

Journal of Educational Planning and Administration

Volume XXXII No. 3 July 2018



**National Institute of
Educational Planning and Administration**
17-B, Sri Aurobindo Marg, New Delhi 110016

ISSN 0971-3859

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Full Page	₹ 2000	US \$ 100
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Bank draft/Online Payment Receipt may be sent to the Deputy Publication Officer, NIEPA in the name of the <i>National Institute of Educational Planning and Administration</i> payable at <i>New Delhi</i> .		

Published by the Registrar, National Institute of Educational Planning and Administration, 17-B, Sri Aurobindo Marg, New Delhi-110016 and printed by the Publication Unit, NIEPA at M/s Viba Press Pvt. Ltd., Okhla Industrial Area, Phase-II, New Delhi-110020.

**JOURNAL OF
EDUCATIONAL PLANNING AND ADMINISTRATION**
Vol. XXXII No. 3 (July 2018)

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Towards a Philosophy of Interdisciplinarity

Ravindra K. S. Choudhary*

Abstract

Despite its growing popularity in academia and beyond, interdisciplinarity is lacking in theoretical perspectives and broader conceptual frameworks. No amount of sheer eclecticism or mere disciplinary border-crossing can lead us towards true interdisciplinarity; nor can empirical explorations alone be of much help in understanding the intellectual foundations and the ultimate rationale for this emerging field. We need to understand interdisciplinarity philosophically; for, philosophy focuses on the deeper and comprehensive matrices of life and the world. A philosophical engagement with varied and variegated interdisciplinary studies and researches is essential for a better understanding of the nature, method and criteria of interdisciplinarity. The present paper is an attempt towards this end.

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Introduction

INTERDISCIPLINARITY has been quite conducive to the production, application and dissemination of knowledge in the current era. “Interdisciplinary approach has been found particularly helpful in dealing with complex questions, addressing broader issues and achieving considerable unity of knowledge” (Choudhary, 2017: 210). There are, however, crucial conceptual issues that have so far received rather inadequate attention in the discussions on interdisciplinarity. Interdisciplinarity is not a simple and straightforward concept; nor is it just a feel-good phenomenon much in vogue. Despite its growing popularity in academia and beyond, interdisciplinary study and research in general is lacking in necessary theoretical perspectives and broader conceptual frameworks. This suggests the need for a philosophic engagement with varied and variegated interdisciplinary studies and researches – we need a philosophy of interdisciplinarity.

What is the Philosophy of Interdisciplinarity?

The philosophy of interdisciplinarity is the investigation into certain fundamental questions that arise from the reflections upon the constructive interface and interaction of different domains of knowledge. Such questions are quintessentially conceptual, rather than straightforwardly empirical; they constitute the main problems of the philosophy of interdisciplinarity. Some of such leading problems are: What really is interdisciplinarity? What is the method of interdisciplinarity? What distinguishes genuine or good interdisciplinary studies from fake or bad ones?

Looking into interdisciplinarity philosophically allows us to probe deeper and broader into the issues of assumptions, methods, criteria, and patterns underlying interdisciplinary studies. “In all interdisciplinary activities,” J. T. Klein emphasises, “some time should be devoted to examining the philosophical underpinnings of the challenge they pose to disciplinary approaches. Good interdisciplinary work requires a strong degree of epistemological reflexivity” (Klein, 1996: 214). Interdisciplinarity is inbuilt in philosophic thinking. Unlike most of other disciplines, philosophy is interdisciplinary by its very nature; it is a generalised study which focuses on the deeper and comprehensive matrices of life and the world.

Interdisciplinary researchers are, mainly, interested in the actual practice and final outcome, often leaving aside the complexity and larger context of the enterprise. What an interdisciplinary researcher usually practises is the first order interdisciplinarity in which (s)he hardly pays attention to philosophical considerations. While this is unfortunate, it is not an indication that philosophical issues underlying interdisciplinarity are of secondary importance. Interdisciplinary research scenario has an air of nonchalance and we are required to analyse this state of affair closely.

An engagement with the first-order interdisciplinary inquiry inevitably raises conceptual issues of fundamental importance. “Interdisciplinarity entails not only the interpretation of disciplinary boundaries, but also more fundamentally, a meta-cognitive rethinking of the ways in which we restructure knowledge itself” (Welch, 2009: 37). Hence, the issues of interdisciplinary understanding may be conceived as arising at two recognisably different levels: (a) Understanding in interdisciplinarity and, (b) Understanding of interdisciplinarity. The latter is an inquiry into the former one, and

hence, it turns into a higher order inquiry or meta-inquiry. Thus while following the philosophy of interdisciplinarity, we are not actually taking part in any particular interdisciplinary research, but are engaged in a higher order meta-study about it.

Understandably, theoreticians of other disciplines also do philosophy in their own ways, particularly while they think about the foundations and rationale of their respective intellectual enterprises. They often recognise that the first-hand field experience and mere data interpretation are not enough for developing a comprehensive conceptual scheme for any branch of knowledge – reflective thinking is also crucial for developing a theoretical scaffolding of the concerned discipline. Sorokin, for instance, makes a distinction between Special Sociology and General Sociology, and he contrasts the latter with more specialised social sciences such as economics, political science and anthropology (Abraham and Morgan, 1985: 227).

In such a meta-discourse, we somehow seek also to understand the phenomena in totality, but we must not be heedless of the distinction between the ‘meta-discourse’ and the ‘master narrative.’ In meta-discourse, a totality is viewed in relational terms, rather than homogenisation of fragments. Needless to say, this totality seems naturally to be a ‘difficult whole’ as it values the complexity of components and contingency factors about the phenomenon as “a more pressing critical imperative” than mere craving for consistency and systematic coherence (Collins, 1995: 221-222).

Characterising Genuine Interdisciplinarity

The problem of characterising genuine interdisciplinarity is central to the philosophy of interdisciplinarity but certain weighty questions naturally arise in this connection. What are the criteria for judging genuine forms of interdisciplinarity? Who can be a connoisseur of interdisciplinarity? There are a number of pertinent points that need to be emphasised:

Cognitive Advancement

The main criterion, in this regard, is connected with the potential progress or addition of something new to the existing corpus of knowledge. The capacity to produce this sort of “cognitive advancement” is so crucial that it has been regarded by many as the defining feature of interdisciplinarity and also as a hallmark of successful interdisciplinary research (Boix Mansilla & Duraising, 2007: 219; Repko, 2008: 7).

An interaction of two disciplines or a set of disciplines may be characterised as genuine if “a substantive give and take” really takes place. But, what does it mean to be ‘substantive’? An interaction may be said to be substantive “only if it promotes, or (is) likely to promote, intellectual progress” that can enable the participating disciplines or at least one of them “to make an advance, which in all likelihood, would not have been possible, or would have been extremely difficult had the two not participated in this commerce” (Prasad, 2003: 105-106).

This view needs to be qualified because it is not enough for a successful and qualitative interdisciplinary venture to promote intellectual progress just in one discipline. If the fruits of intellectual progress are confined to one discipline, then it is a case of multi-disciplinarity, rather than that of interdisciplinarity. As it has been observed, “... whereas multidisciplinary research will primarily aim to advance knowledge in one discipline, the aim of

interdisciplinary research will be to advance knowledge in multiple disciplines, often to do issues that 'transcend' disciplinary boundaries" (Miller, 2011).

Quality Aspect

It is not only the quantity or intensity of influence that matters in interdisciplinary interaction; there is also a quality-oriented side to the characterisation of interdisciplinarity. And "the quality of interdisciplinarity," according to a seminal UNESCO document, "depends on the degree of influence exerted by the respective disciplines in the cooperative process. If one discipline is dominant the quality is poor. If the influence is balanced the quality is high" (1986: 8).

We are thus also concerned about the issue as to how equitable and symmetrical the overall interaction between the participating disciplines has been. On this basis, interdisciplinarity may be contrasted with cross-disciplinarity. Although interdisciplinarity does involve crossing disciplinary boundaries, it is not mere boundary-crossing. Cross-disciplinarity is of low interdisciplinary quality because the communication here is uneven and asymmetric.

Creativity and Critical Thinking

In interdisciplinarity, one needs also to be at home in critical thinking and good at the creative use of imagination so as to be open to wide range of possibilities and disciplinary perspectives. All this make the task too demanding on the part of the characteriser. It has rightly been observed: "Only he who has a good grasp, an in-depth understanding of the historical development of at least one of the participating disciplines, or set of disciplines, and a good working understanding of the basis of the other, or the other set, can do it well. In brief, he has to be a knowledgeable scholar of what is called the history of ideas" (UNESCO, 1986: 107-108).

There has been a long tradition of intimate relationship between philosophical thinking and the history of ideas. It is no accident that philosophical thinking has been found particularly fruitful basis for the characterisation of genuine interdisciplinarity (Stenhouse, 1985: 182). History of ideas provides us resources that are of great help in developing a better understanding of the genesis and quality of interdisciplinary research. For instance, Holbrook makes use of such resources for understanding the idea of integration that has been considered as a characteristic feature of interdisciplinarity (Holbrook, 2013: 1865-79).

Nature of Interdisciplinary Thinking

Thus far we are clear about what it is meant to be interdisciplinary. It is, however, feasible as well as necessary to delineate the nature of interdisciplinary thinking. The chief characteristics of interdisciplinary thinking can be outlined as thus (Choudhary, 2016: 354-355):

- (i) Interdisciplinary thinking is relational and synthetic, not just analytical and reductive. It focuses not simply on the constituents units of the subject or phenomena under question; it is more deeply concerned about the interrelationship, interdependence and the organising principles of them.

- (ii) Interdisciplinary thinking is contextual; it conceives of the subject in the context of a larger whole. Hence, it is opposed to any ahistorical account of things, ideas or insights, whether of knower or known. It is concerned not just about the modes of justification but also puts greater emphasis on the context of discovery.
- (iii) In interdisciplinarity, we believe basically in situated nature of knowledge and employ social epistemology. There is no ideal individualistic knower in interdisciplinary understanding of things. It is collaborative and conducive to teamwork. Thus it is marked by a sharp departure from the Cartesian individualistic epistemology.
- (iv) Interdisciplinary thinking puts emphasis upon dynamism because the phenomenon it deals with is not static but extremely dynamic. Interdisciplinary mind does not remain content with Being; it goes on to believe in Becoming and makes it central to all thinking about the specified domain or even about the world at large. For an interdisciplinary mind, evolution is the law of the universe.
- (v) An interdisciplinarian goes beyond bipolar and categorical determinations and believes in the inherent complexity of phenomena. The laws of identity, excluded middle and contradiction which have been so central in logical thinking by tradition hold no good in interdisciplinary thinking. Multiple-identity and contingency, contradiction and complication, interconnectedness and implication are emerging as more pressing principles in it.
- (vi) Interdisciplinary thinking undermines the traditionally celebrated role of mono-specialist experts and goes on to put forward a fluid and flexible view of expertise. It brings community and interpersonal communication to the fore in any act of knowledge production and dissemination.
- (vii) Interdisciplinary thinking has a remarkable democratic character as it is well accommodative to perspectival pluralism. Insularity and dogmatism are greatest sins in interdisciplinarity; here, we have to look into the matter from many disciplinary perspectives. An interdisciplinarian has to be always alive to possibilities and respectful towards dialogues on equal footings.
- (viii) As soon as we get in on interdisciplinary thinking, we are set to undergo something of a transformational experience. We begin to realise that multiple perspectives are ever possible with regard to the truth of any matter. What such a wide spectrum of views and versions ultimately represent is nothing but different shades of life-experience and the ways of various walks of life. All this can pave the path for a conceptual framework that is comprehensive enough to sustain a worldview.

Issues Involved in Interdisciplinary Method

At first blush, interdisciplinarity seems to be too trendy in its choice of topics, too glitzy in its style, too hybrid in its vocabulary, too pragmatic in its conceptual apparatus and too provisional in its philosophical position. There is, however, no denying that the desire to discipline interdisciplinarity in some intellectual quarters is equally evident. Newell and Green, for instance, speak of “the interdisciplinary method” of research which, according to them, “requires an appreciation of the full complexity of the disciplines involved, especially

the awareness of their often unconscious assumptions in order to discern the underlying common ground or conflict between their insights" (Newell and Green, 1982: 25).

But the big question that arises is as to what sort of method should interdisciplinarity go for? Whether interdisciplinary studies should adopt the methods that have been widely useful and found to be highly fruitful in the world of sciences? A number of issues deserve to be discussed before declaring any particular sort of method best suitable for interdisciplinary study and research in general.

Scientific Method and Interdisciplinary Principle

The scientific revolution has essentially been a revolution of method. Scientific method is characterised by a wide use of experimentation, observation and theory construction. The demarcation between science and non-science is often drawn in terms of this very method. What is more, the principle of interdisciplinarity has many a time been considered as a key characteristic of scientific endeavour. Attempts have been made to demarcate science from pseudo-science and non-science on the basis of what is called the interdisciplinary principle. Accordingly, "Given any scientific discipline, there is an inter-discipline that links it to another scientific discipline. This methodological maxim invites trespassing disciplinary frontiers. And it is fertile, albeit unfalsifiable. Besides, it helps distinguish science from pseudo-science, which is typically isolated" (Bunge, 1999: 143).

If thus viewed, sciences represent the interdisciplinary dimensions of research and development more vividly and vigorously than any other area of intellectual activity. So much so that, science is what naturally makes use of interdisciplinarity friendly methods; whereas non-science adopts insular approach and tries to study things in isolation. But, from a different vantage point, it is disputed whether any such interdisciplinary principle is really achievable that can govern our diverse interdisciplinary practices.

In actuality, interdisciplinarity is realised in wide range and variety, in greater or lesser degrees across natural sciences, social sciences and humanities. Interdisciplinarity is thus more an ideal and it remains ever a subject to fulfilment in differing degrees. Hence, "disciplinarity and interdisciplinarity come in degrees: nothing is completely isolated and unified, and nothing is completely open and scattered. Real science disciplines are more or less so, in varying degrees. These degrees vary between disciplines and across the historical development of each of them" (Maki, 2007).

Historicity and Genealogical Development

The scientific method is itself a paradigm and noticeably the overwhelming one in the current knowledge situation. The scientific paradigm is, however, not so much based on any reflex of natural law as on the consensus within the scientific community itself. But the established scientific community at any moment can be characterised as a group of scientists who share the recognised scientific method. Such a paradigm thus tends to give rise to the 'disciplinary matrix' that can be identified empirically in terms of books and journals, citation networks and indices, conferences and professional forums, and the like (Kuhn, 1996: 176-177).

Reason is for the moderns what was God for the ancients. The scientific method relies heavily upon reason alone which is viewed here as a searchlight that can illuminate sooner

or later every nook and corner of the universe. Hence, for the upholders of scientism, scientific method is capable of serving all sciences, natural as well as social. But shouldn't we take into account the other side of the coin? Can scientism serve sufficiently as a model for the humanistic understanding as well?

Need to Avoid Two Extremes – Scientism and Anti-Scientism

What is important to realise is that 'different forms of intellectual inquiry furnish us with a variety of kinds of knowledge and understanding, no one of which constitutes the model to which all the other should seek to confirm' (Collini, 1993: xlvi). There may be two extreme standpoints in this connection, and that either position is unacceptable. Both standpoints have their specific methodological perspectives, and as such they have their respective advantages; but when they are taken to extremes, they turn equally inadequate in suggesting a blanket methodology for interdisciplinarity.

At the one extreme, there is scientism which is a 'special form of idealism, for it puts one type of human understanding in charge of the universe'; on the other, is anti-scientism which wages war foolhardily on not only scientism but science too, which "can regenerate into a rejection of science – whereas in reality it is essential to the defence of science against misappropriation" (Nagel, 1968: 9-10). Scientism itself, however, is not true science; it does not represent the true spirit of science. For, science in the true sense has to be thoroughly critical, not dogmatic at all. A scientist may even claim that scientism is in fact not science, but a way of thinking that seeks to promote certain values in society at large.

Value Dimension

No matter how wonderful has been the success of science in unravelling so many of nature's secrets, the value dimension must not escape our attention. Values can be seen as "embedded in all types of inquiry and at all stages: in the choice of questions, theoretical positions, variables, and style of research" (Lèlè and Nogaard, 2005: 968). Normativity lies at the bottom of scientific enterprise.

What is at issue is not scientific pursuit itself, but making a reasonable choice. "The typical attitude of one who really accepts an unscientific explanation is dogmatic" (Copi and Cohen, 1996: 531). It is our choice as the moderns that we should be rational, rather than being dogmatic; that we ought to be faithful to observation and experiment. In the long run, however, science has certain social responsibilities and commitments too towards people at large. "Science is not only to know, it is to do, and in the doing it has found its soul" (Glass, 1965: 101).

We have also a variety of academic disciplines concerned primarily with the study of the human as social being belonging to an extremely complex historico-cultural situation. As a broad area of specific studies, this field includes parts of various social sciences as well as those of the disciplines that are deeply concerned about cultural creations of humans such as arts, literature and philosophy. The concept specific components of such an area are thus derived from a wide variety of fields. But it is, in fact, not the specific inputs so much as human values and a philosophico-holistic approach that provide the ultimate rationale for humanistic studies. The typical explanation of human thought and actions, emotions and

aspirations are not always same as explanations peculiar to natural sciences. It is not possible to explain every human action as merely causally connected in the scientific fashion.

Complex and Circumscribed Methods

Methods useful in interdisciplinary research are marked by complexity and contingency. Interdisciplinarity, in consonance with its very nature, often accords great importance to heterogeneity and unorthodox ways of thinking. Methods in interdisciplinary research are mostly genealogical. The essential complexity of interdisciplinarity suggests that no single method can be adequate in exploring interdisciplinarity. Thus one should remain faithful to the variegated nature of interdisciplinarity not only in content but also in method.

Triangulation as it is used nowadays in some social sciences is a case in the point. A diversity of perspectives are invited, involved and integrated in it in order to achieve a sound and robust viewpoint, rather than the lopsided one (Susan, 2009: 512). Interdisciplinary work, according to Klein, “requires active triangulation of depth, breadth, and synthesis.” Clarifying the three dimensions of this triangulation, she says, “Breadth connotes a comprehensive approach based in multiple variables and perspectives. Depth connotes competence in pertinent disciplinary, professional, and interdisciplinary approaches. Synthesis connotes creation of an interdisciplinary outcome through a series of integrative actions” (Klein, 1996: 212).

In interdisciplinarity, we in fact need complex and circumscribed sorts of methods whose variety should reflect the diversity of subjects to be investigated. Nevertheless, interdisciplinarity is essentially concerned with integration, and so its method has to be ultimately integrative. Klein emphasises that “all interdisciplinary activities are rooted in the idea of unity and synthesis, evoking a common epistemology of convergence” (Klein, 1990: 11).

