A Study to Evaluate the Impact of

COMMUNITY LEARNING CENTRES

Initiative

set-up jointly by

Government of Karnataka

and

Azim Premji Foundation

October 2002

5 Pappana Street, St. Mark's Road Cross,
Bangalore-560 001
Tel: 91-80-2272264/2273665
Fax: 91-80-2291869
Website: www.azimpremjifoundation.org

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1. INTRODUCTION

1.1. BACKGROUND

Azim Premji Foundation is working towards achieving the goal of universalisation of elementary education (UEE) in India. Simply stated, UEE means every child up to the age of fourteen years[1] in school and every child learning well. The Foundation has been working for over a year, closely with State Governments and commenced a number of initiatives to work with out-of-school children and with children in government schools. In July 2001, the Foundation planned an initiative of using information technology in schools with a view to:

a.   positively impact the learning levels of children

b.   improve the attendance rates of children in government schools

c.   enhance enrolment rates

The use of computers in this case is to focus on academic learning outcomes in school rather than to teach computer skills to children. In short, this is an effort focused on the use of IT in education, and not on IT education.

The Phase 1 of this initiative consisted of 34 government schools, in 3 rural taluks[2] (15 schools) in Kolar district, one rural taluk (3 schools) in Mandya district, and two urban districts (16 schools) in Bangalore. The computers were set-up between March and July 2001, in these schools. The classroom in which the computers are installed is called a Community Learning Centre (CLC). In this programme, nearly 10,000 children between class 1 and 7 used the PCs on a regular basis. Students had access to computers in the CLC as part of the regular school Time Table.

This is a joint initiative taken up by Government of Karnataka and Azim Premji Foundation.

1.2. THE MODEL

The CLC is located in a room of a government school and is used by children of the school during school hours and by the community before and after school hours. The facility is available free of cost to children from government schools and for the community on a nominal pay-and-use basis.

In the existing 34 CLCs, the typical set-up is as follows:

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[1] This translates into eight years of formal education in most states and seven years in other states.

[2] Taluk is an administrative unit smaller than a district, and usually consists of about 200 villages in Karnataka state

a.   4 -8 computers per CLC (depending on the number of children in the school) located in a local government higher primary school (up to class 7).

b.   There are typically 3 children to a computer at any given point in time.

c.   The CLC is operated by a local youth, called Young India Fellow (YIF)[3].

d.   The revenue generated after school hours is used to pay for the YIF (after the initial 12 months), electricity bills, maintenance of the computers and UPS, security, etc. In cases where the revenues generated may be inadequate, the community decides on how to raise the balance resources through donations, sponsorship and allocation from Village Panchayat funds.

e.   Children typically use the CLC for 2 to 3 class periods (of duration 40 minutes each) a week.

f.   The children come to the CLC as part of their regular school timetable.

g.   The CLC by design is to be used by children between class 3 to 6. Parental pressure often forces the CLC to be opened up for all the children of the school. Consequently the CLC reaches out to all the children from classes 1 to 7.

1.3.   CONTENT

The content available to the CLCs in the past year consisted mostly of basic literacy and arithmetic competencies covered in class 1-3. It was expected that the lowest quartile of children in government schools, who usually have difficulty in basic literacy and arithmetic skills, will benefit from such content. There was no particular mapping to class-wise syllabus.

Four CDs were provided, with language choice of Kannada, Hindi and English on the Main Menu of each CD:

1.   Basic Language

2.   Basic 3rd standard Environmental Sciences

3.   Basic Arithmetic

All content that was provided to the children consisted of learn-it-yourself content. The YIF assisted only when there was a problem and played the role of an enabler between the children and the content. The content is designed in a manner that assumes that the children will use the CDs to reinforce their understanding of concepts that have already been taught to them by their teachers.

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[3] The YIF receives a Fellowship for a period of 12 months.

The Foundation was unable to find any ready made content which was relevant to the context of the rural government school child. Hence more content could not be made available to the CLCs.

1.4. CHILD-COMPUTER INTERACTION IN THE CLC

The YIF, who is from the local village, is trained in the usage of the basics of computers. In the case of the 34 CLCs, since all the YIFs had some working knowledge of computers, their training focussed on the soft skills of working with children, the teachers, and the community.

In the CLCs, typically the children come to the centre and seat themselves in random order in front of the computers at most 3 children to a PC. For the initial few weeks, the YIF inserts a CD and then demonstrates the use of the CD to the children. Thereafter the children explore the contents of the CD on their own, and ask the YIF for assistance as and when they have any difficulty.

