

# Researchers' Meet 2017

National Level

January 5<sup>th</sup> & 6<sup>th</sup> 2017



CONNECT - COLLABORATE - SHARE

## CONFERENCE PROCEEDINGS



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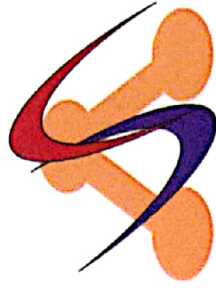
HOMI BHABHA CENTRE FOR SCIENCE EDUCATION

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MUMBAI



*S. Law*



CONNECT-COLLABORATE-SHARE

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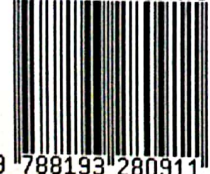
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## 7. AN APPLICATION OF EDUCATION PRODUCTION FUNCTION AT SECONDARY SCHOOL LEVEL IN MUMBAI – Ph.D PROPOSAL

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### **Abstract**

*Economics as an indispensable discipline in Humanities addresses various challenges and issues pertaining to policy makers. In addition to addressing and providing scaffolding in a bid to seek and provide solutions it also plays a pivotal role by the way of its analysis. Economics in fact provides the foundation on which the educational edifice is and in fact needs to be constructed. Thus Economics of Education is an amalgamation of both economics and education which generates a keen sense of awareness that economists steer the vehicle that leads us to the education policy discourse. It covers a vast range of dimensions such as finance and expenditure in education, school management, education quality and standard evaluating impact assessment and so on. As aforementioned, since area of study is Economics of Education, it is sans doubt a fact that this study will be carried out in the light of Education Production Function. Education production function measures relationship between school inputs and school outputs. Several studies have been done on the relationship between school inputs and measure of the school output. However, the lacuna according to me in the various studies read and analysed so far is that the research conducted on the same does not exceed four variables with respect to the inputs. Therefore, present study aims to focus on the various multiple variables that are an inseparable part of Education Production Function, and are often not considered in the process of studying the same. There is need to have clarity on the methodological approach which the current study will be undertaking.*

### **Introduction**

“An investment in knowledge pays the best interest”<sup>1</sup>. Contemplating and analysing this quote by Benjamin Franklin (1758) in its literal sense and not metaphorically we can aptly see that both Education and Economics go hand in hand. The domain of education cannot be studied by divorcing it from the realm of economics. Theoretically, we may view the two as separate but in essence they are one.

An initiation at analysing, studying and investigating economics of education in relation to school resources commenced with the Coleman report (Coleman et al.) (1966)<sup>2</sup>. This report

<sup>1</sup> The aforementioned quote has been listed from *The Way to Wealth*, Franklin's magnum opus work on financial advice.

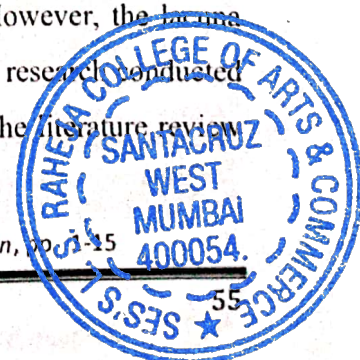
<sup>2</sup> *Equality of Educational Opportunity*, pp. 1-575



relegated its study to the U.S educational system. With respect to the equality of education and to overcome the dilemma, James Coleman and others at John Hopkins institute conducted a study on how to improve academic achievement at the secondary level. The report came up with a rather radical view point that the best way to improve academic achievement was neither to integrate students nor to offer comprehensive programs but rather to raise and increase overall family income. The Coleman report was a landmark in policy research as it aimed to end racial segregation as a hindrance to equal educational opportunity. However, since the standpoint of the report was so radical it was necessary to both comprehend the analysis of the report and come up with surplus proof as regards the impact of resources on academic achievement. Hence, the study of Economics of Education gained an impetus from several contemporaries in the Economic domain following James Coleman. Given the feature of resources in general and economic resources in particular, human capital is an integral facet in Economics of Education. It is as **Gary Becker (1975)**<sup>3</sup> rightly noted a non-tangible form of capital. However, it is impossible to study Economics of Education devoid of human capital. Education is the most important and significant investment in human capital. Considering higher education as an investment in human capital enables us to gain a profound appreciation of the fact as to why the fraction of high school graduates who step a ladder higher to college increases and decreases from time to time. Albeit formal education is not the sole alternative as regards investing in human capital, it still plays a vital role which cannot be neglected. Human capital exerts a domino effect on knowledge, health, skills, values and habits of individual. This is precisely why the entire project of Economics of Education can never be carried out in the absence of human capital. It is crucial to note that economic growth relies strongly on the synergies between new knowledge and human capital.