Knowledge Integration

The genealogy of human knowledge is marked by two seemingly opposing processes – diversification and integration. Diversification is prompted by the need for division of labour and for availing of the expert services in the matters of production, application and dissemination of knowledge. Integration is occasioned by the necessities of unity, synthesis and overall progress in human knowledge. Scientists tend towards diversification and specialism as they are fond of focusing on narrow and specialised fields in a much more disciplined manner with rigid methodology. This has no doubt led science to a grand narrative of success but all this has not been achieved without cost (Choudhary, forthcoming).

Seldom has human mind experienced such an availability of huge databases, exponential growth of information, divergent diversifications and increasing specialisations, sharp analysis and fragmentation. The need for synthesis and integration of knowledge has thus become more obvious than ever before. Philosophy, though very rich in diversity of subjects it deals with, is no less concerned with synthesis and integration. “Philosophy is the integration of knowledge, the synthesis of sciences,” says Durant Drake (Drake, 1933: ix). Philosophical synthesis is interdisciplinarily crucial on several counts:

- (i) Philosophical synthesis provides conceptual basis and methodological organisation to our various intellectual pursuits. Its ultimate aim is to reach a *Weltanschauung* having comprehensive theoretical and practical functions. A *Weltanschauung* or worldview represents one's overall outlook towards life and the world as a human being capable of thinking, feeling and behaving.
- (ii) Philosophical synthesis also gives future orientation to human knowledge. It may acquire a sort of heuristic effect upon further advancement of knowledge. Meta-level thinking is quite common in philosophy and at this level it is capable of bringing about many higher modes of thought such as models, thought experiments and the like. These modes can be potent heuristic devices enabling us to understand wide range of phenomena across disciplinary boundaries.
- (iii) Philosophical synthesis can add meaning to our very existence in the world as humans. It can make science more sensitive and can give a value-oriented humane touch to science and technology.

Interdisciplinarity is integrative not only in method but in content too. Knowledge integration is essentially an ideal with many levels of potential fulfillment. Obviously, such an ideal can be pursued at any moment only relatively and philosophically. This also suggests that myriad variety of interdisciplinary studies and researches are not isolated cases; they are basically interconnected in the larger context of life and the world. Therefore, in the last count, "An interdisciplinary study involves, as a minimum, two distinct disciplines and, as a maximum, that is an ideal, it involves all disciplines. Interdisciplinarity is thus ideally one, and as such it must reflect the essential unity of all human Knowledge" (Choudhary, 2014: 516).

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Socio-Economic and Parental Gradients on Educational Attainment of Children in Northeast India

Melody Thangjam *
Laishram Ladusingh#

Abstract

One of the paradoxes of northeast India is that educational attainment of children is low here, despite the high literacy rate and appreciable level of school enrolment. The attempt made here is to assess the significance of child characteristics, household background and parental education on years of schooling of children in northeast India. It is a panel analysis of children in 5-17 years from northeast (NE) India --- from two rounds of India Human Development Survey 2004-05 and 2011-12. The methods of analysis used are the frequency and bivariate analyses, descriptive statistics and multivariate panel regression. School enrolment of children in 5-17 years in northeast India escalates from 82 to 92 per cent while the average years of schooling rose from 4.3 to 5.3 years during 2004-2012. Even in this region where a majority of the states have the scheduled tribes and scheduled castes populations, children belonging to these social groups have lower years of schooling compared to others. Girls outperform boys in terms of average years of schooling unlike in other states in India. Mother education significantly enhances the years of schooling of children and promotes the household economic well-being. Northeast India has a long way to go for achieving compulsory education for children. Not only increasing accessibility of educational institutions but also promotion of adult education programme at community level are vital for making further progress in education of children in NE India.

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Introduction

Education is the formative process of acquiring knowledge, skills and a set of values in the life course. Education is the key to a person's success in all walks of life; not only good education raises the standard of living of an individual but also contributes to social and economic development. Education empowers people and improves their ability to communicate, argue, and choose in informed ways (Sen, 1999). Economists value education for its role in human resource development which increases labour productivity, leading to a higher equilibrium level of output (Lucas 1998, Self and Grabowski 2004, Mallick et. al. 2016). On the other hand, social scientists considered education is important for the catalytic role it plays in diffusion of knowledge, transformation of society and enhancement in awareness of rights of individuals (Agarwal and Sashi 2014; Bhat 2015; Vaid 2016). It is therefore imperative on both counts to assess the significance of household and parental factors moulding educational attainment of children, more particularly in the context of the northeast India, which is one of the most underdeveloped regions of the country and is also characterised by poor infrastructure and inadequate educational institutions.

The available literature on the significance of household wealth, number of children in the household, parental education, sex of the child and school environment on children's educational attainment lacks in regional coverage, particularly the northeast India. In this context the present paper makes an attempt to assess the determinants of educational attainment of children in northeast India and provide key policy inputs pertinent for this region. More specifically, the objectives of the paper are to assess the impact of parental education, and socio-economic factors on years of schooling of children, and to provide contextual recommendations for enhancement of education of children in northeast India.

The paper is organised as follows. It begins with a review of literature, followed by a brief presentation and description of the socio-demographic and institutional indicators of northeast India, followed by a section on data and methods, the results section and ends with a section on summary and conclusion.

Review of Literature

Considerable literature (Evangelista de Carvalho Filho, 2008; Mingat, 2007; Shavit and Blossfeld, 1993; Jencks, 1972; Coleman et. al., 1966) highlights the importance of household characteristics, in particular parental income, wealth, education and occupation, in determining the educational enrolment and achievement in both developing and developed countries. Behrman (1997) and Korupp et. al. (2002) supports transmission of parental traits to children. Evidence of children of parents from high socio-economic status having better academic performance than those from poor socio-economic status is found in Suleman et. al. (2012). Similarly, Saifi and Mehmood (2011) highlighted the influence of parental education and occupation on academic performance of children. Becker et. al. (1990) hypothesised that maternal education can improve the efficiency of human capital production, leading to increasing returns, across generations, in parental human capital. Coleman (1988) detailed the ways the economic, cultural, and social capital of the family plays a crucial role in shaping the arc of children's educational attainment in the United States.

Analysing the National Council of Applied Economic Research (NCAER) data, Duraisamy (2002) concluded that parental education, family income, and availability of middle schools within the village have a significant positive effect on school enrolment decisions for child in India. From a study of 70,000 children in India from National Family Health Survey 2 (IIPS, and ORC Macro.2000), Huisman et. al. (2010) found that 70 per cent of variation in school enrolment is explained by factors at the household level. Using data from the NSSO, 55th and 61st rounds (1999–2000 and 2004–05) for urban children, Mukherjee and Das (2008) found that parents' higher level of education retarded the school dropout of children during 1999-2005. Vellymalay (2011), on the basis of a study of Indians in Malaysia, reported that educated parents have higher educational aspiration for their children. Borkotoky et. al. (2015) investigated intergenerational transmission of education, by using District Level Household and Facility Survey 3 (IIPS, 2010), and found that maternal educational attainment is indirectly instrumental in promotion of schooling of children, particularly of girl children, by way of having fewer children and avoiding discrimination in allocation of household resources by sex of children. Ngangbam and Ladusingh (2013) also corroborated the finding in the case of NE India. Azam and Bhatt (2015) matched father's and son's educational levels, using India Human Development Survey I (Desai et al., 2004-05/2005), and found significant improvements in educational mobility across generations in India, at the aggregate level, across social groups. Large family size is also a barrier to the educational attainments of children, as a study by Kugler and Kumar (2017) found from the empirical analysis of DLHS 3 (IIPS, 2010). Based on a primary study in South India, Lawrence and Vimala (2012) found a significant relationship between school environment and academic achievement of children. Based on a study in Andhra Pradesh, Singh (2013) reported that students from privately managed schools perform better in test scores than those in government schools. In 1995-96, the average expenditure per student pursuing primary education in rural India in a government school was Rs. 219 for students going to local body schools, private aided schools and private unaided schools it was Rs. 223, Rs. 622 and Rs. 911 respectively (National Sample Survey Organization, 1998). Tilak (2002) complemented that households across socio-economic classes spend considerably for primary education, which is expected to be provided by the State free to all. Singha (2013) brings out the status of education in a conflict setting; he found that conflicts do not affect educational growth.

The foregoing review emphasises the significance of household wealth, number of children in the household, parental education, sex of the child, and school environment on children's educational attainment. However, it is to be noted that the studies covered here are sporadic, and the aforesaid highlights of the factors determining school attainment of children emerges from different studies; Not a single study mentioned above has considered them in a pragmatic manner. As such, the pertinence and importance of the present study need not be overemphasised.

Profile of Northeast India

Northeast India is the abode of many indigenous peoples and is best known for its heart-warming topography and rich cultural heritage. The region, however, has poor infrastructure, limited health and educational facilities, and has no industrial and corporate establishments. The region is also deprived of its due share in the pie of economic growth of

the country and still remains economically underdeveloped. However, the 'Look East' policy endorsed by the masses and politicians alike can provide a takeoff from the present status as far as education is concerned.

The socio-economic, demographic and institutional indicators of states in northeast (NE) India are shown in Table 1.

TABLE 1
Socio-Demographic and Institutional Indicators of States in Northeast India

	<i>Arunachal Pradesh</i>	<i>Assam</i>	<i>Manipur</i>	<i>Meghalaya</i>	<i>Mizoram</i>	<i>Nagaland</i>	<i>Sikkim</i>	<i>Tripura</i>
Land area (sq.km.) ¹	83743	78438	22327	22429	21081	16579	7096	10486
Total population in million ¹	1.38	31.21	2.57	2.97	1.1	1.98	0.61	3.67
Population size - % of national population ¹	0.1	2.6	0.2	0.2	0.1	0.2	0.1	0.3
Population density (per sq. km.) ¹	17	398	115	132	52	119	86	350
Literacy rate(%) ¹	65.4	72.2	79.2	74.4	91.3	79.6	81.4	87.2
Gross enrolment ratio (%) (GER) ²	115.3	75.7	114.9	114	110.9	79.7	118.6	110.5
Dropout rate(%) ²	50	50.2	53.7	68	39.6	47.7	48.8	42.4
Pupil teacher ratio (PTR) (primary school) ²	25	28	25	32	14	20	7	15
Accessibility to school (%) ³	41	20	36.4	40.4	77.4	60.2	53.3	33.1
Unemployment rate per 1000 (15+Population) ⁴	102	43	22	35	22	62	122	84
Literacy rate 2004-05 ⁵ (%)	79.0	81.7	81.0	78.2	78.2	93.2	85.0	80.5
Literacy rate 2011-12 ⁵ (%)	84.0	92.8	95.6	96.8	91.8	83.3	98.1	98.0
Average household annual income (in lakhs) 2004-05 ⁵	1.43	0.77	1.85	0.95	2.64	1.17	1.88	1.17
Average household annual income (in lakhs) 2011-12 ⁵	2.77	1.26	2.42	1.95	3.17	2.04	2.24	0.95

Sources: 1 - Census of India, 2011, 2 - Statistics of School Education 2011-12, Ministry of Human Resource Development, 3 - Indian Stat (2009), 4 - Third Annual Employment & Unemployment Survey 2012-13, Labour Bureau, Chandigarh, Ministry of Labour & Employment, 5 - Authors' Computation from India Human Development Survey (2004-05 and 2011-12).

Among the eight states as in 2011, Arunachal Pradesh has the largest area but is sparsely populated with a population density of just 17 per square kilometre and Assam is the most populous and most densely populated state with a population of 31.21 million and density of 398 persons per square kilometre. The eight states in NE India account for 3.8 per cent of the population of the country as per the Census of India 2011. Literacy rate in the NE is among the highest in the country ranging from 91.3 per cent in Mizoram and 65.4 per cent in Arunachal Pradesh, the state where the gross enrolment ratio is 95.2 per cent almost at par with that of Mizoram. When it comes to gross enrolment ratio at primary level (for 6-13 years) it is reasonably high in the states of Sikkim, Arunachal Pradesh, Manipur, Meghalaya, Mizoram and Tripura, in all these above 94 per cent, and is the lowest 75.7 per cent in Assam.

The main concern is that the dropout rate at primary level in the NE region is among the highest with a rate of 68 per cent in Meghalaya, while the lowest rate is 39.6 per cent in Mizoram. There is also considerable variation in the availability of teachers as can be noted from the fact that in Meghalaya the pupil-teacher ratio is as high as 32 while the lowest is 7 in Sikkim. As for accessibility to educational institutions, when we assess it on the basis of availability of government primary school within habitations, it is found that only 20 per cent of habitations in Assam have primary schools and this shows the most pathetic condition among all states in the NE region. On the other hand, in Mizoram, primary schools are available within 77.4 per cent of habitations. In NE India, Meghalaya, Tripura and Manipur are the states which have lesser numbers of schools within the habitations. One of the factors of underdevelopment of the region is high unemployment rate and it is 122 per 1000 in Sikkim the highest among all the eight states in NE India followed by 102 in Arunachal Pradesh, 84 in Tripura, with the lowest being 22 per 1000 both in Manipur and Mizoram. Literacy rate in NE is among the highest in the country it ranged from 93.2 per cent in Nagaland and 79.0 per cent in Arunachal Pradesh in the year 2004-05, which later changed to 93.2 per cent in Sikkim, the highest and 79.0 per cent the lowest in Nagaland in the year 2011-12. Mean annual household income was the highest in Mizoram and went on improving from Rs. 2.64 to Rs. 3.17 lakh during 2004-05 to 2011-12. It was the lowest (Rs. 0.77 lakh) in Assam in 2004-05 and then improved to Rs. 1.26 lakhs in 2011-12. Tripura is the only state in northeast India where average household income has declined during the aforesaid period from Rs. 1.17 to 0.95 lakh. Average household income has nearly doubled in the states of Arunachal Pradesh and Meghalaya. In sum, there are considerable variations in socio-demographic and institutional indicators between the states in NE India, which have direct or indirect implications on educational attainment of children in the region.

Data and Methods

Data

The unit level data from two rounds of India Human Development Survey - I (2004-05) and India Human Development Survey - II (2011-12) were used for this study. The University of Maryland and the National Council of Applied Economic Research (NCAER, India) carried out both rounds of the surveys and the data collected are representative at the state, union territory and national levels. Similar survey designs and instruments were used in the two rounds of IHDS, and as such they were comparable in most cases. The units of

analysis for this study were children in 5-17 years age group and the study was based on 1340 children in 2004-04 (IHDS - I), yielding 1035 children in 2011-12 (IHDS - II). The information collected included basic amenities, assets, income with source, and demographic particulars of members at household level and age, sex, educational and marital status and relationship with the head of household at individual.

There are three distinct advantages of using the IHDS data. First, it contains additional questions which are not asked in the NSS or NFHS. Second, the IHDS generate data on the actual years of schooling in place of the levels of schooling completed which is generally reported in NSS data. Third, it provides the facility to follow the educational progress of children. In panel data set follows a sample of individuals in successive surveys over a period of time and collects qualitative and quantitative data, with each sampled individual appearing on more than one occasion. Panel data are ideal for an assessment of changes associated with the individuals over time. Panel surveys are rare in India and IHDS is one of the well design longitudinal surveys in India conducted at the national level. The demerits of panel data concern the dropouts and selectivity in dropouts which can introduce a bias in the estimates of change. The other limitation in the context of the present study is the sample size from the northeastern states of India.

Methods

The objective of this study is to measure the association between household's economic wellbeing, parental education, caste (social group) and child education outcome, how this association has evolved over time, and whether it improves over time with parental education, whether it is stronger amongst certain groups identified by castes or geographic location. The emphasis is on assessment of the effect of time varying factors on child schooling outcome which is years of schooling of children in 5-17 years fixed effect panel regression is used for statistical analysis. The model specification is

$$Y_{it} = \beta X_{it} + \gamma Z_i + \alpha_i + \mu_{it}$$

where,

- Y_{it} is the years of schooling of children, i = entity and t = time.
- X_{it} is vector of time varying independent variables and β is vector of coefficients
- Z_i is vector of time invariant independent variables and γ is vector of coefficients
- α_i and μ_{it} are the error terms

Panel regression provides more robust estimates than the usual multiple regressions because of higher degrees of freedom and more sample variability. It has a higher capacity of capturing the changes over time than the cross-sectional or time series data have. Omitted variables, that is, the effect of the correlation between certain variables not included in model specification with the included explanatory variables are taken care of in panel regression. The effect of time invariant unobserved heterogeneity is also controlled in panel regression. One of the main reasons for using panel data is to correct for the endogenous factors caused by the unobserved time constant. Fixed effect model is used in the analysis as the emphasis of the present study is to assess the significance of time varying variables adjusting for the time invariant variables.

Description of independent and dependent variables

In order to assess the potential determinants of schooling outcome of 5-17 years old children in northeast India, years of schooling have been considered as the schooling outcome of children. On the basis of the foregoing literature review, children's background has been considered as an independent variable. These include the place of residence, age, sex, monthly household per capita expenditure (MPCE) (measured in quintiles), caste of the head of household, father's education, mother's education, school type, school fees and number of children in the household. The ages of children have been categorised as 5-10, 11-15, 14-15 and 16-17 years. Father's education is classified as none, primary school, lower secondary and higher secondary. Mother education is classified as illiterate and literate. Sex has been classified as male and female, and the place of residence as urban and rural. Caste is a sort of social status and this variable includes those who are from the lower castes, are socio-economically weaker, and have limited access to institutional facilities despite the existing provisions. Scheduled Castes (SC) and Scheduled Tribes (ST) are considered as belonging to lower social groups. Other Backward Classes (OBC) are, similarly, another group of the lower caste category. Individuals inherit social status from family and, unlike economic conditions, it is not changed for generations. The caste of household head has been categorised as OBC, SC, ST and Others. Monthly per capita expenditure (MPCE) of the households is classified as first quintile, second quintile, third quintile, fourth quintile and fifth quintile.

Traditionally, family system in India has been based on the joint family system, where children lived with their parents and other relatives including grandparents and even uncles and aunts. Family type is categorised as joint family and nuclear family. On the basis of functional bodies, schools are recognised as public schools run by the government and private manage by individuals and private organisations. School type is classified as public school and private schools.

Definition, coding and descriptive statistics of background of children in 2004-05 (IHDS - I) and 2011-12 (IHDS - II) are shown in Table 2. It is noted that 28 per cent of children have rural background and 43 per cent of them are males. The average age of children in the sample is 11-13 years in 2004-05 and 11-15 years in 2011-12. Household monthly per capita expenditure (MPCE) has been taken as a proxy measure of economic wellbeing and, economically, children belong to moderately well off households, which fact has not changed significantly during 2004-2012. Children in 5-17 years in the present study largely belong to ST/SC and OBC. About 91 per cent of children live in joint families. It can be noted that only 26 per cent of children attended private schools in 2004-05 which increased to 32 per cent in 2011-12.

