CHAPTER I

INTRODUCTION

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CHAPTER I
INTRODUCTION

1.1 CONTEXTUAL BACKGROUND OF THE PROBLEM

'Economics of education', as a branch of study is of recent origin. Education had been considered as a non-productive activity and therefore, it did not have any importance in the allocation of resources till the middle of the twentieth century when economic analysis of education became a subject of study and research. Since then great economists like Theodore W. Schultz have tried to prove that education is an investment in human capital to the process of development (Schultz, 1961).

During the sixties, economics of education borrowed models from economics and by the mid-seventies, the models were adopted and the methodologies were suitably moulded to make them distinct. Today, economics of education has become one of the developing branches of economics. This new branch of economics has brought into the fore the following questions. How much should a country spend on education? Is education mainly investment or consumption? What is the optimum combination of pupil's time, teachers, buildings and equipment embodied in schooling? What contribution does education make to the overall development of human resources and how far can we accelerate economic growth especially in low income countries (Blaug, 1972:7). These questions explain the fact that economics of education analyses the economic value of education on the one hand and the economic aspects on the other.

1.1.1 Education As Investment In Human Capital

"The concept of human capital refers to the fact that human beings invest in themselves by means of education, training or other activities, which raises their future income by increasing their lifetime earnings" (Woodhall, 1987:21). Majority of
educationists hold the view that education is for the sake of education and therefore they consider it as an item of consumption. But as far as economists are concerned, they use the terms 'investment' to refer to expenditure on assets which can produce a flow of income in the future, and 'consumption' for expenditure which gives immediate satisfaction or benefits and does not produce further income. Based on these premises, one can examine whether education is an item of consumption or investment.

"Traditionally economic analysis of investment in capital tended to concentrate on physical capital, namely machinery, equipment or buildings, which would generate income in the future by creating productive capacity. However a number of classical economists, notably Adam Smith, pointed out that education helps to increase the productive capacity of workers in the same way as the purchase of new machinery or other forms of physical capital, increased the productive capacity of a factory or other enterprise. . . . Since that time, the concept of human capital has dominated the economics of education and has had a powerful influence in the field of education" (Husen and Postlethwaite, 1994:2643).

One of the first systematic articulations of human capital theory occurred in 1960 when Theodore W. Schultz made his presidential address to the American Economic Association on the theme "Investment in Human Capital" (Schultz, 1961:1-17). In this widely cited address Schultz stated that education was not to be viewed simply as a form of consumption but rather as a productive investment. He argued that education, not only improves the individual choices available to men, but that an educated population provides the type of labour force necessary for industrial development and economic growth. This marked a revolutionary attempt in the field of economics of education (Tilak, 1987:18). Later researches in the area swelled to magnificent proportions, firmly laying the tenets of economics of education like the investment nature of education, human capital formation and the contribution of education to economic growth and income distribution.
1.1.2 Education And Earnings

From the above discussion, it is evident that increased efficiency of a person as a result of planned effort, leads to an increase in his earnings also. Good education is an important means towards the production of material wealth. Education provides greatest opportunities and it will be profitable as an investment. The money appropriated for education is a productive investment which is fully liquidated and is profitable for it returns a yield over and above its value. Referring to the contribution of education to the economic and technical development of India, the new education policy, (1986) reads: "our country has reached a stage in its economic and technical development when a major effort must be made to derive the maximum benefit from the assets already created and ensure that the fruits of change reach all sections. Education is the highway to that goal" (National Policy on Education, 1986: 1).

"Education has to be purposive not only in the overall sense of helping to build up the individual's personality, character and intelligence, but also to build his productive capacity and his ability to take his due place in the army of workers who have to fight the battle for economic growth" (Rao, 1966:5). Hence, the acquisition of new knowledge through education approves the capabilities and capacities of an individual thereby exerting a positive influence upon his earnings.