Children get to use the CLC for 2 to 3 class periods in a week in an organised manner, depending on how the timetable is arranged. These periods are a part of the school timetable. Besides, children also use the CLCs in any free time available such as the teacher being absent, or during lunch breaks, etc., to get more time on the computers.

1.5. INVOLVEMENT OF TEACHERS

The head teachers and teachers of the CLC schools have widely welcomed the CLC initiative. They have supported the YIF and interacted with parents and community members to build broad-based support for the programme.

However, by and large, the teachers did not take any active interest in observing the children using the computers. Repeated offers were made to school teachers for training them on the use of computers free of cost. Except for one or two teachers, none of the others were keen on getting trained.

Since the CDs were not linked tightly to the syllabus that they had to transact, most of the teachers also did not take any interest in understanding the contents of the CDs.

1.6. INVOLVEMENT OF PARENTS AND COMMUNITY

The parents and the community have been very involved in the programme from the beginning. In fact all the electricity bills in the first year have been paid entirely by the community. In several cases, the community has shown their commitment in a number of ways such as providing a fan, strengthening the window grills to enhance the safety, buying a printer, etc.

Since the CLCs have been in existence for a year, and all external financial support for the programme has stopped, all the 34 schools are now working out a way in which the operating costs of the CLC can be met through local resources. Such coming together of the community has many not-so-measurable benefits for the overall performance of the school such as demand for accountability for performance etc.

2. METHODOLOGY

2.1. RESEARCH STUDY

An exploratory study was commissioned by the Azim Premji Foundation to test the CLC model by assessing the impact of CLCs with regard to its objectives. An independent research agency was appointed to carry out the research to assess the impact of the Community Learning Centres. The baseline testing was conducted in August 2001, nearly six weeks after the programme was initiated by the Foundation with the help of an external agency. The follow-up to the baseline study was conducted in March – April 2002.

2.2. RESEARCH QUESTIONS

The research questions taken up in the study were:

a. Will the use of computers in government schools attract out-of-school children back into school?

b. Will the attendance rates of children improve as a result of using computers?

c. Will there be a tangible improvement in the academic learning outcomes of children by using computers for academic learning purposes?

2.3. RESEARCH DESIGN

The research was designed to enable us to make inferences about impact of the treatment, which in this case was the existence of CLC in a school. Two different techniques were used to enable us to exercise sufficient control over the extraneous variables. The first technique used was the experimental group design in which the pre-test observations were compared with the observations after exposure (post-test) to the treatment. The second technique was the control group design in which a control group was chosen that was similar to the experimental group in most respects barring the treatment. This would ensure that the observed differences could be attributed to the treatment for the experimental group.

For the purpose of the research, the experimental group were the 34 CLC schools and the control group comprised 34 non-CLC schools from the same geography.

2.4. SAMPLE

2.4.1. Population

Children betwveen classes 1 to 7 in the CLC and Non CLC schools schools. The schools were in the 6 taluks over 3 districts of Karnataka in 3 rural taluks (15 schools) in Kolar district, one rural

taluk (3 schools) in Mandya district, and two urban districts (16 schools) in Bangalore.   There were nearly 10,000 children involved in the CLC programme.

2.4.2.   Sampling frame for Measurement of Learning Levels

Individual students belonging to classes 3 to 6 from the CLC and Non CLC schools.

2.4.3.   Method

A random sampling method was used to select the students for measurement of learning levels. Every n^{th} child in the attendance register was selected as part of the sample. The values of 'n' were decided based on the strength of each class to ensure that approximately 10-12 students were chosen from each class.   The children were tested on basic Math and language competencies. (The local language in Karnataka is Kannada.)

2.4.4.   Size

The total sample size was 4000, where approximately 2000 children each from the CLC and Non CLC schools were sampled for the baseline and the end line study.

2.5.   DATA COLLECTION

Enrolment:

The data on enrolment figures was collected by the YIFs from each of the 34 CLC schools for the years 1999-2000, 2000-01 and 2001-02. The enrolment data is as per the entry made in the admission register of the school.

Learning Achievement:

The question papers for the baseline were developed in consultation with the head teachers of the CLC schools. Separate question papers were developed for classes 3, 4, 5, and 6 children. In each of the classes, the competencies expected to be achieved in the previous two years were also given importance. For example: The class 5 question paper consisted of 10 questions out of which there was 1 question of std 3, 6 questions of std 4, and 3 questions of std 5 in the Kannada section.

