Chapter - 3
CHAPTER - III

REVIEW OF PAST RESEARCHES

3.1 Introduction

3.2 Researches on size of the Schools, Economic Cost and Achievement of the Pupils.

A. Researches done in Foreign Countries

Study-2: By J.E. Chambers
Study-3: By R.W. Eberts
Study-4: By D.A. Erickson and R.L. Nault

3.3 Researches done in India

Study-1: By Dr. D.T. Lakdawala and K.R. Shah
Study-2: By Dr. D.T. Lakdawala and K.R. Shah
Study-3: By V.B. Sing and T.S. Papola

3.4 Conclusions

References
3.1 Introduction

A peep into the past gives insight into the present. Review of the past researches gives insight into the present problems. Many angularities and rough surfaces of the present problem can be straightened and made smooth with the help of the past researches. The review helps the investigator in preparing his own research design of the problem on hand. At the same time it also acquaints the investigator with the limitations of the tools and procedures used by the past researches as well as the problems faced by them in carrying out the researches. As a result of his research problem with these objectives in sight, the investigator thought it worthwhile to review the past researches on expense with specific reference to pupils achievement. The researches on this problem were varied - on university education, on higher education and on secondary and primary education. The desire of the investigator was to gain the methodological knowledge from this review.
3.2 Researches on size of the schools, economic cost and achievement of the pupils

Various researches have been reported on the above variables in the foreign countries as well as in India. For the convenience, the researches done abroad would be critically examined first followed by those carried out in India.

A. Researches done in Foreign Countries

Study-1:

The research on "School Size and Student Achievement" by Rendall Eberts E K Schwartz and Joe A Stone is reported in Educational Leadership.¹

The objective of the study was to examine the effect of school size on student achievement. The Study was based on mathematics test scores of individual elementary students in 287 schools nationwide.

This study explored how school size affected student achievement in two steps:

(i) Individual students were linked to school related resources by estimating an educational production function with teacher and principal characteristics as inputs.
(ii) Differences across various size classes of schools in the levels of inputs and in the effects of school based inputs on students outcomes were examined in order to identify those characteristics that differ the most across school size.

This two-step approach allowed an examination of both the direct and indirect effects of school size on student achievement. The direct effects were derived from greater effectiveness of school based resources, indirect effects arose from changes in the amounts of school based resources that were associated with differences in school size.

(The authors concluded that large elementary schools with more than 800 students were significantly less effective in producing positive student outcomes than schools with fewer than 200 students).

Student output was measured as gain in achievement of individual students. Each student's post test score, which was administered at the end of the school year, was regressed against the pretest score, along with the other variables. In short the authors used covariance technique to have uncontaminated controlled data.
Conclusions derived by the authors are reported below:

(1) When comparing large schools to medium-sized schools, the largest positive changes in student achievement stemmed from the influence of the following variables: race, administrators per student, teachers per student, amount of time teachers spend in preparation and in service programmes, amount of time teachers spend in service programmes in mathematics, and the teachers' perception that the principal provides active leadership to the mathematic programme.

(2) The strongest negative influences between medium-sized and large schools were found in office personnel per student, teachers' highest degree, and the degree to which teachers feel the principal is encouraging.

(3) With respect to small and medium-sized schools, differences in the coefficients of the following variables were related to positive increases in student achievement: the ratio of teachers to students, office personnel per student, the degree to which teachers perceive that principals provide active leadership to the mathematic programme.
matics programme, and the degree to which principals perceive that they keep the teachers well informed.

The following variables appeared to have a weaker or more negative relationship with student achievement in mathematics for smaller schools compared with medium schools. The amount of time principals report spending in activities related to instructional leadership, and the degree to which principals perceive that teachers in the school work well together.

The overall impact of school size on student achievement was also derived by the authors with the help of step-wise regression analysis.

Small schools seemed to have a greater amount of resources that were shown to have a positive net influence on student achievement gains.