Education acts as the most important factor affecting the earnings of an individual. A person having higher education may be earning more than a person having lower level of education. This difference in earnings is usually attributed to the incremental education. Studies by Nallagoudan (1967), Blaug et al. (1989), Pandit (1972), Goel (1975), Chaudhri (1979) and others claim that there are certain factors other than education which have direct influence upon the earnings. Some investigators have attempted to recognize these factors. These include age, sex, race, native ability, social class, background, place of residence, branch of employment, occupation and
on-the-job training (Blaug 1970:23). Therefore, while considering the monetary benefits of education, one has to eliminate the influence of all these factors. This process is rather complicated. It was because of this reason that Shaffer (1961:1026-35) maintained that the entire notion of the rate of return analysis of education has no place in economic theory. But Blaug, Schultz, Vaizey and others were not willing to concede. Blaug (1970:23), in this regard, states that “apart from age, none of them (non-education factors) is as powerful in their influence on earnings as the number of years of schooling completed”.

This reveals that age and education have a profound influence on the earnings of a person. Tilak in this regard suggests: “ordinarily, only direct monetary benefits, associated with education are brought into the cost-benefit calculus primarily due to measurement problems. For this purpose the construction of the age-education-earnings profile is of primary importance” (Tilak, 1987:63-64). Therefore, in order to measure the benefits of education, it is necessary to construct age-education-earnings profiles.

1.1.3 Age-Education-Earnings (AEE) Profiles

AEE profile is a meaningful tool to estimate the monetary benefits of education. Traditional economists describe the relationship between education and earnings by the use of AEE profiles. Traditional age-earnings are simple relations which demonstrate how the structure of earnings of individuals is distributed across age and level of education and in some cases over gender, race and ethnicity” (Husen and Postlethwaite, 1994:1656). “Assuming, aggregating overall ages, the current relation of demand for and supply of each type of educated person remains unaltered, these profiles would indicate the average pattern of life time earnings associated with each amount or type of education” (Blaug,1969:29).
Although AEE profiles are constructed using the mean earnings of respondents in the sample, which may vary from study to study, they present some common characteristics. These characteristics are summarised from the various related studies, as shown below:

1. AEE profiles demonstrate that, for all educational levels, earnings rise with age up to a maximum and then level off (Psacharopoulos, 1987:141).

2. Earnings are positively correlated with education. Earnings rise at every age with each successive level of education up to the age of retirement. The higher the level of educational attainment, the steeper the rate of increase of earnings and in most cases, the higher the initial earnings of workers at the start of their working life (Woodhall, 1987:210).

3. Normally there is no crossing of profiles among different educational levels. In other words, the absolute level of earnings at any point in time is higher for people with a higher level of schooling (Husen and Postlethwaite, 1994:1656).

4. The profiles are concave towards age (Husen and Postlethwaite, 1994:1656).

5. Workers with higher levels of education reach their maximum earning capacity later than the less educated and their level of earnings at retirement is also higher (Woodhall, 1987:210).

6. The slope of the profiles is positively correlated with level of schooling. In other words, before the earnings peak is reached, the mean earnings of people with a higher level of schooling increases faster than those of people with a lower level of schooling. After the peak, the earnings of more educated people decline faster than those of less educated people (Husen and Postlethwaite, 1994,1656).

These characteristics of AEE profiles will hold good only when income is positively related with education. If there are discrepancies among various occupational groups, and disequilibrium between the supply of and demand for educated persons
with intermixing of both organised and unorganised sectors of the economy, the profiles may not show the usual nature of well behaved AEE profiles as listed above.

Two types of data are most commonly used for the construction of AEE profiles—the ‘time series’ data of education and earnings and the ‘cross-sectional’ data. Some longitudinal studies (Douglas 1964, Taubman and Wales 1974, Hollenbeck 1992, etc.) have used time series data of the earnings and educational attainments of individuals with a view to arriving at true life-cycle data. But in view of the limited evidence available from such studies, scholars have turned their attention to cross-sectional evidence of the relationship between earnings and education.

