QUALITY AND THE ROLE OF FUNDING IN HIGHER EDUCATION: A STUDY OF ENGINEERING COLLEGES IN WEST BENGAL

Thesis submitted to Jawaharlal Nehru University in partial fulfillment of the requirements for the award of the degree of

DOCTOR OF PHILOSOPHY

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DECLARATION

I, Emon Nandi, declare that the thesis titled "***Quality and the Role of Funding in Higher Education: A Study of Engineering Colleges in West Bengal***", submitted to Jawaharlal Nehru University in partial fulfillment for the award of the degree of Doctor of Philosophy is my original work and has not been previously submitted for the award of any degree of this or any other university.

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CERTIFICATE

We, hereby, recommend that the thesis be placed before the examiner(s) for the award of the degree of Doctor of Philosophy of Jawaharlal Nehru University.

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"*But how great my surprise when at the day's end*
I emptied my bag on the floor to find a least little grain of gold among the poor heap.
I bitterly wept and wished that I had had the heart to give thee my all."

(Rabindranath Tagore, Gitanjali, No. 50)

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However, the responsibility for the errors and omissions that remain in this thesis is truly mine.

Emon Nandi

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List of abbreviations

AICTE: All India Council for Technical Education

API: Academic Performance Indicator

B.Tech: Bachelor of Technology

BBA: Bachelor of Business Administration

BCA: Bachelor of Computer Application

BOG: Board of Governors

BOT: Board of Trust

CSE: Computer Science Engineering

DEA: Data Envelopment Analysis

EPF: Educational Production Function

EQA: External Quality Assurance

FGD: Focus Group Discussions

GER: Gross Enrollment Ratio

HC: Highly-preferred Colleges

HEI: Higher Educational Institutions

HGC: Highly-preferred Government Institutions

HOD: Head of the Department

HPC: Highly-preferred Private Institutions

ICAR: Indian Council of Agricultural Research

IISC: Indian Institute of Sciences

IIT: Indian Institute of Technology

IT: Information Technology

LPC: Less-preferred Private Institutions

M.Sc: Masters of Science

M.Tech: Masters of Technology

MAKAUT: Maulana Abul Kalam Azad University of Technology

MBA: Masters in Business Administration

MHRD: Ministry of Human Resource Development

MOU: Memorandum of Understanding

NAAC: National Assessment and Accreditation Council

NBA: National Board of Accreditation

NCHER: National Commission for Higher Education and Research

NIRF: National Institutional Ranking Framework

NITTTR: National Institute of Technical Teachers' Training and Research

NKC: National Knowledge Commission

NLMM: Neo-Liberal Market Reform

NPM: New Public Management

OBC: Other Backward Classes

PBAS: Performance Based Appraisal System

PGDM: Post Graduate Diploma in Management

Ph.D.: Doctor of Philosophy

R & D: Research and Development

SC: Scheduled Caste

SSR: Self Study Report

ST: Scheduled Tribe

SWOT: Strength Weakness Opportunity Threats

TEQUIP: Technical Education Quality Improvement Programme

TTTI: Technical Teachers' Training Institute

UGC: University Grants Commission

WBJEE: West Bengal Joint Entrance Examination Board

WBUT: West Bengal University of Technology

WTO: World Trade Organisation

Chapter 1: Introduction and background of the study

1.1 Introduction and background of the study

The discipline of Economics has envisaged the role of technology as extremely crucial in determining the dynamics of economic growth of the nations. The technical education sector plays a central role in developing the skills among the youths and nurturing research for technological innovation, which are necessary for achieving a sustained economic growth in a country. In India, the development of technical education sector was initiated in the colonial period, where the native and the British both had their own sets of reasons (Headrick, 1988). The British were in a dire need for skilled labour and technicians which could be available locally while the "*swadeshis*" and the "nationalists" had realized the need of skill development for being economically self-dependent (Raina and Habib, 1996; Kumar, 2000). Even after independence, the leaders felt the need for expanding the technical education sector for ensuring economic development of the nation. But this expansion was mainly led by the government initiatives. In the 90's, the government facing the problem of resource constraint, had to allow the private sector to establish the institutes of technical education in order to meet the growing demand for skilled man-power in national and global labour markets. Following this, in the last few decades, India had experienced a phenomenal growth in the number of engineering colleges being mainly spurred by private sector initiative. In 2011-12, there were around 3345 engineering colleges approved by the All India Council of Technical Education (AICTE)[1] compared to 2388 in 2008-009[2], which indicates a compound growth-rate of

[1] Source: Lok Sabha Unstarred Question No. 2446, dated on 28.03.2012, presented in Indiastat, table on State-wise Total Number of Engineering Colleges and Approved Intake in India (2011-2012).
[2] Source: Lok Sabha Unstarred Question No. 1678, dated on 04.08.2010, presented in Indiastat, Region/State-wise Number of Professional and Technical Institutes Approved by All India Council of Technical Education (AICTE) in India (2008-2009 and 2009-2010).

nearly 12 percent per annum. Apart from this, there are private engineering colleges, which are not affiliated to the AICTE, but arriving at an exact number of these unapproved colleges or intake is extremely difficult because of their haphazard growth and the practice of admitting more students than sanctioned intake even by the approved colleges. This phenomenon of mushrooming of private engineering colleges assumes immense importance for the future of nation's young engineering professionals as the skilled labour-force is expected to enhance the economic prospects of the nations by joining the global market. But various studies have found that only a tiny percentage of India's engineering graduates are employable (NASSCOM, 2005, 2009; Saeki and Blom, 2012)[3]. Not only the industry, but also the Working Group on Engineering Education (2008) appointed by the National Knowledge Commission has expressed concern about the poor quality of education and training imparted by these private engineering colleges in India. The problems of low employability and poor labour productivity are attributable mainly to the problem of poor quality of education delivered by the private technical institutes (Sudarshan and Subramanian, 2013; Sharma, 2014; Mehrotra, 2014). Students after graduating from these poor quality institutes often fail to find a suitable job, remain unemployed for quite a long period of time (which increases the opportunity cost) or join low-paid jobs, which do not require any engineering skills. The demand for seats in those colleges, which have failed to attract employers for campus-recruitment has declined and as a consequence, a large number of private engineering colleges have been shut down in India[4]. Maintaining proper regulation in technical education sector became a challenge for the authority and the role of regulatory agencies has attracted severe criticisms in this context ((Deshpande, 2000; Chowdhary, 2001). However, the problem of poor quality is not exclusive for private engineering colleges only, barring a few. It is also relevant for the colleges which are funded by the government. On one hand, there are elite institutions like Indian Institute of Technology (IITs), and on the other hand, there are low quality engineering colleges which have been termed "teaching shops" and "degree mills" by Altbach and Jayaram (2010). The market of engineering education in India is thus

[3] According to the widely quoted report by the National Association of Software and Services Companies (NASSCOM) and McKinsey in 2005, only 25 per cent of the engineering education graduates are employable by a multinational company.

[4] Times of India, October 8, 2012. link: http://articles.timesofindia.indiatimes.com/2012-10-08/news/34322007_1_aicte-new-institutes-colleges

marked by a peaceful co-existence of excellent, good, bad and worst colleges which have created a maze for students interested in pursuing engineering education.

However, the discussion on poor quality has not remained confined within the technical education sector only and eventually it has become the burning issue for the entire higher education sector in India. Both public and private higher educational institutes (HEIs) have been criticised for the failure to produce quality (Agarwal, 2009). The Approach Paper to the Twelfth Five Year Plan clearly argues that the focus should not only be on increased enrollment in higher education, but also on the improved quality of the expansion in higher education. India often boasts off its demographic dividend that 64 per cent of population will be in 19-59 years of age group by 2021[5]. This will add approximately 249 million new entrants in the age group 15 to 64 during 2010-2030[6]. However, this dream of reaping the benefit of demographic dividend will remain an illusion if quality of education provided in India's HEIs is of low quality (Altbach and Jayaram, 2010). The Eleventh Five Year Plan talked about three challenges before Indian higher education sector: inclusion, expansion and excellence. The distinction between quality and excellence should be made clear at this point. In the context of policy reforms in Indian higher education, the term 'quality' refers to the basic minimum standards of education the HEIs have to maintain in order to retain the permission to operate, while 'excellence' refers to the ability of producing extra-ordinary or outstanding level of quality (Bleiklie, 2011). According to Kapur (2011), the Indian higher education system is caught in a 'trilemma' in making efforts to grapple with the issues of cost, quality and expansion simultaneously. As only two of these three can be tackled at a time, an obvious consequence of putting primary focus on reining in cost and pursuing expansion, quality have suffered (Kapur and Mehta, 2017). Meritocracy is often used as an instrument for allocating limited resources in the system but in a diverse nation like India, the gross enrollment ratio (GER) for different socio-economic groups present a dismal picture[7]. In this scenario, balancing between inclusion and excellence is a burning issue for the upcoming reform in the Indian higher education sector.

[5] Economic Survey of India (2011-12), Chapter 13.
[6] Kapur and Mehta, (2017).
[7] In 2014-14, the ratio of women to men enrolled in higher education is 88 to 100 as per UGC Annual Report. Among all the students studying engineering and technology, the per cent of women is 9.88 only.

1.2 The system of quality assurance in India

This problem of poor quality in education needs urgent attention, otherwise the life of young students, and the development of the economy and the society would suffer heavily. To tackle the problem of quality deterioration, the policy-makers had tried to develop an assessment system which would appropriately define and quantify quality so that it becomes easier for the regulatory authorities to check and control the deviations and assess the improvements (Nandi and Chattopadhyay, 2012). Hence, the quality assurance mechanism in higher education was adopted in India. At present the major external quality assurance agencies (EQAs) are:

- National Assessment and Accreditation Council (NAAC) under University Grants Commission (UGC).
- National Board of Accreditation (NBA) under All India Council of Technical Education (AICTE).
- Accreditation Board under Indian Council of Agricultural Research (ICAR)
- The National Institutional Ranking Framework (NIRF) initiated by the Ministry of Human Resource Development (MHRD)

According to the NAAC, the major role of an HEI is to promote the values inherent in education. These core values as specified for Indian higher education system are: *(a)* contributing to national development, *(b)* fostering global competence among students, *(c)* inculcating a value system among the students, *(d)* promoting use of technology, and *(e)* quest for excellence. Although the NAAC started doing the accreditation and assessment in 1998, only a small percentage of the HEIs have been accredited till now. This is mainly because of the earlier voluntary accreditation process which has been recently made mandatory for public institutions in India.[8]

[8] Until recently, NAAC accreditation process was voluntary for HEIs in India. A college or university had to first apply for accreditation, and then subject to some basic qualifying criteria, NAAC would initiate its accreditation process. Colleges or universities were free to decide whether they would go for accreditation or not.

The NBA (under AICTE) offers accreditation to the programmes in technical institutions which are approved by AICTE, provided at least two batches have passed out of the programme or the institution. Under the provisions of the AICTE Act of 1987, all diploma, degree and postgraduate programmes coming under certain disciplines (Engineering and Technology, Management, Architecture, Pharmacy, Hotel Management and Catering Technology, Town and Country Planning, Applied Arts and Crafts) are covered under accreditation by the NBA. The parameters on which accreditation is done and their respective weights are shown in Table A.1 in Appendix.

The EQA agencies help us to have some idea about the performance of the HEIs across the country. But the coverage of the system is extremely low. The accreditation is not mandatory for the private institutions and majority of the public institutions are yet to be accredited. Against the backdrop of the EQA mechanism in India, the next section discusses some of the major policy documents which have commented on the issue of quality and/or suggested some measures for tackling the problem of poor quality in Indian higher education.

1.3 Measures for quality improvement in Indian higher education

Since independence, various commissions and committees have been appointed to diagnose the sources of the problems responsible for delivering poor quality and to suggest measures to reform the higher education sector. Among many of such commissions, Radhakrishnan Commission (1948), Kothari Commission (1964-66), the National Knowledge Commission (2006-09), the Yashpal Committee (2008), etcetera deserve special mentions. A good number of committees have also been appointed to reflect and comment on the issue of poor quality in technical education sector, such as the Sarkar Committee (1945), Thacker Committee (1959), Chandrakant Committee (1971), Nayudamma Committee (1978), Rama Rao Committee (1995), Mashelkar Committee (1998), U.R. Rao Committee (2002), P. Rama Rao Committee (2002), Kakodkar Committee (2010), AICTE Review Committee (2015), Technical Teachers' Training Institutions (TTTIs) or the National Institute of Technical Teachers' Training & Research

(NITTTR), etcetera[9]. The following section briefly presents some of the crucial reports which are still relevant in the current context.

(i) The University Education Commission (1948-49)

The University Education Commission (1948-49) led by Dr. Sarvepalli Radhakrishnan had identified the limitations and suggested the necessary changes required in technical education sector in the seventh chapter of their Report under the section on Professional Education[10]. It emphasised on the needs for having different types of engineers with a broader inclusive view of the society, developing infrastructure for post-graduate studies and research in engineering, expanding the sector without compromising the diversity, establishing specialized engineering schools keeping the geographical and regional features in mind etcetera. The recommendations of the University Education Commission were guided by a broader understanding of engineering education and its role in the national development.

(ii) The National Knowledge Commission (NKC) (2006-2009)

In its Report to the Nation (2006-2009), the NKC suggested for an expansion of higher education to provide students with more choices and create competition between institutions. It also encourages the policy makers for making appropriate policies to create a level-playing competitive field for foreign and domestic universities within the country.

(iii) The Yashpal Committee Report (2008)

On the other hand, the Yashpal Committee Report (2008) made an exception to consider 'quality' in a somewhat different sense in case of higher education. In place of physical parameters of performance evaluation like number of research papers published and

[9] See Saha and Ghosh for details (2012).
[10] Apart from engineering and technology, there were six other subsections on agriculture, commerce, education, law, medicine and new professions.

number of students awarded degrees, it actually suggested three different parameters for performance evaluation, these are: one, socio-cultural aims of higher education; two, academic excellence; and three, institutional self-reform. It suggested the universities to go for self-evaluation which would be credible and transparent and coherent with its long term vision.

(iv) The Report of the Working Group on Technical Education for the XII Five Year Plan (2011)

The Working Group on Technical education appointed by the MHRD has recommended changes in four key areas: research and innovation, technology-enabled learning, the condition of state technical institutions and development of skill and employability. It has acknowledged the importance of programmes like Technical Education Quality Improvement Programme (TEQIP) funded by the World Bank. It helps in creating better infrastructure needed for R & D, training of the teachers and improving employability of the students. Almost 227 institutions were selected for TEQIP in the first phase, while the second phase has considered almost 200 institutions. The Report has also noted the change in the policies of AICTE as it shifted its role from the "monitoring authority" towards the "facilitating body". These shifts are reflected in the way institutions are increasingly being asked for making "voluntary self-disclosure coupled by stiff penalties in case of misrepresentation" (2011, pp. 7).

(v) The Narayanamurthy Committee (2012)

The Naraynanamurthy Committee on corporate participation in higher education (2012) identified a few challenges. These are, shortage of faculty, poor infrastructure, poor academic standard, absence of mandatory accreditation, low employability, etcetera. The report stated,

"The key challenge facing the government and policy makers is how to maintain quality while increasing the reach of the current system without exerting more pressure on public finances and how to create world-class universities in India to bring in competitiveness and enhance innovation". (pp. 2)

It has considered the participation of corporates as absolutely essential in developing research and faculty development in the HEIs. The institutions, according to them, should be able to attract investments from the corporate sector in the wake of resource crunch faced by the government.

(vi) The Rashtriya Uchhatara Sikhsha Abhiyan (RUSA)

The Rashtriya Uchhatara Sikhsha Abhiyan (RUSA) report can be considered as the guiding document for analysing the policy measures in the coming days. The document clearly mentioned about the inability of Indian universities to be listed in the top 200 in Times Ranking, and felt the need for the universities to examine the scope for improvement, especially in the field of research. In increasing investment in Research and Development (R & D), possibility of industry-funding should be explored apart from public funding. It expressed concerns over the declining percentage of Indian world researchers and share of scientific publication in the world, and number of Ph.Ds produced in India.[11] It also identifies "employability" as one of the major indicators in assessing the quality of a higher education system and expressed its concerns about low employability of engineering graduates in particular. It admitted the fact that one of the main reasons for the failure to compete with other countries like China, Korea in the field of education is the shortfall in creating and filling the posts of teaching-staffs in Indian HEIs at the same pace of increase in number of institutions and enrollments. The policy makers are aware of the fact that many private institutes do not pay adequate salary and recruit teachers on contract basis which created a difficulty in attracting experienced teachers in the sector. The student-teacher ratio in India (24:1) is also lower than other developed countries like Sweden and the United States of America. The RUSA document argues in favour of mandatory accreditation of the HEIs, especially of private institutions, by NAAC and of the programmes by NBA. It critically reviewed the affiliation system mainly associated with state universities. Internal governance mechanism in these institutions was a major reason of poor performance, it argued. It insisted on recruiting "professionals" to manage the educational institutes and argued in favour of a governance

[11] Thompson Reuters (2010).

reform in higher education system. The funding mechanism, it feels, should be tied to the performances for ensuring better utilization of resources and thus the system would encourage universities to compete for excellence and prestige. The RUSA document has suggested more central funding should be directed to the state universities and there should be performance linked competitive grants. Equity, excellence and expansion should be achieved by academic and governance reforms. The RUSA thus proposes a norm-based funding but outcome-dependent future grants, which would be shared by the central and the state governments. Private institutes can also apply for these grants on the basis of fulfilling some eligibility requirements. It recommends for exploring the possibilities of Public-Private Partnerships (PPPs) in funding higher education in India.