The school size has a much larger impact on student achievement when medium schools were compared with large schools. The gain in test scores is 28 percent lower in large schools than in medium schools, when all three components were considered. This means that student achievement in larger schools was substantially lower on average than in moderately sized schools.
Study-2:

"An Analysis of School size under a Voucher System" by J.E. Chambers.

The effectiveness of the U.S. Educational System has been called into question in recent years. Various Commissions and studies have declared our nation to be at risk of losing its comparative advantage in education, and consequently its intellectual and productive edge, to other nations.

One of the issues in education was the size of the schools and its impact upon the pupils' achievement. Chambers collected data regarding large and small schools.

The sample for the study was 162 schools spread in the USA. His observations were as under:

(a) Based on achievement gains in mathematics for eighth grade pupils the results showed that pupils in large schools exhibit smaller gains in pupil achievement than comparable pupils in smaller schools. Pupils in schools with 800 or more pupils had a 28 per cent lower gain in achievement than otherwise comparable pupils in
schools with between 400 and 600 pupils.

This disparity resulted from differences across school size in both levels of educational inputs and in effectiveness of these inputs.

(b) Chambers identified a number of education inputs that differed significantly according to school size. From a policy perspective, it was interesting that many of the variables that differed by school size were ones over which educational policy makers presumably had some control.

Study-3:


This research also indicated that school size might be related to student achievement through the way it affected the instructional process.

Eberts had collected data from 77 schools of different regions of the U.S.A. and computed a correlation coefficients between the size of the schools and the time the teachers taken to teach subjects in the schools.
Eberts found a significant inverse correlation between school size and the time teachers spent on instruction.

Study-4:

"An Exploratory Study of the Effects of Public Money and Related Regulation on Canadian Catholic Schools" by D.A. Erickson and R.L. Nault. The teaching as was done by teachers in large and small school was contrasted in the context of pupils' achievement and the pupils' satisfaction.

Erickson and Nault collected data from 46 schools of Canada which were run by Catholic Church. The data regarding the teacher's method used in the class, the pupils' behaviours in terms of their satisfaction and their achievement were collected at a single point.

The authors concluded that the benefits of small schools included a greater probability that teachers became more familiar with the needs of individual pupils and an increased likelihood that parents would get involved in their children's educational programme in small school.
So school size was a variable which was related to the mode of instruction in terms of school and class size and the degree to which the instructional programme was individualized.

3.3 Researches done in India

Study-1: A Classic Study of Lakdawala and Shah

Dr. D.T. Lakdawala and K.R. Shah conducted studies regarding unit costs in higher education and the secondary education in the State of Gujarat in 1969-70.

They selected three universities, Gujarat University, M.S. University, and S.P. University.

They also selected schools of North Gujarat (A'bad and Banaskantha), South Gujarat (Bharuch and Dangs) and central covering Saurashtra and Kutch region.

They collected data concerning receipts and expenditures and enrolments of the students in the year 1969-70.

The conclusions regarding the expenses of the Universities are listed as under:
Conclusions:

(i) The cost structure of higher education in Gujarat consists of salary cost, operating cost, equipment cost and unclassified part of the cost namely, 'others'. Salary cost occupies a place of importance in the over-all cost structure forming about 50 per cent of the total cost.

(ii) Next in importance is operating cost which is composed of such items of cost as administration, college scholarships, contribution to provident fund, contingencies, furniture, hostel, games and sports and repairs of building. This accounts for 27 per cent of the total cost. Along with expenditure on salary of teachers, expenditures on scholarships, hostels and provident fund are also treated here as part of 'instructional cost' as they provide educational facilities and influence the standard of education.

(iii) Equipment cost, consisting of the cost of equipment and library, which has direct bearing on the 'quality' of instruction (teaching) is also an important component of the cost of instruction.
(iv) The remaining items in the cost structure can be conveniently put together and considered here as cost ancillary to education. This, then, gives us two broadly classified types of costs - instructional cost and the cost ancillary to education. The components of cost appearing in the cost structure can also be classified into two broad groups like salary or teacher cost and non-salary or non-teacher cost.