The test was administered by the Young India Fellows and their supervisors. Some tests were also conducted by independent researchers.

The test for the follow-up study was also conducted by Young India Fellows, their supervisors and in some schools by independent researchers. The question paper used for the follow-up study tested the children on the exact same competencies as in the baseline study.   The questions were slightly modified so as to make it different from the original question paper.

The grading of the answer papers was a very objective exercise. The simple grading exercise was taken up by the YIFs and randomly cross verified by the independent researchers.

2.6. DATA ANALYSIS

Enrolment:

The raw data on enrolment in the 34 CLC schools was analysed as per the transition rates observed in each school. The transition rate is a good indicator of whether more children joined a particular school in comparison to the enrolment rates of the school in the previous year. For example, it is expected that in a class of 25 children in Class 1, all children will move to class 2, barring those who are detained/retained or those who drop out of school. If there are more children in class 2 than the 25 in class 1, this could happen only if children transfer from other schools to this school or if out-of-school children have joined this school, laterally to class 2.

The Transition Rate for class A of a particular school in a particular academic year is calculated as:

(No of students in class A – No. of students in class A-1 in the previous year)   X   100

               No. of students in class A-1 in the previous year

The transition rates for classes 2, 3, 4, 5 and 6 of all the 34 CLC schools were calculated for three years. For each class in each of the three years an aggregate of the 34 CLC schools was taken.

Learning Achievement:

The objective of the statistical analysis was to search for any significant changes that may have taken place in the academic performance of the children in the CLCs. For this a comparison of the marks of classes 3 to 6 was done against a Non CLC schools and the results analysed for their statistical significance.

The change in performance in each subject from the pre-test to the post test was found out by subtracting the pre-test scores from the post-test scores. All further analyses were carried out on these changes observed. Descriptive variables were used to carry out preliminary tests and their significance tested using Independent-Samples T Test. The dependent variables for the T Test were the changes in the Kannada and Mathematics scores and the independent variable was the type of programme (whether Non CLC or CLC schools).

The trend in the lowest quarter of marks (0-5) was also observed in both the CLC and Non-CLC schools as per the pre and the post test situation. It was expected that in the CLC schools there would be a transition in the number of students falling in the lowest quarter of marks into a higher scoring segment.

2.7. SCOPE FOR BIASES

There are a number of areas, where there is a scope for biases to creep into the process of conducting a research study.

   a.   **Selection of Schools:** The initial process of selection of schools for setting up the CLCs was based on the recommendation of the state government. The state government gave

the Foundation a list of schools in the vicinity of Bangalore, which had an extra room and power supply. No other criteria were applied.

While it may appear that the selection process of schools is entirely random, the fact that each of these schools did have an extra room is a common factor. When in many government schools, the perception is that there is a shortage of rooms, how come these schools had extra rooms? Does this group of schools point to any bias which is not obvious?
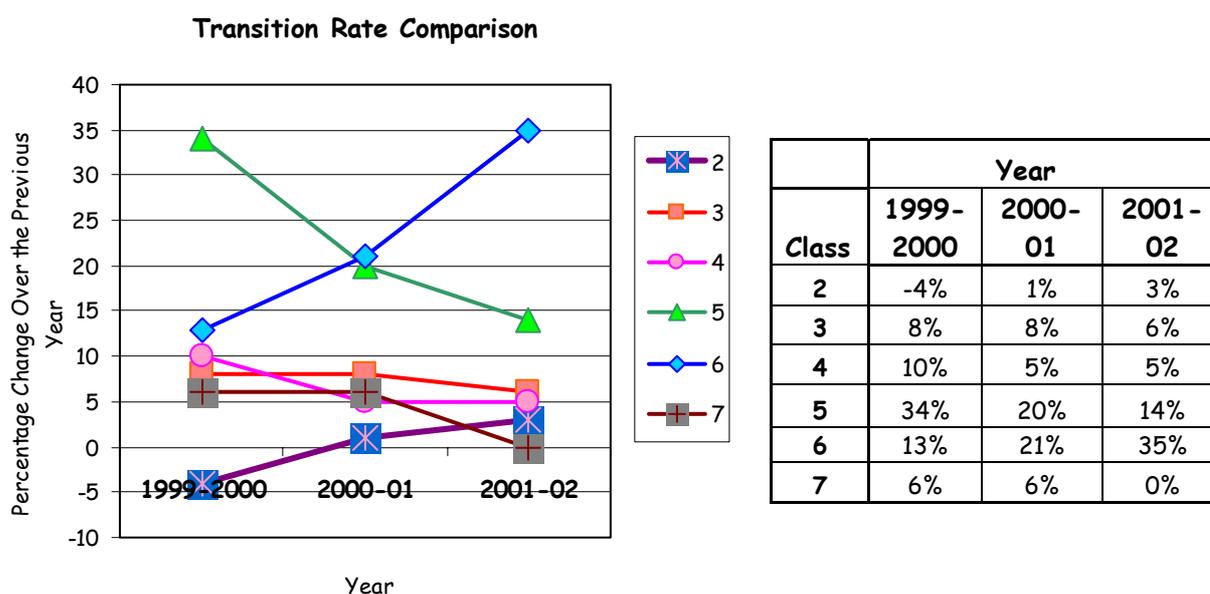
b. **Testing in Non-CLC schools:** When a test is conducted for children of elementary schools, it is always felt that the familiarity with the person administering the test is very important for a child to be able to freely express himself or herself in the test. In the case of Non-CLC schools, the children were tested by the YIF, who was a completely unfamiliar person to them. This could have caused poorer performance in the Non-CLC children. This bias was sought to be corrected by the comparison of proportional changes in marks. Also, the test that was administered was entirely paper based and did not involve any degree of oral/interactive testing with the children.