The policy makers had also tried to draft a few Bills to regulate the market of higher education in India, but most of these did not take any final shape yet. Some of the proposed Bills which directly talked about the problem are -the National Commission of Higher Education and Research Bill, 2010 (NCHER), the Foreign Educational Institutions (Regulation of Entry and Operations, Maintenance of Quality and Prevention of Commercialisation) Bill, 2010, the Unfair Practices in Technical, Medical Educational Institutions and Universities Bill, 2010, and the National Accreditation Regulatory Authority for Higher Educational Institutions Bill, 2010. Recently two major steps have been taken to deal with the issue of poor quality in India. One is the introduction of a nation-wide ranking framework to which almost all the HEIs (public and private both) can apply for getting ranked. The other one is related to the issue of teachers' motivation and governance issues in public institutions. It aims at incentivizing the teachers to perform better. These two are discussed below:

(a) The National Institutional Ranking Framework (NIRF)

One major milestone in the context of assessing and measuring quality of the institutions is the National Institutional Ranking Framework (NIRF) introduced by the Ministry of Human Resource Development (MHRD) in 2016. Having realized the limitations of blindly applying the global ranking method in national systems, the MHRD has come out with a national ranking framework which has a credibility of being published by a government ministry. The institutions interested in getting ranked by the NIRF have to supply the data to NIRF and publish that on their own website for maintaining transparency. The NIRF can directly gather information from sources like Scopus, Web of Science, Indian Science Index, etcetera. Any HEI having at least 1000 enrolled students or any centrally funded institution/university of the Government of India can apply for a common overall rank and other specialized institutions with a single main discipline (Engineering, Medical, Law, Management, Pharmacy or UG degree colleges in Arts, Science and Commerce, etc.) with less than 1000 enrolled students can apply for a discipline specific rank. The National Board of Accreditation (NBA) performed the ranking on behalf of NIRF in 2016 and in 2017. The broad parameters are: teaching, learning and resources (0.30 weightage), research and professional practice (0.30 weightage), graduation outcome (0.20 weightage), outreach and inclusivity (0.10 weightage), and perception (0.10 weightage).

(b) The Academic Performance Indicators (API) under the Performance Based Appraisal System (PBAS) scheme

The implementation of Academic Performance Indicators (API) under the Performance Based Appraisal System (PBAS) by the University Grants Commission (UGC) for teachers' recruitment and promotion in public funded colleges is a bold step in the context of reforming the Indian public higher education system during the recent years. The performances of teachers in the public universities and colleges are now being evaluated on the basis of number of their published research papers, completed research projects, research guidance, trainings/workshops/ conferences attended etcetera apart from other teaching and administrative duties performed. The promotions of the teachers in these institutions are now made contingent upon this calculated API score. With the

aim of incentivizing teachers to perform, this system has interfered with the academic freedom of the teachers. As Das and Chattopadhyay (2014) have argued, the underlying assumption of this kind of reform is the existence of a linear relationship between time spent and outputs produced by the teachers in academic institutions, as if it is analogous to a typical factory production system. This is, arguably, a way of imposing corporate type governance structure in the public institutions, or, implementing university governance reform in line with the New Public Management (NPM).

(c) Summarising the major policy trends

In summarising the recent significant steps taken by the policy-makers to improve the quality of Indian higher education system, three major points are observed. The first one is related to the creation/expansion of the market in higher education by acknowledging the role of private providers and encouraging them to enter the mark*et al*ong with shrinking the scope of public institutions. The second one is related to helping the potential consumers (students) in this market to make informed choices by providing information about quality through ranking and accreditation of the HEIs. The third one is implementing a governance reform to make the system more 'efficient'. According to the policy-makers, the market will foster competition which would ensure Pareto efficiency automatically, while the internal governance reform would minimise the inefficiencies related to resource utilisation, thus would promote technical efficiency. The PBAS-API system seeks to ensure minimum standard to be achieved by the faculty in an objective manner. Though the scope for incentivisation is less it promotes realosation of potentials of the faculty and strengthening the relationship between inputs and outputs. All these measures have deeper implications in the era of globalisation where HEIs feel compelled to compete in a global market.

1.4 Insights from the existing literature on Indian higher education

(i) Quality in the public and the private institutions

Studies on poor quality on Indian higher education, often find distinct reasons for the public and the private HEIs. In case of India, the problem of poor quality is relevant for both public and private colleges, and the factors behind such quality deterioration are widely varied across them depending mainly upon the nature of the institution and its mode of funding. There is a "significant inter-institutional variety of quality" and the problems are related to physical infrastructure and academic practice as argued by Thorat (2016). The most crucial reason is unscrupulous commercialisation for the private colleges, and poor governance for the public. The possible factors for poor governance in the public institutions are resource constraint, lack of flexibility in utilising the funds, poor infrastructure, corrupt and ineffective regulatory system, lack of teachers' motivation etcetera (Chattopadhyay, 2010, 2012a). Sudhanshu Bhushan (2009) argued for the need of "strategic initiatives" in order to improve quality in Indian higher education system. According to him, the institutions should make strategies to to meet the demand of growing knowledge economy, to attract best researchers and professors, to develop a network and partnership with foreign universities, promote Information and Communication Technology (ICT) to handle the administrative tasks and to ctreate a National Qualifications Framework (NQF) (Bhushan, 2009). Devesh Kapur (2008) also identified the split between research and teaching, crisis of governance, highly centralised state regulatory system, politicisation and absence of clear-cut areas of intervention for various regulatory authorities as the main sources of quality problem in public higher education system. On the other hand, private HEIs are criticised for being mainly driven by profit motive albeit in a clandestine manner. Taking recourse to cost cutting becomes an inevitable option for most of the private institutions and in the process; concern for quality gets sacrificed (Tilak and Varghese 1991, Tilak 2006). Mehrotra (2016) explained the poor employability as a consequence of poor quality of higher education. He identified some of the factors like faculty shortage, growth of unregulated private institutions, narrow coverage of accreditation agencies, inadequate funding for public institutions, poor quality of technical and vocational courses. Similar set of factors responsible for poor quality have also been identified by Sharma (2014). Regarding the problem of poor governance in the Indian HEIs, Singh (1975) felt the need to change the

"ethos" and to build professionalism to improve the problems of governance and management. He critically reviews the affiliating and examination system in India and he proposes a three-tier structure involving a large number of universities, a few hundred autonomous colleges and a large number of affiliated colleges to deal with undergraduate and post-graduate education differently. Hatekar (2009) explained the situation of state universities which often fail to produce quality as they are trappedin the vicious cycle of resource crunch, shortage of faculty, bureaucracy and political interference, outdated pedagogic methods, lack of flexibility in allocating resources. The higher education system has also been criticised for protecting the interests of the teachers only, irrespective of their lack of accountability to the students (Dandekar, 1991). Following the arguments made by Adam Smith (1976), he argued, without having a competition among the providers, and a system of rewards and punishment for the teachers, there cannot be any improvement in the system. Ayyar (2015) suggested the separation of the functions of different regulatory agencies and co-ordination of their functioning to re-structure the governing structure of Indian higher education system. He also put stress on the need for introducing output-based funding to improve conduct and performances of the HEIs. Bhushan (2015) has cited the "politicisation" and the "bureaucracy" as the main source of malpractices in the system. Chandra (2017) has discussed about the main elements of governance inside the institutions and the factors which made the academic governance extremely difficult to control. He felt there is a need to define the purpose of the institutions and the benchmarks, to manage the huge scale of operation, sanction more autonomy to universities, restore accountability, decentralise the system and ensure effective leadership.

(ii) The impact of privatisation on quality

There is a dearth of empirical studies or case studies which attempted to examine the issues related to quality deterioration/improvement in higher education in India. However, there are important papers written by eminent scholars or observers on the issues of privatisation, access and equity, role of private and public sector, and policy reforms. In a way, these are all related to the issue of quality in higher education. One set

of such papers expressed concerns over the expansion of private sector and shrinkage of public sector in Indian higher education. They are also critical of the on-going privatisation in the higher education. During the initial years of growth of private HEIs in India, V.N. Kothari (1986) had expressed his concerns about charging high tuition fees, producing low quality of service, subverting norms, excluding students coming from less well-to-do families. These concerns have been re-iterated by various scholars in the subsequent period. Tilak and Varghese (1991) argued, though there is a need for exploring alternative modes of financing higher education (other than the tax revenues), extreme reliance on private sector is not an option as they have failed to produce desirable outcomes due to rampant commercialisation. Tilak (2014) also criticised massive expansion of private higher education system as 'detrimental to the character of education as a public good' (pp. 37). On the other hand, Ved Prakash (2007) admitted the need to promote private higher education which is philanthropic, and to ban other private providers which want to make "quick money". Anandkrishnan (2005) also expressed his concerns over court judgments in favour of relaxing the government regulations in private unaided colleges in the fear of "vanishing equity" from the system. Altbach (2005) acknowledged the role of a few "well-endowed and effectively managed" in promoting excellence in the field of professional education, but felt skeptical about their ability to form the 'basis of comprehensive research universities'. He believes only the public universities have the potential to deliver world-class education. The strengths and weaknesses of privatisation have been discussed by Ghuman (2014) where he suggested the need to curb government interferences on the actions of the regulatory authorities. Gupta (2015) pointed out towards an interesting fact that most of the private universities have been established in the states which have lower literacy rates and in those states where the influential groups can take the advantage of corrupt regulatory authorities and subvert the norms more easily (Dhanura and Kumar, 2014).

Another set of scholars have argued in favour of private sector-led expansion in higher education as they subscribe to the argument that the private sector is more 'efficient' in nature. For example, Agarwal (2006, 2009) argued for a change to the existing funding mechanism and introducing competitive grants to incentivise teachers to perform. He also

stressed on the role of ranking and accreditation to make the system more competitive. A similar line of argument has been advanced by Kapur and Mehta (2004). They have criticised the existing system for being extensively centralised and politicised and for not providing any incentives to the teachers to perform better. They emphasised on the need to have competitive measures for evaluating teachers' performances and linking it to their promotion and tenure. They also stressed on the role of 'merit' in producing quality-education and prescribed national level competitive entrance examinations in each and every HEIs for selecting students on the basis of merit only. Kaul (2006) also felt that role of private sector was gaining increasing importance in today's world and there was no justification for controlling these unaided institutions by imposing the state regulations on them. They should be set free to recover the costs from their tuition fees and there should be other financing mechanisms available for students such as educational loans.

(iii) Quality in the technical education sector

Being specific to the field of technical education, there are mainly three sets of studies. The first one focused on issues related to accreditation and measurement of performances (Das, Sarkar, Ray, 2012; Prathap and Gupta, 2009). The other set of studies have linked poor quality with low employability of the graduates (Fuller and Narasimhan, 2006; Gokuladas, 2010; Chadha, 2014). The third set of studies has tried to examine the sources of poor quality in Indian technical education. Goel (2006) emphasised on the need of competence building by transforming the traditional teaching methods, assessment process, and by recruiting experienced teachers who have practical knowledge about the engineering projects. In an extensive study done by Banerjee and Muley (2007) by involving Indian Institute of Technologies (IITs), Indian Institute of Sciences (IISCs), National Institutes of Technology and some government engineering colleges, and a few private engineering colleges, institutional quality has been examined on the basis of (a) Student output (b) Ratio of postgraduates (Masters and Ph.D.s) to total degrees (c) Student to faculty ratio (d) Selectivity (e) Placements (f) Faculty salary (g) Publications (h) Funding and fees. They have recommended to take some measures in order to attract good faculty, increase the number of Ph.D studies, implement performance based

incentivising schemes for teachers, strengthen the linkage with industry, reform the administrative structure by decentralising and recruiting professional manager. However, this study did not present any theoretical framework for understanding the variation in outputs produced by these institutions. Mehrotra (2015) recommended a cap on the intakes, establishment of community colleges, introduction of soft-skills training and internships to increase employability, revision of the curriculum, recruitment of good teachers, making the system more suitable for women students to develop the technical education sector in India. Another study on governance of technical institutes in India (Blom and Cheong, 2010) was organised for implementing TEQIP (Technical Education Quality Improvement Programme) in this sector which interrogated the idea of 'good governance'. It suggested a few measures to rethink about the legal foundation of public/private division, to make strategic planning, to introduce a common quality assurance mechanism and faculty appraisal schemes, to strengthen industry-academia collaboration, to look for strong academic leaders, to use resources optimally and to make room for international co-operation for technical assistance or mentoring. Bedi (2014) has done a SWOT analysis of the sectors and identified the major weaknesses as faculty shortage, low concern for quality in private colleges, tendency to get more number of students, geographical and branch-wise imbalances, and little interaction/collaboration with industries, low autonomy, little focus on research, examination-centric teaching and less of practical projects etcetera. The technical education should focus on the planning of technical manpower, bridging the skill gap, interacting with industry and building an effective partnership (Sharma, S. K. 2014). Through a case study on engineering colleges in and around Chandigarh, Gupta and Gupta (2014) found out the main problem areas as lack of an efficient management system, low level of participation of industry in the designing of curriculum and bridging the gap, reluctance of the industry to sponsor research programmes among other factors. Ghuman, Singh and Mohammad (2014) critically reviewed the role of AICTE in the practices related to recognition, approval, disbursement of funds, promotion of standards of teaching and research etcetera and consider the sector as over-regulated but under-governed. Deshpande (2000) also criticised the AICTE for ineffective and corrupt regulatory practices. The regulatory authority is not in a position to handle the massive expansion in the field of technical

education and the establishment of state councils for regulating this sector was also suggested (Chowdary, 2001).

1.5 A few un-answered questions

After reviewing the existing literature focusing particularly on the identification of the factors responsible for poor quality in Indian higher education, a few questions still remained unanswered. The first set of questions is on the role of market in improving quality in higher education. In spite of having a huge market in engineering education in India, this sector has been severely criticised for delivering poor quality of education and producing unemployable graduates. If promoting a market-led competition among the HEIs is argued to solve the problem of poor quality in higher education, then why did it fail in this case? If private institutions are supposed to have an efficient system, then why and how the process and delivery of quality of engineering education has been abused by the private providers? Why the market could not ensure quality in spite of having so many regulations in this sector? Why, despite regulaton and existence of quality assuramce agencies, the quality has continued to remain a concern in the Indian case?

The second set of questions is based on the public-private division of the institutions. As discussed earlier, corruption, subversion of norms, rampant commercialisation are some of the main reasons for this alarming situation created by the private HEIs. On the other hand the public institutions are facing resource crunch, shortage of teaching staff, inadequate infrastructure, red-tapism and bureaucratic attitude in decision making, lack of motivation and many other problems. Since the factors responsible are largely different in these two types of institutions, can the solutions be sought by dividing the colleges on the basis of their mode of funding, i.e. public and private ownership and management?

The third set of questions is the most intriguing one, asking why a few public and private colleges are able to produce reasonably very good quality of education while the majority of the HEIs fail to do so in spite of facing the same regulatory structure. Generally the public HEIs used to have a traditional trust based governance system which did not provide any incentive for performing. Then how could a few public institutions manage to remain in the top of the list of best engineering colleges in the country? Why did they

not face any lack of motivation in the absence of an incentivising system unlike others? On the other hand, there are a few excellent private institutions. How come they are not interested in cost-cutting but trying hard to achieve excellence while the majority of private institutions are doing otherwise?

The fourth set of questions expresses concerns about the efficacy of policy measures in this regard. Can any type of straitjacketed reforms be applied on these institutions without understanding the differences in their objectives, mission, vision and goals? Can the policy reforms succeed in checking quality deterioration in this sector without looking at the inherent characteristics of the good called higher education, and the unique nature of competition in the market?

These questions had motivated me to pursue a study in this particular area. This study, 'Quality and the role of funding in higher education: A study of engineering colleges in West Bengal' tries to identify the main factors which determine quality in a higher educational institute (HEI) and to analyse the relative contributions of each of the factors in determining the quality of technical education. With respect to the selected engineering colleges in West Bengal, it makes an effort to examine the variations in the internal governance mechanisms inside the HEIs to understand the relationship between their funding, governance mechanisms and performances. It tries to explore the roles of the students and the teachers, internal governance mechanism of the institutions, the regulatory agencies and the market structure to understand the complex process of quality-generation in higher education. It also seeks to examine the applicability and efficacy of the policies formulated in order to improve quality in higher education in India.

The subsequent efforts for exploring the existing literature related to quality in education, its assessment and ranking methods, input-output relationship and efficiency in case of education, the uniqueness of higher education as a good and the nature of competition in the market, the relationship between mode of funding and governance mechanism of the institutions, state-market-institution relationship have guided me in formulating an analytical framework of the study and identifying the research objectives and research

questions. These will be discussed in chapter 2 and 3 while the next section discusses the rationale for selecting the particular state, West Bengal.

1.6 Rationale for selecting the field: West Bengal

The state of West Bengal had a rich history in the development of science and technical education sector in India. In 1856, a civil engineering department was established under the Presidency College of Calcutta, which was later renamed as Shibpur Engineering College in 1880. The National Council of Education (NCE) had started looking after the College of Engineering and Technology in Bengal since 1910 which became Jadavpur University in 1955. The technical education sector remained under the purview of the government for long in this state as it did not immediately follow the model of private sector led expansion like Maharashtra and Karnataka. As a consequence of the Information technology (IT) boom in the global labour market, there was a shortage of supply of seats in engineering colleges against the huge demand for it. The state of West Bengal has experienced a huge migration of potential students to other states because of limited number of seats in the government-run colleges. Eventually, the private sector was allowed in the late 1990s. There were 88 AICTE approved engineering colleges in 2011-12 (when I initiated my research work) compared to 71 in 2008-09. Unlike the other states, almost all the engineering colleges are approved by AICTE. Except six of them, the rest were private. The development of private engineering colleges in West Bengal is comparatively a recent phenomenon compared to other states like Andhra Pradesh, Karnataka or Tamil Nadu and started as a response to migration of students from West Bengal to these states. The historical background of the state has shaped the role of the public engineering colleges which used to share the technical knowledge with local people in order to make them economically self-sufficient. The association of 'government' with the colleges has been able to generate immense credibility among the students and parents in this state. The private ones entered into the picture as a solution to the problem of a very selective nature of public colleges and for expanding the sector. To respond to the growing demand for engineering education arising mainly from the middle class families, private colleges have been established by various Trusts. Eventually, following the West Bengal University of Technology Act, 2001, an umbrella university

was established and all these colleges are now under Maulana Abul Kalam Azad University of Technology (MAKAUT) which was initially known as West Bengal University of Technology (WBUT). The university had 217 institutions in professional education in the year 2015-16. All the engineering colleges under MAKAUT have the same curriculum, similar mode of evaluation and examination, but in spite of being under the same regulatory authority, there is a huge qualitative difference across colleges and the news about poor quality, poor placements and closure of private colleges has been recently reported in media[12]. However, this is a little surprising. With a moderate degree of expansion (in relation to southern states) of private sector in higher education and with (almost) all the colleges having AICTE affiliation, and with a government regulating the fees charged by the private colleges, the failure of the system to deliver minimum quality of education somehow indicates towards the variations in the objective functions of the institutions, and the ineffective role of market-led competition in higher education, apart from the presence of regulatory loopholes. Also, the question is not limited to the case of undergraduate engineering colleges only, as all the four private universities in the state are actually established by the Trusts who claim to run their engineering colleges successfully. There is a dearth of empirical studies on this (Chatterjee, 2014; Maitra, 2011). Against this backdrop, this study would try to look into the issue of poor quality in engineering colleges in this state.

