CHAPTER II

REVIEW OF RELATED LITERATURE

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CHAPTER II

REVIEW OF RELATED LITERATURE

The review of related literature implies locating, studying and evaluating reports of researches relevant to the topic under investigation. This will enable the investigator to have a clear picture of the problem area. It also performs certain other functions such as to avoid the risk of duplication and to contribute to the general scholarship of the investigator. "It is a crucial step which invariably minimizes the risk of dead-ends, rejected topics, rejected studies, wasted effort, trial-and-error activity oriented towards approaches already discarded by previous investigators, and—even more important—erroneous findings based on a faulty research design" (Mouly, 1963:112).

The topic for the present study being 'A Study on Age, Education and Earnings of Engineers in Kerala', the review of related literature is concerned with the discipline 'Economics of Education'.

2.1 NATURE OF ENQUIRY IN ECONOMICS OF EDUCATION

'Economics of Education' is one of the most rapidly growing branches of Education and Economics. A number of studies in this area have contributed to the fast development of this discipline. The first research study in the economics of education submitted for a formal degree of the Bombay University was done by Kale (1933) on the economics of primary education in Bombay, which was essentially concerned with the problems of financing, enrolment, etc. in primary education (Panchamukhi, 1986:263). However, a systematic and revolutionary attempt in this area was done by Schultz (1961). It was this effort which gave birth, to the discipline 'Economics of Education'.

Later it was given a definite shape by Vaizey (1962), Harbison and Myers (1964), Anderson and Bowman (1965), Rao (1966), Blaug (1972), Psacharopoulos (1973) and
others. Together with, health economics, it makes up the core of the economics of human resources - a field of enquiry which, during the last four decades, has been silently revolutionising such technical subjects such as growth economics, labour economics, international trade and public finance.

In the following sections, the investigator reviews the most important studies related to the area of investigation. These studies are grouped in the following categories: (i) Education and Economic Development (ii) Cost-Benefit Analysis of Education (iii) Returns to Education (iv) Education and Earnings and (v) Economics of Engineering Education.

2.2 EDUCATION AND ECONOMIC DEVELOPMENT

The term 'development' denotes different meanings to different countries. In many countries development means industrialisation. In some, it symbolises the achievement of political and economic independence. Yet another meaning attached to the term is urbanization. Sociologists and political scientists tend to think of development as a process of modernization and they concentrate their attention primarily on transformation of social and political institutions. Development may also mean opportunity for education and movement from rural to urban areas.

A lot of human effort is needed for the economic development of nations, through exploitation of natural resources, mobilization of capital, development of technology, production of goods and services and their transfer and exchange (Harbison and Myers, 1965). Planners, especially in developing nations, most often see economic development as the creation of infrastructure and physical capital formation only. Rao (1966), in the context of a developing country like India which is predominantly rural, states that "unless the human being is equipped with the necessary skills and is motivated to play his appropriate role in production and organises himself properly for
the purpose with regard to economic consideration, the developmental facilities that are created will not be utilised either economically or at their optimum capacity”.

Economists and educationists all over the world agree that by promoting division of labour and specialization, education brings about an optimum combination of factors of production while ultimately results in economic development. They have tried to answer the question of how much education has contributed to economic growth. The earliest attempt was made by Miller (1960). Immediately after two years, an American economist, Edward Denison used the concept of production function in order to identify the contribution of different factors of production to the increase in the national income or gross national product (GNP) of the United States between 1910 and 1960 (Denison 1962). His analysis led to the much publicized conclusion that increases in the level of education of the labour force accounted for as much as 23 percent of the annual rate of growth of GNP in the US. A major breakthrough, in this area, was achieved through the pioneering study of Schultz (1963), based on an analysis of empirical input-output series linked to investment in education in the United States. The findings in Schultz’s study supported those of Denison’s study. Denison then went on to apply similar techniques to various European countries but his results were less clear-cut. In a correlation analysis using similar measures of educational development, Anderson and Bowman (1963) suggested that primary schooling and literacy were more correlated with the level of economic development than the provision of secondary or tertiary education.

The same reservations can be attached to the various exercises in national correlation comparisons that reached their apogee in the widely published work of Harbison and Myers (1964) on human resources indicators. Carle (1964) conducted a macro level study with a sample of 57 countries and estimated the relationship between educational expenditures and per capita G. N. P. Nallagoundan (1965), in his
comprehensive study, attempted to assess the contribution of education to India's economic development during 1950-51 to 1960-61. Rao (1966), in his Delhi based study, found income differentials between persons with different levels of education and also between technical and non-technical personnel. Bennet (1967) investigated the relationship between vocational and general secondary education in the development process and found that economic variables were generally more highly correlated with vocational than with academic schooling.