The studies based on this type of data have “the advantage of reflecting the way in which private educational choices are usually made for an average person from his expectations of the financial benefits of additional years of schooling by comparing the present earnings of different occupations regarding various quantum of education” (Blaug, 1969:25). The distinct advantage of cross-sectional data over time series data is that they are free from the influence of trade cycle and implicitly provide estimates of earnings in terms of money which has constant purchasing power. In addition, they provide reliable estimates of the cost of student time as a resource input in the educational system. The appropriate measure of this input is the earnings of people of similar age, ability and prior education who are currently in employment, and this information can be read directly from age-education-earnings data for a given year (Blaug, 1970:25-27).

Having introduced the techniques of analysis, let us look into the type of education under study, ‘Engineering Education’.

1.1.4 Engineering Education In Kerala

The major purpose of engineering education is “to educate the students in the quantifiable rational and unambiguous contents of knowledge currently available in the
field of engineering and to impart appropriate skills which are deemed essential" (Vijayaraghavan and Purushothaman, 1996:401).

Engineering education in our country has the crucial role of moulding technically skilled human capital for the reconstruction of the nation. "In the past three decades, engineering education in India has grown to such an extent that we claim to have the third largest continent of engineers and technologists in the world. However, it cannot be claimed that the quality of such engineers is uniform and the standards are at international levels or their efficiency is very high. In this fast changing world, engineering education should be viewed as a dynamic production process and management of such a process requires the establishment of progressive national goals, competitive performance standards, accurate evaluation procedures, appropriate feed-backs and automatic controls so that the net products are capable of contributing to the national growth and development" (Vijayaraghavan and Purushothaman, 1996:397).

As in the case of the country as a whole, engineering education in Kerala too has become very attractive to all categories of people in the society. The simple reason is that the society has realized the high economic status acquired out of this form of education. This has increased its demand in a big way. The reasons for this tremendous increase may be two fold. On the one side, it is an item of consumption as it directly satisfies human wants and on the other and the most important side, it is a productive investment in man.

Realizing the gravity of this situation, the government has recently opened a few more institutions in Kerala for this type of education. According to the Information Brochure published by the Government of Kerala, for Entrance 2000, there are 32 engineering colleges other than REC Kozhikode. In addition, the Cochin University of Science and Technology has two colleges, one at Thrikkakkara and the other at
Pulinkunnu which offer B.Tech. courses, making a total of 35 institutions. The variety of courses offered is also quite impressive, 23 branches, ranging from the traditional Civil-Electrical-Mechanical categories to the most modern Information Technology. At present, the total number of engineering seats available in the state is 8873 for the various disciplines (CSES, 2000:1). There has been considerable increase in the number of seats during the last three years. During 1998, the annual intake of students in engineering colleges was only 4223. This increased to 5798 during 1999. This increase was due to the inception of more engineering colleges in the government sector and in the self financing sector and introduction of new courses and increase of seats in the existing colleges (Economic Review 1999: 163-164).

1.2 NEED FOR THE STUDY

There is a misconception that an engineering degree is a gateway to financial success. Engineering education, today, demands heavy investments on the part of the parents as well as the government. But sadly that, there has not been a proportionate increase in the earnings structure of Engineers except in the case of a few who are employed in multinational companies especially in the Information Technology (IT) field. "Parents, students and legislators are concerned about what they are getting for their money. It will be no good to conceal the truth that many employers, students and educators are highly critical and largely dissatisfied with civil engineering education today" (Saxena, 1996:408). This has become a felt-problem related to almost all branches of engineering education. There is considerable disequilibrium between the supply of and demand for engineering graduates and post graduates in our country.