1.7 Concluding remarks

In the context of the on-going debate on the issue of quality deterioration in Indian higher education, this study seeks to understand the role of various factors in determining quality in higher education in general and technical education in particular through a study of government and private engineering colleges in West Bengal. It tries to understand the possible role of mode of funding and ownership (public and private) in the determination of quality in higher education. It also examines the relative contribution of students and teachers in determining the quality of teaching-learning process in the colleges. It seeks to explore the variations in internal governance mechanisms in the different institutions

[12] Ananda Bazar Patrika, 20th March, 2013; The Times of India, August 24, 2014, February 20, 2016, May 9, 2016.

and understand the interactions between state-market-institutions with respect to the particular area. The thesis would seek to address whether private sector based expansion would do justice to the major concern the Indian higher education is faced with, improvement in the quality of technical education. The next chapter would present a brief review of the literature on this subject.

Chapter 2: A brief review of literature and the theoretical framework

2.1 Introduction

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2.1 Introduction

The last chapter has introduced the research problem and situated it in the context of the on-going debate on quality of higher education in India. This chapter makes an attempt to critically review the existing literature on this subject. This would also help me in developing a theoretical framework within which the research would be undertaken. The next section presents the issues related to the definition of quality in education. Section 3 briefly discusses the debates on the measurement of quality and critically looks into the methods adopted by the national and global quality assurance and ranking agencies. In connection with the debates on measurement of quality, Section 4 explains the concept of educational production function and the Input-Output analysis of educational production. In Section 5, the role of the process through which inputs are converted into outputs in the educational institutes is discussed in brief. The issues related to the role of market in improving quality are examined in Section 6. Section 7 explains the role of funding in determining the strategies of the HEIs and Section 8 discusses the role of funding. After the discussion, the gaps in the literature are identified in Section 9. The research objectives and the research questions which have emerged from these gaps are mentioned in Section 10. Section 11 presents the theoretical framework which would guide the research design of this study. In the last section, the definitions of a few key terms used in the study have been explained and clarified in the context of the present study.

2.2 Definition of quality in education

Quality is an inherent characteristic of any education system as an education devoid of quality cannot be called education at all (Krishna Kumar, 2010). Garvin's (1988) five types of definitions of quality in terms of general goods and services have been mentioned in the NAAC report in the context of defining quality in education. These are listed below:

1. Product based definition (objective and measurable)
2. User based definition (customer satisfaction oriented)
3. Manufacturing based definition (subject to fixed input requirements and specifications)
4. Value based definitions (in relation to cost)
5. Transcendent definition (subjective, personal and beyond measurement)

Now, let us examine the applicability of each of the above-mentioned definitions in case of education. Education is not a finished product with a set of specific characteristics which are universal in nature (Majumdar, 1983; Winch, 2010). Hence the product based definition has a limited scope in this regard. While delivery of teaching is a service in the sense it is produced only when it is delivered, knowledge can assume the form of a product like patent, journal articles etcetera. The customer based definition of quality is also problematic as satisfying the customers, i.e., the students cannot be the aim of any educational system. It has other broader purposes to serve in view of national and social development. Since educational service is not produced through a fixed technology with pre-specified quantity of inputs, the manufacturing based definition cannot be applicable (Majumdar, 1983). The cost of operation cannot be the sole determining factor of the quality of any education system; hence the only definition with which we are left with is the transcendent definition. This approach considers quality as an attribute which is subjective and cannot be measured with the pre-determined universal parameters. Applying the transcendent definition attracts criticism that it gives a scope to do away with the accountability, as there is nothing like a perfect standard of quality which can be set as the benchmark (Nandi and Chattopadhyay, 2012).

In education, assurance and measurement of quality gained popularity during the evolution of Total Quality Management mainly advocated by W. Edwards Deming (1986) as noted by Kumar and Sarangapani (2004). Now, quality assurance mechanism is considered as the first step for improving quality. As mentioned earlier, applying the transcendent definition of quality increases the scope of deviation from the desired standard as it is subjective in nature. This risk is too costly as a poor-quality education system adversely affects not only the individuals and their families but also it retards the social and economic development of the nations. In view of this, to avoid the risk, almost all the major higher education systems in the world have adopted the External Quality Assurance (EQA) mechanisms. The EQA agencies and the rankings, both try to monitor, evaluate or review the practices in higher educational institutes with the help of pre-specified universal yardsticks (Martin and Stella, 2007). Through the process, they provide information to the stakeholders, i.e. the students, employers, policy-makers, educationists, and concerned individuals and help them in informed decision-making. The need for providing information to the students arises because of the presence of information asymmetry and imperfect information in the market of higher education (Arrow, 1973). These problems occur mainly due to the following reasons:

(a) Education is an "experience good" and only the students can experience the quality of education (McPherson and Winston, 1993).[13]

(b) The providers may possess some critical information regarding the quality of service but they may not be interested in revealing the information.

(c) Price of the service fails to reveal information about the quality since education is not market determined and is largely subsidised in most of the country.[14]

[13] Even the students may not assess the true quality as benchmarking would be difficult in view of lack exposure of curriculum and pedagogy of other reputed quality institutions. Also, evaluating the merit of research is also a difficult process. Number of patents, research publications etc cannot be the absolute measure.

[14] In the private sector, to an extent the cost of education imposed on the students may reflect the cost of its provision but not quality of education, truly speaking. Quality is co-produced in the class room as the students are also required to put in effort with a high level of motivation to help produce and experience quality education.

It is in this context that the EQA agencies play a key role in developing the national and global market of higher education by providing the relevant information to the stakeholders (Nandi and Chattopadhyay, 2012). The methodology and implications of ranking and external quality assurance mechanisms adopted worldwide attracted severe criticism from the scholars (Marginson, 2007a). Actually, the method of ranking higher educational institutions on the basis of their performances and measuring quality with the help of the universal and pre-determined parameters is based on the Input-Output analysis of educational production. In other words, it is rooted in the assumption that educational production is analogous to that of a firm which produces consumable product. The underlying assumption of a fixed technology which converts a particular quantity of inputs (of homogeneous quality) into certain outputs is questionable on various grounds. The next section critically reviews these claims.

2.3 Educational production function

When a higher educational institution is compared with a firm, actually the process of knowledge generation is compared to the production function of the firm and the production function for education is called Educational Production Function (EPF). This approach is also referred to as the Input-Output analysis of educational production. In its simplest form, in EPF is nothing but the following:

$Y_i = f(I_i)$

Where Y_i is output of i^{th} students and I_i is the set of inputs relevant to the i^{th} student.

Identifying the inputs and the outputs is the first task for specifying the EPF. The list of outputs produced in a university can be classified in four categories- (i) Educational output (ii) Informational output and (iii) Research outputs and (iv) Consumption benefits[15]. But the total number of degrees awarded or number of students passed cannot do justice to the idea of educational output, although these are being popularly and increasingly used to measure higher educational institution's outputs in a quantifiable and

[15] See Bear 1974, Attiyeh 1974, Stiglitz 1975, Chattopadhyay 2012.

measurable manner[16]. Majumdar (1983) argued that a small number of 'properly educated' students in comparison to a large number of 'barely educated' ones may be more beneficial to the society. The inputs, on the other hand, can be conceptualised in terms of hard work by students, hours per period of faculty time in different disciplines, labour of other staffs apart from faculty, hours of students' time, available resources, facilities like library, and other infrastructure. The most common inputs are the followings: the ability of the students, infrastructure provided by the institution, teachers' qualifications and the socio-economic characteristics of the students. The identification and valuation of these inputs and outputs is problematic as the weights vary across the institutional missions and visions and thus, measuring productivity is a real problem in this case.[17] Bowles (1970) tried to estimate the production function in schools. In his model, educational output is a function of three types of input indicated by the variables related to the school environment, factors related to the environment outside the school and ability of the students. The achievement of the students measured by the test score is generally taken as the outputs and the relationship between inputs and outputs assumes a functional form like following one (Hanushek, 2008).

$A_i = f(X_i, Y_i, Z_i)$

Where, A_i= a measure of school output (for example, test score)

X_i= Set of variables related to school environment (for example, teachers' quality, infrastructure and other facilities)

Y_i = Set of variables related to outside factors, like socio-economic condition of students, parental income and education, etc.

Z_i = Set of variables related to students' ability.

There have been other studies which tried to explain the variations in test scores and found family inputs more important than school related inputs. The pioneering study was the Coleman Report, the US government's study on educational opportunity (Coleman *et*

[16] See Majumdar 1983.
[17] See Chattopadhyay 2012.

al., 1966). These studies reveal the fact that students' achievements are related to two sets of inputs, one is directly controlled by the policy-maker (for example, school characteristics, teachers' qualification, and curricula, etcetera) and the other not controlled by the policy-maker (for example, family background and innate abilities). However, specifying a single production function was difficult. Hanushek (1996, 2003) summarized 90 individual publications that appeared before 1995 and contained 377 separate production function estimates. He further concluded that most of these studies found that simply pumping more resources into the school system would not improve students' performance because there is a considerable degree of inefficiency attached with the way schools allocate and spend their resources. Pritchett and Filmer (1999) argued that this may happen if the allocation of resources is done in a way in order to benefit the teachers as they have the decision-making power. Krueger (2003) refuted Hanushek's conclusions by saying his sample of estimates are biased. In short, there is a lack of consensus about the effect of a particular input on students' achievement (Todd and Wolpin, 2003). Both Hanushek and Krueger acknowledged that the absence of theoretical justifications is largely responsible for biased estimates or wrong specification of the model. Also, the EPFs are critiqued as they generally do not acknowledge that a student's achievement is a function of 'accumulated learning and culmination of all past efforts and learning' but the effects of the past efforts will diminish with time (Chattopadhyay, 2012). Further, there are high chances of positive relation between students' family characteristics and school characteristics which may ultimately lead to biased estimates (Hanushek, 1986).

The increasingly popular practice of measuring quality in higher educational institutions mainly based on quantifiable concepts of input and output and a fixed technical relationship between them. In case of higher education too, Bear (1974) made an attempt to specify an EPF. However, there is a scope for criticism regarding the applicability of this kind of EPF in higher education. First, as higher educational institutes have different objectives, the outputs produced in each of them would carry different weightages in these institutions[18]. Second, it is extremely difficult to quantify the net value addition to

[18] For example, the weightage for teaching andresearch would not be same for a teaching and research university.

the existing stock of knowledge as the number of degrees or assessing test scores may not be an appropriate way to measure a higher educational institute's value addition. Valuation of research outputs is more problematic as it may not have any immediate impact and a proper market for fundamental research. Publications and market value of research (reflected through patents) may not do justice to the research outcomes.[19] Also, a higher educational institute's contribution towards society cannot be captured only in pecuniary terms. Third, an exact valuation of the inputs is also difficult. For instance, as Becker (1964) argued, valuation of the time spent on studying which is one of the most crucial inputs in educational production would vary from individual to individual depending on the context. If a student's cost is measured by his/her foregone income, it may fail to capture the pleasure of studying or doing research.

In short, the EPF views educational production similar to that of the firms. As the firms try to be "efficient" in order to survive, analogously this Input-Output approach also fixes "efficiency" as a target for the educational institutions. The next section critically evaluates these claims and discusses the concept of efficiency and productivity in the context of education.

2.3.1 Efficiency and productivity

The supporters of fostering competition in higher education often argue that creation of a market would improve quality by making the higher educational institutions more 'efficient'. There are three main types of efficiency in Economics- allocative efficiency, economic efficiency, and technical efficiency. Allocative efficiency refers to the ability of the market to allocate scarce resources according to the demand and supply. On the other hand, the economic efficiency can be achieved by selecting the right combination of inputs given costs and technology of a higher educational institution. On the other hand, technical efficiency means operating on the production frontier. Economic efficiency is related to achieving the minimum cost given output and is measured at a given point of time. Measurement of productivity is generally based on costs and is measured at two points of time. Following the economic understanding of productivity, teachers are more

[19] A case of market failure for fundamental research

productive in a school where one teacher teaches fifty students in a class compared to another one where one teacher teaches thirty students in a class. But this type of comparison is not tenable as quality of education is differently constituted. For example, in this case, quality of education may depend on teacher-student interaction inside a classroom. If so, then being productive has very little correspondence with producing quality. Similarly, achieving economic efficiency is not a meaningful concept to be applicable in case of assessing quality in education. Another important point is that there can be various ways of teaching and learning and thus one given combination of inputs can also produce different outputs in different higher educational institutions depending on the process choice and interaction among various stakeholders (Hanushek, 1986). Even the concept of technical efficiency is least applicable because it is extremely difficult to think of only one input combination in higher educational institutions and the vagueness of defining inputs and outputs also adds to the problem (Chattopadhyay, 2012). Based on these grounds, Majumdar (1983) argued that there can be no such single production function with a particular type of input combination in case of education. In education, students and teachers together produce outputs. Unlike a firm, there can be various ways of teaching-learning which will shape the entire process of transformation of inputs into outputs. According to Winch (2010), the EPFs estimated by different researchers often fail to understand the actual contribution of various inputs in teaching learning process in reality. Understanding the teaching-learning process inside higher educational institutions is extremely crucial in explaining relative contributions of different inputs in delivering quality education. The process is more likely to be different across public and private higher educational institutions depending on their purposes.

2.4 The process, governance and quality in education

In case of education, it is a customer-input based technology where the quality of students (i.e., the customers) mainly determines the quality of outputs. But given the quality of inputs, not every institution is going to convert them into outputs in the same way. The variations in the conversion process depend on the nature of governance mechanisms in the higher educational institutions (Chattopadhayy and Pathak, 2016). From the angle of the structural perspectives, the governance in higher educational

institutions is of two types, internal and external. Internal governance is generally studied through the degree of centralisation, authority, hierarchy and the role of different bodies like Board of Governors, Academic Council, Teachers' Union, etcetera and the relationship among these bodies. Also, at the organisational level size and composition of different decision-making bodies are related to the efficacy of academic governance (Lee, 1991; Schuster, Smith, Corak and Yamada, 1994). Organisational structures are also shaped by the institutional goals and objectives. One major challenge for an academic institution is to strike a balance between academic structures and administrative structures through interacting with each other, designing a power-sharing mechanism, prescribing rules and policies, adopting budgetary control etcetera (Bess and Dee, 2008; Bolman and Deal, 1991). On the external front, in most of the countries, states/governments have the ultimate authority to control the Higher educational institutions either academically and organisationally (Ferlie, Musselin and Andresani, 2008). Also, external actors like judiciary, external assessment agencies, and international bodies like WTO influence academic institutions' decisions to a great extent. In these structural considerations of academic governance, human agency and culture must be incorporated to understand the governing process. Here, the structure, culture and human agency can be separable, but not separate (Willmott, 2000).

2.4.1 Internal governance

In the literature, the studies on governance in academic institutions are found to be guided by six main theoretical perspectives. These are: the structural theories, the human relations theory, the cultural theories, the social cognition theories and the open systems theory. The structural theories focus on the functional role of organisational structures inside the institutes (Kezar and Eckel, 2004). The human relations theories focus more on the role of individuals to study how the different people influence the governance process inside the institutions (Bolman and Deal, 1991; Morgan, 1886). The cultural theories study the role of 'symbolism, values and beliefs' in determining the governance process The social cognition theories study how individuals learn and understand the environment inside the organisations (Argyris, 1994). But the most relevant in this case is the structural theories as here the institutions are assumed to have a pre-defined objective

on the basis of which thy work rationally to improve higher educational institutions' performances. In literature on academic self-governance, the main theories used to study the structural functions of various stakeholders inside the institutions can be summarized as below:

(a) Institutional theory

Institutional theory deals with the structures, processes and activities inside an organisation (Austin and Jones, 2016). An academic institution has its own boundary but its leaders need to pursue "legitimacy, approval, and funding from the general environment in order to survive" (Fogarty, 1996). The environmental influences can be of economic, social and political type and can re-shape higher educational institutions' decisions such as introducing new courses, changing the admission policy or recruitment requirements. In a global field, higher educational institutions are being increasingly affected by external influences and the degree of influence is positively related with the degree of openness of the higher education system. Demands emerging from global/national labour markets can also influence higher educational institutions to redesign its curricula to retain competitiveness in the global/national sphere (Castells, 1996; Jongbloed, Enders and Salerno, 2008).

(b) Resource dependence theory

This explains the relationship between an organisation and its external environment including other organisations and the stakeholders. The organisations are not self-sufficient and are dependent on external environment for critical resources (Drees and Henugens, 2013; Scott, 2003). Not only academic institutions are dependent on its environment, but also they may be controlled by the environment (Pfeffer and Salancik, 2003). In other words, as higher educational institutions need resources either from the government or from the teachers/students or funding agencies, they must be dependent on those who control these financial and academic resources. Environmental rules, regulations, norms and expectations may impose constraints on academic institutions and finally shape institutional structure, process and behaviors to a large extent (Austin and Jones, 2016).

