference is highly significant. It is not due to sampling error. It was an internal test used for comparison. The annual examination of grade IV conducted by the educational authority of the area was also used for comparison. This was an external test. Here also the means showed a significant difference. The mean of the experimental group was higher than the mean of the control group and the difference between the means was six times its standard error. Such a large difference is due to real difference in teaching and not merely due to sampling error. The evidence conclusively proves that the results obtained on the previous occasion in the case of one single-teacher school at Gargoti in 1962-63 are now confirmed by similar results over a group of twenty schools in rural areas in their natural setting, where the experimental pattern was tried.

9 The experiment has now been tried twice and it has been much discussed and thought over during the last four years, since it first came to be tried at Gargoti. By internal and external evaluation techniques, it has stood testing and showed its superiority. In the circumstances, it would not be desirable to leave the matter at this stage. It is now necessary to extend the field of the experiment to a larger area and in this respect, the Kolhapur District would be the most suitable unit. The Kolhapur District has in it a big hilly tract with a large number of single-teacher schools. The Taluka Radhanagri, Ajra, Bawda, have in them a big number of single-teacher schools and it is necessary to extend the experimental pattern to these talukas. Such a procedure would involve the following:—

(a) An orientation programme to the teachers and inspecting officers on the pattern.

(b) Cooperation of the educational authority of Kolhapur District and other Talukas in the area.

(c) Assistance from the NCERT for staff in the training programme that may have to be undertaken for the extension of the programme.

10 A training programme for introducing the scheme has been included in our first report on the single-teacher school experiment at Gargoti, hence it is not intended to repeat the same here. But the programme included in that report were of four weeks' duration and two weeks' duration for teachers and inspecting officers respectively. In view of financial difficulties, the larger number of teachers to be oriented, even when one district like that of Kolhapur is taken, I would modify the old programme by reducing the duration of the programme to three weeks for teachers. This programme should consist of the following :—

(i) Subject matter instruction in the syllabus integrated with the method of teaching.

(ii) A study of the organizational pattern of the work in the single-teacher school as formulated in the Gargoti plan and

(iii) practice in teaching and observation of work in Gargoti school and the twenty schools where the experiment was carried on. The experimental programme is being continued in these schools and the work done in these schools would be available for inspection and observation.

11 So far as inspecting officers are concerned, it is essential that they should have studied and observed the working of the scheme which is going to be implemented. For this purpose a week's orientation would be enough. They would study the organizational pattern, the technique of correlation between teaching and activity and observe some schools actually implementing the scheme. For a further expansion of the programme these measures are essential. The success of the plan and the improvement of single-teacher schools will depend upon the extent to which support and encouragement are given for the wider adoption of the plan.



## APPENDIX I

### A SPECIMEN OF THE MONTHLY PROGRAMME OF WORK

N. B. Monthly programmes of work were drawn up by the teachers in the meeting. The following is the plan for the month of January, 1966. It is given as a specimen.

#### PLAN OF WORK FOR THE MONTH OF JANUARY, 1966

#### *ACTIVITIES TO BE ORGANISED IN THIS MONTH*

1. **Gardening** : harvesting the crop in the plot, cleaning and preparing fresh beds, sowing seeds for the next crop.
2. **Makara Samkrant** : 14th January, explaining the significance of Samkrant. Organising a small function of *Tilgur* in the school.
3. **Republic Day** : 26th January, giving a brief history of Indian Independence, explaining the significance of the republic day, participating in the local function, organizing the school function.
4. **Anniversary Day of Mahatma Gandhi** : 30th January. Gandhi's life and work—giving a brief account.
5. **Farm Visits** : visits to farms, to study and observe rabi crops.
6. **Claywork and paper work** : Activities as usual.

#### *ACADEMIC SUBJECTS*

- (i) **Language** : *Grade I* : Prayer song for the month, national anthem and other national songs, writing of

simple words from the reader, dramatization of stories, lesson nos. 16-19 from the first reader.

*Grade II* : Prayer song and the national anthem. Description in a few sentences of activities done in the class, lessons 26 and 27 in the reader, community singing, dramatization of stories read.

*Grade III* : Prayers and national anthem for the current month. Lives of Indian leaders in the form of stories; lessons nos. 9 and 11 in the reader. Writing short sentences—attention to be paid to the sizes and shapes of letters.

*Grade IV* : Prayer and national song for the month. Describing the activities done in the month. Lessons nos. 14, 27, 42 and 45 in the reader. Correction of written work.

(ii) **Arithmetic** : *Grade I* : Numeration and notation of numbers from 25 to 50, weighing and measuring vegetables grown in the plots, simple addition of numbers, with two digits without carrying.

*Grade II* : Use of multiplication tables, with reference to activities organised in the school, addition and subtraction of numbers with two digits, involving carrying or borrowing. Building numbers upto 300. Simple ideas of postal transactions.

*Grade III* : Numbers upto 1000. Acquaintance with metric tables of weights and measures from environment, problems to be selected, multiplication involving carrying.

*Grade IV* : New plots to be formed and measured, new coins, weights and measures, elementary ideas of fractions, numeration and notation upto 10,000.

**GENERAL KNOWLEDGE** : as a group activity for all the four classes

- (1) Need of sunlight and water for growth of plants
- (2) Rabi crop as grown on the farm.

- (3) Idea of the campaign for growing more food.
- (4) Observation of Makar Samkrant, Republic Day, Anniversary of Gandhiji's death.
- (5) Using the map of Maharashtra to give an idea of towns, industries, rivers, etc. in the State.
- (6) Biographies of three great leaders in the form of stories.
- (7) Balanced diet and its composition.
- (8) Diseases as arising from contaminated air.
- (9) Prayer and community singing. Community song already supplied. National songs as given on pages 2,3, 4 of the pamphlet. Page 21, song 'True religion' to be learnt.
- (10) Games and sports, *Langdi*, *Hututu* and other games which do not require much equipment.