In the same year, Mukerji and Rao (1967) conducted an empirical investigation into the relationship between functional literacy and economic development. Chaudhari (1968) examined the impact of education on the agricultural sector in India. Ribich (1968) studied the issue in another angle. He analysed the role of education as an effective means of helping people to lift themselves out of poverty. Sen (1968), a critique of 'fixed requirement approach', evaluated the various approaches to manpower planning in terms of their logical implications and provided a critical survey of manpower plans of Yugoslavia, Turkey and India.

Adams and Bjork (1969) made an attempt to quantify the relationship of education to economic, political and other aspects of development. Beida (1970) estimated the product moment correlation between marginal difference in educational expenditure and the rate of economic growth.

Kamarov (1971) in his study, stressed that improvement in the education and cultural and technical level of the workers affects national economy and the wage structure. Immediately after 2 years, Sharma (1973) in his doctoral thesis, studied the economics of education with special reference to educational development of Madhya Pradesh. In the next year, Singh (1974) also tried to find out relation between educational progress and economic development in Punjab. But Dholakia (1974) took a longer period 1948-49 to 1968-69 for estimating the relative contribution of education to economic
growth in India. Khajapeer (1976) studied the vicious circle of illiteracy and found that there is high relationship between illiteracy and poverty. David (1978) also found that human resource development depends mainly on the general growth of employment and education in the right direction. Jafri's (1978) study was mainly intended to assess the manpower situation in the industries and to suggest guidelines to channelize educated manpower for economic development.

Nair (1978, 1978) conducted two studies, in the same year, relating to education and economic development in Kerala. He suggested a methodology for calculating effective cost of education. Dave (1979) studied the issue in the reverse direction. He aimed at studying the impact of economic growth on educational development. The main purpose of the study by Nair (1980) was to determine whether the existing system of education in Kerala promoted the development of human resources. Khajapeer (1981) studied the academic performance of the farmers functional literacy programme participants in relation to some social-psychological factors. Jaleel (1982) studied the relationship between education and economic growth in Malappuram district, and found that there is positive correlation between level of education and economic growth. Tilak's (1986) study on education and regional development, covered a range of aspects, focusing on a few important functions of education at regional level employment, earnings etc, and the differential capabilities of the education system in performing these functions in different regions in India.

Five village panchayats were selected for the study. He found that sex, place of birth, caste and size of the family have significant influences on the development of human resources.

2.3 COST BENEFIT ANALYSIS OF EDUCATION

"Cost-Benefit Analysis is a technique which attempts to set out and evaluate the costs and the benefits of investment projects to help to decide whether or not the project should be undertaken" (Bannock, Baxter and Rees, 1972:89).

Cost-Benefit Analysis (CBA) in educational investment has significant differences from that of investment in physical or water resources. In physical projects, CBA is applied before project implementation for ascertaining the economic efficiency. Planners can either take up or reject a project on the basis of the analysis of costs and benefits. But in educational projects one cannot measure the costs and benefits before hand. On the other hand CBA is used as a measure of the extent to which current supplies of educated people represent over or under-investment in the 'education industry' (type or level) generally after few years of functioning (Blaug, Woodhall and Layard, 1969:26).

Through CBA of educational projects, administrators and planners get useful data for making choices regarding the selection or rejection of a project (Sharma, 1969). If the objective is an efficient allocation of resources between different uses, the yield on investment in men has to be compared with that of investment in other forms of capital. If the returns to investment in a particular educational level are higher than the returns to physical capital, one would conclude that there is under-investment at this level of education. Conversely, if the returns to human capital are lower than the returns to physical capital, investment in the physical capital should be given priority. Hence, decision on the optimum allocation of resources could not eliminate the concept of profitability measures of investment in education (Psacharopoulos, 1973).
An educational system's (or sub-system's) cost-benefit ratio is an important indicator of its external productivity. If the accrued benefits to individuals or to society substantially exceed the educational costs, then that particular educational effort can be viewed as a good investment (Coombs and Hallak, 1987). When economists perceive expenditure on education and training as investment in human capital, they provide the analogies between education and investment in human capital. To them, it is possible to measure the profitability of investment in capital through applying the techniques of CBA that have been traditionally applied to physical capital (Woodhall, 1983).