Education commission (1966) highlighted some valuable suggestions for the quality improvement of this type of education. The commission recommended: " in the
immediate future, attention should be given to the elimination of present high wastage rates at all levels (of engineering education) and to improvement in quality of instruction offered" (Education commission, 1966:716). The commission also pointed out that in the immediate future, emphasis should be placed not on the establishment of new institutions or large scale expansion, but on the expansion of existing institutions to optimum size in terms of quality. This necessitates the need for introducing quality improvement programmes to attain maximum efficiency.

"Over the years, a large number of programmes and schemes have been formulated and implemented for improving the quality and standards of technical education in India. They include programmes related to faculty development, curriculum development, apprenticeship training, community polytechnics, development of rural technology, modernization and removal of obsolescence, institutional networking, technical man power information system, advanced technician courses, continuing education, research and development, industry-institution interaction, and so on" (Thakur and Thakur, 1996:360-361). Further several innovative programmes have been introduced as part of the implementation of National Policy on Education-1986. But because of inadequate resources the scope and dimensions of these programmes have been reduced considerably. Thakur and Thakur, by citing various reasons, conclude: "several imbalances and distortions have crept into the technical education system .... In short, while there are some isolated institutions of excellence in the system, a lot more remains to be done to improve the overall quality of technical education. Taking into account the scenario by the turn of the century in socio-economic, industrial and technological areas, more concerted efforts need to be made to enable the technical education system play the desired role" (Thakur and Thakur, 1996:362,364). If this is the case with India as a whole, it would certainly be more crucial in the state of Kerala. It is a fact that no innovative programmes have so far been implemented effectively to improve the system of engineering education in Kerala.
The various rate of return studies reviewed in chapter II brings out a general conclusion that private rates of return are generally higher than social rates of return for all levels and types of education. This becomes one of the major reasons explaining the great rush of students, especially in professional institutions. The parents as well as the government spend huge amounts on engineering education in the state of Kerala, like any other state in India. In Kerala, the total expenditure on technical education during 1998-99 was Rs. 92.91 crores. This was only Rs. 32.61 crores during 1992-93. (Economic Review, 1999:165). This shows that there has been a three-fold increase in expenditure on technical education during the above period. But it is not known whether the investment made for this type of education in Kerala, particularly engineering education, is as or more profitable than investment in physical capital.

Though there are a good number of studies relating to the economic aspects of general education, the number of studies emphasising the economic benefits of engineering education is very limited (section 2.6 of chapter II). Hence an exploration into the economic aspects of engineering education is found imperative. In other words, it is to be estimated that how much income a professional Engineer can earn during his/her total earning span of life (life-long earnings) after the completion of engineering education and how the earnings of a more educated Engineer differ from that of a less educated one. Further, the influence of factors, like sex, community, place of residence, economic background of the family, size of the family, medium of instruction at school, nature of employment, nature of management and job satisfaction on the earnings of Engineers also remains unattempted. This motivated the investigator to have a study on the education and earnings of Engineers in Kerala. Hence the present study.
1.3 STATEMENT OF THE PROBLEM

There has been no specific study relating to age-earnings (AE) of the different educational categories of Engineers in Kerala. Besides, no study has so far been made to analyse the inter group differences in the AE of Engineers classified on the basis of sex, community, place of residence, economic background of the family, size of the family, medium of instruction at school level, nature of employment, nature of management and job satisfaction. Hence a study of the present type is found feasible to analyse the above aspects. The present investigation is an attempt to study the effect of age and education on the earnings of the various categories of Engineers in Kerala. The study is, thus, entitled "A Study on Age, Education and Earnings of Engineers in Kerala".

1.4 DEFINITION OF KEY TERMS

The important terms used in the title are defined for the purpose of clarity.

1.4.1 Education

In the present study, the term 'education' is taken to mean education which is imparted through the various engineering colleges in Kerala leading to graduate, post graduate and doctorate degrees in the various disciplines of engineering.

1.4.2 Earnings

In the study, 'earnings' refers to the total income earned annually by engineering professionals.