(v) Analysis of variation in the over-all recurring institutional cost and in its components shown that they differ widely by type of colleges. Professional education colleges are costlier than general education colleges. By components of cost, the extent of variation between different types of colleges is found to be higher with regard to operating and equipment costs than that in salary cost. This can be taken to show that the relative costliness of professional education colleges like engineering, education and medicine is explained by costs other than salary cost. Variation in average salary cost (i.e., per pupil salary cost) is more influenced by the variation in pupil-teacher ratio than by the average annual salary of a teacher.
(vi) Instructional cost (as distinguished from 'salary' or 'teacher' cost) forms about 2/3rds of the total cost for all colleges taken together as well as for colleges of various types individually. The cost ancillary of education accounts for slightly more than 1/3rd of the total cost. Over the period 1960-61 to 1968-69 we observe an increase in the proportionate share of 'instructional cost' in the total. Classification of total recurring cost into teacher and non-teacher costs also shows that during the reference period the former gives a growth rate of around 79 per cent as against that of 45 per cent in the latter.

(vii) In real terms the instructional cost shows a gain of 2 per cent. We also observe an increase of 8 per cent in salary cost.

(viii) A lower pupil-teacher ratio of 19 in 1969-70 when examined in the context of the existence of a large number of uneconomic or inefficient educational institutions in terms of size is more an indication of under-utilization of educational facilities created.
(ix) The three main determinants of cost - size, age and pupil-teacher ratio - are found highly correlated. Size and cost relationship for Arts, Commerce and Arts and Commerce colleges of the Gujarat University shows that most of the colleges are sub-optimal in terms of enrolment which suggests that there is still scope for larger enrolment.

(x) The possibility of uneconomic colleges becoming viable is remote. The requirements of students exceeds the availability in most cases. Further, constraints such as geographical distribution of colleges and aid policy cut down the availability of students for such colleges. The excess capacity found in teacher training colleges hints at the possibility of raising the proportion of trained teachers to total in Gujarat to a level attained by other states.

Study-2: Study on Unit Cost

The conclusions regarding the unit at the school stage in Gujarat are listed as under:

Conclusions

(i) Of the three types of management of schools, government and private aided schools figure importantly. The problem at the Secondary stage of education in Gujarat is that of the existence of a large number of uneconomic or inefficient high schools in terms of size. And since there is a negative relationship between per pupil cost and size (as well between age and pupil-teacher ratio), other things being equal, with the increase in size, cost per pupil declines. Thus, high schools in order to be economic or efficient should raise their size. According to our analysis the minimum possible size should vary between 240-319.

(ii) Two pertinent questions emerge at this stage. They are: (a) How can the existence of such a high proportion of sub-optimal secondary schools be explained? Does this reflect on the allocation of resources within the education sector itself? (b) What possible alternatives one can think of in making a high school of optimum
size? Two plausible explanations for question (a) are: (i) the increase in the proportionate share of secondary schools in the total grant paid to the educational institutions by the State Government during the last decade of 1960's. The share of secondary schools in the total grant has gone up from 15.46 per cent in 1960-61 to 21.83 per cent in 1968-69. (ii) Secondary schools draw students from elementary schools. In view of the fact that the rate of drop-out is quite substantial at the elementary stage, the supply of students to the next stage of education appears to be restricted. When viewed in this manner, it appears that there should a reallocation of resources between levels of education ensuring optimum utilization of resources invested in education.

(iii) With regard to the question (b), two possible alternatives may be (i) consolidation of high schools as suggested by the Education Commission; (ii) improving the quality of elementary education in terms of drop-out rate and thereby ensuring a large supply of students to high schools.
V.B. Singh and T.S. Papola conducted studies regarding Rate of Returns in India. Since expenditure on education has been treated, both on theoretical and empirical grounds, as an investment in human capital, a capital scarce developing economy has to allocate rationally its investible funds with a view to maximizing the effectiveness of investment. Evaluation of investment effectiveness of outlays on education may be attempted on the basis of any of the following two approaches: (1) Contribution of education to Gross National Product and (2) Financial returns education.