The use of CBA in human resource projects, especially in education was attempted by Strumulin in 1929. CBA became a topic of interest and controversy especially among economists, in the 1960's, when several economists including the Nobel Laureate Theodore W. Schultz (1961), devised statistical methodologies for measuring the contribution of education to national economic growth. Miller (1960), Becker (1962, 1964), Mincer (1962), Bowman (1962) and Hansen (1963) are the important among them. Till the beginning of 1970's CBA of educational projects were undertaken by at least thirty two countries including both developed and developing countries (Woodhall, 1970; Psacharopoulos, 1973).

Bowles (1967) used earnings data from a sample survey of employment in private firms in 1964 to estimate benefit-cost ratios at different educational levels in Northern Nigeria. In a widely publicized study of the benefits, costs and finance of public higher education in California, Hansen and Weisbrod (1969) concluded that the general effect of public subsidies for higher education in California is to promote rather than to discourage inequalities of income.
Smith (1970) calculated benefit-cost ratio for courses in technical colleges for the academic year 1964-65. His sample was of 17,500 men who were almost exclusively employed by large private companies. The earnings differentials were standardized for mortality, unemployment and geographical region. Alpha co-efficient of 0.5, 0.65 and 0.8 were used. Paul (1972) applied the CBA to a specialised branch of education, viz. management education. Shortlidge (1973) applied the technique of CBA to another specialised branch of education, viz. agricultural education, at the Govid Ballabh Pant college of Agriculture and Technology. A best summary of the research on benefits of education as changes in individuals and changes in society is provided by Bowen (1977) in his classic realise ‘Investment in Learning’.

Harris (1984) analysed the costs and benefits of vocational training school at Mississippi. Ranigopal (1984) attempted a cost-benefit analysis of the Indian Family Welfare Programme and revealed that the benefits are not increasing corresponding to the growth in expenditure. Kouritsky and Graff (1986) tried to determine whether the use of CBA by children tends to be age related, a function of instructional mediation, both or neither. Ekhami (1992) in a paper, discussed the use of cost analysis and cost benefit analysis in school library media centres. In a micro level study, Daniel (1996) analysed the costs and benefits of University education in Pathanamthitta district.

2.4 RETURNS TO EDUCATION

The rate of returns approach is basically a method for taking efficient resource allocation decisions. The Internal Rate of Returns (IRR) is the rate at which the present value of benefits is equal to the present value of costs. If IRR of education is higher than the rate of return on alternative opportunities, then investment in education is advisable. When education is treated as capital, then the approach of IRR, which is basically the norm for investment decision-making, becomes quite relevant and necessary for efficient investments in education (Buch, 1986:269).
Not withstanding the various conceptual and practical problems involved in the calculations of IRR, a large number of studies exist in India and abroad with the application of IRR-technique. In theories developed by Becker (1960, 1962 and 1964), Hansen (1963), Lassiter (1965), Harberger (1965), Harberger and Salowsky (1966), Klinov-Malul (1966) and a host of others, it is assumed that rational people will attempt to invest in education up to the point where returns to them in terms of extra income are equal to the cost of undertaking education, including the income forgone while education is being undertaken.

For India, Harberger (1965), Nallagoundan (1967), Selowsky (1967), Kothari (1967), Hussain (1967), Blaug, Woodhall and Layard (1969), Panchamukhi and Panchamukhi (1969), Chaudhri and Rao (1970), Pandit (1972), Paul (1972) are some of the earlier attempts in this field. Subsequently, a number of research studies, by Shortlidge (1973), Goel (1975), Pandey (1976), Chaudhri (1979), Venkatasubramanian (1980), Tilak (1980), Reddy (1981) and others, have been conducted which have presented the IRR for different types and levels of education with the help of ad hoc sample survey data for different regions.

Of these studies, only Pandit (1972a) is based on an all-India sample, while others were either micro-studies covering a section of the population. Tilak (1980) analysed the inequality in the returns to education between males and females and between backward and non-backward castes.