Education production function measures relationship between school inputs and school outputs. Educational or academic achievement can be considered as school output and various school inputs could be socio economic status, student- teacher ratio, parental involvement, school infrastructure, parental qualification, teacher qualification, teacher experience and type of school. Several reviews and articles have been written on the relationship between school inputs and measure of the school output. However, the literature according to me in the various studies read and analysed so far is that the research conducted on the same does not exceed four variables with respect to the inputs. The literature review

<sup>3</sup> Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education, pp. 1-15



that follows from here concentrates and takes into account the multifarious components that can and ought to be considered under the purview of Education Production Function.

### Literature Review

Socio economic status as one of the variable under Education Production Function is an indispensable facet in our analysis, as it is responsible not only in terms of the cognitive output but also health and socio emotional results. A study conducted by Robert H. Bradley and Robert F. Corwyn (2002)<sup>4</sup>, Selcuk R. Sirin (2005)<sup>5</sup>, Betts and Morell (1999)<sup>6</sup>, Dustmann (2004)<sup>7</sup>, Jones and Jackson (1990)<sup>8</sup>, Filer (1983)<sup>9</sup> and Wise (1975)<sup>10</sup> along with Grogger and Eide (1995)<sup>11</sup> shows that socio economic status definitely have some bearing on academic achievement of students. The next variable under our consideration following Socio Economic Status is the school infrastructure and its resources. Several economists like Eric Hanushek (1989)<sup>12</sup>, Betts and Shkolnik (2000)<sup>13</sup>, Betts and Morell (1999)<sup>14</sup>, Hanushek (1997)<sup>15</sup>, Hedges, Laine and Greenwald (1994)<sup>16</sup> have undertaken a detailed research on the impact of school infrastructure on academic achievement. Parental involvement is also one of the most powerful inputs in relation to students' academic achievement. Studies conducted by many scholars such as Feinstein and Symons (1997)<sup>17</sup>, Haveman and Wolfe (1997)<sup>18</sup>, Eccles and Harold (1993)<sup>19</sup> supports the fact that parental involvement is important factor determining students' academic achievement. Studies done by Betts and Shkolnik (2000)<sup>20</sup>,

<sup>4</sup> *Socio economic Status and Child Development*, pp.372-391

<sup>5</sup> *Socioeconomic Status and Academic Achievement: A Meta-Analytic Review of Research*, pp. 417-453

<sup>6</sup> *The Determinants of Undergraduate Grade Point Average: The Relative Importance of Family Background, High School Resources and Peer Group Effects*, pp. 268-293

<sup>7</sup> *Parental Background, Secondary school track choice and Wages*, pp. 209-230

<sup>8</sup> *College Grades and Labour Market Rewards*, pp. 253-266

<sup>9</sup> *Sexual Differences in Earnings: The Role of Individual Personalities and Tastes*, pp. 82-99

<sup>10</sup> *Academic Achievement and Job Performance*, pp. 350-356.

<sup>11</sup> *Does School Quality Explain the Recent Black/White Wage Trend?*, pp.231-253

<sup>12</sup> *The Impact of Differential Expenditures on School Performance*, pp. 45-51+62

<sup>13</sup> *The Effects of Ability Grouping on Student Achievement and Resource Allocation in Secondary Schools*, pp. 1-15

<sup>14</sup> *The Determinants of Undergraduate Grade Point Average: The Relative Importance of Family Background, High School Resources and Peer Group Effects*, pp. 268-293

<sup>15</sup> *Assessing the Effects of School Resources on Student Performance: An Update*, pp. 141-164

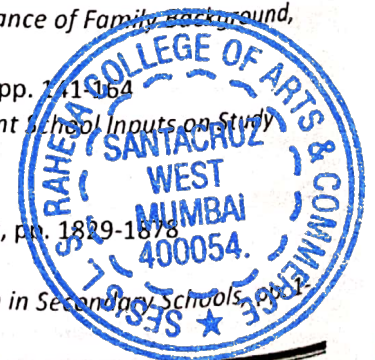
<sup>16</sup> *An Exchange: Part I: Does Money Matter? A Meta-analysis of Studies of Different School Inputs on Study Outcomes*, pp. 5-14