(c) Agency theory

In Agency theory (or, Principal-Agent theory), generally the principals are the owners of a corporation and the agents are the executives or the managers. Principals delegate some authority to the agents for managing the corporation by signing a contract and the managers are expected to act in the best interest of the principles (Jensen and Meckling, 1976). But both the principals and agents are rational, opportunistic individuals trying to maximise their personal utilities (Eisenhardt, 1989; Jensen and Meckling, 1976; Davis *et al.*, 1997). There may be a clash of interests and utility choices between the principals and the agents if the agents try to maximise their own utility which may diverge from the principals' utilities. Agency theory has been used to analyse government-university relationship and university governance (Kivisto, 2005; Lane, 2007; Lane and Kivisto, 2008). In case of internal governance inside a particular institution, agency theory can be used to understand the relationship between the Board of Governors and teaching/non-teaching staff where the former can be imagined as the principals and the latter as the agents.

(d) Stewardship theory

Contrary to the Agency theory, Stewardship theory considers the agents as good stewards who perform at the best interest of their institution (Donaldson and Davis, 1991). Academic institutions which are public, philanthropic and non-for profit may function for the sole purpose of serving the society and there the executives/managers can play the role of good stewards. An academic institution's principal, or the faculty members can strive for achieving the prestige and fulfilling the institutional mission and objectives being guided by their own conscience. Role of academic leadership in the higher educational institutions can be explained through this framework.

(e) Stakeholder theory

This theory assumes that the external stakeholders (in case of education, parents, civil society, private organisations, etcetera) play an important role in governance of academic institutions and their views/opinions can influence the internal decision-making process. The involvement with stakeholders shapes the way an institution is responding to the larger society (Jongbloed *et al*, 2008). The Board of Governors, the principal, teachers and the students of an academic institution may have to communicate or negotiate with the external stakeholders for seeking legitimacy from it. It is argued that the role of external stakeholders is increasingly gaining importance and academic governance is becoming more stakeholder-driven in terms of the institutions' economic actions and societal obligations (Amaral and Magalhaes, 2002).

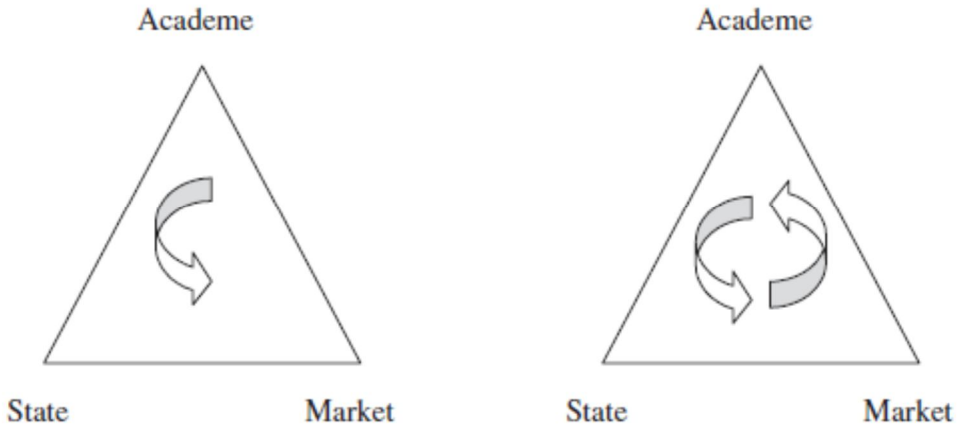
Though the two theories mostly used in analysing governance in higher educational institutions are stewardship theory and agency theory, but there is a need to combine other theories as well in order to complement each other and to capture the different dimensions of academic governance. Stewardship theory is based on trust and commitment of academic institutions, whereas agency theory talks about self-interest driven individuals busy in utility maximising, and these can explain governance in higher educational institutions in opposite (sometimes complementing) ways. But unless the external environmental influences constantly occurring between an institution and its external environment are taken into account, the story will not be complete (Christopher, 2010). The social, legal, political and economic contexts have to be juxtaposed on the internal governance mechanism and then one would be able to understand the relationships, interactions between the former and the latter and the influences on each other.

2.4.2 External governance: State-institution interaction

Public higher educational institutions are directly controlled by the state. The private ones do enjoy a greater degree of freedom, but they may have to abide by the rules laid down by the regulatory authority in some countries. Button Clark's "Triangle of Co-ordination" consists of three key elements- the state, the market and the academic oligarchy (1983) (Figure 3.1). Pussar (2008) argued that the state actually represents an administrative, legal, bureaucratic and coercive system which structures the relationships between the

institutions and civil society. In case of a weak state, market may dominate over state, but the forces can be countered if the academic oligarchy is powerful enough. Though the public higher educational institutions are under the purview of the state, its academic oligarchy can be autonomous enough to raise their voice regarding any coercive acts taken by the state. The relative degree of power and authority of these three elements may vary from time to time depending on the political economy of the nation-states (Austin and Jones, 2015). In lieu of the recent trends in the higher education sectors worldwide, the states have been observed to be adopting the role of a facilitator to ensure growth and development of the higher education market (Breneman, Pussar and Turner, 2006; Pussar, 2008). Jongbloed (2003) has argued there can be continuous changes in the roles of and relationships among these three elements depending on the political economy of the nation-state. He has depicted the new roles of the government as the facilitator of market-economy in the right-hand triangle of Figure 3.1.

Figure 2.1: The ever-changing role of the state

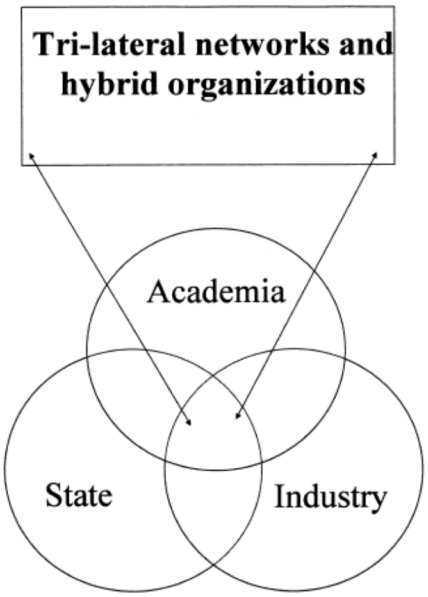


Source: Jongbloed (2003), pp. 132

The Triple Helix Model of government-university-industry thesis emphasizes on the role of universities/higher educational institutions in innovation and knowledge generation and contributing to national development (Etzkowitz and Leydesdorff, 2000). The higher educational institutions transfer knowledge to the industry which enables economic development of the nation-states. There can be three categories depending on the

relations between state, academic institutes and the industry (Etzkowitz and Leydesdorff, 2000). In the first case, both academia and industry can be subsumed under the nation-state. In the second case, all three elements of Triple Helix Model, state, academia and industry retain their own boundaries but are related to each other. This is kind of a lasses-faire model. The third category consists of a tri-lateral network with overlapping elements among academia, industry and state (Figure 2.2). The government may try to create an environment where the higher educational institutions can share innovative ideas and knowledge with the firms and take part in knowledge-driven economic development of the nation. Here, the state may not directly control the higher educational institutions but may create conditions which would re-shape the behavior of these institutions.

Figure 2.2: Model 3- The Triple-Helix of University-Industry-Government Relations



Source: Etzkowitz and Leydesdorff (2000), pp. 111.

The third case is more applicable in today's world where the different zones of intersection reflect interesting features of the interactions among the three elements in this model. The central zone of intersection, where all three elements are interacting with

each other, presents the hybrid model where the public institutions can be asked by the state to compete in the market for students and to get funding from the industry[20].

In the context of the emerging forms of relationships among the state, institute and the market, the following section discusses the neo-liberal reforms through which are advocated for improving qualiy in higher education.

2.5 The Neo-liberal reforms for quality improvement

After discussing the theoretical structure of "quality" in education, this section discusses the recent measures being adopted by the national and global higher education systems in order to to improve quality in the sector. There are mainly two types of interventions both of which can fall undee the e neo-liberal discourse of poly-reform. In the context of policy-reforms in higher education, the ideology of neo-liberalism has mainly ventured at two levels; the first one is the "New Public Management (NPM)" and the second is the "Neo-liberal Market Model (NLMM)" (Marginson, 2013). Both of these levels are inter-connected with an agenda of reforming the sector and the later is a larger framework whithin which the former is a subset. The first one, the NPM which intervenes at the institutional level, has been termed as a "hybrid set of organisational practices" by Simon Marginson (2013). He explained that, though the NPM believes in the 'virtues of competition', but this competition is not based on any demand-supply interactions, rather it is more like a system of regulation and competition. Accroding to the idea of NPM, the public institutions are supposed to operate like the corporate entities, compete for funds, recruit entrepreneurial managers, enhance the auditing and accountability system, evaluates quality of the outputs and held the staff responsible for the outcomes (Marginson, 2009). The NPM relies heavily on the quantification of outputs which is rooted in the Input-Output analysis of educational production discussed earlier (Marginson, 1997). Basically it is trying to reform the governance structure inside the institutions so that the institutions become economically efficient. It has also replaced "trust" in the HEIs by introducing the systems of contracts, monitoring and surveillance (Chattopadhyay, 2016). The new system has laid excessive focus on "strategic planning,

[20] There may be various types of hybrid models.

performance indicators, quality assurance measures and academic audits" as noted by Olssen and Peters (2005). The concept of "performativity" has assumed the central space in the governance of educational institutions. Stephen Ball (2000) explains the concept of "performativity" as a "*technology, a culture and a mode of regulation, or a system of 'terror'..... that employs judgments, comparisons and displays as means of control, attrition and change"* (pp.1). Following the global pattern, the recent policy reforms in Indian higher education also show a trend where the state has framed new regulatory policies to reform the public institutions and tried to create a market to infuse efficiency among the HEIs. The PBAS-API scheme, as discussed earlier, is an attempt to re-structure the governance in the public HEIs by infusing the neo-liberal ethos of competition (Das and Chattopadhyay, 2014).

On the other hand, the NLMM aims at creating a market where the private and public providers would produce higher education like any other commodities in the market without facing any direct intervention from the state, except the indirect control practised through NPM (Marginson, 2013). In the context of Indian higher education, Chattopadhyay (2015) has argued, these neo-liberal reforms aim at achieving technical and allocative efficiency by targeting the very orgainisational structure of the institutions and creating a market for higher education. The next section discusses the nature of market and and its role on improvement of quality of higher education.

2.6 Market of higher education and quality

2.6.1 Higher education as a quasi-public good

A perfectly competitive mark*et al*locates goods and services in an efficient way according to the preferences of the buyers and sellers at a price which equals demand and supply. Firms maximise their output given cost or minimise the input-cost given output to achieve productive efficiency. In a perfectly competitive market with homogeneity of products, availability of full information, presence of finitely uncountable number of buyers and sellers, the problem of quality is assumed away. But the market of higher education is imperfect due to various reasons. In the market of higher education, the

service provided is not of homogeneous quality. The quality of education varies across different institutions and there is information asymmetry regarding the quality of the service (Cave, 1994; Teixeira *et al.*, 2004). Higher education is also characterised as an "experience good" and it is extremely difficult to judge the quality of the education provided in a university (Majumdar, 1983, McPherson and Winston, 1993)[21]. In short, the problem of information asymmetry or imperfect information is inevitable in the market of higher education (Stiglitz, 2000; Dill and Soo, 2004). As a consequence, the price-mechanism fails to perform the dual role of indicating the quality of goods as well as equating demand and supply. The fear of adverse selection and moral hazards further threaten the efficiency of the market mechanism. Higher education is associated with immense positive externalities accruing to the society. In spite of having fully private universities and self-financed courses in public universities, still the degrees cannot be bought but have to be earned by the students by proving their eligibility. The service has to be jointly produced by the stusdents and the teachers. Especially in a developing nation, ensuring access to all eligible students coming from diverse socio-economic background is a major policy goal which calls for government intervention and subsidies. Because of all of these, higher education is generally characterised as a "quasi-public good" and the market is called "quasi-market" (Teixeira *et al*, 2004; Chattopadhyay 2007)

2.6.2 The objective function of the higher educational institutions

Following the constitutional requirements, the market for higher education in India is a not-for-profit sector where the providers can generate "reasonable surplus" but not profit. In fact most of the leadng HEIs in the world operate in order to maximise higher their prestige (Bok, 2003). The diversion from profit-making has made the role of the institutional objective functions very crucial in explaining behavior and strategies. Marginson (2004) argues that universities compete for achieving a social status and terms the competition in higher education market a "status competition". Higher educational institutions are more interested in achieving a certain status for their institutions and they

[21] Even the student himself may not be in a position to judge what he/she has learnt just after completing the course.

are motivated by “pursuit of excellence” (Clotfelter, 1996) or “prestige maximisation” (James, 1990). In case of higher education, most of the reputed HEIs are non-for profit organisations. Massy (2004) listed some of key diffeences between the non-for profit and the for-profit organisations. These are: the non-for profit orgnisations generally produces “social goods” whose quality is extremely difficult to evaluate. The consumers have no other option but to impose trust on the providers regarding the quality issue. The non-for profits may not recover the full cost of and hence they are provided with a subsidy. The differences in the objective functions of the HEIs thus make a huge difference in the ways the function.

2.6.3 Selection competition

In the production function of other good, the quality of inputs is homogeneous. But since the higher educational institutions deal with human beings, the ability to produce quality output depends largely on the quality of its inputs i.e. students, and teachers in this case (Woodhall and Blaug, 1965). Therefore, it is obvious that higher educational institutions will try to get hold of the best students and teachers available in the market through offering scholarships to students or attractive remuneration to the teachers. Winston (1999) explains why better endowed universities are more selective. In order to attract best quality students with higher international test scores and better academic records, they offer high scholarships to reduce the net cost of education for the student. Same can be said in case of teachers also, as better endowed universities will offer higher remuneration and facilities to their faculty members and attract the best in the field. Also the students and the teachers can as well select the “best” institutions depending on their priorities. As a consequence, better students and better teachers are found in better institutes which produce better quality. That is why students’ entry-level test scores are bound to be high in all reputed HEIs (Dill and Soo, 2003). This also creates a “peer effect”, an important input which helps in co-production of knowledge (Rothschild and White, 1995). This type of competition is termed as Selection-based Competition or S-Competition (Glennerster, 1991). Of course, better-endowed universities are expected to win in this type of competition and maintain their standards. Thus, the market of higher education becomes hierarchical in nature.

2.6.4 Positional goods and positional competition in education

Simon Marginson (1995) argues that there are many "positional goods" associated with this kind of competition in higher education. For example, places in education are positional goods as seats in a top ranked higher educational institution give higher "relative advantage" to the degree-holders in comparison to others having a degree from a mediocre or poorly branded higher educational institution. Some "positional goods" are consumption benefits, but most are investment goods[22]. The credentials of the degree, which are used for getting a job in the labour market or for securing a place in further education, vary widely depending on the brands of the institutions. The "positional goods" in general have three interesting characteristics (Marginson, 1995). First, at a given level of value, the number of "positional goods" cannot be expanded infinitely as there is a limit on the number. Second, production of positional goods is based on "hierarchy and scarcity of outputs". Having a competitive market of higher education where the customers (parents or students) can choose among a wide range competing institutions is a necessary condition for creating "positional goods". The third point about positional goods in specific to education and Marginson (1995) argued that these are generally produced under simple commodity production, not under fully capitalist production. The competition in higher education market is hierarchical, and this hierarchy is the main reason behind positional competition in higher education. There is a vertical differentiation among higher educational institutions which determine the relative "social position" attached to the students graduating from these institutions.

2.7 Strategies of competition

The external environment of the institutions has been defined as a space mainly consisting of the state, providers of higher education, industrial partners and the external stakeholders. Due to the changes in the external environment, new challenges may emerge over time in front of the institutions. For example, the state may impose new regulatory requirements, or the competitor may start offering a new course. Since the

[22] Parents can get consumption benefits in terms of social prestige by admitting their wards in an elite top-branded school. Investment goods are created when someone is investing for studying in a top-ranked college in order to gain a relative advantage in the labour market.

extremely crucial inputs (the students and the teachers) are active in decision -making, the public and private providers have to compete with each other in order to improve or sustain their position in the market. Failing to do so, the students and teachers would start preferring the other institutions over it. At a fixed point of time, the inputs are given, and the nature of governance mechanism is also given. These cannot be changed within a short span of time, say, within an academic year. But the outputs of research and teaching determine the change in the stock of reputation which give signals to the potential students and teachers in the next year. The changes in the style of internal governance may also be bought in to follow the "performative" agenda to commensurate with the strategies. To tackle the continuous challenges posed by the external environment, institutions need strategic planning (Kotler and Murphy, 1981). To understand the dynamics of competition in a regulated market, the strategies have to be investigated in details. Brewer *et al.* (2009) follow an industry-study framework to study strategies in the US market of higher education. Strategies of research universities have been studied by Noll (1988) and Feller (1996). Zemsky *et al.* (1997) investigated the strategies regarding selection of students. There are some studies on game theoretic approaches to study the strategies of educational institutes (Carmichael, 1988; Masten, 1995; Toma, 1986).

Before analysing the strategies, one important aspect about the nature of the objective function of these institutions needs to be discussed. In India, the educational institutes are legally bound to be not-for-profit. The surplus, if so generated, cannot be distributed among the shareholders but has to be re-invested for the development of the institution. In fact, many of the renowned educational institutes in the world are actually guided by not-for-profit agenda. Instead of profits, these institutions are assumed to be guided by the prestige maximising objectives (James, 1990; Clotfelter, 1996). The willingness to adopt competitive strategies to cope with the challenges faced with in the external environment may depend on the objective functions of the institutions. But since implementing the strategies needs adequate financial capital to invest, the ability to succeed in the competition is also dependent on the initial endowment and mode of funding in the institutions. The next section discusses the role of funding in delivering quality service in higher educational institutes.