A number of such studies abroad are reported to have been conducted during this period. Some of them have already been mentioned. Hanock (1967) estimated the returns, by means of multiple regressions. Blaug (1967) estimated rates of return of a sample of about 2,800 male employees in five large firms in Britain. The private and social rates of return to a university degree were estimated to be 8.5% and 6% respectively. Schultz (1968) also attempted to study on returns to education using a rather small sample of urban labour force of Bogota in 1965.
Psacharopoulos (1968), in his doctoral study, estimated internal rates of return to investment in education in Greece. Ogilvy (1968), estimated the private and social rates of returns to education in New Zealand. The private and social rates of return to a university degree were 14.70% and 13.20% respectively. Selowsky (1968) also estimated a variety of social rates of returns of working people in Bogota during 1963-66. Thias and Carnoy (1969) calculated rates of returns to education in Kenya using a special survey data. Rogers (1969) estimated both social and private returns to a number of subjects within higher education in Brazil. In the same year Psacharopoulos (1969) also estimated rate of returns to investment in Hawaii based on the reports of the 1960 census of population.

Using special tabulations from the 1960 population census of Pureto Richo, Carnoy (1970) estimated the rate of returns figures in urban and rural areas. Clark and Fong (1970) used sample household survey in 1966 to estimate the returns to education in Singapore. Bowman (1970) also used sample survey in firms employing ten persons or more in order to estimate rates of returns to investment in education in Japan.


In addition to the various Indian studies mentioned earlier, some recent studies also need mentioning. Kumari (1986) estimated the rates of returns to post graduate collegiate education in the University of Meerut and also analysed different types of
costs and benefits and their inter relationships. Debi (1987) estimated both adjusted and unadjusted internal rates of returns to higher education in Orissa. Mathew (1987) estimated the private rates of returns to different levels of education in Chunakkara village in Kerala. Hollenbeck (1992) analysed the returns to academic and technical programmes using empirical evidence from the National Longitudinal Survey of High School students. Cox (1994) estimated the internal rate of returns to the two year post-BS Pharm Degree, using data from the 1990 Purdue National Pharmacy Compensation Survey. In a research paper, Duraisamy and Duraisamy (1995) estimated the private rate of returns to higher education in India.

Groot (1995) attempted to analyse type specific returns to enterprise related training and developed an empirical model for heterogeneous human capital investment decisions, using survey data from a cohort of Dutch workers. Acharya (1996) worked out rates of returns to education based on the unit record data of the National Sample Survey for the year 1987-88. Daniel (1996) estimated the private rate of returns to university education in Pathanamthitta district in Kerala. The internal rates of return to graduate and post graduate education were 12.78% and 11.50% respectively. Unni (1996) estimated the private rates of returns to education for men and women separately.

The various rate of returns studies reviewed above, bring out a general conclusion that, by and large, the rate of returns from investment in education is higher than from other investments, and the rates are lower for higher levels of education indicating that the law of diminishing returns is applicable to educational investment. These conclusions suggest that there is the need for increasing the expenditure on education in general and on lower levels of education in particular.
2.5 EDUCATION AND EARNINGS

Education transforms mere human resources into productive human capitals. Therefore, more educated workers earn higher income than those who have lower educational qualifications. There is a positive relationship between education and earnings in any country irrespective of the nature of economies. This relationship has been extensively analysed in order to throw light on the relationship between education and economic growth, to measure the social and private returns to education, to evaluate education as a form of investment in human capital and to examine the links between education and the distribution of income (Woodhall, 1987:209).

Information on earnings and level of education has been collected regularly in the United States census since the 1940s, but most countries have to rely on sample surveys for data on the average earnings of workers classified by educational level. The first landmark study in empirical profitability in the United States by Glick and Miller (1956) analysed the 1949 census data of medium income group in terms of age, race, sex, education and adjusted the income data by the probability of survival. They found that college education is worth $1,00,000. Miller (1960), extending his earlier work with Glick, estimated life-time income of people with different years of schooling.

The various rate of returns studies reveal that there are some non-education factors affecting the earnings of a person. The method for dealing with earning related variables other than education is the process of standardization (Jaleel, 1982). There are two methods for dealing with this problem. The first method is by applying an adjustment factor- ‘alpha factor’ as Mark Blaug puts it. The second method is through regression analysis. While Becker (1964), Denison (1964), Selowsky (1968), Schultz (1968), Thias and Carnoy (1969), Blaug, Layard and Woodhall (1969), Smith (1970) and others followed the first method, the second method was adopted by Hunt (1963), Camoy (1964), Hanoch (1967), Blaug (1971) and others.
Mark Blaug, after examining the influence of the various factors affecting earnings, concluded that age and education are the most powerful factors affecting earnings (Blaug, 1970:23). It is because of this reason that a number of studies on education and earnings have used the technique of 'Age-Education-Earnings (AEE) Profile' for estimating the contribution of education on earnings. Maglen and Layard (1970), Woodhall (1970), Blaug (1970), Mincer (1974), Psacharopoulos (1975), Nallagoundan (1978), Jencks et al (1979), McMahon (1987) are some of the earlier studies in this area.