The conclusions regarding the Rate of Returns in India are listed as under:

Conclusions

In spite of the paucity of data, some pioneering attempts have been made to calculate the rates of returns on education in India. Each successive attempt has improved upon the preceding estimate through certain methodological innovations. But this may also impose limitations on the validity of comparisons between the results of these studies. For 'what' is
being calculated may be different at different times and 'how' it is being calculated differs every time.

First, an attempt to evaluate the economic rate of return of investment in education was made by Arnold C. Harberger. The basic data used in this study are from A Socio-Economic Survey of Hyderabad conducted by the Indian Institute of Economics. Harberger estimates the rates of returns on Secondary and Higher education on the basis of age-education earnings profile. The returns have been calculated on two different assumptions: Assumption I taking direct costs of each stage of higher education as an increasing percentage of the earnings of 'a Primary school graduate' starting at the age of 14 and increasing by one year at every stage and Assumption II taking the direct costs of education as 50 percent of foregone earnings.

The findings are (1) on Assumption, the rates of return of higher (graduate, Post-graduate) as compared with primary, education were 15 percent and as compared with secondary education were 16.9 percent and those of secondary as compared with primary education were 11.9 percent (2) on assumption II the corresponding rates of return were 14.1, 16.3 and 10.0 percent respectively.
Another attempt was made by V.N. Kothari in a paper submitted to the Seminar on Investment in Education organized by the Department of Economics, Lucknow University, Lucknow, in February 1966. The data have been taken from the Report on the Economic Survey of Bombay City, conducted by the Department of Economics, Bombay University. Certain missing clues like the age-specific earning data for each educational level have been estimated by the author himself. Following in general, Harberger's methodology based on age-qualification-specific-earnings profile, Kothari has calculated the rates of return on education for the High School, all Graduates, Arts and Science graduates and technical and engineering graduates. The Social monetary rates of returns for these four types of education have been calculated at 20, 13, 10 and 22 percent, respectively and the private monetary rate of returns for college education as estimated at 14 percent and that for technical and engineering at 25 percent.

In the same Seminar, another attempt was by Ishrat Z. Hussain by way of verification of a hypothesis that there is a positive association of total and differential returns with different levels of education. In the absence of adequate data relating to life time earnings the writer has adopted the
device of discounting the average earnings per year by loss of many years due to mortality throughout the working age span. Certain analytical devices, like assuming the average earning for each level of education as equal to the earnings in the seventh year after completion of education; subsequent increase in earnings being assumed due to experience and not due to education and deduction on account of incidence of unemployment, have been adopted. She has then calculated cost both direct and indirect, the latter being taken as earnings foregone during the education period beginning at the age of 15 or after matriculation. After accounting for an 8 percent rate of interest on cost of education. She has estimated the rates of net returns to total costs, which are 37 percent for matriculates, 4 percent for all graduates, 3 percent each for Post-graduate (general) and professional graduates. With regard to differential net returns which may really be taken to be net returns to the economy, the writer finds that they are negative in case of graduates and post graduates and positive only for professional graduates.

In spite of the differences in methodology, coverage and findings, the three studies on India reveal certain general conclusions: (1) The returns
on college education in India varying between 4 per cent (Hussain—all graduates) to 10 per cent (Kothari—Arts and Science graduates) are lower than that of 14.8 per cent of the U.S.A. to 1958. (2) The rates of return are high for Matriculates, varying from 20 per cent (Kothari) to 37 per cent (Hussain). Low for general graduates (as given in (1) above) and high in case of professional graduates (22 Percent—Kothari). The net returns to the economy are found to be positive only in case of professional graduates (Hussain). (3) The rates of return on education are found to be lower than those on Physical Capital (Harberger).

3.4 Conclusions

The critical review carried out by the investigator gave him many clues regarding data collection, methodology concerning research design and statistical model.

Particularly from the researches of foreign countries he got the regression and trend technique which he had used in his computation.

In many researches reported in this chapter, the various researches used simple designs having simple
techniques of statistics. The present investigator, wherever feasible, used this idea in the present thesis, particularly in Chapter V.

Thus, he gained useful knowledge from the reviews of the past researches.
References


6. Ibid P 78-79.