2.8 Role of funding and quality in higher education

Simon Marginson has discussed two ways of defining public-private divide in higher education (2007b). The first one refers to Samuelson's definition of public goods (1954). According to him, good or services which are non-rival in consumption and non-excludable in nature are public goods. Goods which do not have any of these properties are classified as fully private goods. As public and partially public goods are under-provided in the market which is an outcome of market-failure, state financing in order to ensure adequate provision of public goods is required. The second type of distinction between public and private comes from juridical notions (Marginson, 2007b). In this sense, if an institution is owned by the state, then it is public. Otherwise it is private. The good, higher education has already been characterised as the 'quasi-public good' in the section on market presented above. Since what is produced in the HEIs is a blend of two dimensions, publicness and privateness, in this study the focus is on the institutions and the institutions are called public/private based on their ownership and funding[23]. In other terms, the institutions are called "public" if they are owned and funded by the government and termed as "private" if they are owned by the private bodies and receive funding from the market.

To understand the role of funding in determining the quality of higher education, the various modes through which institutions are funded need to be explored. Jongbloed (2007) has given a framework for understanding the impacts of sources and methods of funding on the governance mechanisms. The two questions guiding the explanation, as presented by Jongbloed (2007, pp. 122) are:

(i) What is funded by the government?

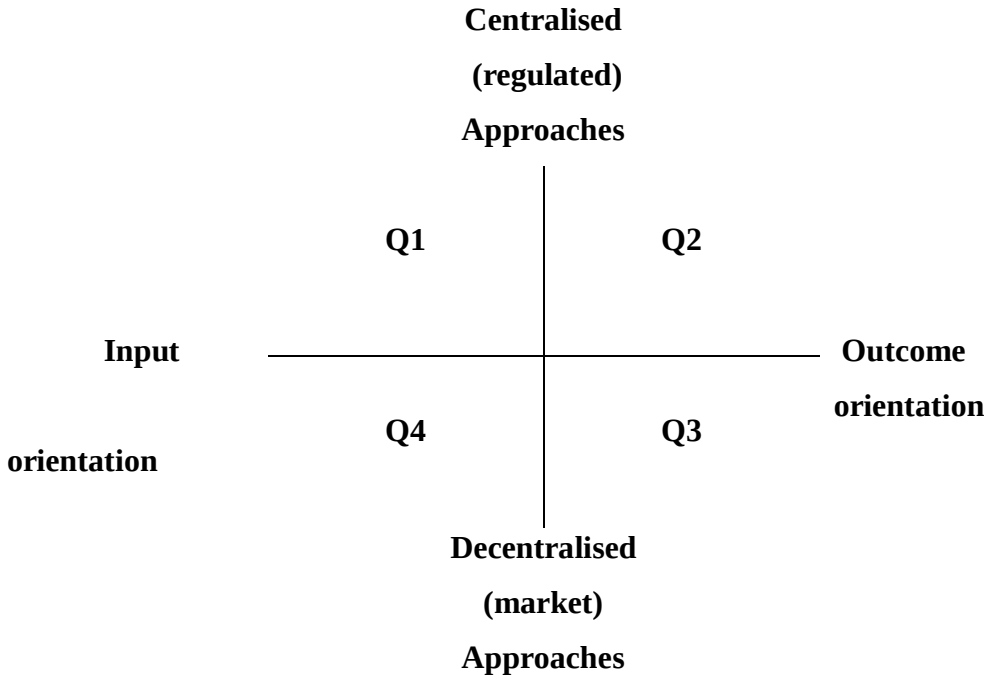
(ii) How is it funded?

The first question deals with the issue of funding inputs versus outputs and performances in the higher educational institutions. In other words, the first question looks into the "degree of output orientation" in the funding process. Input-centric funding means public

[23] The hybrid types of institutions where the different types of bodies are responsible for funding and management are kept outside the main focus of the study.

funding is available to cover the salaries of teaching and non-teaching staff, infrastructural costs and some operational costs. The amount of funding may be calculated on the basis of total number of students enrolled in a higher educational institution. On the other hand, output-centric funding is attached to the performance of the higher educational institutions where performance is measured on the basis of certain parameters like number of papers published by the teachers and the citations, number of students placed in campus recruitments, number of research projects completed etcetera. The second question is related to "the degree of market orientation" in funding mechanisms. Answers to the second question are also related to the factors like whether higher educational institutions are competing for funds, or they have the freedom to determine their fees, other charges and the methods of selection of students. The figure presented below depicts a matrix where degree of centralisation or decentralisation is measure vertically and the degree of output or input centrism is measured horizontally. There are four quadrants, Q1, Q2, Q3 and Q4.

Figure 2.3: Funding systems



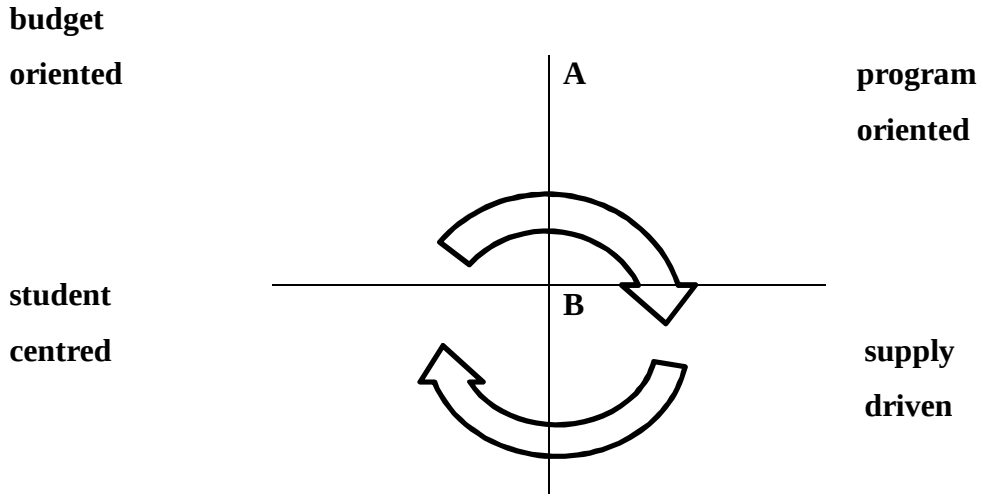
Source: Jongbloed (2007, pp. 123)

Q1 represents a system where degree of centralisation is high, and the funding is input-based. Q2 is also high on the degree of centralisation but the funding is based on outcomes, or performances. Q3 is a market oriented system where the higher educational institutions compete for funds and the basis of funding is the outcomes or the performances. Q4 represents a system which is decentralised (market oriented) but the funding is input-based. The designing of the voucher system where students with vouchers can choose any institution and the funding is directly provided to the institution can decide the degree of output orientation and centralisation of the higher educational institutions belonging to Q3 and Q4.

The higher educational institutions belonging to the Q1, do not have much tension about the funding as it follows a traditional method of budgeting where the actual allocations will be determined by the government on the basis of the Higher educational institutions' plans and requirements irrespective of their performances. On the contrary, the higher educational institutions belonging to the Q2 and Q3 have to be very serious about their performances as the funding is now based on the outcomes. In fact, even in Q4, the higher educational institutions have to care for their performances as here the consumers (students) have the power to choose the provider and being rational individuals, a student would choose the best institution given his/her eligibility[24]. Therefore, for the higher educational institutions in Q2, Q3 and Q4, it is quite obvious that the goal of their internal governance would be designed in such a way that it would help them achieving more outcomes which could be measured by the standard parameters[25]. This obsession with 'performance' can penetrate through all the layers of internal governance and shape their process of turning inputs into outputs.

[24] It is also assumed by the advocates of voucher system that students have full information about the service quality.
[25] Parameters are already discussed in the section on quality measurement.

Figure 2.4 Trends in funding mechanisms



Source: Jongbloed (2007), pp. 126

During the last few years, the changes in the policy-making showed a shift in the funding mechanism from budget-oriented funding to performance-based competitive fundimg (Jongbloed, 2007). This shift to performance-centric compettive funding made the HEIs more concerned about their performance. This also ushered in a change in the governance-structure which is mainly based on the idea of "performativity" and closely aligned to "audit culture" with emphasis on economic efficiency and cost effectiveness. When the economic concept of "output-orientation' of funding is assimilated by the owners/managers through the everyday practices inside the institutions the new norms are created keeping "performance" at the central space, it gives rise to a culture called 'performativity' as defined by Ball (2000). In simpler terms, it is expected that such higher educational institutions would monitor each and every activity of its staff and students to reduce the cost-inefficiencies and incentivize them for being more productive and performing better. Achieving higher ranks in university league tables would be one of the main missions of such higher educational institutions. The promotions, salaries, and the job-tenure of the staffs may be related to their performances, and failing to perform would lead to the termination of contracts. On the other hand, higher educational institutions belonging to Q1, which receives centralised input based funding, are expected

to be less “performative” and more concerned about traditional roles of higher education, such as giving access to students coming from diverse socio-economic background, serving the society, sharing research outcomes with local artisans in order to develop the local economy, etcetera. Their governance mechanisms would reflect more of faculty autonomy and less of managerial hegemony. The question of accountability would be handled differently by these two types of institutions which in turn would impact the governance mechanisms.

2.9 Gaps in the literature

The literature of Economics of Education focusing on the role of education on the productivity of individuals and its impact on economic growth and development of the nations has mostly ignored the qualitative differences among the various education systems in the world except a few ones (Hanushek, 2003; Pritchet, 2001). These studies consider education containing a homogeneous quality, and try to estimate its impact on growth and development across countries without understanding the fundamental differences in the education system across the nations. The much-talked-about human capital theory mainly focuses on the impact of years of schooling on individuals’ productivity and earning and overlooks the qualitative differences of the education provided in different institutions. The theoretical papers on EPF (Bowles, 1970; Hanushek, 1986) focused extensively on efficiency and productivity assuming a fixed technology for all the educational production in the institutes. This is not tenable as the process of input conversion varies across institutions depending on various factors (Chattopadhyay and Pathak, 2016). Without the presence of a fixed technology, the notion of efficiency does not seem much meaningful (Majumdar, 1983). The studies on estimating efficiency among public and private institutions, like the studies on DEA model, undermined the very nature of the good called higher education and the process of delivery.

On the other hand, the studies on internal management of educational institutions treat higher educational institutions like any other corporate institutions and review the system from the angle of employer-employee relationship. They focus on the marketing

strategies of the corporations but fail to link the problems to the unique features of this particular service and the market.

The scholars (Winston, 1999; Glennerster, 1991; Marginson 1995, and many more) have explained the competition in higher education is based on selection of inputs and the uniqueness of the nature of competition. The target of achieving "efficiency" has been critically examined by various scholars with a focus on the cost of operations, but they have not focused much on the relationships among various internal stakeholders who determine the internal governance process.

On the other way, there has been a wide debate on public and private divide in higher education. The role of state versus that of market has been discussed extensively but so far the role of mode of funding on quality has not been examined much. Jongbloed (2003) has explained the mode of funding in terms of degree of centralisation and the input-output orientation, but did not link it to the determination of quality of the service delivered in these institutions. The role of funding on determining quality assumes greater importance in countries like India where the applicability of regulations on the HEIs depends largely on their mode of funding and ownership. The selection of inputs and the ability to make strategies discussed above are also dependent on the mode of funding. There is a need to study these aspects with reference to India.

The literature on poor quality of Indian higher education mainly talked about the failure and gaps of the existing regulatory system. These studies have focused mostly on the elite institutions like Indian Institute of Technology and did not look into the details of their complex interactions between the state, market and institutions.

After reviewing the relevant literature on the identified problem, it was felt that there is a need to combine these theoretical structures together to understand the problem in totality. For analysing the factors determing the quality of education produced in the HEIs, there is a need to look at the role of inputs, the process thrugh which these inputs get converted into the outputs and the competitive strategies of the HEIs in anregulated market. Based on this understanding, the research objectives and questions have been formulated.

2.10 Research objectives and research questions

- **Research objective 1**

R.O.1 To understand the role of inputs (students, teachers, infrastructure) in determining performances in the colleges categorised by different type of funding and reputation?

- **Research questions**

R.Q.1.1 How do the quality of inputs vary across the mode of funding and reputation of the colleges?

R.Q.1.2 What are the factors determining the employability (in campus placement drives) in the colleges categorised by different type of funding and reputation?

R.Q.1.3 What are the factors determining the differences in academic performance of the students of the colleges categorised by different type of funding and reputation?

- **Research objective 2**

R.O.2 To examine the role of internal governance mechanism in determining the performances of public and private colleges?

- **Research questions**

R.Q.2.1 How and why do the internal governance mechanisms vary across the mode of funding and reputation of the colleges?

R.Q.2.2 How and why do the role of the internal stakeholders vary across the colleges categorised by different types of funding and reputation?

R.Q.2.3 How and why do the relationships among the internal stakeholders vary across the mode of funding and reputation of the colleges?

- **Research objective 3**

R.O.3 To understand the role of competitive strategies in the structure of a regulated market in improving the performances of institutions categorised by different type of funding and reputation?

- **Research questions**

R.Q.3.1 What are the features of the market of engineering education in West Bengal?

R.Q.3.2 What are the structure, role and scope of regulatory mechanism in this market?

R.Q.3.3 How do the providers strategize to compete with each other?

The search for answers to these research questions has to be guided by a theoretical framework. With the help of the survey of literature discussed above, I have tried to conceptualise a theoretical framework of the analysis.

2.11 The theoretical framework of the study

Based on the survey of literature presented above, the theoretical framework of this study has been conceived in the following way:

(i) The quality of inputs plays the most important role in determining quality of education. The main two inputs are the students and the teachers who are active in decision-making. Thus, the production system in higher education is mainly driven by the input-based technology.

(ii) The role of funding and its influence on the functioning is determined mainly by the mode of funding. The degree of input-output orientation for allocating the funding, and the degree of competition in getting the funds, both of these determine the way an institution actually functions. The objectives of an institution (prestige maximisation or profit maximisation) also guide the functioning.

(iii) The degree of compulsion with which the government regulations are applicable on different institutions depending on their mode of funding, also determines the opertions of the institutions. The features of the regulatory

structure (for example, admission and recruitment policies) can also shape the input-selection process.

(iv) The structure of the market (for example, the number of providers) and the "freedoms" enjoyed by the consumers and producers can shape the nature of competition in this market.

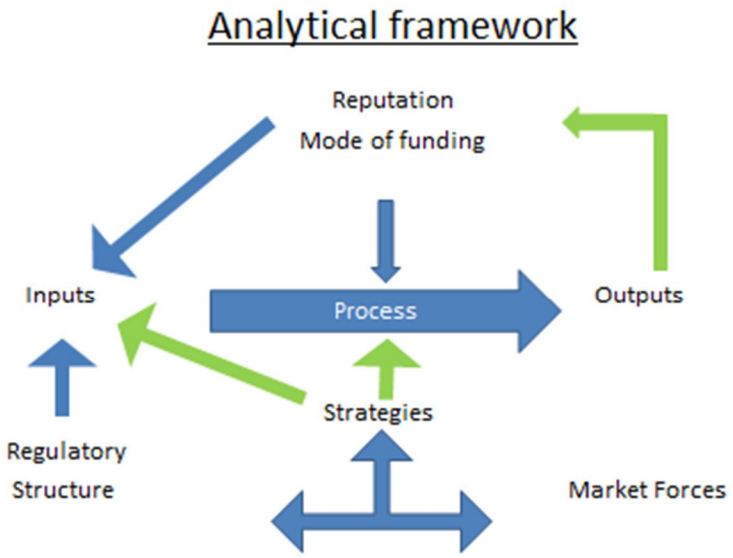
(v) In higher education, the students are both the inputs and outputs. Given outputs, the process of converting an input into output gets reflected through the internal governance processes in the institutions. There cannot be a particular or a fixed type of technology associated with the conversion process.

(vi) The nature of process in higher educational institutions depends on the mode of funding/management and their objectives.

(vii) Given the inputs and the nature of the governance in a short period, the institutions strategize to increase its reputation and prestige in the long run. The ability to make strategies is determined by the mode of funding, reputation and the objective functions of the higher educational institutions.

(viii) The external factors like the regulatory structure and features of the market influence the process in an independent, and/or interdependent ways. All these together determine the quality of outputs in the higher educational institutions.

The analytical framework is present in Figure 2.5.



2.12 Definitions of terms and concepts used in this study

This section presents the definitions of some of the terms and concepts and clarifies the context in which they are defined. Henceforth, these terms will be used to convey the particular meanings in this study.

2.10.1 Public and private

In this study, institutions are termed as public and private depending on their mode of funding. The institutions which are funded, managed, and owned by the government have been referred to as public institutions. The institutions which are self-financed, and managed and owned by the private bodies have been referred to as private institutions.

2.10.2 Reputation and prestige

Reputation is a function of relative position of the institution in the market. It is used to give "non-price signals" to the stakeholders (Brewer *et al.*, 2009). Prestige is similar to the self-esteem of the institutions, and this based on intrinsic motivation.

2.10.3 Outputs of the institutions

Outputs refer to the academic performance and placement of students and research publications and research projects completed. Academic performance means the average CGPA obtained by students in university examinations. Employability refers to the chance of being recruited by the employers in the campus-interviews.

2.10.4 Inputs

Inputs refer to ability of the students, qualification of the teachers and infrastructural facilities.

2.10.5 Process of conversion

The process means the way inputs are converted into outputs, which is generally referred to as the technology in EPF. The features of this process are assumed to be reflected through the internal governance mechanism of the institutions.

2.10.6 Governance – internal and external

The term governance refers to the organisational structure and the roles and relationships among different structural bodies of the institutions. Internal stakeholders are the students, staff, teachers, administrative officers, principal, director, Board of Governors, Board of Trustees. Externals are the government authorities, university, industrial partners, and other providers in the market.

The next chapter will discuss the research methodology adopted to fulfill the objectives of the study and to answer the research questions mentioned above.