c. **Bias based on Gender:** The selection of the sample of children was based on every n^{th} child in the attendance register. This has eliminated not only the possibility of gender bias, but also ruled out the possibility of hand-picking the "bright" children for the purposes of the test.

3. FINDINGS

3.1. ENROLMENT

To evaluate the effectiveness of the CLC schools in attracting out-of-school children back to school, thereby increasing enrolment rate, the Transition Rate was calculated as per the procedure mentioned in the methodology.

Graph 1: Transition Rate Comparison for Classes 2, 3, 4, 5, and 6 expressed in percentage

Transition Rate Comparison

Class	Year		
	1999-2000	**2000-01**	**2001-02**
2	-4%	1%	3%
3	8%	8%	6%
4	10%	5%	5%
5	34%	20%	14%
6	13%	21%	35%
7	6%	6%	0%

Graph 1 showing the transition rate comparison, points to interesting results. The observations on the graph:

a.   We began preparatory work to set-up CLCs in December 2000. This led to the setting-up of 34 CLCs between March and August 2001 in the 34 government schools. An increase in enrolments would be expected in June/July 2001 and 2002.

b.   It is important to note that in June/July 2001 and June/July 2002 (since the setting up of the 34 CLCs), there have been consistent and positive changes in enrolments, over the previous year. This points that more children have joined these set of schools than in the previous year.

c.   The spurt in transition rates in class 5 and 6 are seen largely on account of change in government policies.

d.   Data to state conclusively how many children were out-of-school and how many transferred from other schools is not available.

It is difficult to conclusively state based on the quantitative information available, whether children joined the school because of the on-going efforts by the government to enrol all children into school, or because they were attracted to school by computers.

However, interviews with parents and children reveal that a number of children came back to school because they were excited at the prospect of "playing" on the computer. (Most of the educational content in the CLCs is given in the form of education games.)

3.2. ATTENDANCE

Attendance rates in school are also expected to show an improvement. However, it is widely believed that, that attendance records maintained in many schools are not dependable. Only anecdotal evidence has been gathered, which supports the hypothesis that children are indeed attending school more regularly since the CLCs have been set up.

3.3. LEARNING LEVELS

3.3.1 ANALYSIS OF MEAN SCORES

The relative performance of children in CLC schools and Non CLC schools were compared between baseline and follow up tests. The following table brings out the mean improvement and proportional changes in marks for the Non CLC schools and the CLC schools in the pre and post-test.

Table 1: Kannada: Means for Non CLC and CLC schools

Class	Non CLC schools			CLC schools		
	Baseline score	Change in scores at the time of the End Line	Proportional change (in percent)	Baseline score	Change in scores at the time of the End Line	Proportional change (in percent)
Class 3	11.52	2.11	18.32	12.52	2.83	22.60
Class 4	11.81	0.98	8.30	13.56	2.61	19.25
Class 5	10.70	0.41	3.83	12.86	1.51	11.74
Class 6	11.52	0.51	4.43	13.61	1.17	8.60

The shaded boxes in the table shows the highest proportionate increase for a class. In case of Kannada for all classes (3-6), the increase in test scores in case of CLC schools is greater than the Non CLC schools.