Considering the husband-wife education gap in India, educational level of father has been classified as no education, primary, lower secondary and upper secondary levels. On the other hand, educational status of mother is categorised as non-literate and literate. Educational level of father are mostly completed primary school and 65 per cent are of mother are literate. Annual educational fee spent by the household for schooling increased more than threefold during 2004-2012 --- from Rs. 624 to Rs. 2272. The number of school going children in 5-17 years age group per household was found to be 2 during 2004-2012.

TABLE 2
**Definition, Coding and Descriptive Statistics of Background of Children in 2004-05
 and 2011-12**

Variable	Definition	Mean		SD		N	
		2004-05	2011-12	2004-05	2011-12	2004-05	2011-12
Residence	Rural =0,Urban = 1	0.28	0.29	0.45	0.45	1340	1035
Sex	Male = 1, Female = 2	1.43	1.48	0.50	0.50	1340	1035
Age of child	5-10 = 1,11-13=2 14-15=3,16-17=4	1.90	2.21	1.04	1.06	1340	1035
MPCE quartiles	First =1,Second = 2, Third = 3 Fourth= 4,Fifth=5	2.74	2.68	1.41	1.44	1340	1035
Caste	OBC= 1,SC/ST =2, Others = 3	1.57	1.57	0.77	0.77	1340	1035
Family type	Joint family = 0, Nuclear family = 1	0.91	0.90	0.28	0.30	1340	1035
School type	Public = 0,Private=1	0.26	0.32	0.44	0.47	1101	950
Father's education	Non-literate=0, Primary school= 1 Lower secondary=2, Higher secondary=3	1.73	1.73	1.18	1.20	1065	763
Mother's education	Non-literate=0, Literate=1	0.65	0.65	0.48	0.48	1063	766
School fees	Indian Rupees	642.19	2272.74	1200.58	5831.39	987	869
Number of children	Average of child per household	2.0	2.0	0.09	0.10	1340	1035

Note: MPCE - Monthly per capita expenditure, OBC - Other backward Clsses, SC - Scheduled Castes, ST - Scheduled Tribes

Results

Enrolment rate and distribution of enrolled children by levels of education for selected backgrounds of children in northeast India for 2004-05 and 2011-12 are shown in Table 3. School enrolment rates among boys and girls in 2004-05 were 80.4 and 84.2 per cent respectively, while the corresponding figures in 2011-12 are 90.2 and 93.6 per cent respectively. An increase of nearly 10 per cent in enrolment rate, regardless of boys or girls, was observed during 2004-2012. On further assessment of enrolled children by level of education. It was found that more than four-fifth of the children were enrolled for primary level and about one-fourth for upper primary level. Among the boys, the proportion enrolled in secondary and higher secondary levels escalated from 13 to 17 per cent and for girls from 12 to 18 per cent during 2004-2012.

TABLE 3

Enrolment Rate and Percentage Distribution of Enrolled Children by Educational Level for Selected Background of Children in Northeast India for 2004-05 and 2011-12

	<i>Year</i>	<i>Per cent (N)</i>	<i>Pre-school</i>	<i>Primary school</i>	<i>Upper primary school</i>	<i>Secondary school</i>	<i>Higher secondary school</i>	<i>N</i>
Sex								
Male	2004-05	80.1 (765)	10.2	52.2	24.7	12.0	0.8	615
	2011-12	90.2(539)	5.6	49.4	27.8	14.8	2.5	486
Female	2004-05	84.5 (575)	13.0	52.1	22.6	9.9	2.5	486
	2011-12	93.6 (496)	5.4	47.2	29.3	15.1	3.0	464
Child Age								
5 -10	2004-05	84.3(651)	21.9	76.7	1.1	0.4	0.0	549
	2011-12	97.9(325)	15.7	84.0	0.3	0.0	0.0	318
11 - 13	2004-05	90.2(327)	1.0	42.7	53.2	2.7	0.3	295
	2011-12	95.2(334)	0.6	55.4	42.5	1.6	0.0	318
14 - 15	2004-05	78.9(208)	0.6	12.2	48.8	37.8	0.6	164
	2011-12	87.9 (207)	0.0	6.6	59.3	33.5	0.6	182
16 - 17	2004-05	60.4(154)	2.2	7.5	20.4	53.8	16.1	93
	2011-12	78.1(169)	0.0	3.0	20.5	57.6	18.9	132
Residence								
Rural	2004-05	79.2(961)	13.1	55.1	21.4	9.9	0.5	761
	2011-12	90.5(734)	6.6	51.7	26.8	13.1	1.8	664
Urban	2004-05	89.7(379)	7.7	45.6	29.1	13.8	3.8	340
	2011-12	95.0(301)	2.8	40.6	32.5	19.2	4.9	286
School Type								
Government	2004-05	74.1(1340)	9.9	53.2	25.4	10.7	0.9	816
	2011-12	67.7(1035)	5.1	48.4	29.6	14.9	2.0	643
Private	2004-05	25.9(1340)	15.8	49.1	19.3	12.3	3.5	285
	2011-12	32.3(1035)	6.2	48.2	26.4	15.0	4.2	307
MPCE Quintile								
First	2004-05	73.6(363)	13.9	67.4	12.4	6.0	0.4	267
	2011-12	82.9(304)	6.8	60.3	23.8	8.7	0.4	252
Second	2004-05	81.5(259)	10.9	50.2	28.0	9.5	1.4	211
	2011-12	92.1(214)	7.1	49.8	27.9	14.2	1.0	197
Third	2004-05	84.7(288)	11.1	47.5	30.7	10.7	0.0	244
	2011-12	95.7(185)	2.8	48.0	30.5	14.7	4.0	177
Fourth	2004-05	84.7(228)	10.9	44.0	29.5	13.0	2.6	193
	2011-12	97.0(169)	4.9	39.6	31.7	20.1	3.7	164
Fifth	2004-05	92.1(202)	9.7	46.8	20.4	18.8	4.3	186
	2011-12	98.2(163)	5.0	36.9	31.3	20.6	6.3	160

Cont...

Socio-Economic and Parental Gradients on Educational Attainment of Children in Northeast India

Father Education								
None	2004-05	71.8(227)	18.4	62.0	12.3	6.1	1.2	163
	2011-12	81.4(177)	7.6	51.4	29.9	10.4	0.7	144
Primary school	2004-05	81.5 (368)	8.8	50.3	29.5	10.9	0.5	300
	2011-12	88.6(255)	4.5	54.5	27.6	9.0	4.5	134
Lower secondary	2004-05	83.2(184)	8.5	54.9	24.2	10.5	2.0	153
	2011-12	94.7(131)	7.3	43.6	29.8	16.9	2.4	124
Higher secondary	2004-05	90.2(412)	10.0	46.9	27.0	14.0	2.2	371
	2011-12	99.3(300)	5.0	45.3	28.2	17.8	3.7	298
Mother Education								
Non-Literate	2004-05	74.7(372)	12.2	61.5	17.6	7.6	1.1	278
	2011-12	84.4(270)	10.5	46.5	30.3	11.0	1.8	228
Literate	2004-05	87.6(691)	10.6	47.4	27.3	12.9	1.8	605
	2011-12	96.0 (496)	3.6	48.7	27.9	16.0	3.8	476
School Fees	2004-05	642(1340)	814	562	562	910	1767	986
	2011-12	2275(1035)	2878	1736	1738	2968	11931	868
Family Type								
Joint	2004-05	88.6 (114)	16.8	62.4	14.9	5.9	0.0	101
	2011-12	87.4(103)	11.1	48.9	25.6	13.3	1.1	90
Nuclear	2004-05	81.6(1226)	10.9	51.1	24.7	11.6	1.7	1000
	2011-12	92.3(932)	4.9	48.3	28.8	15.1	2.9	860
Caste								
OBC	2004-05	80.0(801)	9.5	53.4	24.3	11.2	1.6	641
	2011-12	89.3(624)	4.9	49.4	27.7	15.8	2.3	557
SC/ST	2004-05	83.9(310)	11.9	48.1	28.1	10.4	1.5	260
	2011-12	97.4(231)	8.0	44.0	33.3	11.1	3.6	225
Others	2004-05	87.3(229)	17.0	53.5	16.5	11.5	1.5	200
	2011-12	93.3(180)	4.2	50.6	25.0	17.3	3.0	168
Number of Children								
One	2004-05	80.0 (315)	11.1	56.0	19.8	12.3	0.8	252
	2011-12	90.5 (263)	7.1	52.5	24.4	12.6	3.4	238
Two	2004-05	84.8(683)	11.7	51.8	26.1	9.2	1.2	579
	2011-12	92.3(531)	5.5	44.5	31.8	15.7	2.5	490
More than two	2004-05	79.0(342)	11.1	49.3	22.6	14.1	3.0	270
	2011-12	92.1(241)	3.6	52.3	25.7	15.8	2.7	222
Total	2004-05	82.2(1340)	11.4	52.1	23.8	11.1	1.5	1101
	2011-12	91.8(1035)	5.5	48.3	28.5	15.0	2.7	950

Enrolment rate increased during 2004-2012 irrespective of age of children --- 84.3 to 97.9 per cent among 5-10 years, 90.2 to 92.2 per cent among 11-13 years, 78.9 to 87.9 per cent among 14-15 years and 60.4 to 78.1 among 16-17 years old children.

Children are enrolled largely in age equivalent levels of education; nearly all of the children in 5-10 years are enrolled for pre-school and primary education, 96 per cent of 11-13 years for primary and upper primary levels, more than 85 per cent of 14-15 years for upper primary and secondary levels and more than 70 per cent of 16-17 years for secondary and higher secondary levels. As the analysis is based on panel data of children there is evidence emerging the advancement in educational attainment of children during 2004-2012. Enrolment of children among rural children during 2004-2012 has improve from 79.2 to 90.5 per cent while among urban children not only is the level of enrolment is higher than in rural from 89.7 to 95 per cent. Another major rural-urban differential is that a higher proportion of children in urban are enrolled for secondary and higher secondary levels. Enrolment in public schools dropped down from 74.1 per cent in 2004-05 to 67.7 per cent in 2011-12 while that in private schools increased from 25.9 to 32.3 per cent during the aforesaid period. Higher proportion of children enrolled in private schools are for secondary and higher secondary education. It is also further noted from the analysis that enrolment rate of children in 5-17 years in northeast India varies directly with household economic condition as measured by monthly per capita expenditure (MPCE) and among children from the lowest and highest MPCE quintile households varies from 73.6 to 92.1 per cent in 2004-05 and from 82.9 to 98.2 per cent in 2011-12. This clearly indicates that enrolment rate is higher among children from economically better off households than among children from economically poorer households. Further, it is noted that more children from economically sound households are enrolled in secondary and higher secondary levels than children from economically weaker households. Parental education do matters in school enrolment of children in northeast India, as enrolment rate among children of father with no education is 71.8 and 81.4 per cent in 2004-05 and 2011-12 respectively while the corresponding figures for children of father educated up to higher secondary level are 90.2 and 99.3 per cent respectively. Intergenerational transmission of education from parents to offspring is also evident from the fact that a higher proportion of children of father with higher education are enrolled in secondary and higher secondary levels than among children with less educated fathers. A similar conclusion holds well by literacy status of mother. Enrolment rate of children from nuclear family has increase from 81.6 to 92.3 per cent during 2004-2012 but not improvement for children from joint family. More children from nuclear families are enrolled in secondary and higher secondary level than children from joint families. Looking at the differentials in enrolment rate of children by social groups, it is observed that enrolment rate among children from OBC is the lowest of the three social groups though it is improving over time. Enrolment in secondary and higher secondary levels are lower among children from OBC and SC/ST children as compared to that of children from others social group.

When assessing the enrolment rate by the number of school going children in the household, it is found that enrolment rate is marginally higher when there are two school going children in the household 84.8 and 92.3 per cent in 2004-05 and 2011-12 respectively. It is further noted that enrolment in secondary and higher secondary education is lower among only child of school going age, indicating educational disadvantage of single as against the common notion that more children in household can cause financial hindrance to children's education. To comprehend the financial burden of child education on household, annual school fees for different levels of school education were analysed and it was found that for all levels of education school fee has increased manifold during 2004-2012.

Figure 1 below shows the average years of schooling of children by their age. It is observed that average years of schooling of children 5-17 years in northeast (NE) India increases almost linearly with the age of children and educational improvement of children in the region over the period 2004-2012 is also conveyed as the average years of schooling of children in 2011-12 by age of children is at higher level than in 2004-05.

Figure 1
Average years of Schooling of Children by Age in NE India for 2004-05 and 2011-12

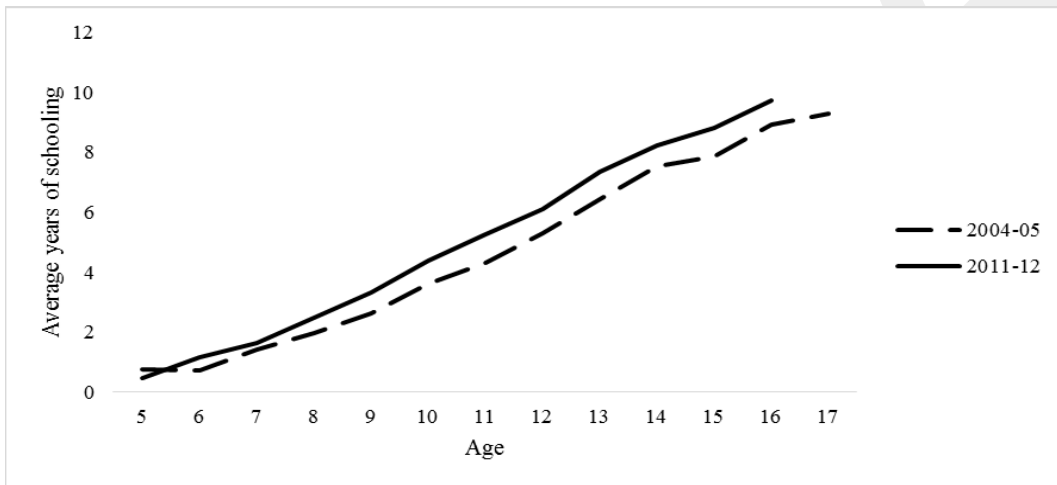
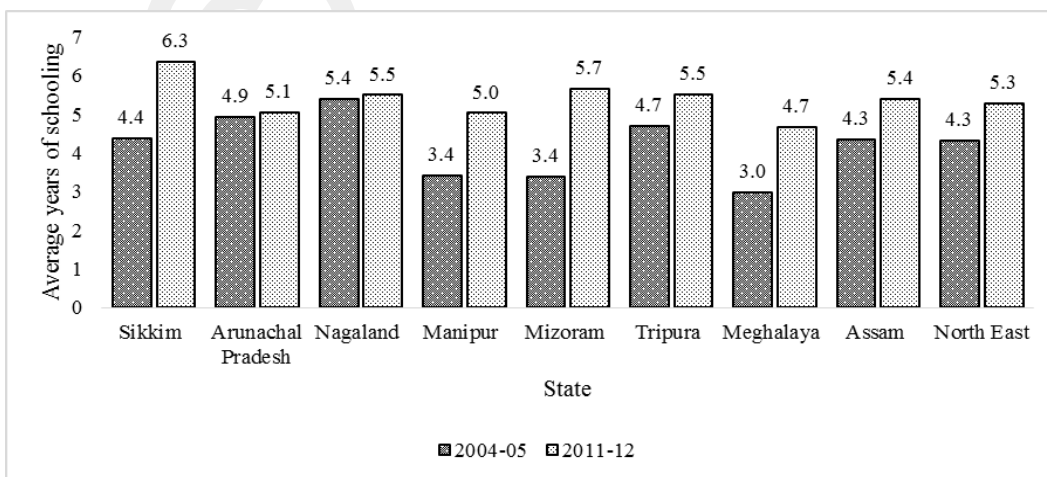


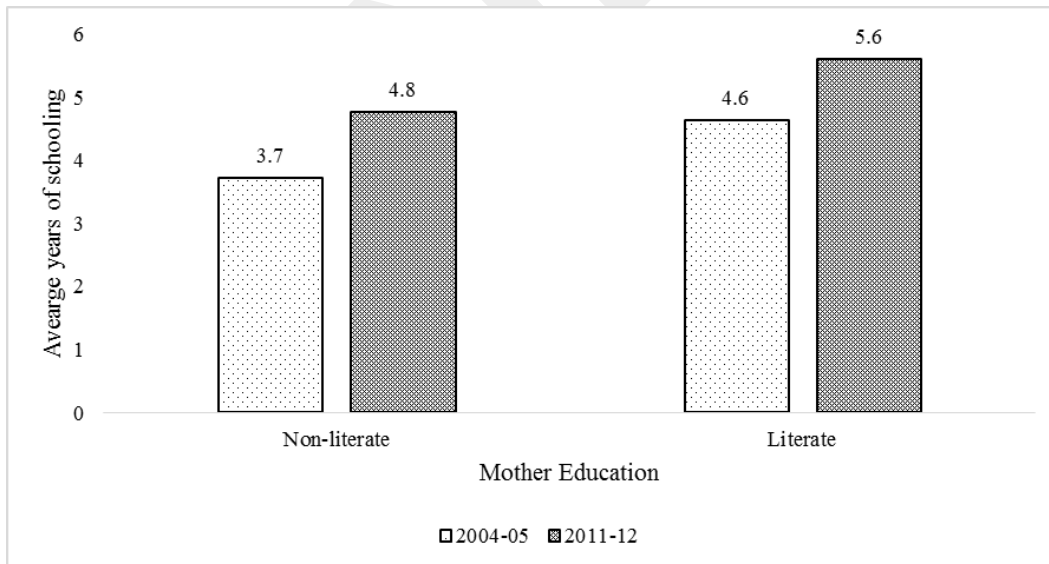
Figure 2
Average Year of Schooling of Children in 5-17 Years by States in Northeast India for 2004-05 and 2011-12



To assess the inter-state variation in educational outcome of children, the average of schooling of children in 5-17 years by states in NE India is shown in Figure 2. For the NE region the average years of children in 5-17 years improves from 4.3 to 5.3 years during 2004-2012. However, there is considerable inter-state variation in the pace of increase. Educational level of children in terms of years of schooling has not improved during 2004-2012 for Arunachal Pradesh and Nagaland and remains at about 5 and 5.5 years respectively. The increase in average years of schooling is highest from 3.4 to 5.7 in Mizoram; it moderately increased from 3 to 4.7 years, and there was no improvement in Nagaland. The main point emerging from this simple assessment of average years of schooling of children in 5-17 years is that educational attainment of children in NE India is low when compared with the educational standard in India, that is, primary for 6-10 years, upper primary for 11-13 years, secondary for 14-15 years and higher secondary for 16-17 years. This suggests the need for further improvement in educational level of children to commensurate with their age. Parental education is of particular interest in view of intergenerational transmission of education from parents to offspring. From Figure 3 it is evident that the average years of schooling of children of literate mother is about a year more than children of non-literate mother. It is encouraging to note that over the period 2004-2012 average years of schooling of children improved by one year regardless of literacy status of mother.