1.4.3 Engineers.

For the purpose of the study, the term 'Engineers' is taken to mean professionals in the field of engineering, who are educated and employed in Kerala, having a minimum of graduation in engineering.
1.5 OBJECTIVES OF THE STUDY

1.5.1 Major Objective

The present investigation is designed with a view to studying the Age-Education-Earnings (AEE) profiles of the various categories of Engineers in Kerala.

1.5.2 Specific Objectives

1.5.2.1 To construct and interpret Age-Earnings (AE) and Age-Education-Earnings (AEE) profiles of Engineers in the total sample.

1.5.2.2 To construct and interpret AE profiles of Engineers in the subsamples classified on the basis of sex, community, place of residence, economic background of the family, size of the family, medium of instruction at school, nature of employment, nature of management and job satisfaction.

1.5.2.3 To construct and interpret AEE profiles of Engineers in each subsample.

1.5.2.4 To estimate the total life-long earnings, average life-time earnings and peak earnings of the different educational categories of Engineers in the total sample and in each subsample.

1.5.2.5 To find out whether there exists significant difference in the earnings of the different educational categories of Engineers in the total sample.

1.5.2.6 To find out whether there exists significant inter group difference in the earnings of Engineers in each subsample.

1.5.2.7 To find out whether there exists significant difference in the earnings of the different educational categories of Engineers in each subsample.

1.5.2.8 To gather suggestions for the quality improvement of engineering education in Kerala.
1.6 HYPOTHESES OF THE STUDY

On the basis of the above objectives and the related literature, the following null hypotheses are formulated for the study.

1.6.1 There is no significant difference in the earnings of the different educational categories of Engineers in the total sample.

1.6.2 There is no significant inter group difference in the earnings of Engineers in the subsamples classified on the basis of sex, community, place of residence, economic background of the family, size of the family, medium of instruction at school, nature of employment, nature of management and job satisfaction.

1.6.3 There is no significant difference in the earnings of the different educational categories of Engineers in each subsample.

1.7 METHODOLOGY

1.7.1 Method

The method adopted for the present study is cross-sectional survey method. The survey is conducted on Engineers educated and employed in Kerala, having a minimum of graduation in engineering.

1.7.2 Sample

The sample consists of 2010 Engineers belonging to various categories. A detailed account of the sample survey and techniques of analysis have been presented in Chapter III.

1.7.3 Tools used

The most important tool prepared by the investigator is the questionnaire named 'Age-Education-Earnings Survey' (AEE Survey). The investigator also conducted unstructured individual interviews with experts in the field of engineering education to gather information regarding the quality improvement of engineering education in Kerala. Available documents in the respective offices were studied in detail.
1.7.4 Procedure

The data thus collected have been analysed using appropriate statistical techniques.

1.8 SCOPE AND LIMITATIONS OF THE STUDY

The major objective of the present investigation is to study the AEE profiles of the various categories of Engineers in Kerala. The study is based on a survey conducted on 2010 engineers educated and employed in Kerala. The sample is selected from the 14 districts of the State of Kerala.

However, there are some limitations of the study. The study focused only on engineers educated and employed in the state of Kerala. Only three educational groups viz. graduate, post graduate and doctorate degree holders in engineering were taken into account. For the construction of AEE Profiles, cross-sectional data were used. Income from other sources was not included in earnings. Most of the self-employed Engineers and certain Engineers employed in the private sector were hesitant to furnish the actual salary details. Further, variables namely subject and institution of study were not included.

1.9 ORGANISATION OF THE REPORT

The report consists of five chapters. An introductory overview of the area of study, with a general framework is presented in chapter I. Chapter II deals with a review of related literature and studies conducted in the state of Kerala, India and abroad. Chapter III describes the method of study in detail. In chapter IV, the analysis of data, by using different statistical techniques, is given. Chapter V summarises the report and presents findings, suggestions and conclusion.