Normally the AEE Profiles have a positive slope till the age of retirement and then becomes negative. The shape of the AEE Profiles can be simply related to the process of physical and intellectual maturity. However, Becker (1964) argues that the slope of AEE Profiles reflects investment in human capital.

Shah and Srikantiah (1981) found that education and earnings were positively correlated and that the rates of growth of earnings were higher for persons with more schooling. Jaleel (1982) constructed AEE Profiles to study the contribution of education to economic growth in Malappuram district and found that the AEE Profiles of the more educated are higher and significantly different from that of less educated. Nautiyal (1985) attempted to find out the relationship between education, earnings and income distribution and to study the impact of education on agricultural productivity in Uttar Pradesh. A clearer evidence of the role of education for the improvement of earnings was presented by Reddy (1988) in a similar study for Andhra Pradesh. Using the data for 1,150 farmers, he found that education of the farmers and their agricultural income are positively correlated. Daniel (1988) constructed AEE Profiles to study the economic benefits of secondary education in Pathanamthitta District.

Chacko (1990) also constructed AEE Profiles to study the contribution of education to economic development in the rural areas of Kerala. Lakshmanasamy and
Madheswaran (1993) analysed the age-earnings of science graduates. In a research paper, Srinivasan (1993) attempted to estimate the earnings functions for urban males. The empirical evidence clearly shows that the earnings functions of urban males have been well represented by the functional relationship in which education, age and age square were the elements. Tansel (1994) also estimated an earnings function for urban wage earners in Turkey together with a wage earner choice education. Weisberg (1995) constructed AE profiles for Israel labour market between 1974 and 1983 and found that both higher wages and AE profiles were related to higher education levels. For higher education levels, the AE profiles present steeper parabolic shapes. Daniel (1996) in another study, constructed AEE profiles for university educated employees in Pathanamthitta district, Kerala. The study found that the earnings of post graduates at all age levels are higher than graduates. Besides the profile of post graduates has less fluctuations. Daniel (2000) in a recent study constructed AEE profiles of Teacher Educators in Kerala. The study found that education and earnings are positively correlated. Sex and place of residence have direct influence on earnings. The profile of females has a negative slope towards the end of their career.

2.6 ECONOMICS OF ENGINEERING EDUCATION

Engineering education is one of the most significant components of human resource development spectrum, with great potential for adding value to products and services, improving the quality of life of the people and for contributing to the development of the national economy. During the past five decades, “there has been a phenomenal expansion of technical education facilities in the country. At the time of independence in 1947, we had only 38 technical institutions at the first degree level, and 53 institutions at the diploma level, with annual intake capacities of 2,940 and 3,670 respectively. Only about half a dozen institutions offered some limited facilities for post-graduate
activities in the field of engineering and technology. Today we have 184 recognised technical institutions at the first degree level and more than 444 polytechnics at the diploma level with annual admission capacities of 37,000 and 75,000 respectively. About 140 institutions offer facilities for post-graduate studies and research in engineering and technology with an annual intake capacity of more than 9,400 students". (Thakur and Thakur, 1996:358). A description of the nature of engineering education in Kerala is given in section 1.1.4 of chapter I and 3.4.2.1.2 of chapter III.

A brief explanation of the various studies related to the economic aspects of engineering education in Kerala, India and abroad, is presented. Studies included in this section may directly or indirectly be related to the earlier sections of this chapter. But such a classification is made with a view to locating accurately the untouched areas related to the problem under study.

Nair (1965) attempted a study to estimate the parental cost of engineering students. The sample consisted of five engineering colleges in the state of Kerala. The average annual cost of engineering education was found to be Rs. 1882.86. Blaug, Layard and Woodhall (1969) estimated rates of returns to engineering education along with other types and levels of education. The private and social rates for an engineering degree were found to be 15.50% and 12.50% respectively. Richardson (1969) estimated the rates of returns to non-graduate and graduate engineers in a study for Great Britain. The private and social rates of graduate engineers were found to be 15.30% and 9.20% respectively. The corresponding rates to non-graduate engineers were 26.40% and 18.00% respectively. Smith (1970) calculated benefit-cost ratios for courses in technical colleges in 1964 - 65. The sample volume for the study was 17,500 men. Among the various studies conducted by IAMR, two studies worth mentioning in this connection; one on civil engineers (IAMR, 1969) and the other metallurgists (IAMR, 1971). The methodology was developed to take care of the special characteristics pertaining to
these branches. Using a global approach, the demand estimates for engineers were worked and a series of manpower demand projections were made on the basis of different relationships established between engineering, employment and other parameters (Srivastava, 1997: 105).