Figure 3

Average Years of Schooling of Children by Educational Level of Mother for Northeast India in 2004-05 and 2011-12



The average years of schooling by levels of education are shown in Table 4; this was meant to assess whether age of children is in concordance with level of education. It can be noted that children enrolled in primary school had completed 2.7 years of schooling in 2004-05 and 3.3 years of schooling in 2011-12. However, the average years of schooling of children enrolled in upper primary, secondary and higher secondary school were 7, 9.4 and 11.3 years in 2004-05 and have not improved in 2011-12. This suggests that the pace of improvement in education of children in terms of years of schooling is not appreciable.

TABLE 4
Average Years of Schooling by Levels of Education
in 2004-05 and 2011 - 12

	<i>Average Year of Schooling</i>	
	<i>2004-05</i>	<i>2011-12</i>
Preschool (below 5 years)	0.3	0.0
Primary school (5- 10 years)	2.7	3.3
Upper primary school (11-13 years)	6.9	7.0
Secondary school (14-15 years)	9.4	9.3
Higher secondary school (16-17 years)	11.3	11.2
Overall	4.3	5.3

In order to comprehend the scenario more closely, the proportion of enrolled children whose age are lower and higher than the prescribed age by levels of education for 2004-05 and 2011-12 are shown in Table 5. It is noted that out of 574 and 459 children in 2004-05 and 2011-12 for primary schooling 26.7 and 41.8 per cent respectively were older than the prescribed eligible age 5-10 years. Likewise, out of 262 and 271 children enrolled for upper primary schooling in 2004-05 and 2011-12 the proportions of children who were above the prescribed eligible age 11-13 years are 37.8 and 49.8 per cent respectively. Only 2.3 and 0.4 per cent of enrolled children in 2004-05 and 2011-12 were below the age of 11 years. Further out of 122 and 142 children enrolled for secondary schooling in 2004-05 and 2011-12 large proportions of children 50.8 and 43 per cent are in the prescribed eligible age 14-15 years while only 8.2 and 3.5 per cent respectively are below the age of 14 years and 41 and 53.5 per cent respectively are older than 15 years. As regards 17 and 26 children enrolled for higher secondary in 2004-05 and 2011-12, a majority of the children, 88.2 and 96.2 per cent, are in the prescribed eligible age 16-17 years while the fractions are below 16 years. It is evident that the low average years of schooling of children in northeast India the consequence of large proportion of enrolled children for each level of schooling are older than the prescribed eligible age for the corresponding level of education.

TABLE 5

Percent of Enrolled Children Younger and Older than the Prescribed Age by Levels of Education in 2004-05 and 2011-12

	<i>Age</i>	<i>2004-05</i>		<i>2011-12</i>	
		<i>Per cent</i>	<i>N</i>	<i>Per cent</i>	<i>N</i>
Primary school (5- 10 years)	5 - 10	73.3	574	58.2	459
	> 10	26.7		41.8	
	< 11	2.3		0.4	
Upper primary school (11-13 years)	11 - 13	59.9	262	49.8	271
	>13	37.8		49.8	
	< 14	8.2		3.5	
Secondary school (14-15 years)	14 -15	50.8	122	43.0	142
	> 15	41.0		53.5	
	< 16	11.8		3.9	
Higher secondary school (16 - 17 years)	16 - 17	88.2	17	96.2	26

The modelling strategy is to fit three versions of fixed effect model to assess changes in the magnitude, direction and significance of factors in its contribution in the change in educational level of years of schooling of children in northeast India. Model I considers only child characteristics, age, sex and type of school attended. Household's background, residence, MPCE quintile, number of school going children in the household, social group of household head, parental education and family type are assess in Model II. In Model III child characteristics, household background and parental education are integrated. Table 6 shows the estimates of effect of change in demographic and socio-economic factors on change in years of schooling of children.

TABLE 6

**Estimates of Effect of Demographic and Socio-Economic Factors on
Average Year of Schooling among Children for 2004-05 and 2011-12**

<i>Background Characteristics</i>	<i>Model - I</i>	<i>Model - II</i>	<i>Model - III</i>
Age of Child (in years)			
5 - 10 ^R			
11 - 13	0.700***		0.687***
14 - 15	1.450***		1.414***
16 - 17	2.027***		2.070***
School Type			
Public ^R			
Private	0.009		-0.029
Sex			
Male ^R			
Female	0.052**		0.047*
Residence			
Rural ^R			
Urban		0.185***	0.155***
MPCE Quintile			
First ^R			
Second		0.244***	0.069
Third		0.264***	0.016
Fourth		0.378***	0.060
Fifth		0.354***	0.019
Number of Children			
One ^R			
Two		0.099	-0.014
More than two		0.100	-0.005
Caste			
OBC ^R			
SC/ST		-0.130**	-0.085**
Others		-0.145**	-0.132***
Family Type			
Joint ^R			
Nuclear		0.422***	0.164**

Cont...

Father's Education			
None ^R			
Primary school		0.070	0.001
Lower secondary		0.058	0.017
Higher secondary		0.014	0.042
Mother's Education			
Illiterate ^R			
Literate		0.067	0.137***
Year			
2004-05 ^R			
2011-12	0.003	0.248***	-0.007
Constant	0.737***	0.343***	0.474***
Sigma _u	0.262	0.511	0.250
Sigma _e	0.556	0.869	0.540
Rho	0.182	0.257	0.177
R-square			
Within	0.615	0.072	0.642
Between	0.883	0.081	0.837
Overall	0.617	0.076	0.647

Note: ***P < 0.01, ** P < 0.05, *P < 0.10

From the column under Model I it is noted that among the child characteristics as expected change in years of schooling of children concomitantly increases with their age when sex and type of school attended are adjusted and it is statistically significant at $P < 0.01$. Effect of type of school attended has no significant effect on years of schooling of children when age and sex of child are adjusted. Controlling for age and type of school attended, female children have advantage over their male counterpart in education outcome in terms of years of schooling and is significant at $P < 0.01$. No significant change in average years of schooling over time is noted.

The estimated effects of household background and parental educational status are shown in the column under Model II. Change in years of schooling of urban children are higher than that of rural children when other household background are controlled and the differential in years of schooling by sex of children is significant at $P < 0.01$. Change in average years of schooling of children increases with increase in economic well-being of household from first to fifth MPCE quintile when other factors are adjusted and is significant at $P < 0.01$. Number of children of school going age children in the household has no significant effect on years of schooling of children. When it comes to assessment of social group differentials in educational outcome of children when other factors are controlled, it is found that as compared children from other backward castes (OBC) improvement in years of schooling of children from SC/ST and other general castes are lower and the differential is

significant at $P < 0.01$. Children from nuclear family comprising of parents and other siblings out perform in terms of years of schooling over children from extended joint family when other factors are adjusted and the difference is significant at $P < 0.01$. After adjustment of other household background parental educational status do not show any significant effect on child educational attainment. Change in years of schooling of children over the period 2004-05 to 2011-12 is noted and is significant at $P < 0.01$ under Model II.

Child characteristics, household background and parental educational status are integrated and their effects on years of education of children are shown in the column of Model III. The effects of age and sex of children in child characteristics, urban residence, social groups and family type on years of schooling of children remains largely unchanged from Model in terms of magnitude, direction and level of significance when other factors are adjusted. However, the significance of economic status of household as measured by MPCE dwindles out and the significance of mother literacy status emerges when other child characteristics and household background are controlled. It is found that children of literate mothers have higher years of schooling than that of non-literate mothers and the differential is significant at $P < 0.01$. The estimated intra-class correlation coefficient of years of schooling of children 5-17 years in northeast India is 17.7 per cent which is modestly high. Child characteristics, household background and parental background considered in this study explained 83.7 and 64.2 per cent of between and within years of schooling variation. In the final Model III change in average years of schooling during 2004-05 to 2011-12 is found to be not statistically significant.

Summary and Conclusion

One of the paradoxes of human resource development in northeast India is the low average years of schooling of children in 5-17 years despite the high enrolment rates and appreciably high literacy rates. To provide policy inputs for enhancement of average years of schooling an attempt is made to assess child characteristics, household background and parental education on years of schooling of children.

On the whole, school enrolment rate in northeast India is impressive and comparable to other developed states in the country. Three-fourth of children is enrolled in public schools but over time, and patronisation of private schools is increasing. There is also considerable improvement in enrolment rate during 2004-2012. What is more socially appealing of the region is that enrolment rate among the girls is higher than that among the boys and enrolment of children is invariant of number of school going children in the household. However, there exist considerable differentials in enrolment by place of residence, household economic status, parental education, family type, and social groups.

An assessment of years of schooling of children reveals that children from northeast India have low average years of schooling, which is contrary to high enrolment rate in the region, suggesting the need for assessment beyond enrolment rate for mitigation of educational enhancement of children. This study reaffirms the significance of improving literacy of mother, accessibility to educational facilities proxy by urban residence and nuclear family structure in enhancement of educational attainment of children in the case of northeast India. Notwithstanding the findings elsewhere, the economic well-being of household is found not to be significant factor of educational outcome of children in the region once the mother literacy is controlled. One of the most encouraging findings of

the study is that unlike in other parts of the country girls have significantly higher years of schooling than the boys.

The aforesaid findings of the study clearly suggest that human resource development in northeast India, which is the abode of many indigenous tribes and castes, needs to pay more attention to enhancing the years of schooling of children to make them employable. Dropout rate in four states, namely, Assam, Arunachal Pradesh, Manipur and Meghalaya, is above 50 per cent while it is more than 40 per cent in the other states in northeast India. Thus the first step for improvement of years of schooling of children is to reduce school dropouts.

The availability of trained teachers is also pivotal for retention of enrolled students and NE states have inadequate DIETs (District Institutes of Education and Training) with 19 in Assam, 7 each in Meghalaya and Manipur, 6 each in Arunachal Pradesh and Nagaland, 4 in Tripura, 2 in Mizoram and one in Sikkim. Increasing the accessibility of school will also be crucial due to the hilly terrain of the region.

The study suggests that northeast India has still a long way to go to ensure the 'Right of Children to Free and Compulsory Education (RTE) Act, 2009' which entitles every child of the age of six to fourteen years with the right to free and compulsory education in a neighbourhood school till completion of elementary education. A lot more needs to be done in the context of northeast India also to translate into reality the provisions to promote, with special care, the education and economic interests of the weaker sections of the people, and, in particular of the Scheduled Castes (SC) and Scheduled Tribes (ST), and to protect them from social injustice and all forms of social exploitation by the states under Article 46 of the Indian Constitution. An important conclusion which can be drawn from this study is that for enhancement of educational attainment of children in a region like the northeast India, the supply side needs to be further supported by sensitisation of community and household the need for education of children. Adult education programmes at community level can also be promoted to educate women as it pays dividend in enhancing the children's education.

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Factors Affecting Academic Achievement in Students: An Empirical Study

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Abstract

Academic achievement has been viewed as a nexus of several variables dynamically interacting to bring about an outcome, lending itself to great significance in an individual's academic and professional life. This study investigates the relationship between academic performance of students and personality, intelligence and creativity in Indian universities. The sample (n = 113) from a college in Mumbai responded to the Raven's Standard Progressive Matrices, NEO Five-Factor Inventory and Guilford's Alternate Uses Tasks as measures of intelligence, personality and creativity respectively. Students' GPA scores were used as a measure of academic achievement. Small but significant correlations were obtained between students' academic achievement and intelligence scores, and between personality dimensions of openness and extraversion with subscales of creativity. A regression analysis revealed that creativity scores on elaboration are the best predictors of academic achievement. The study also revealed gender differences in intelligence, personality and creativity variables.

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Introduction

MODERN times have seen an upsurge in the methods and application of knowledge in the form of technology and analytical abilities. These problem-solving abilities borrow their understanding from the early learning experiences primarily established through formal education. The demands of the newer job market are virtually and physically driven by the ability of the employees to solve problems resourcefully. Academic achievement becomes essential in deciding where and how each individual's potential can be maximised. In the milieu of these requirements, it is essential to revisit the theoretically driven models which have withstood the predictions about academic achievement.

Role of Intelligence and Creativity in Academic Achievement

Studies have iterated intelligence and academic achievement (AA) as correlated variables. IQ tests seem to predict performance better on traditional academic tasks (i.e. scholastic ability) than they predict performance on real-world complex problems which include traits like "street smartness" (Ormrod, 2008). Thus, several IQ tests do not serve as a reliable measure for the overall intelligence (Bracken & Walker, 1997). Considering this viewpoint, it is essential to determine the roles of other variables in predicting academic achievement.

Researchers initially viewed creativity as a component of intellectual prowess and thus elucidated fluency as the most basic output of creativity (Galton 1869, 1962; H. L. Hargreaves, 1927). As much as creativity is related to novelty, it is also related to problem-solving to a great extent (Kaufman & Sternberg, 2006). Thus, creative cognition is seen as dealing with basic cognitive processes, available to all which operate on stored knowledge to yield novel, contextually relevant ideas and solutions (Ward & Kolomyts, 2010). According to Csikszentmihalyi and Getzels (1971), the way people formulate problems and accomplish tasks is an inherent part of the creativity process. Others, such as Wallas (1926), describe a stage of incubation as essential for problem-solving. Moreover, the idea of problem-solving differs in terms of creative process and the final product. Thus, it is crucial to understand whether students who have different academic backgrounds initiate the problem-solving task in a different manner and if it has an effect on their overall academic performance.

School children who were high on creativity and those with high intelligence scores, both had comparable scores on a standardised achievement test (Getzels & Jackson, 1962). Supporting this study, Torrance (1962) proposed a theory that IQ would have an effect on AA up to a certain threshold IQ level (about 120) after which creativity would begin to have a significant effect (Xiaoxia Ai, 1999). On the other hand, other studies have reported no significant correlation between creativity and AA thus suggesting that creativity and intelligence consists of different skills and abilities thereby affecting the AA differently (Edwards & Tyler, 1965; Marjoribanks, 1976; Mayhon, 1966; Tanpraphat, 1976). A longitudinal study of students from the 7th to the 11th grade in West Germany showed that not only was the correlation between creativity test scores and school grades actually negative in the case of physics (-.12), but it did not go beyond .26 even for art (Sierwald, 1989). Another study showed that IQ is related more to basic forms of achievement while creativity is to more higher forms of achievement involving verbal

expression (Smith, 1971; Shin & Jacobs, 1973). This indicates a possibility that relationships between creativity and intelligence could vary with age and difference in academic settings depending on the kind of curriculum a student gets enrolled into.

Relationship between Creativity and Intelligence

A major question which persists is to what extent is intelligence related to creativity. Guilford was one of the first researchers to develop taxonomy of human abilities that subsumed creative thinking as a part of intelligence (Batey & Furnham, 2006). Guilford's structure-of-intellect (SOI) model (1967a) proposes three main components; of which "divergent production/divergent thinking" (DT) component represented creativity. On this ground, he developed a creativity test (Guilford's Alternative Uses Task), which is a quantitative measure assessing creativity in terms of fluency, flexibility, originality and elaboration. However, DT was seen as an insufficient ability for creative achievement (Guilford, 1950). Many early investigations into the relationship between creativity and intelligence suggested that the two concepts are not the same. The most intelligent individuals were not found to be the most creative, and correlations between creativity and IQ were fairly low. Dearborn's (1898) Harvard study employing inkblots showed that intellectuals hardly gave imaginative responses. Thus, it can be implied that intelligence serves as a foundation for creativity, providing the individual with a basic understanding of rules to solve problems in a socially appropriate manner. However, the way in which the individual solves the problem would be the product of his or her creativity.

Role of Personality in Academic Achievement

Traditional theorists maintain that only intelligence is enough to predict AA but such theories do not account for how the personality traits of an individual interact with the cognitive abilities and the environment to influence the overall academic learning (Boyle, 1990).

The concept of stable traits served as an important step towards understanding personality as contributing to one's intelligence and it has been asserted that there could be a common trait which facilitates intelligence for acquiring knowledge. Most of these studies have relied on one of the culturally robust models of personality. The fifth factor in the Five-Factor model (Costa & McCrae, 1992a), i.e., 'openness to experience,' is related to an individual's vocabulary and education (Eysenck & Eysenck, 1985). It is indeed, a fact that curious and imaginative men are better educated than others since they explore opportunities and thus utilise their intellectual capacities in an efficient manner (Digman, 1990). Conscientiousness (C) has been consistently found to predict academic success right from childhood to adulthood (Chamorro-Premuzic & Furnham, 2003). It is associated with personal attributes necessary for academic pursuits, like dutifulness, competency and achievement-striving. Self-discipline, a trait closely related to C, has been shown to predict school performance more strongly than intelligence among school girls (Duckworth & Seligman, 2005). Neuroticism (N) was found to be negatively correlated with academic performance among university students (Leith & Davis, 1972). In response to the growing competition in the educational environment, students tend to become more anxious

which affects the quality of their performance. Openness to experience (O) also reflects openness to learning opportunities, resulting in a positive correlation with scholastic achievement (Ackerman & Heggstad, 1997). It may also have positive effects precisely when students are engaged in creative and artistic activities (Chamorro-Premuzic & Furnham, 2003). The effect of Extraversion (E) on academic success is largely age-dependent, with initial facilitation towards success during elementary school but debilitating academic success later in high school and college (Zeidner, 2009). The relation between Agreeableness (A) and academic attainment is negligible, since the traits closely associated to A, like compliance and altruism, fall more towards social adjustment thus likely to be more instrumental in a cooperative classroom setting. (Shiner, Masten & Roberts, 2003).

Relationship between Personality and Intelligence

Theories proposed by influential figures like Binet (1905), Terman (1906), Wechsler (1944), Spearman (1927), Gardner (1983) and Anastasi (1992) have highlighted an intricate relationship between personality and intelligence. Yet the theories supporting intelligence as the cognitive aspect of personality have gathered much ground in the ongoing debate than the other perspectives (Eysenck & Eysenck, 1985).

Psychometric studies in intelligence saw the emergence of many landmark theories like the Cattell's 16PF model which explicitly mentions intelligence as one of the 16 basic source traits (Cattell, 1971). His structure of personality model related intelligence with radicalism and dominance, leading to success and independence across situations, eventually leading to personality formation. He also stated that crystallised and fluid ability have different roles to play in personality development. Moreover, the relation-perceiving power of intelligence directly aids certain personality developments, e.g., the growth of conscientiousness (Barratt, 1995). The above-mentioned literature is intriguing as it accounts for the interplay of a variety of variables playing a significant role in predicting academic success of a student over a period of time.

The current study thus attempts to elucidate the relationship that exists between academic achievement, intelligence, creativity and personality factors. We, therefore, hypothesised, that academic achievement would be predicted by intelligence and a personality variable like Conscientiousness along with the sub-facets of creativity in the Indian education system after controlling for the certain environmental factors (such as hours of sleep, hours of physical activity, etc.) that could confound the individual's intentional learning and work in an educational environment.