Table 2: Mathematics: Means for Non CLC and CLC schools

Class	Non CLC schools			CLC schools		
	Baseline	Change in scores at the time of the End Line	Proportional change (in percent)	Baseline	Change in scores at the time of the End Line	Proportional change (in percent)
Class 3	9.06	5.05	55.74	11.91	3.13	26.28
Class 4	10.16	1.21	11.91	12.36	2.90	23.46
Class 5	9.29	0.84	9.04	11.74	1.93	16.44
Class 6	11.58	0.68	5.87	12.45	2.30	18.47

The shaded boxes in the table shows the highest proportionate increase for a class. In case of Maths except for class 3, for all the other classes the CLC schools show a greater proportionate increase in scores as compared with the Non CLC schools.

Table no. 1 and 2 indicate the performance of the CLC and Non CLC schools in the subjects of Maths and Kannada on the basis of the change in the mean scores from the baseline study to the end line study. The Independent-Samples T Test was used to test the significance of the results obtained. The data was analysed for T test as per procedure mentioned in the methodology. The following table brings out the summary of the observations as per the T test:

Table 3: Kannada: Summary of T Test

Class	Non CLC/ CLC	Statistical Significance*	CR value
Class 3	CLC	Not significant	0.327
Class 4	CLC	Significant	0.015
Class 5	CLC	Not significant	0.096
Class 6	CLC	Not significant	0.143

* *0.05 level of significance*

Table 3 is indicative of the performance of the CLC and Non–CLC schools with regard to improving learning outcomes of children from class 3 to 6 in the subject of Kannada. The CLC package has given statistically significant relative improvements in class 4.

Table 4: Mathematics: Summary of T Test

Class	Non CLC/ CLC	Statistical significance*	CR value
Class 3	Non CLC	Significant	0.007
Class 4	CLC	Significant	0.011
Class 5	CLC	Significant	0.048
Class 6	CLC	Significant	0.001

***** *0.05 level of significance*

Table 4 is indicative of the performance of the CLC and Non–CLC schools with regard to improving learning outcomes of children from class 3 to 6 in the subject of Maths. The Non-CLC schools are seen to perform better in Class 3. However, the impact of the CLC schools in improving academic achievement in classes 4, 5 and 6 in the subject of maths is seen to be significant.

3.3.2 ANALYSIS OF LOWEST QUARTER OF MARKS

The software that was provided to children in the CLC schools was designed to partially address only the academic competencies of grade 1, 2 and 3. Of the children tested on grade 2, 3, 4 and 5, the most important target group of this initiative was the lowest performing children in each -of these classes. To gauge the impact of the CLC schools in this regard, it would be expected that the number of students scoring in the lowest quarter (0-5) of marks would decrease with exposure to learning supplemented by CLCs.

Table 5: Number of Students lying in the Lowest Quarter of Marks (0-5) in the CLC and Non-CLC schools

	CLC schools		Non CLC schools	
Subject	Baseline	End line	Baseline	End line
Kannada	118	32	112	88
Maths	130	37	164	116

Table 5 indicates a change in the number of children scoring in the lowest quarter of scores when tested at the end line study. The table reveals a dramatic drop in the number of children who were in the lowest quartile of scores between the baseline and end line assessment in CLC schools, as compared to only a marginal drop in the Non CLC schools.

4. CONCLUSIONS

The following were the main conclusions of the exploratory research:

1. There has been a positive change in enrolment rates (over the previous year) in the CLC schools.

2. The impact on attendance rates of children could not be quantified for lack of reliable data. Due to inability to collect quantitative data, only anecdotal evidence can be cited to prove an increase in attendance rates in the CLC schools.

3. The performance of the CLC schools was better (statistically significant) than the Non CLC schools for Class 4 in case of Kannada. The results for all other classes were statistically not significant.

4. The performance of the CLC schools was better (statistically significant) than the Non CLC schools for Classes 4, 5, and 6 in the case of Maths.

5. The performance of the Non CLC schools was better (statistically significant) than the CLC schools in the subject of Maths for Class 3. For all other classes the performance of the CLC schools was found better (statistically significant) than the Non CLC schools.

6. The CLCs schools show a larger number of children (than the Non CLC schools) shifting out of from a range low scores (0-5 marks) to a higher range of performance.