Maglen and Layard (1970) estimated the AE profiles of employees in the electrical engineering industry in 1966 and produced a variety of profitability estimates. Private rates of return were estimated as 12.00% for a first degree, 10.50% for a master's degree and 12.90% for a doctoral degree. The corresponding social rates were 8.10%, 5.70% and 7.40% respectively. Mithal's (1973) study aimed at surveying critically the development and growth of professional education in India including engineering education and analysing the factors that influenced its development in the various periods. The major objective of the study by AICTE (1976) was to assess the manpower in industries and do job analysis of the technicians working in the industries with a view to improving essential pre-requisite to planning for technical education in the country. The study highlighted the relationship between academic qualifications and technical education of technical manpower in different job levels. Khan (1977) attempted a study to estimate student wastage in engineering education. The major findings of the study were: (i) Very high drop-out rates were observed in polytechnics. Though the drop-out rates in engineering colleges were not low, they were less than 50% of those in polytechnics. (ii) The day scholars dropped out comparatively more than their counterpart boarders. The main objective of Arora's (1981) study was to identify the problems of students studying for professional courses - Medicine, Law, Engineering and Education. The major finding was that medical students had the lowest and law students had the highest number of problems in all ten areas. Both the engineering and the teaching students occupied almost the middle position.
Sivadasan (1984) conducted a study on the utility pattern of engineering graduates in Kerala, mainly to assess the magnitude of unemployment among engineering graduates and to know their absorption in various public and private industrial sectors and establishments and their utility pattern. The study found that 56.90% of the total employed engineering graduates are working within the state and the remaining 43.10% outside the state. Pinto (1985) studied the factors contributing towards job satisfaction of industrial employees and their relation to education and training. Singh (1986) attempted to find the incidence of job satisfaction among professionals viz. teachers, engineers, advocates and doctors. The sample consisted of 80 doctors, 80 engineers, 80 advocates and 80 teachers, all males from rural and urban areas. The study found that: (i) age and experience and positively correlated with job satisfaction (ii) size of the family is negatively correlated with job satisfaction (iii) professionals with extra academic and professional attainments have a lower job satisfaction (iv) married professionals are more satisfied than unmarried professionals.

Though there are many studies using the earnings data of general population and linking them with education data, studies of sectoral nature estimating the effects of education on economic variables are very few. One such study was carried by Hebbare (1989) for a few firms in electrical and electronic industry in a city and concluded that the social rates of return to education are fairly high in this industry. Buechtemann (1994) found that despite the massive and increasing amounts of public and private expenditure on education and training in highly industrialized and also in industrializing and developing countries, there is a scarcity of clear evidence balancing the costs of and returns to such investment. Vijayaraghavan and Purushothaman (1996) in their study suggested systems approach to undergraduate engineering education in India. Several suggestions regarding the quality improvement of engineering education were also given in the study.
Saxena (1996) studied the need for restructuring civil engineering education in India. After gathering criticism from employers, students and educators in the field of engineering, he suggested various strategies for the quality improvement of civil engineering in our country.

2.7 CONCLUSION

The foregoing review of related studies throws light on the nature of work done relating to the problem under study. It helped the investigator a lot in defining the problem, limiting the scope and formulating hypotheses.

The studies, in general, reveal that education is increasingly being considered as an important factor in the overall economic development. Majority of the studies which estimated the contributions of education suggest that for higher levels of education, the rates of returns are lower. Several studies used AEE Profiles to assess the contribution of education to economic growth. Studies relating to the economic aspects of engineering education are very few in number. Besides, none of these attempted to study the inter group differences in the earnings of engineers in the subsamples classified on the basis of medium of instruction at school, size of the family, nature of employment, nature of management, job satisfaction etc. All these factors might have significant influence upon the life time earnings. Hence, it has been found imperative to study the pattern of life-time earnings of engineers classified on the basis of the above factors. The present study is an attempt in this direction.