Method

Sample

Participants (n = 113) included undergraduate male (n = 33) and female (n = 80) students from a college in Mumbai. Participants who volunteered for the study belonged to the Arts stream (n = 50) and Commerce stream (n = 63) and ranged between 18 to 22 years of age (M = 20, SD = 0.5). Informed consent from all the participants was taken prior to administering the tests.

Material

Intelligence

A 60-item non-verbal group test called Standard Progressive Matrices (SPM; Raven et. al., 2004) was administered to measure intelligence.

Personality

A 60-item personality inventory, NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992) was administered. Responses were obtained on a 5-point Likert Scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Scores on five subscales were obtained – neuroticism, extraversion, openness, agreeableness and conscientiousness.

Creativity

Guilford's Alternative Uses Task (Guilford et.al., 1954, Guilford, 1967a, 1967b), was administered to assess Divergent Thinking. Responses were analysed to yield scores on four subscales --- fluency, flexibility, originality and elaboration.

Academic achievement

Grade point average (GPA) on a 7 point GPA scale on the most recent exam results was obtained.

Procedure

The administration of the scales was carried out in a classroom setting using pen and paper format. Participants responded to the demographic questionnaire. This was followed by administering SPM. Participants next responded to the NEO-FFI questionnaire. Creativity test was administered by instructing the participants to write as many possible uses of an object (e.g., a brick) within 5 minutes. All the tests were scored as per instructions provided in the respective manuals.

Results

The descriptive statistics for the sample are provided in Table 1. Gender differences were found on some of the variables wherein females ($n = 80$) scored higher than males ($n = 33$) on academic achievement, creativity, fluency, flexibility, elaboration, extraversion, agreeableness, and conscientiousness. The sizes of the effect for these differences ranged from moderate to large.

TABLE 1
Descriptive Statistics

Variables	Males (n=33)		Females (n=80)		Entire Sample (n=113)		t	d
	M	SD	M	SD	M	SD		
GPA	5.89	1.02	6.38	0.84	6.24	0.92	2.43*	0.55
INT	45.33	10.76	45.23	6.27	45.26	7.80	-0.05	
CRE	34.27	11.23	52.14	21.79	46.92	20.92	5.72**	0.92
F	8.18	2.69	10.69	3.64	9.96	3.57	4.04**	0.74
X	22.15	7.31	35.45	15.94	31.57	15.21	6.07**	0.95
O	1.79	1.76	1.84	2.02	1.82	1.94	0.13	
E	2.15	2.37	4.16	3.62	3.58	3.42	3.47**	0.61
NEU	39.3	7.54	41.74	7.16	37.10	4.69	1.58	
EXT	38.27	5.65	38.44	5.88	39.81	4.32	0.14	
OPN	41.7	6.54	43.9	5.76	40.75	4.22	1.68	
AGR	36.91	6.88	41.73	6.03	37.12	4.85	3.50**	0.77
CON	40.88	7.75	43.23	5.71	42.95	4.00	1.57*	0.37

Note: GPA = Grade Point Average; INT = Intelligence; CRE = Creativity; F = Fluency; X = Flexibility; O = Originality; E = Elaboration; NEU = Neuroticism; EXT = Extraversion; OPN = Openness; AGR = Agreeableness; CON = Conscientiousness (* $p < .05$, ** $p < .01$).

Table 2 presents the correlations amongst the variables in the study. Elaboration and academic achievement show a significant correlation ($r = 0.23$, $p < 0.05$). The correlations between openness and creativity subscales although low in magnitude indicate some association between them.

TABLE 2

Bivariate Correlations among the Variables

<i>Variables</i>	1	2	3	4	5	6	7	8	9	10	11	12
GPA	-											
INT	0.15	-										
CRE	0.12	0.12	-									
F	0.03	0.12	0.85**	-								
X	0.09	0.10	0.97**	0.79**	-							
O	0.10	0.02	0.54**	0.45**	0.39**	-						
E	0.23*	0.15	0.60**	0.35**	0.45**	0.53**	-					
NEU	0.07	0.00	0.09	0.05	0.12	-0.03	-0.02	-				
EXT	-0.05	-0.02	0.18	0.20*	0.17	0.01	0.12	-0.22*	-			
OPN	0.07	0.13	0.35**	0.25**	0.31**	0.22*	0.37**	0.11	0.11	-		
AGR	-0.16	0.14	0.15	0.07	0.17	-0.01	0.12	0.12	0.07	0.15	-	
CON	-0.04	-0.07	0.04	0.05	0.03	0.09	0.05	-0.21*	0.10	0.01	-0.06	-

Note: GPA = Grade Point Average; INT = Intelligence; F = Fluency; CRE = Creativity; X = Flexibility; O = Originality; E = Elaboration; NEU = Neuroticism; EXT = Extraversion; OPN = Openness; AGR = Agreeableness; CON = Conscientiousness (* $p < .05$, ** $p < .01$).

Our hypothesis that AA will be predicted by Intelligence (INT) and Conscientiousness (CON) was tested using regression analysis (Table 3). The first model tested this hypothesis and was found to be insignificant ($R^2 = 0.005$, $F(2,110) = 1.282$, $p < n.s.$). A second hierarchical regression tested if AA can be predicted by fluency (F) which is the verbal component of creativity, controlling for INT and CON. The second model was also found to be insignificant ($R^2 = -- 0.004$, $F(3,109) = 0.891$, $p = n.s.$). A third model added neuroticism along with the previous predictors to predict AA. This model also yielded insignificant results ($R^2 = -- 0.008$, $F(4,108) = 0.545$, $p = n.s.$). A fourth model looked at Elaboration (E) subscale of creativity and Agreeableness (AGR) as predictors for AA, with E predicting AA better than AGR ($R^2 = 0.055$, $F(2,110) = 4.295$, $p = 0.01$). Out of all the predictors, only E was a significant predictor of AA. Altogether, 5.5 per cent of the variability in AA was predicted by knowing the scores on these predictor variables. The statistics for the regression analysis can be found in Table 3.

TABLE 3

Summary of Hierarchical Regression Analysis for Variables Predicting Academic Achievement (AA) (*N* = 113)

Variable	Model 1			Model 2			Model 3			Model 4		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	<i>B</i>	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
INT	0.017	0.011	1.550	0.017	0.011	1.508	0.017	0.011	1.522			
CON	-0.004	0.013	-0.291	-0.004	0.014	-0.300	-0.002	0.014	-0.134			
F				0.005	0.025	0.189	0.003	0.025	0.142			
NEU							0.009	0.012	0.727			
E										0.058*	0.025	2.34
AGR										-0.025	0.018	-1.444
<i>R</i> ²	0.005			-0.004			-0.008			0.055		
F for change in <i>R</i> ²	1.282			0.859			0.545			4.291		

Note: GPA = Grade Point Average; INT = Intelligence; F = Fluency; NEU = Neuroticism; CON = Conscientiousness; E = Elaboration; AGR = Agreeableness (**p* < .05, ***p* < .01).

Another regression equation, summarised in Table 4, was tested wherein elaboration (E) predicted AA. The model yielded significant results (*R*² = 0.05, *F* (1,111) = 0.891, *p* < .05). Only E predicted AA significantly.

TABLE 4

Summary of Simple Linear Regression Analysis for Variables Predicting Academic Achievement (AA) (*N* = 113).

Variable	<i>B</i>	<i>SE B</i>	<i>B</i>	<i>t</i>
E	0.06*	0.025	0.23	2.54

Note: *R*² = 0.05, (**p* < .05, ***p* < .01);

E = Elaboration.

Discussion

The current research investigated the relationships between academic achievement (AA), intelligence, creativity and personality. The findings on gender differences are noteworthy. Females were found to be higher on variables like AA, creativity, fluency, flexibility, elaboration, neuroticism, openness, agreeableness and conscientiousness. This is indicative of some attributes which characterise females differently from males. In the Indian context, the gender roles of girls and boys are predetermined by external agents like

cultural norms, parental styles, media, and societal expectations. Girls learn to adhere to the standards of precision and socially determined righteous behaviour. This has been theorised previously in the principle of semantic congruence (Burke & Reitzes, 1981) which predicts that people with specific role identities choose role behaviours that have meanings similar to the meanings of their identities. The gender roles in an Indian context are predefined and painstakingly delineated for both the genders. Thus, the roles that we identify with, play an important part in our everyday initiatives. Another reason for these results could also be the perceived competence of the two genders, wherein boys feel that success or achievement is necessarily dependent on factors other than the academic grades; other factors may include parental investment and the normative influences on employee selection procedures. Factors like parental support and societal acceptance in their gendered self may contribute to maintaining their stable sense of self as females strive harder to gain their position in the rat race.

Girls in India are also expected to conform to the given norms of the society which drives them towards maintaining a sense of stability in their relationships, indicative of the high scores on agreeableness and conscientiousness. The high scores on elaboration and fluency are especially indicative of their strengths like detailed explanatory understanding, often masked by the perception of being gregarious. The greater form of expression in girls also fits in the general assumption of the female gender stereotype but is essentially contributing to their creative prowess. Lastly, according to Gender Similarity Hypothesis (Hyde, 2005), males and females are similar on most, however, not all psychological variables. The current study supports this theory.

The relation between AA, intelligence and the conscientiousness factor of personality has been supported by findings across different populations. Further, results revealed that E predicted AA (Table 4), meaning, the more detailed approach an individual has, he or she possesses, a greater likelihood of achieving higher AA. This indicates the emphasis laid on thinking in a more detailed manner in the Indian context.

Results also found a relationship between openness and creativity. The fifth factor of the original Five-factor model of personality has been the focal point of debate over its nomenclature with several researchers. Currently recognised as Openness to experience (McCrae & Costa, 1992a), it was also termed as Culture (Norman, 1963; Hakel, 1974) and Intellect or Intellectance (Borgatta, 1964; Digman et. al., 1981; Hogan, 1983; Peabody & Goldberg, 1989; John, 1989). The current study supports the previous findings that reiterate the relationship between personality and creativity. The openness factor in FFM includes traits like being open to trying out new activities and being flexible with thoughts and ideas. Furthermore, the extraversion factor in FFM includes traits like excitement-seeking and warmth. High scorers on both these factors are also high on creativity, which was consistent with our findings.

There is a dearth of studies investigating AA and the underlying explanations, specifically personality and creativity, in the Indian context. The Indian education will benefit immensely from understanding its students through these studies. A major limitation of the study was the sample comprising of an unequal number of females ($n = 80$) and males ($n = 33$) leading to bias with a majority of males being from the commerce stream ($n = 33$) and while a majority of females were in the arts stream ($n = 50$). Secondly, DT as a measure of creativity may not be able to assess domain-specific aspects of creativity (Baer, 1998; Kaufman & Baer, 2004; Plucker, 1998).

Future studies with a larger sample size and inclusion of more variables like motivation which are socio-culturally relevant are recommended. Secondly, the analysis of students' preferred versus their currently enrolled streams owing to the intelligence, creativity and personality traits could be studied. Thirdly, the verbal, non-verbal and performance measures of intelligence could be used so that all the aspects underlying a student's cognitive ability are considered. Lastly, the 10th and 12th grade marks could also be considered as the two are important indicators of a student's academic advancement in the Indian context. A broader scope for the assessment of AA should be examined.

The current study was an initiative to understand what leads to the AA of students in an Indian educational system. It should be noted that intelligence constitutes a major part of the student's development, yet emphasis should also be laid on the personality traits, creativity and the level of motivation.

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Inequitable Access to Provisions in Secondary Education in Uttar Pradesh: An Analysis in the Backdrop of the National Focus on Equity

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Abstract

Improving access at the secondary level in India, with a focus on equity, has emerged as a challenge in the wake of national efforts being made to universalise education up to Class X. Studies focus on a more difficult proposition of achieving equitable access at secondary level, as it is conditional on many supply and demand side factors, and includes not only the provision of opportunities but also an ensuring of participation. This has been even more challenging in a state like Uttar Pradesh where secondary education has developed as a rudderless sector, relying heavily on private provisioning. As a result, over the years, 'between-school' inequities have emerged in the secondary sector in Uttar Pradesh with gradations in both government and private provisioning, leading to multiple education providers with varying degrees of infrastructural facilities and inequities in access to teachers. In order to capture these phenomena, this paper constructed a physical facility index for selected secondary schools in two districts of Uttar Pradesh. The resultant index of schools was averaged into various categories to look at the relative positioning of secondary schools with respect to the availability of infrastructural provisions. In addition, the index of schools was also correlated with a few teacher variables to find out if there was an association between the presence of infrastructural provisions and the existence of more qualified and trained teachers at secondary level. Towards the end, the findings conclude with recommendations for providing all secondary schools with equitable opportunities of universalisation of access is to be achieved.

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The Context

ACCESS to secondary education gained prominence in the Indian national discourse with an emphasis on universalising opportunities in order to raise the minimum levels of education up to Class X (Planning Commission 2008; GoI 2005). The demand for secondary education has built up manifold in India by way of concerted efforts before and after the enactment of Right to Free and Compulsory Education Act (2009) --- with evidences now pointing to a national average of 92.81 per cent Gross Enrolment Ratio (upper primary) and substantially reduced dropout rates¹ at the end of upper primary cycle (NUEPA 2017). Though the ratio of upper primary to secondary schools/sections has stood at 2.54 for all India, well within the norms and pointing towards better physical access to secondary schooling; the transition rate from elementary to secondary is low at 90.62 per cent, revealing internal inefficiency of elementary education (NUEPA 2017). Despite the all-India figures showing a promising and upward trend for universalisation of secondary education, there are inter-state inequities in both access and participation at this stage of schooling.

It has been well researched that much of secondary education sector in India has grown on accord of private initiatives owing to a historical lack of a comprehensive developmental policy covering all stages of schooling (Mehta 2003, Biswal 2011, Sujatha and Rani 2011). A high incidence of private sector at secondary level can be gathered from the following statistics. The strength of schools imparting elementary education in the country are about 14.49 lakh, out of which 74.32 per cent schools are in the government sector whereas the number of secondary schools (Class IX and X) in the country stand at about 2.39 lakh, with a government² share of mere 34.56 per cent (NUEPA 2017).

Given a large government sector at elementary level as compared to the secondary level, the base for transition of children from the elementary to the secondary level appears to be quite narrow, particularly for the disadvantaged sections of population. This has been documented as a critical factor in deciding the fate of participation at the secondary level as secondary education in many developing nations is found to be largely private, forcing the burden of fees and other expenditures on households (Lewin 2007). In addition, a truncated structure of government provision at secondary level offsets the broad base provided by completion of elementary education. Such structural inequities tend to exclude certain socio-economic groups, especially girls from participating at secondary level.

Other than issues such as inequitable provision at systemic level, there are many other factors that obstruct access to secondary schooling. Some of them can be stated as the internal efficiency of elementary education cycle (Lewin 2011), socio-economic status of children, inappropriate age-grade matrix (Lewin 2011 a, 2011 b; Lewin and Sebates 2012) and costs for this level of education (The World Bank 2009). Hence it is argued that any policy on expanding access to secondary education needs to focus on providing equitable

¹ Average annual drop-out rate for government management schools at the upper primary cycle was 11.72 per cent for the country. The figure for private management schools was unavailable for the same year (NUEPA 2017).

² Government here refers to secondary schools belonging to only Department of Education. There are other government managed secondary schools but their share is miniscule: tribal/social welfare department 2.09 per cent, local body 4.37 per cent, other government management 0.25 per cent and central government 0/99 per cent (NUEPA 2017).

opportunities to those who complete elementary education so that the above stated factors inhibiting access are compensated for. This could include improving supply side interventions such as affordable schooling options, equitable learning opportunities in classrooms, improving grade retention by making schools more inclusive, or instituting various need based support systems such as scholarships or incentives for enhancing demand.

In fact these strategies have already made their way into programme implementation at secondary level in India (GoI 2014). Access and equity were prominently operationalised in documents related with implementation of Rashtriya Madhyamik Shiksha Abhiyan (RMSA), a centrally sponsored scheme that sought to universalise access and improve the quality of secondary education system in the country. The guidelines specified for universalising the access to secondary education stressed on providing secondary schools “within a reasonable distance of any habitation to ensure access for universal enrolment of children in the age group of 14 to 18 years” as well as focus on infrastructural development of secondary schools (GoI 2014 a). For achieving equity, the guidelines of RMSA framework detailed design of multi-pronged strategies for removing social and gender disparity with a focus on special focus groups (such as SC, ST, Minority, girls and CWSN) (GoI 2014 b). A few issues identified as critical to bringing equity in the system were low enrolment, high dropout/low retention and low learning at secondary level, for which broad strategies and interventions were spelt out. Gradually, over the successive years to the launch of RMSA, targeted interventions for achieving equity in access and participation at secondary level have seen more presence at the ground level through its inclusion in district and state level education plans (see Zaidi et.al. 2012 for appraisal of plans).

Given the above national context, this paper is an empirical investigation into the distributional aspect of equity in access to secondary schooling in two districts of Uttar Pradesh. The paper begins with presenting the findings of key researches conducted in Uttar Pradesh on secondary education followed by the conceptual framework developed for the analysis. The resulting sections of the paper analyse secondary education provisions across the sample schools to arrive at findings that point towards inequitable access. It is hoped that this research is a significant addition to the growing literature on access and participation in secondary education in India (Siddhu 2010, Harma 2011, Sujatha and Rani 2011, Narula 2012, Zaidi 2013).

Characterising Secondary Education in Uttar Pradesh

An analysis of time series data has established that expansion of secondary education in Uttar Pradesh is not commensurate with the demand for this level of education (Sujatha and Rani 2011). Further, the secondary education sector in the state is characterised by a lesser role of government in schooling provisions and a substantial private aided sector that has burdened state resources (Kingdon and Muzzammil 2003, Mehrotra and Panchmukhi 2006). These factors along with a large private unaided sector as the main educational provider pose challenges for achieving equity in access and participation at secondary level. As per the latest statistics, the share of government secondary schools/sections in the state was a mere 8.46 per cent (including categories of schools belonging to the Department of Education, Tribal/ Social Welfare Department, local body and central government).

Compared to this, the share of private aided sector at secondary level was 19.27 per cent and the share of private unaided sector stood at 71.37 per cent (NUEPA 2017).

The unbridled expansion of private unaided sector at secondary level in Uttar Pradesh can be described as a system that has emerged largely by 'default rather than design' (Rose 2005, Chopra and Jefferey 2005, Tooley and Dixon 2006, Sujatha and Rani 2011) primarily due to state withdrawal from providing schooling provisions. In Uttar Pradesh, there was a considerable rise in the private unaided secondary schools since the mid-1980s, filling the gap in demand for secondary education that was not effectively met by the government and private aided schools whose relative proportion declined over time (Sujatha and Rani 2011). Additionally, the private unaided sector both at the elementary and at secondary level in the state has been found to be a heterogeneous mix of schools that are recognised and unrecognised on one hand and elite and low fee private schools on the other hand (Kingdon 1994, Srivastava 2008). It is also found that the low-fee private schools offer a poor alternative to already low performing government schools, as is the case in many other states of the country (Srivastava 2008, Panchmukhi and Mehrotra 2005).