Chapter 3: Research methodology and a brief description of the sample

3.1 Introduction

The previous chapter presented a brief review of literature and the gaps in the literature from which the research objectives and the research questions have emerged. This chapter discusses the methodology adopted in this study to fulfill the research objectives. In the next section, an effort has been made to situate the study among some of the major paradigms of scientific research. Section 3 explains the type of methodology needed for pursuing this research. The research design, tools of data collection and mode of analysis are discussed in Section 4 and 5. Then, some of the sample characteristics and a brief description of the field are provided in Section 6.

3.2 Situating the study among various research paradigms

Designing a study has to go through the process of seeking answers to some of the basic questions regarding the four main sets of assumptions related to ontology, epistemology, human nature and methodology (Burrell and Morgan, 1979). Following Crotty (1998), I have listed four such questions are listed below:

What epistemological assumptions have informed this particular research problem? What theoretical perspectives have driven the methodology for asking these research questions? What methodological assumptions have guided the particular choice of methods? And, finally, what methods should I use?

Hitchcock and Hughes (1995) suggested that ontological assumptions should lead to epistemological assumptions, which, in turn, would guide the methodological

considerations, which, again in turn, will determine the tools and techniques of data collection. Following this sequence I will make an effort to situate the present study in this framework by explaining each sets of assumptions related to ontology, epistemology, methodology and methods. These sets of assumptions which shape the way we view and interpret the social realities are referred to as the research paradigms in scientific research. In other words, paradigms are like the nets that contain the researchers' epistemological, ontological, and methodological assumptions or premises (Denzin and Lincoln, 2005).

3.2.1 Ontological assumptions

These assumptions are related to the very nature of the social phenomenon which is being studied. On one hand, nominalists view the social reality as a product of individual consciousness and cognition. They think there are no universal meanings attached to any objects of thought as the world is created by our own minds (Cohen *et al.,* 2007). On the other hand, the realists believe that the social reality is external to the individuals and objective in nature. Objects do have their independent existence and there can be universal meanings free from the knowers' perspectives. In this study, I would like to assume the realist assumptions that social reality can be of objective nature, independent of individuals' own consciousness. For example, for interrogating students' 'priority' of a particular stream over college, I assumed the term 'priority' has a universal meaning which does not vary from student to student. Similarly, I assume the terms like 'institution' or 'market' have specific meanings in case of examining the relationships between the two. Also, this study assumes that the particular social phenomenon of poor quality in technical education is not constructed by individuals' own minds; rather it has an independent existence as it is evident by the numbers and statistics produced by the reports.

3.2.2 Epistemological assumptions

These assumptions are related to the question of how knowledge can be acquired. If the researchers believe knowledge is hard and objective, then they assume the role of the observers. This is the positivist approach to uncover the social reality. On the other hand, if one sees knowledge as personal and subjective, then he/she has to get involved with the subjects to understand the reality (Cohen *et al.*, 2007). The researcher, in this study, has assumed the role of the observer without getting involved in the process of teaching-learning in the institutions. Positivist paradigm believes that by applying the methodologies of natural science, absolute truth can be revealed. Post-positivism toned down this claim by accepting the fact that truth can be uncovered only in a probabilistic way instead of an absolute way (Baronov, 2004). Following this paradigm, this study also assumes that an absolute truth may not be attainable in this case. But an attention should be paid for making 'pure, untainted' observations in order to increase the degree of probability associated with the truth about the social reality of poor quality in Indian higher education system.

3.2.3 Assumptions about human nature

This is about assuming the nature of relationships among the individuals and their environment. There can be a deterministic relationship between the two where the individuals respond deterministically and mechanically being controlled by the environment (Cohen *et al.,* 2007). On the other hand, the individuals can create their own environments by their own actions in voluntary ways. The first concept is termed as 'determinism' while the second one is called 'voluntarism'. In this study, both the types of assumptions are applicable in respect to different research questions. For example, I assume that during the counseling for selecting the college, a student would select that institution which has highest rank/reputation given his/her eligibility to pay the fees. I assume all the students are the rational decision-makers who behave in this particular way to maximise their utilities by getting admitted in the best possible college given the fee-structure. This is a kind of deterministic behavior I have assumed. On the other hand, after admission, when a group of students are located within a specific type of academic environment of their college, there may be variations in group behavior depending on the

type of academic environment. In other words, the behavior of a group of students in college A may not be similar to the behavior of another group of students in college B. Students and teachers in college A and B may face similar external and internal environment (determined by institutional objectives, mode of funding, regulatory structure, etcetera) but may act differently depending on their goals and priorities in lives.

3.2.4 Methodological considerations

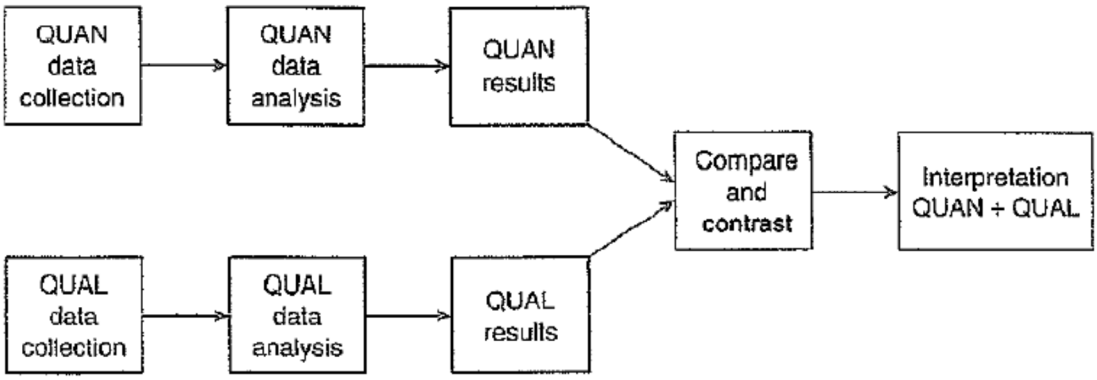
Generally those who assume a positivist and objectivist approach towards social reality, and think that social world is 'hard, real and external', adopt such methodologies which help them to search for universal laws which can explain and govern the phenomena being investigated (Burrell and Morgan, 1979). This approach is referred to as nomothetic, and researchers guided by this approach generally choose quantitative research methods. On the other hand, if the researchers feel that the social reality is understood through the personal and subjective views and experiences of the individuals, they try to focus on the particular individual cases instead of searching for general or universal rules (Cohen *et al.*, 2007). This approach is referred to as ideographic, and researchers guided by this approach generally choose qualitative research methods. This study has ten research questions pertaining to three main research objectives as already stated in Chapter 2. Some of these research questions are looking for answers which need to be generalized in some sense, while the rest of them are trying to understand the uniqueness of a particular case which cannot be generalised. For example, in answering the research question related to identifying the factors determining the performance of 309 students, the findings can be generalised to some extent, though in a limited fashion. On the other hand, when looking at a particular type of institutions to analyse their actions/reactions to the external conditions governed by the regulatory structure and the type of competition in the market, the findings can be unique and specific to the particular type of institutions. Therefore, adhering to a single approach and a single method would not do justice to all the research questions stated earlier. Therefore, a mixed method approach would be adopted in this study.

3.3 A need for the mixed method

As already explained, selecting a research method is based on which particular paradigm one chooses , and what sets of assumptions he/she is considering regarding reality (ontology), knowledge of that reality (epistemology), and the particular ways of knowing that reality (methodology) (Guba, 1990). The quantitative approach is mainly based on positivism, assuming the reality is objective, and independent to the individuals' perceptions. Qualitative approach, on the other hand, assumes the social reality is constructed by the individuals' own minds and can be interpreted differently by each one of them. But, Haase and Myers (1988) argued, as both the methods have the same aim of understanding the social reality, there is no harm in combining both. Clarke and Yaros (1988) also argued that in some cases where the social reality is extremely complex, the role of a single method may have limited scope in investigating the reality. In fact, philosophers have argued that even being guided by the positivist framework, one can adopt qualitative methodologies as there is no binary choice of either-or type (Howe, 1992). Onwuegbuzie and Leech (2004) promoted the case of mixed methods as the 'third research paradigm' which can bridge the 'schism' associated with the quantitative and qualitative research approaches (Johnson and Onwuegbuzie, 2004). Sale, Lohfeld and Brazil (2002) pointed out that any argument made in favour of combining these two types of approaches needs to justify the very reasons for doing so. According to them, there can be two specific reasons: one, to get a complete understanding of the social reality by doing cross-validation or triangulation of one or more theories or sources of data (Denzin, 1970) and two, to get complementarity of the results by using the two methods where the strengths of one method help to overcome the limitation of the other (Morgan, 1998). This study uses the mixed methods for the first reason mainly.

Creswell and Clark (2007) explained four main types of mixed methods design, such as: triangulation design, embedded design, explanatory design and exploratory design. They also discussed the main four variants of the triangulation design, such as, the convergence model, data transformation model, validating quantitative data model and multi-level model. This study, in particular, uses the convergence model of triangulation depicted in the chart below:

Figure 3.1: Convergence model of triangulation used in this study



Source: Creswell and Clark (2007)

In this study, both quantitative and qualitative data on the phenomenon of poor quality in technical education in the state of West Bengal have been collected and analysed separately by quantitative and qualitative modes. Then the results are compared and contrasted to get a complete understanding of this particular topic. Also, the quantitative and qualitative results pertaining to two sets of research questions have been used to corroborate or validate each other to finally achieve at a valid conclusion of the particular social reality investigated in this study.

3.4 Research design and sampling framework

After deciding to locate the study in the state of West Bengal with a focus on the colleges under MAKAUT (as explained in Chapter 1), the population has been defined as the set consisting of all the 75 engineering colleges affiliated to MAKAUT. Initially it was decided that one-fifth of the population, i.e. 15 colleges would be included into the sample. Among these 75 colleges, 69 are self-financed (privately funded and managed) and 6 are funded and managed by the government. According to the population proportion, the ratio of public to private colleges is 1 is to 9 approximately. But in order to include the sources of variations, the proportion of public to private colleges has been

decided as 1 is to 3 (approximately) so that sample would include 4 public colleges and 11 private colleges.

This study aims at exploring the role of mode of funding in determining quality in the said HEIs. Therefore, apart from including the public and the private colleges, there is a need to include a variation in the quality of service provided by the institutions taken in the sample. To add the qualitative differences into the sample, a proportion of "good" and "bad" quality colleges have to been brought in the sample. But there is no full-proof method of judging the quality of service in the HEIs as discussed in the earlier chapter. Using insights from the various definitions of quality discussed in the literature (discussed in Chapter 2), there is no doubt that the actual notion of quality can never be accurately captured by using universal yardsticks for measurements. Rankings and the reports of other EQAs cannot be relied upon because of two reasons, first, they are not mandatory and many of the institutions do not reveal the information. Second, the methodologies of measurement adopted by such agencies are not beyond question. Having understood this fact, initially it was decided to use the outputs (placement and academic grades) to categorize the institutions. But, it was found that only a handful of the institutions actually furnish these information in their websites, brochures, and prospectus. In fact, most of the institutions do not comply with any 'mandatory disclosures' as per the AICTE norms. It was impossible to find information on the performance of majority of the colleges included in the set of population on the basis of secondary sources of information. Finally, the 'preference' of the students in selecting the institutions has been considered as the starting point. The students with their West Bengal Joint Entrance Examination (WBJEE) ranks apply to a few colleges and finally select the preferred institution in the counseling. The lower the rank, the wider is the choices faced by the students. The underlying assumption is the eligible students being the rational decision makers, select the best suitable institution given their eligibility. The selection of the students can be guided by various factors, like the prestige and reputation of the colleges, the fee structure, the location and the distance from the hometown, the placements and the academic performance of the last batch of students, the qualification of the faculty and the infrastructure etcetera. However, this study does not assume anything about the reasons of the preference revealed by the students at the initial stage.

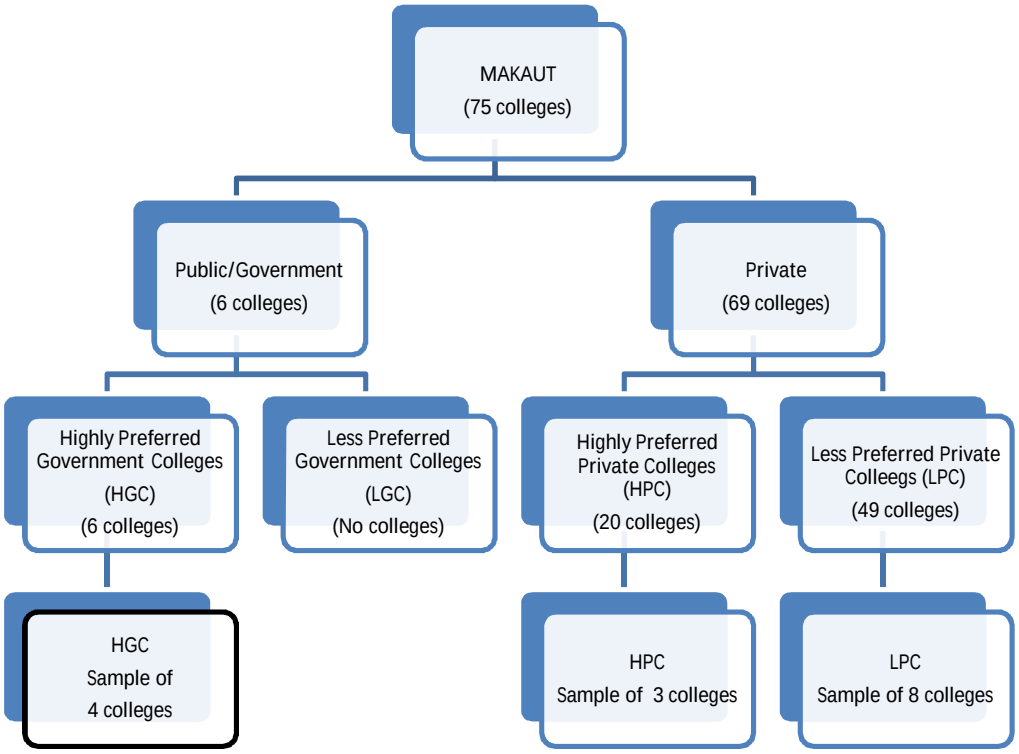
It only uses the students' WBJEE ranks to categorize the colleges. In the literature review presented in the previous chapter, the role of good quality students in determining the quality of education has been already discussed. This has also provided the rationale for the categorization of the institutions on the basis of the WBJEE ranks of the enrolled students in the last academic year. The opening and closing ranks of the students getting admitted in various colleges are published by the WBJEE board in different streams. For comparing the results across the streams, only two streams, Computer Science Engineering (CSE) and Information Technology (IT) have been taken into account. Then, the opening and closing ranks of all the private colleges under MAKAUT in these two streams have been used to generate ranks for all 69 private colleges. The assumption is, the college which gets the students with lower WBJEE ranks is more "preferred" than the others. It must be re-iterated here that the reasons of the students' preference and selection of an institution have not been taken into account at this stage of the study. After ranking the institutions based on their students' opening and closing ranks in the last academic year, it can be assumed that the top ranked colleges are the ones which are most "preferred" by the students. By taking data for three counseling sessions for each year, then calculating average ranks for three years for each stream, an average rank for each of the institutions was ascertained. On the basis of these ranks, these private colleges have been categorised as the "Highly Preferred Private Colleges (HPC)" and the "Less Preferred Private Colleges (LPC)". The first category, HPC includes colleges having ranks in the range of 1 to 20. The colleges with ranks in the range of 21 to 69 are categorised as LPC[26]. The similar exercise has been done for public colleges as well. In this case, the categories have been termed as the "Highly Preferred Government Colleges (HGC)" and the "Less Preferred Government Colleges (LGC)". After doing the categorization, finally it was decided to take 4 out of 6 HGCs, as there is no entry in the LGC category. This is because all the government colleges have the ranks belonging to the range of 1 to 16 among all the colleges.

After deciding the number of representative colleges in each category, the plan was to select a random sample from each of the three categories (HPC, LPC and HGC) keeping

[26] Obviously, the scale is not uniform, because the difference between the colleges having rank 1 and 10 are not the similar in comparison to the colleges having ranks 21 and 31.

the already decided number of public and private colleges (i.e., 4 public and 11 private) in mind. Since, the government colleges do not have any less preferred ones, all the 4 colleges have been selected randomly from the set of 6 HGCs. The 11 private colleges were purposively divided among the HPCs and the LPCs, and 3 from the HPC category (out of 20) and 8 from LPC category (out of 49) have been selected randomly. This was mainly done to keep the diversity within the set of private colleges and to maintain a 50 percent proportion of "Highly Preferred Colleges" to "Less Preferred Colleges" in the entire sample of 15 colleges in total (7 Highly Preferred, 8 Less Preferred). But, in reality, when I approached the institutions for doing the fieldwork during July, 2013 to July, 2014, I was denied permission in three private institutions. Among these three, one is from HPC and other two from LPC. Therefore the final number of colleges ended up as 12 involving 4 in the HGC category, 2 in the HPC category and 6 in the LPC category.

Figure 3.2: Sampling framework



3.5 Tools of data collection and modes of analysis

3.5.1 Primary sources

The analysis is done mainly on the basis of primary data, which have been collected from the field. In each of the 12 colleges, approximately 25 students studying in the eighth semester of CSE/IT course are randomly selected which has totaled up to 309 students in the sample. These students have been interviewed using a structured questionnaire. This data is mainly qualitative in nature and it has been analysed quantitatively, using descriptive and inferential statistical tools.

Apart from this, approximately 10 to 12 students (irrespective of their streams and semester of study) in each of these colleges have been randomly selected for Focus Group Discussions (FGD). In each of these colleges, 3 to 4 teachers were randomly selected for interviewing using an open-ended questionnaire. The total number of teacher-respondents is 45 in this study. The principals or directors in each of these 12 colleges were also interviewed using an open-ended questionnaire.