<sup>17</sup> *Attainment in Secondary School*, pp. 1-19

<sup>18</sup> *The Determinants of Children's Attainments: A Review of Methods and Findings*, pp. 1819-1878

<sup>19</sup> *Parent-School Involvement During the Early Adolescent Years*, pp. 568-587

<sup>20</sup> *The Effects of Ability Grouping on Student Achievement and Resource Allocation in Secondary Schools*, pp. 1-15



Rivkin, Hanushek and Kain (2005)<sup>21</sup>, Finn, Gerber and Zaharias (2005)<sup>22</sup> shows that Teacher-student ratio as one of the independent variables in addition to the above variables also generates an influential impact on students' academic achievement. Teacher qualification (Certification) is also often regarded as an input to measure students' academic achievement as an output. Several studies by various authors such as Goldhaber and Brewer (2000)<sup>23</sup>, Haycock (1998)<sup>24</sup>, Barnett (2003)<sup>25</sup>, Clotfelter, Ladd and Vigdor (2007)<sup>26</sup>, Buddin and Zamarro (2009)<sup>27</sup> have attempted to correlate and find if there is any necessary connection between the two. Studies undertaken by Hanushek, Rivkin and Kain (2005)<sup>28</sup>, Hedges, Laine and Greenwald (1994)<sup>29</sup>, Wolters and Daugherty (2007)<sup>30</sup> showed that Teacher Experience is also one of the indispensable variables under Education Production Function along with qualification.

### Operational Definition of Terms and Concepts

The review of related literature has helped researcher to define various terms and concepts operationally.

#### 1. Educational / Academic Achievement

Achievement at the secondary school level with respect to the curricular and co-curricular dimension measured in terms of marks gained in tenth grade.

#### 2. Socio Economic Status

Socio economic status is defined in terms of student's family's economic and social position based on education, income, and occupation.

#### 3. Student- Teacher Ratio

Student-teacher ratio is defined in terms of the number of students per teacher in the respective class.

<sup>21</sup> *Teachers, Schools and Academic Achievement*, pp. 417-458

<sup>22</sup> *Small Classes in the Early Grades, Academic Achievement, and Graduating From High School*, pp. 214-223

<sup>23</sup> Does High School Certification Matter? High School Teacher Certification Status and Student Achievement, pp. 129-145

<sup>24</sup> Good Teaching Matters: How Well-Qualified Teachers Can Close the Gap, pp. 1-31

<sup>25</sup> *Better Teachers, Better Preschools: Student Achievement Linked to Teacher Qualifications*, pp. 1-13

<sup>26</sup> *Teacher Credentials and Student Achievement: Longitudinal Analysis with Student Fixed Effects*, pp. 675-682

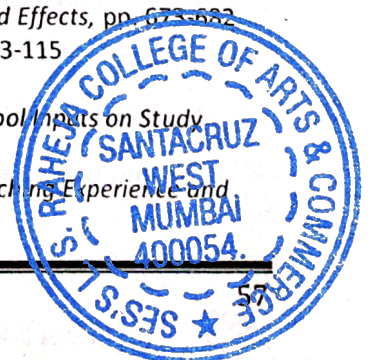
<sup>27</sup> *Teacher Qualifications and Student Achievements in Urban Elementary Schools*, pp. 103-115

<sup>28</sup> *Teachers, Schools and Academic Achievement*, pp. 417-458

<sup>29</sup> An Exchange: Part I: Does Money Matter? A Meta-analysis of Studies of Different School Inputs on Study

Outcomes, pp. 5-14

<sup>30</sup> *Goal Structures and Teachers' Sense of Efficacy: Their Relation and Association to Teaching Experience and Academic Level*, pp. 181-193



#### 4. Parental Involvement

Parental involvement is defined with respect to the active interest taken by the parents in every facet of children's academic development which can be specified in terms of time given for studies, extra coaching etc.

#### 5. School Infrastructure

School infrastructure shall be studied in the context of its tangible as well as non-tangible resources that contribute to students' academic growth and progress.

#### 6. Parental Qualification

Parental Qualification will be analysed in terms of the parents' formal academic accreditation.

#### 7. Teacher Qualification

Teacher Qualification will be defined in the context of certification s/he receives as a part of his/her designation.

#### 8. Teacher Experience

Teacher Experience shall be defined and measured in the terms of his/her contribution to the academic process in quantitative sense with reference to the number of years and in the qualitative sense with reference to the service s/he renders to the academic output of the organization/institute s/he is a part of.