Other than the issues related to the systemic inequities in the secondary education provision, physical access to this level of education has also been of concern, as per the latest data available. A few studies may point otherwise. Low access to secondary schooling can be gauged from the fact that the ratio of upper primary to secondary schools/sections in the state stood at 3.67 against the national average of 2.54 (NUEPA 2017), pointing to one secondary school for 4 upper primary schools. However, the density of 1.03 secondary schools per 10 sq. km. was better than the national average of 0.73 (NUEPA 2017). An analysis by Lewin (2011 a) found that Uttar Pradesh along with West Bengal and Haryana belonged to a group of states that were characterised by less than 56 per cent Gross Enrolment Ratio but with more than 67 per cent of habitations having a secondary school within 5 km radius. It was suggested that even though physical access was not a major problem in Uttar Pradesh, the concern was efficiency of elementary schools, as a large percentage of these schools were small schools, creating a bottleneck in transition to secondary schools (ibid). This can be corroborated with the transition rate from elementary to secondary schools in Uttar Pradesh that stood at 88.85 per cent as compared to national average of 90.62 per cent in 2014-15 (NUEPA 2017).

Apart from physical distance or internal efficiency of the elementary cycle that serve as important indicators for measuring the access, the structure and length of schooling system across different school managements was also found to affect access at secondary level. In secondary schools of district Jyotibha Phule Nagar, Uttar Pradesh, it was found that inaccessibility for the poorest families increased with a rise in cost between school levels, as a result of non-availability of integrated schools (which provided both elementary and secondary cycles). In addition, 'cost' was found to be a more significant factor as compared to distance to the school (Siddhu 2010). It meant that a cheaper school located at a distance was a more viable option for poor parents than a costlier school located nearby. Another study carried out in the same district also confirmed the fact that the main determinant of school choice among the rural poor was poverty (Harma 2011). Hence both 'cost' and availability (or lack thereof) of integrated schools was detrimental to the participation of the disadvantaged at the secondary level.

It is thus evident from the above discussion that access to secondary education is far from being equitable in an enormous state like Uttar Pradesh --- characteristic of multiple

education providers that are mostly private, internal inefficiency of elementary education and high incidence of cost of schooling --- obstructing equitable access at secondary level.

Since this paper has been conceptualised in the backdrop of national focus on equity, it would be useful at this point to deliberate on how the notion of equity is understood and applied in academic literature, thereby derive the meaning of '(in-)equitable access' which is relevant for the analysis of secondary education provisions in this paper.

The Conceptual Framework

In the literature on analysis of equity in educational systems, the notion of 'equal' educational opportunities has been one of the recurring criterions. Often analysis of (un-)equal educational opportunities is regarded as the minimum threshold to understand if an education system operates on the principle of equity or otherwise (Burbules et.al 1982, Carron and Chau 1981; Gutman 1997; Jacobs 2010). The provision of (un-)equal educational opportunity is also understood to reflect distributional aspects of equity and examine if students have been provided with the same measure of, for example, infrastructure or learning opportunities or there is an absence Jacobs 2010, Ainscow et.al. 2012). But mere equal provision does not imply that all students will have the necessary conditions to access the opportunities provided, for which additional inputs and processes need to be designed in order to make the system more equitable. It is here that different scholars have enriched the understanding of this principle by defining equity as also need-based/desert (merit) based (Gewirtz et.al. 1995), as vertical and horizontal equity (Berne and Stiefel 1985) or as variations of equity in educational outcomes (Burbules et.al. 1982). This notion of equity also finds resonance in a broader understanding of access that is not only supply of equal educational opportunity but also includes provision of need based opportunities to learning, enabling grade retention and ensuring equitable participation of students from low socio-economic background (Lewin 2007, Govinda and Bandyopadhyay 2008, Jacobs 2010). This only means that providing for 'equitable access' would require additional inputs and support over and above 'equal' provisions.

In the context of this paper and its analysis, the notion of (un-)equal educational opportunity has been explored as a measure of (in-)equitable access across geography and types of schools. The spread of (in-)equitable access in a particular geographical area has been conceptualised variously in both Indian as well as Western contexts. At primary schooling in India, Ramachandran (2004, 2012) coined the term 'hierarchies of access' that explained how a hierarchical structure in provisioning of education led to further gender and social inequities in access, "The issue of children from different social strata attending differently endowed schools, gender discrimination in the choice of school by parents (government for girls and private for boys) or the issue of poorly endowed village schools/single teacher schools being the preserve of the most deprived — have now been accepted within educational discourse" (Ramachandran 2012). Diversity in school supply and provisions was found in studies conducted for primary schooling in Delhi by Juneja (2011) and at secondary level in Madhya Pradesh by Narula (2012), highlighting implications for equitable participation. Though at times, multiplicity of supply side provisions have been found to enhance access as providing diversity of schooling option, this arrangement has largely led to inequalities in participation wherein the socio-economic status of students has correlated with certain types of schools (Juneja 2011).

Similar inequities in educational systems can be discerned in Western contexts too. Ainscow et. al. (2012) proposed a useful framework for analysing inequities in access in education through – within-school, between-school and beyond-school factors. The ‘within-school’ inequities related to processes inside the school including teacher interactions, grouping of students within classrooms and the school policies designed to deal with student diversity etc. The ‘between-school’ inequities indicated how school provisions were organised in a particular area; how different school types catered to different social and economic groups and if at all schooling opportunities were available in an area. Finally, ‘beyond-school’ inequities were conceptualised as the larger social and economic inequalities or the developmental levels of areas/towns/cities which provided the contexts within which schools operated.

The framework of ‘between-school’ inequities in access to provisions across school categories in a particular geographical area is particularly useful for this present research. In addition, since the notion of (un-)equal educational opportunity has been considered as one of the principles of equity, a Physical Facility Index (PFI) was constructed through the method of principal component analysis for sample schools to see if educational opportunities in terms of secondary school provisions and trained and qualified teachers were distributed (un-)equally across the categories taken for analysis. However, to place the analysis in a broader context of the national focus on equity in secondary education, the term ‘(in-)equitable access’ have been used to present the findings and draw inferences for the existing scenario of access to secondary schooling provisions in Uttar Pradesh.

The next section details the profile of the two districts and presents the methodology of construction of the index.

Secondary Education across Two Districts: A Profile

The two districts, Meerut and Bareilly, from the Western Region of Uttar Pradesh were chosen on the basis of literacy rates from Census of India 2001³; Meerut (64.82 per cent) being comparatively advanced than Bareilly (47.84 per cent)⁴. The secondary schools in the state fall into three broad sectors as discussed above – government, private aided and the private unaided. Within these three broad sectors, there are different types of schools providing secondary education. Secondary schools are affiliated to different boards of education, which are the Board of High School and Intermediate Education (UP Board), the Central Board of Secondary Education (CBSE) and the Council for the Indian School Certificate Examinations (CISCE). The UP Board is a state owned board, whereas CBSE is a board for government (for Central Government schools and State Government schools of select states in India) and private schools under the Government of India. There are two types of Central Government secondary schools found affiliated to CBSE in Uttar Pradesh. One are the schools of the Kendriya Vidyalaya Sangathan for children of the central government employees having a transferrable job and the second, the Jawahar Navodaya Vidyalaya, which are located in rural areas and conduct entrance examinations, however are open to general public. The CISCE is an independent examination body affiliated to

³ http://www.censusindia.gov.in/2011-common/census_data_2001.html

⁴ This empirical research is part of doctoral thesis. Detailed methodology at every stage of sampling has been provided in the thesis (Malik 2015).

the University of Cambridge, to which only a few private schools are affiliated across the state. The board affiliated to CISCE is popularly referred to as the ICSE board. Other than this, the secondary schools in Uttar Pradesh exist in three categories --- only girls that enrol only girls, likewise only boys catering to only boys and co-educational for both girls and boys.

In the two districts combined, out of a total of 655 secondary schools⁵, the share of government schools (both Central and State Government) was a mere 3 per cent, as compared to 33 per cent of schools belonging to the private aided and 64 per cent of schools belonging to private unaided sector. A large private unaided sector was a reflection of the larger picture of educational providers at secondary level in the state. There were 83 per cent of secondary schools affiliated to the UP Board, 15 per cent with the CBSE and only 2 per cent with the ICSE board (CISCE). A large share of secondary schools in the districts were co-educational schools, with the existence of 20 per cent schools for only girls and 9 per cent schools for only boys.

Sample

Around 15 per cent of secondary schools were selected from the total number of secondary schools in each of the two districts. From within the district, 15 per cent of the schools were taken from rural and urban areas (see Table 1). Thus, the total sample from district Meerut was 53 secondary schools and from district Bareilly was 45 secondary schools, a total of 98 secondary schools. Within the selected sample secondary schools, in both rural and urban areas, due representation to the extent possible was given to schools belonging to the three school types (government, private aided and private unaided), the three school categories (only girls, only boys and co-educational) as well as schools belonging to three affiliating boards of education (UP Board, CBSE and ICSE) (see Figure 1). The numbers of secondary schools falling under each category have been provided in Table 4.

TABLE 1

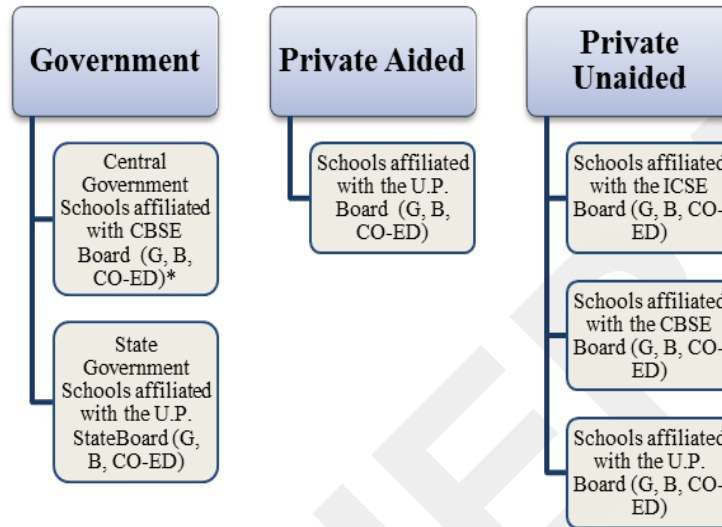
Sample Secondary Schools

<i>District</i>	<i>Location</i>	<i>Total Number of Secondary Schools</i>	<i>Sample</i>
Meerut	Rural	143	22
	Urban	209	31
	Total	352	53
Bareilly	Rural	114	17
	Urban	189	28
	Total	303	45

⁵ Office of the Joint Director, Meerut and Bareilly divisions and of the District Inspector of Schools, Meerut and Bareilly districts, 2010-11

Figure 1

Categories of Educational Providers in Uttar Pradesh



*G=only Girls, B= only boys, CO-ED= co-educational

Methods and Dataset

The use of educational development index has been employed by many researchers for a range of inter-state, inter-district and rural-urban comparisons on various education related indicators (Srivastava and Nigam 1997, Yadav and Srivastava 2005, Rani 2007, Jhingran and Shankar 2009). For the present paper, a Physical Facility Index (PFI) of sample secondary schools was constructed on the basis of the method used for computation of Education Development Index through principal component analysis (Mehta and Siddiqui 2009, NUEPA 2014, OECD 2008).

The data for 98 sample secondary schools from two districts was drawn from the Secondary Education Management Information System, SEMIS (NUEPA 2011). This dataset offered a country wide collation of information on a wide range of variables for all the secondary and high secondary schools. Though the SEMIS collected data for a number of infrastructure related variables of secondary schools, for the present study, 20 variables were chosen according to their relevance for measuring access at secondary level in the Indian context. The twenty variables chosen were as follows: Electricity, Generator set, Computers for students, Computers for teachers, Internet connection, Laboratory, Library, Urinals for girls, Lavatories for girls, Staffroom for teachers, Playground, Sports equipment, Room for sports equipment, Indoor games facilities, Room for indoor games, Activity room, Television, VCR/CD/DVD player, Tape recorder and Audio/visual/public address system.

Construction of the Physical Facility Index (PFI)

The variables for computing physical facility index were coded in binary values in the SEMIS dataset for 2010-11. For all the variables, the existence of the facility was coded as 1 and the absence of the facility was coded as 0. There were two variables: urinals for girls and lavatories for girls, for which the data were not available in secondary schools that were exclusively for boys (10 such schools were in the sample). These two variables were treated as missing values for the 10 schools. All the remaining 18 variables were coded as either 1 or 0 for all the 98 secondary schools and these did not have any missing values for any of the schools in the sample.

Principal Component Analysis and Weights

Principal Component Analysis (PCA) is used for decomposing the original data into a set of fewer linear combinations that together explain the variance found in the original data (OECD 2008, Field 2009). In this case, PCA was employed as a step for constructing an index for each of the secondary schools. The dataset containing binary values for each of the 20 variables across 98 schools was run through SPSS Version 19.0. The analysis resulted in 5 components with Eigen values above 1, the values being 7.276, 1.936, 1.508, 1.220 and 1.068 explaining 65 per cent of the cumulative variance. As a next step, the 5 components with Eigen values above 1 were extracted for each of the 20 variables in the Rotated Component Matrix. Further, the values assigned to the 20 variables under each component were multiplied by corresponding Eigen values. The columns represented by a, b, c, d and e resulted as multiplications of extracted components and Eigen values (see Table 2).

- Extraction Method: Principal Component Analysis
- Rotation Method: Varimax with Kaiser Normalisation
- A Rotation converged in 10 iterations

The last column representing the weights of each of the variables were the addition of the multiplied values for each variable.

TABLE 2

Rotated Component Matrix, Eigen Values and Weights for 20 Variables

Variables	Rotated Component Matrix (RCM)					Eigen Values					Weights
	1	2	3	4	5	1	2	3	4	5	
						7.276	1.936	1.508	1.22	1.068	
						(Eigen value 1*1 st Column of RCM)	(Eigen value 2*2 nd Column of RCM)	(Eigen value 1*3 rd Column of RCM)	(Eigen value 1*4 th Column of RCM)	(Eigen value 1*5 th Column of RCM)	(a+ b +c+ d+e)
						A	b	c	d	E	
Electricity	0.064	0.644	0.27	-0.272	0.198	0.49446	1.24678	0.40867	-0.3318	0.21146	2.6932
Generator	0.473	0.521	0.16	0.082	0.161	3.6544	1.00866	0.24279	0.10004	0.17195	5.1778
Internet	0.738	0.31	-0.05	0.083	-0.023	5.70179	0.60016	-0.0799	0.10126	-0.0246	6.5077
Computer for Students	0.148	0.833	0.09	0.034	0.03	1.14345	1.61269	0.13874	0.04148	0.03204	2.9684
Computer for Teachers	0.251	0.689	0.08	0.09	0.067	1.93923	1.3339	0.1131	0.1098	0.07156	3.5676
Laboratory	0.165	0.215	0.35	0.004	0.539	1.27479	0.41624	0.53082	0.00488	0.57565	2.8024
Library	0.307	0.59	0.13	0.21	-0.086	2.37188	1.14224	0.20056	0.2562	-0.0919	4.0627
Staffroom Teachers	0.157	0.179	0	0.714	0.202	1.21298	0.34654	0.00302	0.87108	0.21574	2.6494
Urinals Girls	0.028	0.068	-0.02	0.111	0.864	0.21633	0.13165	-0.0362	0.13542	0.92275	1.4423
Lavatory Girls	0.406	0.596	-0.01	0.254	0.284	3.13676	1.15386	-0.0136	0.30988	0.30331	4.9174
Playground	-0.009	-0.014	0.4	0.774	-0.024	-0.0695	-0.0271	0.60923	0.94428	-0.0256	1.6758
Sports Equipment's	0.202	0.198	0.71	0.447	-0.159	1.56065	0.38333	1.06616	0.54534	-0.1698	3.7253
Room storing sports equipment's	0.215	0.282	0.79	0.307	0.031	1.66109	0.54595	1.18378	0.37454	0.03311	3.7985
Indoor games	0.723	0.21	0.12	0.098	0.088	5.5859	0.40656	0.17794	0.11956	0.09398	6.3839
Room for Indoor games	0.754	0.118	0.19	0.109	-0.009	5.8254	0.22845	0.29104	0.13298	-0.0096	6.4875
Activity Room	0.24	0.056	0.73	-0.098	0.219	1.85424	0.10842	1.09632	-0.1196	0.23389	3.4124
Television	0.829	0.273	0.16	0.103	0.075	6.40485	0.52853	0.23676	0.12566	0.0801	7.3759
Audio/visual/public address system	0.247	0.38	0.34	0.167	0.141	1.90832	0.73568	0.51121	0.20374	0.15059	3.5095
VCR/CD/DVD player	0.789	0.175	0.26	0.08	0.088	6.09581	0.3388	0.3951	0.0976	0.09398	7.0213
Tape recorder	0.687	0.126	0.28	-0.323	0.132	5.30776	0.24394	0.42375	-0.3941	0.14098	6.5105
Total Weights											86.6895

Calculating the Index for a Single School

The weights for all the variables were added to arrive at the total weights (86.6895). Once the weights for the variables were calculated, the index for each school was calculated by multiplying the school specific binary values (of its variables) with the weights assigned for each of the variables. The sum of these multiplications was then divided by the total weights, to obtain the PFI of each secondary school (see Table 3 as an example of a dummy School X). Thus the formula used for computation of the index was:

$$I = \frac{\sum_{i=1}^n X_i \left(\sum_{j=1}^n |L_{ij}| E_j \right)}{\sum_{i=1}^n \left(\sum_{j=1}^n |L_{ij}| E_j \right)}$$

Where I is the Index of the school, X_i is the i^{th} value, L_{ij} is the component loading of the i^{th} variable on the j^{th} component, E_j is the Eigen value of the j^{th} component (Mehta and Siddiqui 2009). The values of the index of secondary schools varied between 0 and 1, with increasing values towards 1 showing better infrastructural provisions, 1 denoting existence of all facilities, whereas 0 representing no facilities at all.

Presentation of Data Analysis

The results for the analysis have been presented as mean scores of PFI of different categories of schools in two districts (Table 3). Besides comparing the mean scores of secondary schools across the two districts, and for rural and urban areas within each of the districts, the scores were also presented for School Type (Government, Private Aided and Private Unaided), schools belonging to three Affiliating Boards (UP Board, CBSE and ICSE), School Category (only girls, only boys and co-educational) and All Types of Schools (UP Board state government, UP Board private aided and UP Board private unaided, CBSE Private, CBSE central government, ICSE private). The PFI was computed to find out if (in-)equitable access to infrastructural provisions existed across different types of secondary schools. In addition, another measure of access, i.e. teachers was also correlated with PFI to know if students accessing different types of schools had access to trained and qualified teachers at the secondary level or not. The variables for teachers used in the analysis were: total teachers in position, graduate teachers in position, graduate trained teachers in position, post-graduate teachers in position and post-graduate trained teachers in position for Classes IX and X.