3.5.2 Secondary sources

For secondary data, college websites containing mandatory disclosures, brochures, minutes of the Governing Body meetings, self-study reports submitted to NAAC and NBA have been considered. The manuals, statutes and annual reports are mainly collected from the college authorities. The notifications and circulars issued by MAKAUT, AICTE, and the Department of Higher and Technical Education, West Bengal, and other policy documents such as RUSA, NEP have been studied. Reports published by MHRD, UGC and other agencies on technical and higher education in India, policy documents and Bills related to quality improvement, articles published in local and national newspapers, etcetera have been considered.

3.5.3 Modes of analysis

The analysis of data collected from primary and secondary sources has been guided by the analytical framework presented in Chapter 2. The data collected through structured questionnaire from 309 students across 12 colleges in the sample have been analysed

quantitatively using descriptive and inferential statistical tools. This analysis tries to answer the first research objective of this study. This approach is guided by the theoretical framework of Input-Output analysis. The data collected through FGDs and interviews using open-ended questionnaire have been analysed qualitatively using the content analysis. This approach has been adopted for answering the second and third research objectives. The theories of academic governance provided a framework under which the analysis for answering the second research objective has been done. For the third research objective, apart from these, case studies have also been done to do an in-depth analysis. This analysis has been guided by the basic principles of market and industry-study framework from the Economics discipline.

Finally, as explained in earlier sections, the quantitative and qualitative results have been compared and contrasted in order to achieve at the final conclusions. The following table presents the research questions, and the relevant approaches for collection and analysis of data pertaining to each of the research questions.

Table 3.1: Mapping Research objectives to method of collection and analyses of data

Research objectives	**Research questions**	**Data needed on**	**Tools of data collection**	**Method of analysis**
R.O.1 What is the contribution of the inputs (students, teachers, and infrastructure) in determining performances in the colleges categorised by different types of funding and reputation?	R.Q.1.1 How does the quality of inputs vary across the mode of funding and reputation of the colleges?	Students' placements, WBJEE rank, score at 12th and 10^{th} grade, CGPA in last semester examination, communication skill, qualification and experience of the teachers, number of books in libraries, number of laboratories, classrooms, availability of hostels, internet connectivity, etcetera.	Structured questionnaire (primary source), annual reports, self-study reports collected from the college (secondary source)	Quantitative analysis using descriptive and inferential statistical tools, guided by Input-Output analysis

Table 3.1: Mapping Research objectives to method of collection and analyses of data				
Research objectives	**Research questions**	**Data needed on**	**Tools of data collection**	**Method of analysis**
(Continued from the last page)	R.Q.1.2 What are the factors determining the employability (in campus placement drives) in the colleges categorised by different type of funding and reputation?	Students' placements, WBJEE rank, score at 12th and 10th grade, CGPA in the last semester examination, communication skill, parental education and income, caste, gender and religion of the students, institutional characteristics like qualification and experience of the teachers, number of books in libraries, number of laboratories, classrooms, availability of hostels, internet connectivity, etcetera.	Structured questionnaire (primary source), annual reports, self-study reports collected from the college (secondary source)	Quantitative analysis using descriptive and inferential statistical tools, guided by Input-Output analysis
	R.Q.1.3 What are the factors determining the differences in academic performance of the students of the colleges categorised by different type of funding and reputation?	Students' placements, WBJEE rank, score at 12th and 10th grade , Marks in the semester examination, communication skill, parental education and income, caste, gender and religion of the students, institutional characteristics	Structured questionnaire (primary source) annual reports, self-study reports collected from the college (secondary source)	Quantitative analysis using descriptive and inferential statistical tools guided by Input-Output analysis

Table 3.1: Mapping Research objectives to method of collection and analyses of data				
Research objectives	**Research questions**	**Data needed on**	**Tools of data collection**	**Method of analysis**
(Continued from the last page)		like qualification and experience of the teachers, number of books in libraries, number of laboratories, classrooms, availability of hostels, internet connectivity etcetera.		
R.O.2 What is the role of internal governance mechanism in determining the performances of public and private colleges?	R.Q.2.1 How and why the governance structures vary across the mode of funding and reputation of the colleges?	Organisational structure, duties and tasks assigned to teaching and non-teaching staff, sanction of leaves and other grants, service conditions, formation of internal committees, grievance redressal mechanism, etcetera.	Interviews with semi-structured/ open-ended questionnaire and FGDs (primary source)	Qualitative analysis using content analysis and guided by the theories of academic governance
(Continued from the last page)	R.Q.2.2 How and why the roles of the internal stakeholders in decision-making vary across the colleges categorised by different type of funding and reputation?	Formation of the Board of Trust and the Board of Governors, qualification and reputation of the members, administrative structure, the recruitment policies, duties and tasks assigned to teaching and non-teaching staff, incentives and punishments, academic freedom of teachers,	Interviews with semi-structured/ open-ended questionnaire and FGDs (primary source)	Qualitative analysis, using content analysis and guided by the theories of academic governance

Table 3.1: Mapping Research objectives to method of collection and analyses of data				
Research objectives	**Research questions**	**Data needed on**	**Tools of data collection**	**Method of analysis**
		sanction of leaves and other grants, service conditions, the scope of raising a protest, frequency of meetings, etcetera.		
(Continued from the last page)	R.Q.2.3 How and why the relationships among the internal stakeholders vary across the mode of funding and reputation of the colleges?	Institutional mission, vision, objectives, formation of the Board of Trust and the Board of Governors, qualification and reputation of the members, administrative structure, the recruitment policies, duties and tasks assigned to teaching and non-teaching staff, incentives and punishments, sanction of leaves and other grants, recruitment policies and service conditions, the scope of raising a protest, frequency of meetings, grievance redressal mechanism, unions of teachers and students, etcetera.	Interviews with semi-structured/ open-ended questionnaire and FGDs (primary source)	Qualitative analysis using content analysis and guided by the theories of academic governance

Table 3.1: Mapping Research objectives to method of collection and analyses of data				
Research objectives	**Research questions**	**Data needed on**	**Tools of data collection**	**Method of analysis**
R.O.3 What is the role of competitive strategies in the regulated market of higher education in improving the performances of institutions categorised by different type of funding and reputation? (Continued from the last page)	R.Q.3.1 What are the features of the market of engineering education in West Bengal?	The number of providers and their profiles, the type of products they offer, fees they charge, rules and regulations imposed by state and central authorities etcetera.,	Interviews with semi-structured/ open-ended questionnaire and FGDs, websites (primary source) Annual reports, self-study reports collected from the college, notifications and circulars issued by MAKAUT, AICTE, and the Department of Higher and Technical Education, West Bengal, UGC, MHRD, etcetera (secondary source)	Qualitative approach, case studies, guided by basic Economics principles and theoretical structure of the market, industry study framework
	R.Q.3.2 What are the structure, role and scope of regulatory mechanism in this market?	Rules and regulations levied by the affiliating university, state and central government, and other accreditation and assessment requirements, etcetera.	Interviews with semi-structured/ open-ended questionnaire and FGDs (primary source) Annual reports, self-study reports collected from the college, notifications and circulars issued by MAKAUT, and the Department of Higher and Technical Education, West Bengal, AICTE,	Qualitative approach, case studies, guided by basic Economics principles and theoretical structure of the regulations, industry study framework

Table 3.1: Mapping Research objectives to method of collection and analyses of data				
Research objectives	**Research questions**	**Data needed on**	**Tools of data collection**	**Method of analysis**
			UGC, MHRD etcetera (secondary source)	
	R.Q.3.3 How do the providers strategize to compete with each other?	Scholarships/fee-waivers given to students, recruitment of teachers, salaries and perks given to teachers, investments in infrastructure, allocation of budgets, MOUs signed with other universities, sponsored research grants fetched, consultancy projects, design of websites and brochures, institutional mission, vision and objectives, students' placements, relationship with industrial partners, etcetera	Interviews with semi-structured/ open-ended questionnaire and FGDs, websites (primary source) Annual reports, self-study reports, annual budget sheets collected from the college (secondary source)	Qualitative approach, case studies, guided by basic Economics principles and theoretical structure of the market and regulations, industry study framework

3.6 A brief description of the sample

Among the 12 colleges included in the sample, 5 are located in the vicinity of the capital city Kolkata, 2 each in the districts of Nadia, Murshidabad and Burdwan, and one in Hooghly. The private institutes are relatively new entrants in the field compared to the public institutions. Apart from offering the B.Tech courses, some of the institutions also offer other courses like M.Tech, MBA, MCA, BBA, BCA, etcetera. The size of the institutions varies with the number of students in the institutions. A brief description of

the colleges is presented in Table 3.2. In these 12 colleges, 309 students have been interviewed in total with a structured questionnaire. The proportion of students belonging to different social categories is presented in Table 3.3.

Table 3.2 A brief description of the colleges included in the sample

Serial number	College Code	Type of funding	Sampling category	Location (District)	Year of establishment	Number of students (total)	Type of courses offered
01	HGC1	Public	Highly preferred	Nadia	1995	1200	B.Tech, M.Tech, MCA
02	HGC2	Public	Highly preferred	North 24 Parganas (Greater Kolkata)	1941	600	B.Tech, M.Tech, Ph.D
03	HGC3	Public	Highly preferred	North 24 Parganas (Greater Kolkata)	1919	520	B.Tech, M.Tech and Certificate course
04	HGC4	Public Private	Highly preferred	Mushidabad	1927	600	B.Tech, M.Tech
05	HPC1	Private	Highly preferred	North 24 Parganas (Greater Kolkata)	1997	1440	B.Tech, M.Tech, BBA, BCA, M.Sc., MBA, PGDM
06	HPC2	Private	Highly preferred	North 24 Parganas (Greater Kolkata)	2001	1200	B.Tech, M.Tech, MCA
07	LPC1	Private	Less preferred	Hooghly	2010	2400	B.Tech and Diploma
08	LCP2	Private	Less preferred	North 24 Parganas (Greater Kolkata)	2009	1200	B.Tech, M.Tech, Diploma
09	LPC3	Private	Less preferred	Burdwan	2003	2000	B.Tech, BCA, BBA
10	LPC4	Private	Less preferred	Burdwan	2002	2400	B.Tech, M.Tech, Diploma, BBA, BCA, BBH(M)
11	LPC5	Private	Less preferred	Murshidabad	1998	800	
12	LPC6	Private	Less preferred	Nadia	2009	720	B.Tech, Diploma

Source: Field survey

Table 3.3 A brief description of the students interviewed with the structured questionnaire (percent in parenthesis)

Serial Number	College code	Number of students	Male	Female	SC	ST	OBC	General
01	HGC1	31	25 (81)	6 (19)	5 (16)	2 (6)	0	24 (77)
02	HGC2	26	22 (85)	4 (15)	4 (15)	2 (7)	3 (12)	17 (66)
03	HGC3	23	19 (83)	4 (17)	7 (30)	2 (9)	0	14 (61)
04	HGC4	22	15 (68)	7 (32)	3(14)	2 (9)	3 (14)	14 (63)
05	HPC1	25	15 (60)	10 (40)	0	0	1(4)	24 (96)
06	HPC2	25	19 (76)	6 (24)	2 (8)	0	0	23 (92)
07	LPC1	22	14 (64)	8 (36)	1 (5)	0	0	21 (95)
08	LPC2	28	19 (68)	9 (32)	4 (14)	0	0	24 (86)
09	LPC3	27	20 (74)	7 (26)	3(11)	0	1 (4)	23 (85)
10	LPC4	20	17 (85)	3 (15)	4 (20)	0	0	16 (80)
11	LPC5	26	17 (65)	9 (35)	1 (4)	1 (4)	3(12)	21 (80)
12	LPC6	24	17 (71)	7 (29)	3 (13)	2 (8)	3 (13)	16 (66)
Total	ALL	309	229 (74)	80 (26)	37 (12)	11 (4)	14 (4)	247 (80)

Source: Field survey.

Table 3.4: A brief description of the respondents (teachers)

Serial number	College Code	Designation		Type of contract			Process of recruitment according to the rules mandated by the		Total
		Assistant Professor	Associate Professor	Permanent	Ad-hoc (semester wise)	Guest (Lecture wise)	Regulatory authorities	College authorities	
01	HGC1	2	2	3	1	0	4	0	4
02	HGC2	2	1	2	1	0	3	0	3
03	HGC3	2	0	2	0	0	2	0	2
04	HGC4	2	2	3	1	0	4	0	4
05	HPC1	3	2	2	2	1	5	0	5
06	HPC2	3	2	1	2	2	5	0	5
07	LPC1	4	0	1	2	1	1	3	4
08	LPC2	3	0	1	0	2	1	2	3
09	LPC3	3	1	1	1	2	2	2	4
10	LPC4	3	0	0	2	1	0	3	3
11	LPC5	3	1	0	2	2	1	3	4
12	LPC6	3	1	1	0	3	1	3	4
Total		33(73 %)	12 (27 %)	17 (38 %)	14 (31%)	14 (31 %)	29 (64 %)	16 (36 %)	45

Table 3.5: List of some of the key variables (students' survey)			
Serial no.	**Name of the variable**	**Label of the variable**	**Type**
1	Marks	Percentage of marks obtained in university examinations till the beginning of 8th semester	Continuous
2	job_offer	Placement of the respondent	Binary, 0 means "not placed", 1 means "placed"
3	Inc	Family income per month	Continuous
4	father_edu	Total years of schooling of the mother	Continuous
5	mother_edu	Total years of schooling of the father	Continuous
6	gender_female	Gender of the respondent	Binary, 0 means male, 1 means female
7	soc_cat	Caste groups of the respondent	Binary, 1 means SC, ST, OBC,0 means General
8	area_dom	Area of domicile	Binary, 1 Rural, 0 urban
9	Course	Specialisation of the course	Binary, 0 CSE, 1 IT
Source: Field survey.			

Table 3.6: Summary of the variables for all the students in the sample

Variable	Obs	Mean	Std. Dev.	Min	Max
course	309	.2265372	.4192696	0	1
gender_fem~e	309	.2588997	.4387409	0	1
soc_cat	309	.1682848	.3747258	0	1
area_dom	309	.197411	.3986908	0	1
inc	309	54.4822	24.00048	5	100
father_edu	309	14.16505	3.259642	0	17
mother_edu	309	12.53398	4.137606	0	17
marks	309	70.34434	7.945967	50	92.3
job_offer	309	.3171521	.4661221	0	1

In this chapter, the justification for adopting a mixed method to pursue this study has been explained. The sampling framework and the tools of data collection have also been discussed. The data gathered from the field will be anlysed in the next three chapters keeping in mind the three main research objectives of this study. The mode of analysis would be both quantitative and qualitative as explained in the earlier sections. At the end, results will be corroborated with each other to get a fuller understanding of the problem. The next will start with the aim of exploring the role of students, teachers and infrastructural facilities in determining the performance of these twelve institutions included in the sample.

Chapter 4: Role of inputs in determining the performance of the institutions

4.1 Introduction

After discussing the methodologies which have guided the research-design of this study, this chapter seeks to answer the first research objective, i.e., to analyse the relative contribution of various inputs (students, teachers, and infrastructure) in determining the performance of the institutions included in the sample. Although the main objective of this study is to understand the concept of "quality" in higher education, the abstractness associated with the term "quality" in education makes it difficult to capture the actual reality in the true sense of the term[27]. Being guided by the output-centric conventional approaches of measuring quality in education discussed in Chapter 2, this study uses the performance of the institutions as an indicator of quality. This study acknowledges the difference between the two terms "quality" and "performance" but uses the second to reach closer to the first. This chapter will begin with an analysis of the contributions of the inputs in determining the performance of these institutions and the next two chapters would try to deal with the other determinants of delivering quality in higher education. The next section explains the features of the "highly preferred" and "less preferred" colleges used as a sampling criterion to get a hint about the most crucial outputs in these institutions as perceived by the students. In Section 3, a few indications emerging from the cross-tabulations are presented. The identification of the dependent and independent variables and the construction of the model for the analysis of the factors determining the performance of the students studying in these institutions are discussed in Section 4. Section 5 summarises and concludes the whole discussion.

[27] As discussed in Chapter 2.

4.2 The preference of the students for selecting the institutions

The sampling of the colleges was done in a manner to keep the two dimensions in mind, first, the mode of funding and management (public and private), and second, the preferences of students (reflected through the researcher's ranking of the colleges based on their students' WBJEE ranks)[28]. In this way, colleges were categorised in three groups: The Highly Preferred Private Colleges (HPCs), the Highly Preferred Government Colleges (HGCs) and the Less Preferred Private Colleges (LPCs). After selecting the institutions, 309 students in the three groups of colleges were interviewed with a structured questionnaire. They were asked about their reasons for selecting the particular college during counseling. They were given multiple options in the questionnaire and requested to mark the most important reason which had guided their selection of the college. They were provided with an option of marking more than one choice, in case they felt there was more than one reason which were equally important. Table 4.1 presents the reasons marked as the most important across the three types of colleges included in the sample.

Table 4.1: The most important reasons behind selection of the college

Marked by the students in the colleges (in %) / The most important reason for selecting the college	HPC	HGC	LPC
Ranking of the college	74	52	01
Faculty and infrastructure	38	15	01
Placement and academic performance	70	55	00
Fee structure	00	75	03
Credibility of the owners	32	43	01
Availability of the Stream	01	11	83
Location near hometown	08	06	28
Location near Kolkata	28	09	14

Source: Field Survey.

(Row and Column values will not add up to 100 because of multiple responses).

[28] As discussed in Chapter 3.

Looking at the descriptive statistics presented in Table 4.1, it can be noted that 74 percent of the students who were studying in the HPCs marked the "Ranking of the college" as the most important reason behind their selection of the college. The reasons of good placement and academic performance were cited as the most important by 70 per cent of the students in these colleges. The reason of good faculty and infrastructure were marked by 38 percent of students in these HPCs[29]. On the other side, among the students in the HGCs, most of them (75 percent) marked the fee-structure as the main reason for selecting the college. The next two most cited reasons are: the ranking of the college and the credibility of the owners (52 and 43 percent, respectively)[30]. In case of the LPCs, the mostly cited factor as the main reason was the availability of the IT related streams[31]. The next factor marked by 28 percent of students in these colleges was the location of the college near their hometown.