#### 9. Type of School

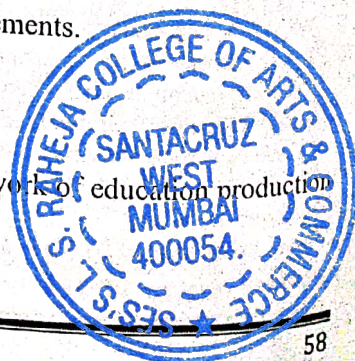
The type of school will be defined in the context of the recognition it receives, whether from the government or non-government agency.

### Research Problem and Objectives

Against the background of this literature review where it has been clearly indicated that there are multiple variables that influence the Education Production function, these multiple variables which are an inseparable part of Education Production Function need detailed examination. This is the research problem that the study intends to focus on. Hence, the study outlines the following objectives with the broad aim of examining the Education Production function in studying the factors influencing the academic achievements.

### Objectives

1. To examine the methodological approach and the framework of education production function in the context of educational achievements.



2. To apply this framework of education production function to study the influence of social and economic status on the academic achievements of secondary school students of Mumbai.
3. To examine the relationship and impact of school infrastructure and school type on the academic achievement of secondary school students of Mumbai.
4. To study the relationship between parental qualification, parental involvement and the academic achievement of secondary school students of Mumbai.
5. To examine the link between teacher student ratio, teacher qualification, teacher experience and the academic achievement of secondary school students of Mumbai.
6. To suggest policy recommendations on the basis of inferences drawn from this study.

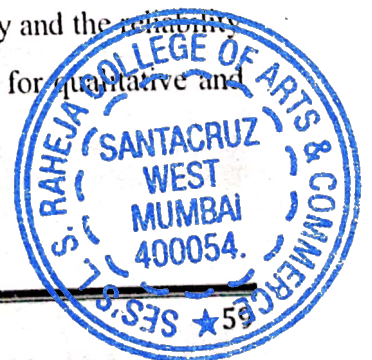
### Methodological Approaches

Research design will be based on primary and secondary data sources. Secondary data will help in data mining and will be collected from all the possible documentary sources such as DISE reports on the district level educational indicators, data on Sarva Shiksha Abhiyaan in Maharashtra, ASER etc. Also reports and publications, journals and individual research papers in print and on internet relevant to this study will be used along with primary data.

In the initial stage of the research secondary data will be used for analysing the relationship between academic achievement and other variables at the macro level. After that primary data will be collected in order to see how far this is applicable to secondary school level in Mumbai city.

The population of the study will be all the secondary students of Mumbai. For the purpose of the study a representative sample of nearly 1000 students (both boys and girls) will be selected. Care will be taken to incorporate students of different municipal wards, under both aided and unaided schools. In the first stage of sampling, selection of schools (aided and unaided) will be carried out by using the stratified sampling technique. The strata will be formed on the basis of municipal wards. In the second stage of sampling, incidental sampling technique will be used keeping in mind the administrative problems and paucity of time.

For the purpose of the present study, the researcher will make a scheduled questionnaire. A pilot survey will be carried out in the initial phase for establishing its validity and the reliability indices. Appropriate data statistical packages and techniques will be used for quantitative and quantitative data analysis.



### **Need, Scope and Limitations of the Study**

Primary research in this field examining the Socio Economic Status and academic achievement in India is limited, due to dearth of knowledge at all levels. It is obvious that the education sector needs research studies and collection of data which can have important policy implications. The present study shall be conducted in Mumbai only and ideally speaking there is vast scope to study the impact of Socio Economic Status on academic achievement by taking larger samples. Study will be done on secondary school students only. Researcher has delimited himself to the secondary schools of Mumbai. It will not include secondary schools from any other city, state of the country.

### **Expected Results and Policy Implications**

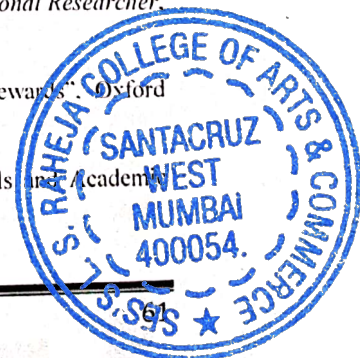
In the present research, the researcher expects to get significant understandings of the relationship between academic achievement of students and socio economic status. Researcher also expects to get a significant insight about the relationship between academic achievement and the other variables such as school infrastructure, parental qualification and involvement, teacher qualification and experience. On the basis of expected results significant policy recommendations will be given to improve the academic achievement of students of different aided and unaided schools.

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