TABLE 3
PFI of a Dummy Secondary School

<i>School x</i>	<i>Binary Value</i>	<i>Weights of the Variables Multiplied by Binary Values of the School</i>
Electricity	1	2.693
Generator	0	0
Internet	0	0
Computer for students	1	2.968
Computer for teachers	0	0
Laboratory	1	2.802
Library	1	4.063
Staffroom Teachers	1	2.649
Urinals Girls	Missing Value	
Lavatory Girls	Missing Value	
Playground	1	1.676
Sports Equipments	1	3.725
Room storing sports equipments	1	3.798
Indoor games	0	0
Room for Indoor games	0	0
Activity Room	1	3.412
Television	0	0
Audio/visual/public address system	1	3.510
VCR/CD/DVD player	0	0
Tape recorder	0	0
<i>Total Weights for the dataset</i>		86.690
<i>Physical Facility Index for the School</i>		0.361

Findings

The mean PFI of sample schools of district Meerut was found to be higher than the sample schools of district Bareilly showing better infrastructural facilities available in schools of Meerut, an educationally advanced district (Table 3). The rural-urban inequities in access to provisions were stark in both the districts, as the mean PFI of secondary schools in rural areas was lower than that of the urban schools. The disparity in the availability of infrastructural provisions was higher for district Bareilly as compared to district Meerut, with a mean difference of 0.284 and 0.180, respectively. The mean PFI of sample secondary schools for School Type (a composite of all government, private aided and private unaided schools irrespective of the affiliating school boards) ranked the government schools (Bareilly = 0.522, Meerut = 0.577) of both the districts higher than the private aided (Bareilly = 0.446, Meerut = 0.441) as well as the private unaided schools (Bareilly = 0.420, Meerut = 0.400). One of the reasons for a high mean score of government secondary schools

in School Type for both the districts was the fact that government secondary schools affiliated to both CBSE and UP Board were counted in the same category (Table 3).

As pointed before, a few of the secondary schools in Uttar Pradesh cater to only girls and only boys, while the remaining and a larger share belongs to co-educational schools. It was found that the mean PFI score of only boys secondary schools (0.564) was higher than that of co-educational secondary schools (0.414) and only girls secondary schools (0.367) in district Bareilly. The mean PFI score of only girls secondary schools (0.565) was found to be higher than that of only boys (0.350) and co-educational schools (0.413) in district Meerut. Though Bareilly showed inequitable access to infrastructural provisions in only girls secondary schools, the same category of schools had the highest mean PFI among schools of different categories in Meerut.

While comparing schools belonging to three different affiliating boards of education, it was found that secondary schools affiliated to the ICSE Board had the highest mean PFI in both the districts (Bareilly = 0.956, Meerut = 0.980). Since ICSE is a private affiliating board, there were no government schools in this category. The mean PFI of secondary schools affiliated to the CBSE Board came second with scores of 0.929 in Bareilly and 0.764 in Meerut. The secondary schools belonging to the UP Board had the lowest mean PFI among the three categories in both the districts, clearly showing a hierarchy between schools funded by Central Government (CBSE) or affiliated to a central board (ICSE) on the one hand and schools that are either funded by the state government or funded privately affiliated to the state board of education (UP Board) on the other. The mean PFI score for schools affiliated to the UP Board was 0.339 for Bareilly and 0.349 for Meerut.

Comparisons between the six types of secondary schools, in the category of All Types of Schools revealed an interesting picture. In between government schools, the CBSE Central government secondary schools had a higher mean PFI score than schools funded by the UP state board. The difference between these two categories of schools in both the districts was larger than 0.5 points, with a wider gap in Bareilly (Table 3). Even the mean PFI score of private aided secondary schools was higher than that of the state government secondary schools in both the districts, despite both types of schools being affiliated to the U.P. Board. In the private unaided sector, the mean PFI score of schools affiliated to the UP Board was much lower than those affiliated to CBSE and ICSE boards. To compare, the mean PFI score of private unaided secondary schools belonging to UP state board stood at 0.293, as against the score of 0.956 for schools belonging to the ICSE Board in district Bareilly, a huge gap of about 0.66 points. Similarly, in district Meerut for the same two types of schools, the gap in mean scores of PFI was about 0.70, in favour of ICSE board.

To investigate if secondary schools with a high PFI score also had access to a higher number of teachers and those who were better qualified and professionally trained, a correlation matrix was computed between PFI scores of each school with the teacher variables of the same schools. It was found that most of the teacher variables and PFI scores of secondary schools (N = 98) were positively correlated ($p = 0.01$) (Table 4). There existed a positive association between the PFI score of sample secondary schools and teachers in position ($r = 0.386$, $p = 0.01$), graduate trained teachers ($r = 0.429$, $p = 0.01$), post-graduate teachers ($r = 0.331$, $p = 0.01$) and post-graduate trained teachers ($r = 0.315$, $p = 0.01$) in the schools. This showed that secondary schools which had better infrastructural facilities also had more number of teachers in position for Classes IX and X, a higher share of graduate trained teachers, post-graduate teachers and post-graduate trained teachers.

TABLE 4
Mean PFI Scores for Secondary Schools (N=98)

Districts	Mean	Location	Mean	School Type	Mean	School Category	Mean	Affiliating Board	Mean	All types of Schools	Mean
Bareilly (n=45)	0.419	Rural (n=17)	0.243	Government (n=3)	0.522	Only Girls (n=8)	0.36 7	CBSE (n=4)	0.929	U.P. State Board Government Schools(n=2)	0.304
		Urban (n=28)	0.527	Private Aided (n=12)	0.441	Only Boys (n=4)	0.56 4	ICSE (n=2)	0.956	U.P. State Board Private Aided Schools (n=12)	0.441
				Private Unaided (n=30)	0.400	Co-educational (n=33)	0.41 4	U. P. State Board (n=39)	0.339	U.P. State Board Private Unaided Schools (n=24)	0.293
										CBSE Private Schools (n=3)	0.919
										ICSE Private Schools (n=2)	0.956
									CBSE Central Government School(n=1)	0.959	
Meerut (n=53)	0.443	Rural (n=22)	0.338	Government (n=5)	0.577	Only Girls (n=13)	0.56 5	CBSE (n=9)	0.764	U.P. State Board Government Schools (n=3)	0.364
		Urban (n=31)	0.518	Private Aided (n=17)	0.446	Only Boys (n=6)	0.35 0	ICSE (n=2)	0.980	U.P. State Board Private Aided Schools (n=17)	0.446
				Private Unaided (n=31)	0.420	Co-educational (n=34)	0.41 3	U. P. Board (n=42)	0.349	U.P. State Board Private Unaided Schools (n=22)	0.271
										CBSE Private Schools (n=7)	0.727
										ICSE Private Schools (n=2)	0.980
									CBSE Central Government School (n=2)	0.896	

Discussion

The foregoing analysis has brought out inequities in access to provisions in secondary education across schools in two districts of Uttar Pradesh. It was found that secondary schools in district Bareilly lacked in provisions and facilities when compared with schools in district Meerut. The existence of inter-district variations on educational indicators in Uttar Pradesh have earlier been pointed out in researches carried out by Srivastava and Nigam (1997) and Srivastava (2001). The research by Srivastava and Nigam (1997) constructed a composite human development index and found that districts such as Bareilly, Moradabad and Shahjahanpur had low literacy, high infant mortality rate (IMR) and average net domestic product (NDP) per capita. On the contrary, districts such as Ghaziabad and Meerut in West UP and Kanpur and Etawah in Central UP were characterised by high literacy rate, high NDP and medium IMR. Other than inter-district variations, the overall scenario of districts in Uttar Pradesh, although at elementary level, was found to be lagging behind a number of districts across the country. An education development index constructed by Jhingran and Shankar (2009) revealed that there were 26 districts in Uttar Pradesh which were among bottom 100 districts in the total districts (500) covered for the study, measuring a composite of indicators on access and equity.

TABLE 5

Correlations between Physical Facility Index and Teacher Indicators of Secondary Schools in Both Districts (N = 98)

<i>Teacher Indicators</i>	<i>Pearson Correlation</i>	<i>PFI</i>
Teachers in Position for classes IX and X	r	.386**
Graduate Teachers in Position for classes IX and X	r	0.180
Graduate Trained Teachers in Position for classes IX and X	r	.429**
Post- Graduate Teachers in Position for classes IX and X	r	.331**
Post- Graduate Trained Teachers in Position for classes IX and X	r	.315**

** . Correlation is significant at the 0.01 level (2-tailed).

The location of schools in heterogeneously endowed geographical areas has become an important indicator of equity analysis. This means that different quality of schools are available to different children, who are at an advantage or disadvantage because of the location of schools, thereby causing inequity in participation by location (Ramachandran and Chatterjee 2014). Further, in both the districts, secondary schools belonging to rural areas were far behind those located in urban areas in terms of PFI. Inequities in access to provisions in rural and urban areas was highlighted through an infrastructural facilities development index developed for ranking of states in India on various parameters (Yadav and Srivastava 2005). The findings revealed that both rural and urban areas of Uttar Pradesh lacked infrastructural facilities at high secondary level (Class IX-X) when compared with other states. The index for rural Uttar Pradesh fell in the category of highly

backward (index = 0 - 0.25) along with Karnataka and Madhya Pradesh and the index for urban Uttar Pradesh was part of the category of backward states (index = 0.26 - 0.50) along with other states such as Bihar, Odisha, Karnataka, Tamil Nadu and Andhra Pradesh.

In the analysis between School Types belonging to three education providers – government, private aided and private unaided, it was found that the mean PFI score of government secondary schools was highest, concealing within itself the presence of central government schools. In fact, because of the inclusion of central government schools in the category of schools affiliated to the CBSE board, the analysis by Affiliating Board put CBSE secondary schools at the top, followed by schools affiliated with the ICSE Board and at last the schools affiliated with the UP board. However, inequitable access to secondary provisions existed between schools belonging to both CBSE and ICSE on one hand and those affiliated with the UP Board. Another significant finding that emerged from the analysis was the fact that secondary schools catering to only girls in district Bareilly had the lowest mean PFI amongst the three School Category offering less than equitable opportunities to girls. Previous researches have highlighted that in the context of existing social inequalities and a hierarchical society, the quality of schools greatly affects participation of girls and children from socially disadvantaged sections (Ramachandran 2012, Chudgar and Creed 2014).

Looking at the six combinations of secondary schools in All Types of Schools one could gauge that there was not much difference in mean PFI score of government secondary schools and private unaided secondary schools belonging to the UP Board in both the districts. While comparing government and private primary schools in six districts from each of the two states, Madhya Pradesh and Uttar Pradesh, Pandey and Goyal (2012) found that both the school types did not differ in physical facilities. Further, within the government sector in Uttar Pradesh, there were schools funded by the Central government (affiliated to the CBSE board) which had a high mean PFI as against schools of the state government (affiliated to the UP Board). A unique fact about Central Government schools in districts is that they either cater specifically to wards of central government employees (usually 2 or 3 in a district), that is the KVS or those which admit students based on an entrance examination, the JNVs (only 1 in a district). Most of these Central Government schools are fully furnished and have a PFI closer to 1 or 1. Whereas the mean PFI scores of secondary schools belonging to State Government showed that they were far behind in terms of secondary school provisions. Ramachandran (2004) highlighted that even within government schools there were sharp differences in quality having greater impact on children from disadvantaged groups who accessed poorly furnished schools. Inequities in access to government and quasi government schools existed in Delhi, with differentiations of Sarvodaya Kanya Vidyalayas and the Pratibha Vikas Vidyalayas in the government sector on one hand and quasi-government schools belonging to association of defence services and central civil services possessing varying degrees of facilities and quality of education on the other hand (Juneja 2011). Likewise, the private unaided sector also displayed a hierarchical structure of provision with secondary schools having a high mean PFI score belonging to CBSE and ICSE board, followed by private aided schools (affiliated to the UP state board) and lastly the private unaided schools of the UP state board. There were thus four gradations of secondary schools with differing physical provisions within this sector, confirming the findings of many researches that have found private supply as heterogeneous in character with a wide range of provision (Kingdon 1994, Srivastava 2008, Chudgar and Creed 2014).

Other than physical facilities being a measure of inequitable access, the variables related with teacher deployment also hold significance. Correlation between PFI scores of 98 secondary schools and teacher variables revealed that schools with better physical facilities also had access to more number of teachers in position as well as those who were more qualified and trained. Earlier researches have pointed to intra-district variations in access to educational resources and human resources, with less experienced teachers being deployed to schools hosting low socio-economic status children (De Luca et.al. 2009, Darden and Cavendish 2011).

Conclusion

In the backdrop of a national focus on achieving equity in secondary education, the scenario presented through an analysis of provisions in secondary education in two districts of Uttar Pradesh presents a distressing picture. Though multiple researches have pointed out to a heterogeneous private sector in education, this paper highlights that inequitable access is present not only among private providers but also with in the government sector at secondary level. The overall scenario of secondary education in Uttar Pradesh revealed that schools with a higher mean PFI score were those which belonged to either central government or private schools affiliated to central boards of education (such as CBSE and ICSE). However, the share of such schools is miniscule in the total secondary schools available to the student population of the state. Instead, the largest share of secondary schools in Uttar Pradesh is affiliated to the UP state board. In this category, it was the private aided schools which scored higher on mean PFI scores as compared to state government or private unaided schools. Taking this further, there was not much difference in the mean PFI scores of state government and private unaided schools affiliated to the UP Board at secondary level when compared with other school categories in All Types of Schools. Thus, government and private unaided secondary schools affiliated to the UP Board had the lowest levels of provisions. Taken together along with private aided schools, these form the largest share in the secondary education schools in the state. Hence, when it comes to provisions of secondary education they are inequitably distributed within geographical locations, characterising 'between-school' inequities (Ainscow et.al. 2012) and across all types of schools, be it within the government or the private sector, creating 'hierarchies of access' (Ramachandran 2004, 2012) for students at secondary level. This has impact on equitable participation of students, as has been argued, ".....diversity of supply leads to unequal provisions to unequal life chances and inequitable outcomes" (Juneja 2011).

On the contrary, if the goal of universalisation of access is to be achieved at secondary level, it is imperative to provide infrastructural provisions and trained and qualified teachers across geographical areas and different types of schools as the first step towards providing equitable opportunities at secondary level (GoI 2014, GoI 2014 a, GoI 2014 b). The state government as also the affiliating boards of education in Uttar Pradesh need to examine that schools operate well within the norms be it for physical facilities or appointment of qualified and trained teachers in all schools to encourage participation at secondary level. This would fulfill the parameter of equal opportunity which is a reference criterion in achieving equity in access (Burbules et.al. 1982, Carron and Chau 1981, Gutman 1997, Jacobs 2010). Lastly drawing insights from an analysis of six major education systems across the world, it was found that countries which ranked high in educational development provided children with

equitable and high quality educational opportunities (Adamson 2016). It was recommended that “Education policies should actively invest in equitable delivery of educational services and supports. Longer-term investments in education equity can yield higher performance in outcomes. These investments include services designed to address current gaps in resources, achievement, and opportunity faced by different subgroups” (ibid).

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Book Reviews

NATH, Samir Ranjan (2016): *Realising Potential: Bangladesh's Experiences in Education*, Dhaka, Bangladesh: Academic Press and Publishers Library, pp.165, ISBN: 9789849242710

Bangladesh has made tremendous progress during the first four and a half decades after its independence, but the country showed a steady increase in the number of schools and enrolment both during last few years only, by ensuring access to school education, especially at the primary level and for girls. While the Net Enrolment Ratio (NER) at the primary school level has become 98 per cent in 2015, the percentage of children completing primary school was close to 80 per cent. It is now a well known fact that Bangladesh has achieved gender parity in access and may manage to bridge the gap between the rich and the poor at the level of school education as a whole.

One of the major initiatives the country has taken is the involvement of the community and the non-government organisations (NGOs) in different educational programmes. However, despite such improvement, the country is still facing various challenges regarding the quantitative expansion as well as qualitative improvement and of the persistence of disparity at all levels of school education. This is what has been depicted by Samir Ranjan Nath in his book under review, *Realising Potential: Bangladesh's Experiences in Education*. The book has captured the policies, plans and practices over a long period of time, viz 1971 - 2015. The author has critically examined different policies and plans undertaken by the government, deliberated on various issues pertaining to socio-economic, gender and regional disparities, and identified the areas of improvement to which the government needs to pay more attention and make further intervention.

The book has been organised in three chapters. The first chapter starts with a description of the overall situation of education in Bangladesh and the future strategies. It focuses on the policies, achievements and challenges in education during the first four and a half decades since Bangladesh gained its independence in 1971. The chapter has elaborated upon the progress made in the different sub-sectors of education --- starting from the primary up to the tertiary sector. Analysing the available secondary data, the author has showed how Bangladesh could improve its Human Development Index (HDI), so that now it is much ahead of Pakistan which ruled the country for about two and a half decades. The country has also adopted programmes to achieve EFA and MDGs as well. The country has also adopted Vision 2021 along with a perspective plan "to make this vision a reality," as the author has mentioned. As a result of continuous efforts and strategic interventions, a steady growth could be achieved in the number of institutions, facilities, enrolment and teachers for all sectors of education, though it was more planned development in case of basic education than higher education as the author has observed. While summing up the discussion, the author has mentioned the different challenges which the education system is facing, including the growing disparity at all levels of education. Hence he has made some

suggestions for more improvement in education with special focus on improving the quality of education which is far from satisfactory across the country. According to him, "long term vision with short-term goals along with financial and non-financial resources is the way forward"(p.101). Thus the first chapter has successfully explored the entire gamut of educational system of Bangladesh, its shortfall and the appropriate strategies needed to overcome these shortfalls.

The second chapter is a case study of the BRAC, which is a national level NGO. The BRAC started working as a relief organisation in Bangladesh since the country's liberation from Pakistan in 1971 and is still working since then. The chapter is a focused case study of the "BRAC's Non-Formal Approach to Primary Education" --- the most important non-formal approach to primary education in Bangladesh. In this chapter an attempt has been made to discuss the quality of the BRAC intervention in pre-primary and primary education, based on the data and findings from studies conducted during the past three decades which witnessed gradual improvements in total and female literacy rates and a reduction in the gender gap in literacy rate. Subsequently, in 1984, this non-government organisation initiated its interventions based on the concept of "joyful learning" for improving school education when primary school enrolment rate in the country was as low as 58 per cent, along with considerable gender disparity in enrolment. A unique non-formal education model was developed by this organisation for equipping the underprivileged children with basic reading, writing and numeracy skills, along with certain life skills and social studies. Although the number of children who received education at the BRAC schools was less than that in the government schools, it was yet quiet substantial. In the present context, the author could have stressed on provisioning of formal basic education for all children including those who are from the marginalised sections of society; in fact elementary education may now be made free and compulsory for all children, making it a fundamental right as in India.

The third chapter of the book focuses on educational provisions made at the tertiary level and educational attainments of the young people because, as is a widely accepted fact, education of young people is very crucial for nation building. This chapter has also discusses the relationship between education and labour force participation, and it is very important to pay adequate attention on the quality of education at this stage. More researches are required in this regard. In addition, training and employment of youth population are also some major concerns, as limited access to education and the lack of employment opportunities have drastic impacts on society. The education system of Bangladesh needs to respond to the aspiration of its youth as well as it should meet the different challenges which they are facing. In view of this, the author has suggested the adoption of a participatory educational planning process involving the youth who also can express their views and provide the meaningful inputs.

Though the author has very efficiently dealt with different aspects of progress and prospects of school as well as higher education in Bangladesh, more discussion should have been there on the quality of education provided at all levels. For, access to education of reasonable quality in schools as well as institutions of higher education can only ensure employability of students once they complete their education. Though the author himself has mentioned that "An equitable quality of education can be the basis for ensuring equitable economic growth," it would be worthwhile to see how the quality of education can be

improved and how equitable access to quality education can be ensured in a low-income and developing country like Bangladesh. It is understandable that ensuring quality education for all is a challenging task in most countries including Bangladesh, but no one can deny the fact that strong political will may help the country to improve the quality of education which is also a part of the Sustainable Development Goal (SDG) 4. For its translation into reality, the task requires meticulous planning and resource mobilisation.

In this context, it may be said that the book under review is undoubtedly a significant contribution in the field of education and more specifically in the case of Bangladesh. Since the book has dealt with various issues regarding the policy and practices of education provided at various levels, starting from the pre-primary to the post-secondary education, while linking it with the labour market requirements, it will obviously be beneficial to all who are interested in getting a detailed understanding of the challenges and issues pertinent to education in Bangladesh. In view of this fact, the book may be considered as a welcome contribution in the field of education in general and educational planning and management in particular. The book will be immensely useful for scholars, academicians and policy makers working in the area of educational development in the context of South Asia and specially Bangladesh. Apart from these, anyone who wants to see positive changes being wrought in the education system of Bangladesh will find the book extremely useful.

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VARGHESE, N. V., SABHARWAL, Nidhi S. and MALISH, C. M. (Eds): *India Higher Education Report 2016: Equity*, New Delhi: Sage Publications, pp 421, ISBN: 978-93-866-0224-4, Price: ₹ 1250.00

Inequality of any nature and of all forms needs to be examined, evaluated and addressed to initiate and propel positive changes towards meeting the Sustainable Development Goals (SDGs) which place a high premium on education --- in the form of SDG 4. India is one of the most unequal countries in the world in terms of income, wealth and social fabric. It has been fairly well documented that endemic poverty; unemployment; lack of sanitation and safe drinking water, healthcare and education determine as much as produce inequalities.

Education assumes centrality in the process, as it contributes to capacity building, thereby widening the scope for work opportunities which in turn affects the access to resources. The labyrinth of systems in governance, social relations and institutions often results in exclusion and discrimination, leading to deprivation of certain social groups on the basis of identities like gender, caste, ethnicity, region and religion. It affects access to services, goods and resources which in turn affects knowledge and skill development. While social exclusion does not necessarily equate to poverty, there is a strong correlation between the socially excluded groups and their access to resources, particularly education. It is noteworthy that about 12 per cent Scheduled Castes (SCs) --- as against about

34 per cent of the privileged castes (others) --- are among the population located in the highest income quintile. In contrast, about 27 per cent SCs --- as against only about 10 per cent of the privileged castes --- are in lowest income quintile. This is evident from the National Family Health Survey (NFHS) 4. The NSSO data of 64th and 68th Rounds also suggest a slower change in the poverty ratio during 2004-05 and 2011-12 among the SCs as compared to the others.

There is no denying that education is one of the indicators which reflect on the development levels. It is important for economic growth, social progress, human development, political stability, gender parity and other aspects of progress and positive change. For this reason, indicators of education have been an integral part of all development indices such as HDI (Human Development Index), GDI (Gender Development Index), GEM (Gender Empowerment Measure), Social Development, Social Well-Being, etc. Education is also recognised as crucial in creating awareness, empowering and promoting equity and achieving inclusive growth.

The present volume --- India Higher Education Report 2016 edited by N. V. Varghese, Nidhi S. Sabharwal and C. M. Malish and published by Sage Publications gives a direction for attainment of this goal. This book connects the dots which highlight the status of educational attainment and outcomes across varying social groups. It is indicative of the intent of the Centre for Policy Research in Higher Education (CPRHE, NIEPA) to develop an insight into the equity concerns in higher education. Growing diversity and experiences of socially disadvantaged groups in higher education institutions --- those from scheduled communities, those who come from rural background, those who are poor --- and the widening diversity of the student body is reflected through ideological orientation, values and social interaction. All this has been well captured in the papers incorporated in the present volume which is second in the series of India Higher Education Report (IHER). The book is organised under four themes ---

- Equity and development;
- Regional and social inequalities;
- Equity in outcome; and
- Diversity and discrimination.

The book discusses the issues of economic, social and regional inequalities, gender imbalance, inequalities among religious minorities and persons with disabilities, privatisation of higher education, achieving equity in school education, and diversity in student composition. The contributors include eminent scholars and all of them have enriched the book by their well-researched work.

While Amitabh Kundu examines the economic and educational inequalities between different socio-religious groups across gender and consolidates the role of education in development, M M Ansari reflects the concerns of minority groups in higher education through a detailed analysis of gross enrolment ratio, literacy rate and share of Muslim children in school education. Padma Velaskar examines equality and excellence in education in the framework of the nationalist ideology and the ideal of social justice, policy discourse, global capitalism and neo-conservatism, and establishes that transition from the colonial to post-colonial to global society has weakened the constitutional principles, which is reflected in a decline in equality and excellence goals in higher education. The issue of privatisation in

higher education has been discussed by Sukhadeo Thorat and Khalid Khan. They strongly argue that access to higher education has increasingly become unequal. The poor, SC, ST and Muslims are affected more than the rest. They propose expansion of higher education institutions in public and private aided sectors, improving infrastructure and faculty positions, hostel facilities, and liberal loans for making higher education inclusive. While Vani K Borooah draws attention towards access, quality and structure, regional disparities in availability and access form the core of the argument posed by Sachidanand Sinha.

Gender becomes the core of the discussion invoked by Ratna M Sudarshan by highlighting the linkage between higher education and workforce for women and the challenges therein, and the gendered social norms which prevail in the institutions of higher learning. Kalpana Kannirban and Soumya Vinayan bring in the discourse the context of people with disability and their rights to higher education and reflect on the exclusionary measures and barriers experienced in Indian universities. The economic realm has been well discussed through the connects between state, market and quality of education by Rajan Gurukkal. This has been taken forward in the graduate labour market and employability discussion by S Madheswaran, Smrutilekha Singhari and Mona Khare in their detailed papers. While Ashwini Deshpande reflects on the social diversity in access and exclusion in higher education, Wandana Sonalkar takes it forward by examining what happens after one's entry into the seat of higher education. Relevance of higher education in civic learning is well established by the work of Nidhi S. Sabharwal and C. M. Malish.

The findings of the chapters included in this report are rich in content. They are a reliable source for the policymakers to use them for the forward-looking policies. In the present times, campuses are getting diversified fast and continuously. The erstwhile space of the privileged male-dominated institutions of higher education are fast getting occupied by women, less privileged and underprivileged men, religious minorities, ethnic groups and persons with disabilities. This report shows the way forward for minimising the inequalities in education --- regional, social, ethnic and in all other forms; and social exclusion and discrimination experienced by students from disadvantaged groups --- while providing alternatives for better opportunities.

The present volume is endowed with a lucid preface by yet another eminent scholar Prof JGB Tilak, former Vice Chancellor of NUEPA; and opens with a detailed introduction to the volume. This volume is a ready reference for all those working in the areas of education with interest in exploring disparities and inequalities. This is a much needed contribution and will also be guidebook for the policy makers.

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SINGH, Avinash Kumar (ed) (2016): *Education and Empowerment in India: Policies and Practices*, Routledge: South Asia, ISBN: 978-1-315-66810-2, pp. 404, Price: ₹ 1050.00

EDUCATION has the power to transform lives through its critical role in building human capital. Education is widely agreed to be a form of investment that builds up human capabilities, including knowledge, skills and competencies to enable individuals to fully realise their personal, social and economic well-being. Equal access to educational opportunities facilitates a redistribution of human wealth, and as such it is a powerful instrument for reducing poverty and achieving equity. In other words, education is of value, in itself, and also a means for higher economic growth and reduced poverty. Education as a value embodies an emancipatory meaning, which relates to developing human personality and one's personal agency that results in an expansion of abilities to make strategic choices. As a means, education is an instrument for promoting and sustaining equal distribution of opportunities to participate in economic and social development. Creating empowerment through education involves a process of acquiring abilities to choose and demand resources, as well as enabling the access to such means and control over resources that tilts the balance of power in favour of the marginalised. Empowerment through education results in equity in access to opportunities for the disadvantaged groups at multiple levels, including the cognitive, psychological, political and economic levels.

The insightful essays in *Education and Empowerment in India: Policies and Practices*, edited by Avinash Kumar Singh, explore the theoretical architecture of the concept of empowerment, barriers to empowerment, and mechanisms to engage in the process of empowerment through education. The articles in this book were originally written and presented in a seminar on the theme of "Education and Social Empowerment: Policies and Practices" organised by the National Institute of Planning and Administration (NIEPA) in the memory of Shri Anil Bordia, a noted educationist who initiated major programmes that used education as a channel for empowering the marginalised social groups.

In the Introduction titled "Education and Empowerment in India: Policies and Practices," the volume's editor offers a comprehensive view of the relationship between education and empowerment. The editor highlights, in particular, the perspectives of the rights-based approach and capability approach to draw a relationship between education and empowerment, especially as it relates to the socially disadvantaged groups, and views empowerment largely "in relation to achieving particular goals and objectives" (p 4). In other words, the process of empowerment through education is seen as being facilitated by enhancing capabilities and enabling access to rights and entitlement to educational opportunities for the marginalised. The editor then delineates a relationship between the persisting educational inequalities and social disadvantages faced by the scheduled castes, scheduled tribes, women and the minorities, followed by a discussion on the role of educational policies and programmes to facilitate access and empowerment of the disadvantaged social groups through formal education and non-formal education. Although this article contains an insightful analysis, further empirical enquiry with an 'equity lens' may be required to fully understand the outcomes of empowering interventions offered through formal education and non-formal education. This is specifically so, as these relate to raising the consciousness of the oppressed as well as others for a change in the oppressive

social relations and on altering the structural socio-cultural conditions that may work as impediments on the path of empowerment through education.

The introductory article lays the foundation for the detailed essays that follow. The book is divided into five parts. Part I, titled "Education and Empowerment: Perspectives and Overviews," consists of three articles, which focus mainly on theoretical perspectives on the relationship and approach to empowerment through education. This section begins with the article titled "Education and Citizenship: Beyond the Rights Based Approach" by Dipankar Gupta, which comprehensively draws a link between education, empowerment and citizenship, highlights the positive role of education in accessing citizenship rights and strengthening democracy, and argues for equal access to universal quality education and not just a right to education. The second article, "Perspectives on Education and Social Empowerment" by K L Sharma presents the theoretical ideas of Karl Marx, Emile Durkhiem, John Dewey and Pierre Bourdieu, reviews the policies of expansion of higher education in India and reflects on the stratified structure of higher education opportunities, with hierarchy in institutional prestige influencing social empowerment. Article three, "Conscientizacao, Everyday Struggle and Transformative Education: Towards a Framework for Effective Community-Education Linkage" by Ravi Kumar, offers a critique on the role of community participation in overcoming the inequities in the education system and suggests that "the issues of everyday life should constitute the curriculum and pedagogies in schools" (p 66) to attain conscientizacao, and to make the educational functioning more equitable and democratic.

The focus of the part II of this book is on education of the disadvantaged, which discusses the emancipatory role of education in social advancement and the educational challenges facing the scheduled castes, scheduled tribes, minorities and the women. This section begins with the article "Education and Emancipation: The Saga and Ideology of Dr B R Ambedkar" by N Jayaram which describes the educational journey of Babasaheb Ambedkar, his role in raising the Dalit consciousness, and critically examines Dr Ambedkar's strategy of emancipation through education for the socially disadvantaged social groups facing challenges arising out of institutions of caste and untouchability. The article on "State Policy, Education and Tribes" by Virginius Xaxa critically assesses state policies to understand the status of educational development of the tribal population in India, and argues that while policies follow a principle of integration, in practice it is an assimilation of tribes in the educational process as reflected through the language, culture and history of the dominant linguistic communities in the medium of instruction, curriculum and pedagogy. The author delineates a relationship between the alienation of the tribal population and the lower levels of educational progress. In continuation, Asoka Kumar Sen analyses the historical factors, including an assessment of the influence of the colonial educational policy and contemporary challenges facing educational empowerment of the Ho adivasis in Singhbhum, Bihar, in the article "Faltering Steps to Modern Education: The Ho Advasis of Colonial Singhbhum." Zoya Hasan, in the article "Disparities in Access to Higher Education: Persistent Deficit of Muslims," focusses on educational development of Muslims, assesses the reasons for the educational inequalities in access to higher education, and argues for broad-based affirmative action policies for the Muslims to address the issues of discrimination and persisting educational disparities. The article on "Enabling Equality: Girls' Education, Social Norms and Community Interventions" by Ratna M Sudarshan provides an overview of

how gender equality has been interpreted and assessed in the education policies and programmes. The article offers two examples of initiatives from Rajasthan and Uttarakhand that “explicitly tried to understand and address the normative constraints that surround girls’ and women’s participation in the educational process” (p 49), and argues for a holistic approach to women’s empowerment through education and for a sustainable change in the gendered social norms. She states: “a broader vision of education is needed that includes structured learning within schools as well as experiential learning in daily living. Along with school processes, community initiatives that attempt to change everyday normative practices through processes of negotiations and community learning has to be valued and supported as an intrinsic part of education (p 40).”

Contributions of educational policies and programmes for social empowerment are the theme of Part III, which starts with the article “Policy Reform and Educational Development in a Federal Context: Reflections on the Uneven Process of Change in Bihar” by Manisha Priyam. This article discusses the Bihar Education Project, initiated in 1990, and examines the District Primary Education Programme to assess their achievements and shortfalls in meeting the objective of improving school participation in Bihar. Article ten by Vimala Ramachandran, titled “Exploring the Legacy of Three Innovative Programmes: Lessons Learnt from Lok Jumbish, Shiksha Karmi and Mahila Samakhya,” provides a comprehensive overview of the three projects Lok Jumbish, Shiksha Karmi and Mahila Samakhya initiated in the 1980s and 1990s, and highlights their impact in multiple forms: an initiation “of a national debate on educational reforms that accorded importance of social mobilisation to enable people to demand services, the curriculum framework, gender and social equality and the importance for need-based planning” (p 198). In continuation, article eleven on “Making Policies Work for Education and Social Empowerment: Reflections on the Shiksha Karmi Project in Rajasthan” by Shobhita Rajagopal discusses the contributions of the Shiksha Karmi programme in strengthening the primary school system of rural Rajasthan by addressing teacher absenteeism, low enrolment and high dropout, especially among girls, by following a responsive, context-based planning approach. The role of adult education in social empowerment has been analysed in article twelve, “Adult Education and Social Empowerment: Indian Experience’ by A Mathew, by way of discussing the design, organisational and management structures, as well as the challenges in the implementation process of the National Adult Education Programme and Total Literacy Campaign.

Challenges related to realising the right to education, including declining quality of the state school system, problem of retention of children in schools, and issues concerning adolescent education are the focus of the articles in part IV of this book. Padma Velaskar, in her article “Neo-Liberal Policy and the Crisis of State Schooling,” raises the threshold of possible explanations by exploring and interweaving the social, political and economic processes to empirically understand the crisis of the state educational system in Mumbai. Gunjan Sharma, in the article “Shaping Everyday Educational Vocabulary: State Policy and a Slum School,” presents the community discourse and perceptions of parents, teachers, NGOs and state functionaries, concerning the educational schemes, schools and schooling, and examines its effect on shaping school-going pattern of children living in a slum. The article “Retention of Children in Schools in the States of Telangana and Andhra Pradesh: Challenges for RTE” by Shantha Sinha examines the magnitude of the problem of retention of children in schools in Andhra Pradesh in the backdrop of the Rights of Children for Free and

Compulsory Education Act (RTE Act, 2009). It argues that empowerment through education is linked to the realisation of entitlement of being enrolled in school, and underscores the importance of disaggregated data on enrolment and dropout at the district/mandal level and across caste, ethnicity and gender groups. Sharada Jain, in the article “Adolescent Education: Issues and Challenges.” views the out-of-school adolescents as a distinct group and, based on the field experiences of Sandhan, argues for a holistic approach of planning to their learning needs that addresses their physical, emotional and social contexts.

The last part of this book focusses on concerns related to accessing higher education. It starts with the article “Justice Framework of Public Policy in Higher Education” by Sudhanshu Bhushan, which gives an excellent comparative overview of the public policy guided by a framework of rationality and of justice, argues for social empowerment through public policy based on justice framework, especially as it relates to nyaya-based perspective of justice, and views an enhancement of capabilities as an important pillar of justice requiring concerted public policy attention. Theoretical underpinnings and the importance of affirmative action policies for the disadvantaged social groups are highlighted in the article “Affirmative ‘Action and ‘Parity of Participation’ in Higher Education: Policy Perspective and Institutional Response,” by Kumar Suresh, for improving access to educational institutions. Empowerment of disadvantaged social groups is detailed out in article nineteen on “Community Colleges: An Alternative System of Education for Social Empowerment” by Abraham George, which highlights the importance of vocational education offered through community colleges for social and economic empowerment. Article twenty on “Education, inequality and Neo-liberalism” by Ranabir Samaddar critically examines the financing of higher education through educational loans in the era of neo-liberalism and reflects on its implications for students as debt-holders and on social inequalities in access to educational opportunities.

This book offers an expansive and diverse collection of scholarly papers, and is a significant contribution to the literature on education. Different authors in this book have attempted to present theoretical and empirical enquiries, which advance the knowledge on implications of educational practices on forms of empowerment of the disadvantaged groups, related to consciousness-raising or skills acquisition. By way of analysing different educational programmes, the articles in this book have shed light on context-specific strategies and interventions for the education of disadvantaged social groups. The book will be of great value to scholars, teachers and practitioners who are interested in understanding the linkages between education and empowerment of the socially disadvantaged groups, minorities and women.

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