During counseling, the students of the HPCs and the HGCs had a large number of options before selecting the colleges because of their relatively better WBJEE ranks. The ability to pay the fees and to bear the cost of education had guided the choices of most of the students studying in the HGCs. For the students in the HPCs, this fee structure did not matter much. For them what mattered most were the ranking and the placement and academic performance of the colleges. These were also the second and third important reasons cited by the students in the HGCs. Rankings are also based on the placement and academic performance of the student apart from a set of institutional characteristics (qualification and performance of faculty, infrastructure and resources). The next section presents the variation in these factors across the three types of colleges.

[29] One thing should be noted here is that these three reasons are inter-related in nature as the ranking agencies rank the colleges on the basis of all of these factors. Still these options were given separately to the students to explore their utmost priorities. For example, a student might have looked at the rankings only while another one might have checked the information about faculty qualification and infrastructural facilities from the college websites before appearing in the counseling. Someone might have looked at the data on placement and academic performance of the last batch of students.

[30] Credibility is defined by the degree of trust levied on the owners or of the college. This option was mentioned by the students first in the pilot survey and then has been added in the questionnaire. For example, as students explained, a highly credible college has the least possibility of facing abrupt closure.

[31] Most of the students in the LPCs, as revealed in the interview, wanted to study the CSE or IT and they were ready to select the college which had availability in these streams.

4.2.1 Placement

In the highly-preferred colleges including both the public and private (HCs), 77 out of 152 students (51%) were selected by the recruiters on campus through their placement drives. In the HPCs, 54 percent of the students were recruited by the emloyers while in the HGCs, this proportion was 49 percent. On the other hand, in the less-preferred private colleges (LPCs), which were private, only 21 out of 157 students (13%) could manage to secure jobs through campus-recruitment drives. In total, 98 out of 309 (32%) students in the sample were placed while 211 out of 309 students (i.e., 68%) was not (Table 4.2).

Table 4.2: Status of placement across the colleges (in percent)

Status of Placement	Highly-preferred Colleges	Less-preferred Colleges	Total
Not placed	75 (49)	136 (87)	211 (68)
Placed	77 (51)	21 (13)	98 (32)
Total	152	157	309

Source: Field survey

4.2.2 Academic performance

Academic performance of a student is generally measured by the test scores. Here the percentage equivalent of the provisional Degree Grade Point Average (DGPA) was calculated on the basis of three years' YGPA (Yearly Grade Point Average) according the rule mentioned in the MAKAUT website. The variable is names as "marks" which reflects the percentage of marks obtained by the students till the beginning of 8^{th} semester. Since all the colleges were under the MAKAUT, the examinations were centrally conducted by the university, their scores were comparable. It is apparent from the Table 4.3 that the students in the Highly-preferred Colleges (HCs) performed better than the students of the Less-preferred colleges (LPCs).

Table 4.3: The distribution of marks of the students across colleges (in percent)		
Type of the institutions / Marks	**Percentage of students in the Highly-preferred Colleges (HCs)**	**Percentage of students in the Less-preferred colleges (LPCs)**
=>50 marks < 60	2	11
=>60 marks < 70	16	65
=>70 marks < 80	43	22
=>80 marks < 90	38	02
Above 90	1	0
Total	100	100
Source: Field survey		

To understand if the differences in average marks among the HCs (including the HPCs and the HGCs) and the LPCs were statistically significant, a t-test was carried out. First, a test for variance ratio was conducted and then a two sample t- test for equal/unequal variances was carried out. The results of variance ratio test allowed us to accept the hypothesis of unequal variance. The results of the t-test with unequal variance lead to the rejection of the null hypothesis of equality of means and thus the alternative was accepted. Finally, we conclude that the mean marks of the students in the Highly-preferred Colleges (the HCs including both the HPCs and the HGCs) was greater than that of the less-preferred colleges (LPCs) and this difference was statistically significant (Table A.2 and A.3 in the Appendix).

4.2.3 Ranking, reputation and prestige of the preferred colleges

The third most important factor cited by the students in the highly preferred colleges was the performance of the colleges in the rankings published by the popular ranking agencies for the colleges. This is also related to the relative position of the institutions discussed in the previous chapter. The HPCs did feature in the popular rankings done by the private agencies as well as the NIRF. The government ones were excluded by many of the private ranking agencies but they had established a position in the field due to their historical legacy.

It is clear that the HCs (including the HGCs and the HPCs) fared reasonably better than the LPCs in terms of placement and academic performance. This study makes an attempt to understand why certain colleges produce better outcomes (measured by proportion of students placed and the average marks of the students) than others. One interesting issue shown in the above tables is that given the similar institutional characteristics of the HCs (including the HGCs and the HPCs), 51 per cent students got placed in the campus-recruitment while 49 per cent did not. But all the students had the benefit of similar institutional characteristic. As already mentioned in Chapter 2, the literature in the area of Economics of Education argues that the technology used in the HEIs is mainly input-driven technology, where the students as inputs are the key factors in determining the institutional performances (Majumdar, 1983). Also, the effects of a favourable "peer group" on the performance of the students are well-acknowledged in the literature (Winston, 1999). Given the similar institutional characteristics of the HCs (including the HGCs and the HPCs), some of the students could do better while others could not. On the other hand, given the same institutional characteristics of the LPCs, a few could achieve better results while others could not. In this context, this chapter seeks to answer the following question: which are the factors determine students' performances in these institutes? Why within the same type of institutions some students performed better while others did not? To answer these, there is a need to go beyond the institutional level and initiate investigation at the individual level to figure out how the students of different academic and non-academic abilities and socio-economic background have performed across colleges[32].

4.3 Conceptualising the problem

After identifying the academic performance and the placement in the campus-recruitment drives as the two main criteria for students' selection, the next important issue is related to the approach of analysing the relative contributions of various inputs on these outcomes.

Taking hints from the existing studies seeking to explore the determining factors of school-performances critically reviewed by Hanushek (1979, 1997), the main factors responsible for explaining the differences in performances of the students can be listed as the followings:

[32] Studies in explaining students' performances identified these sets of variables (Hanushek, 1986).

(i) Students' academic abilities

(ii) College characteristics

(iii) Students' socio-economic background

(iv) Students' non-academic traits

These are explained in more details below:

(i) Students' academic abilities

In spite of studying in the same college, and enjoying the same kind of teaching-learning and infrastructure, only a few could achieve the placement or get a first class in the university examinations. Even if all other background factors are controlled, only a few among others are seen to perform better. This fact indicates that their individual innate abilities matter a lot, and perhaps the most. Academic abilities can be indicated by their performances in the past examinations, though limitations of using standardized test scores in reflecting cognitive capacities are well acknowledged in literature. Still, in this study, individual student's ranks in the WBJEE, score of their higher secondary (HS) examination and the percentage of marks obtained in university examinations can be used in capturing their abilities in academic fields since the tests are very specific to their fields of study. Thus, the set of individual abilities are defined as follows:

I_i = (Marks in the university examination, Ranks in the WBJEE, score in the HS examination)

(ii) College characteristics

The most of studies trying to estimate the EPF looked into the role of institutional resources and other characteristics in determining the school-outputs (Verstegen and King, 1998). According to Hanushek (1997), the popular measures of these institutional characteristics include the three sets. These are, the "real resources of the classroom (teacher education, teacher experience, and teacher-pupil ratios, the "financial aggregates of resources (expenditure per student and teacher salary)" and the "measures of other resources in schools (specific teacher characteristics, administrative inputs, and facilities" (pp.143). Keeping these in mind, an index was created to capture some of these basic features of the institutions.

The Teaching-Learning-Resources Index (TLRI)

Based on the NIRF methodologies[33], a combined matrix of institutional characteristics was calculated for each the 12 colleges in the sample. The index was calculated on the basis of the teacher-student ratio, qualification and experience of the faculty members, resources spent by the institution (per student per year) and the industry-academia linkage. The detailed steps of calculations involved are mentioned in the Appendix. The respective TLRI scores of the twelve colleges are mentioned below:

Table 4.4: TLRI score of the colleges	
College Code	**TLRI Score**
HPC1	16.51
HPC2	13.36
HGC1	16.00
HGC2	15.51
HGC3	14.93
HGC4	13.50
LPC1	14.12
LPC2	10.13
LPC3	8.53
LPC4	8.21
LPC5	7.72
LPC6	7.52
Source: Calculation based on data provided by the institutions surveyed.	

The placement possibilities also depend on the characteristics of the colleges as the employers' willingness for visiting the college-campus for recruitment may be dependent on the resources and the reputation of the college[34]. Funding agency's enthusiasm to bear the cost of negotiations

[33] Presented in the Appendix.

[34] Reputation measured by ranking the colleges based on their opening and closing ranks published by WBJEE boards.

with the recruiters in terms of time and money may make a whole lot of differences. Therefore the vector of college characteristics can be indicated through TLRI score, mode of funding and preference level of the colleges.

(iii) Students' socio-economic background

Social and economic structures play a key role in determining the opportunities faced by a student (Bowles and Gintis, 1976). For example in the United States, Collins (1979) observed that very often the employers offer the high salaried jobs only to the people from the high status groups. Giving more importance on status than objective skills excludes disadvantageous groups from the competition. In India, it was found that there are credible evidences of discrimination based on caste and religion in private urban jobs in India (Thorat and Attewal, 2007). Similarly, several studies have shown the negative effect of caste discrimination on educational attainment in India (Mathur, 2005). Very often in a society men and women are given different roles and the differences in their temperament and abilities are considered as a reason (Beteille, 2003). But this practice actually has its root in the social norms and conventions which vary across different societies (Mead, 1963). For determining academic performances in university examination, ethically these issues should not appear as all answer scripts are anonymous. But eliminating the idea of a biased grading system does not mean that socio economic background does not have any role in determining students' academic performances. Parental income is one of the major factors determining the boundary of the opportunity sets for children in our society. Parents use resources to create a home environment conducive to higher attainment in education (Teachman, 1987). Since childhood, the supportive home atmosphere makes a lot of difference. Parents provide human and material resources that help developing their children's academic skills and orientations (Leibowitz, 1974 and 1977; Mercy and Steelman, 1982). Parents with more education and income probably have more ability and motivation to create educational resources (Teachman, 1987). Many sociologists have also argued that parents use material and nonmaterial resources to create a home atmosphere that fosters academic skills, motivation, and orientation. Therefore, variables like gender, social category, family income and parental education can be expected to play a role in determining students' academic performances and employability. The vector of socio-economic background can be specified as:

B_i = (Gender, social category, family income, parental education)

(iv) Students' non-academic attributes

Apart from the generic skills related to students' fields of study, employers may look for other traits like communication skills, leadership qualities, abilities for being a good team member. In particular, these can play significant roles if employers do not pay much attention to the grade obtained and lessons learnt by the students during the coursework. Recruiters may look for trainable freshers who would go through mandatory induction programmes and various on-the-job trainings arranged by the firms. In this case employers would only be interested in students who are smart and presentable and can communicate in English. The degree certificates of students would only serve as a 'screening device' here. Keeping this hypothesis in mind, the vector of non-academic traits can be formulated as:

N_i = (Communication skill, extra-curricular activities, participation in various events in the college)

The next section presents a brief understanding of the variables belonging to the above-mentioned sets and their relationships with the two indicators of performance, the CGPA and the placement of the students.

4.4 Indications from the cross-tabulations

After getting an idea from the existing literature about the possible role of several variables in determining the performance of students in the HEIs, this section presents the cross-tabulations describing the variations in students' performance and these variables. The first sub-section focuses on the placements and the second deals with the academic performance of the students in these institutions. The results of the relevant t-test are presented in the Appendix.

4.4.1 Placements and other variables

(i) Type of the institution

The placement records revealed that the highly preferred colleges (HCs) including both the HPCs and HGCs, could manage a relatively higher rate of placement than the less-preferred ones. Among these HCs, private colleges (HPCs) performed better than government colleges in

this respect. In case of private colleges which are of high preference (HPCs), the proportion of the placed students (54 per cent) of was the highest among all three groups of colleges followed by the government colleges (HGCs), where only 50 out of 102 students (49 percent) were recruited by the employers. In case of the LPC colleges, only 13 per cent could manage to secure a job in the campus-placements (Table 4.6).

Table 4.5: Placement and college category

Placement / Colleges	Placed	Not placed	Total
HGC	50 (49 %)	52 (51 %)	102
HPC	27 (54 %)	23 (46 %)	50
LPC	21 (13 %)	136 (87 %)	157
Total	98 (32 %)	211 (68%)	309

Source: Field survey
(In parenthesis, the percentage values of the cell value to its row totals are presented)

However, not much of a difference was noted in the reputation of the recruiters and the pay-packages offered by them among the three groups of the colleges. However, in some of the LPCs, it was reported that a few local start-up firms had visited the campuses for recruitment and their pay-packages were considerably less compared to other reputed IT consultancy firms.

(ii) The Teaching-Learning-Resources Index (TLRI)

Now, let us examine the institutional characteristics which could play a vital role in determining the placement rates in different colleges. As discussed earlier, the TLRI-score was calculated to capture the qualifications and experience of the faculty members, unit cost of education and other resources. The following table shows the TLRI scores and percentage of students placed. We observed a positivecorrelation between the TLRI and the percentage of students recruited on campus.

Table 4.6: TLRI score and the status of placement		
College Code	**TLRI Score**	**Percent of students placed**
HPC1	16.51	76
HPC2	13.36	32
HGC1	16.00	65
HGC2	15.51	54
HGC3	14.93	40
HGC4	13.5	32
LPC1	14.12	36
LPC2	10.13	18
LPC3	8.53	15
LPC4	8.21	15
LPC5	7.72	3
LPC6	7.52	0

(b) Socio-economic background of the students

(i) Gender

If we look into the placement data with a gendered perspective, a few more things may be unraveled. Among these 229 male students in the sample, 78 were recruited by the employers from the campus (34 percent) and 151 were not (66 percent). Among the 80 female students, 20 of them succeeded to secure a job (25 percent) from the campus-placement drives and the rest 60 female students (75 percent) could not do so. So the overall success rate of success in campus-placement was apparently higher for male students compared to female students (Table 4.7).

Table 4.7: Gender, placement and college category						
Gender / College	Male			Female		
	Placed	Not placed	Total	Placed	Not placed	Total
HGC	44 (54%)	37 (46%)	81	6 (29 %)	15 (71%)	21
HPC	19 (56%)	15 (44%)	34	8 (50%)	8 (50%)	16
LPC	17 (15%)	97 (85%)	114	4 (1%)	39 (99%)	43
Total	80	149	229	18	62	80
Source: Field survey						

For the male students, the HGCs had the higher rate (54 percent) than the HPCs (50 percent). But for the female students, for the HPCs, it was 50 percent which was higher than the HGCs colleges (29 per cent). It can also be mentioned at this point that the ratio of male to female students was the lowest in these HPCs. While male to female students' ratio is approximately 4:1 and 3:1 in the HGCs and the LPCs respectively, it is only 2:1 in the HPCs.

(ii) The social categories of the students

Since private colleges were not bound to follow the policies of reservation, most of the students of socially deprived categories (SC, ST and OBC together) in the sample were from the HGCs. In these colleges, only 1 out of 31 students of socially deprived categories got placed while in the HPCs, none of them could do so. In the LPCs 3 out of 18 socially deprived students managed to get placed in campus recruitment (17 percent). In the HGC colleges, due to reservation, there was a huge gap between the average WBJEE rank of socially deprived students and that of the unreserved students. But in the private colleges, since there was no hard bound rule for maintaining the reservation policies, no considerable difference in the average rank of these two groups of students was noticed (Table A.4 in the Appendix).

(iii) Parental income

The proportion of placed students across three sets of colleges is presented in Table 4.8.

Table 4.8: Family income and the proportion of students placed across the colleges

Category of the colleges / Monthly income in Rupees	HGCs		HPCs		LPCs	
	Placed (%)	**Not-placed (%)**	**Placed (%)**	**Not-placed (%)**	**Placed (%)**	**Not-placed (%)**
inc<=5000	14	86	NA	NA	NA	NA
5000<inc=<10000	67	33	NA	NA	NA	NA
10000<inc=<20000	6	94	NA	NA	0	100
20000<inc=<40000	44	56	36	64	7	93
40000<inc=<60000	62	38	41	59	8	92
60000<inc=<80000	84	16	82	18	18	82
80000<inc=<100000	88	12	64	36	50	50

Source: Field survey
NA: No student in the relevant category

As discussed in the earlier section on students' preference, there were two kinds of students studying in the government colleges. One set was for the meritorious students with poor economic background who had preferred the college for its low fee structure. The other set of students were from relatively well-off families but preferred the government college because of its high ranks and good faculty and infrastructure. Table 4.11 shows that 67 percent of the students coming from the families with monthly income between Rs. 5,000 to 10,000, could secure a job in the placement drives in the HGCs. In other two types of colleges, there was no student in this category. Thee successful students in this income category were the meritorious students with better WBJEE ranks who had to select the HGCs because of their relatively poor or modest financial condition. Overall, including all the colleges, a weak trend of increasing proportion of placed students with increasing family income was observed, though there were exceptions.

(iv) Parental education

The effect of parental education on students' performance has been extensively studied in the literature as discussed during conceptualisation the problem in earlier sections. In case of this

study, an overall picture of the increasing proportion of placed students with increasing educational qualification of the father (with a few exceptions in the HGCs) can be noted from Table 4.9.

Table 4.9: Fathers' education and the percentage of placed students across the colleges

No. of students Placed / Fathers' Education	HGCs		HPCs		LPCs	
	Placed (%)	Not-placed (%)	Placed (%)	Not-placed (%)	Placed (%)	Not-placed (%)
Illiterate	4	96	NA	NA	0	100
Primary	0	100	NA	NA	NA	NA
Secondary	38	62	NA	NA	0	100
Higher Secondary	32	68	NA	NA	3	97
Graduate	52	48	42	58	15	85
Postgraduate	75	25	74	26	29	71

Source: Field survey.
NA: No student in the relevant income category

Similarly in case of mothers' education, there was a sharp positive relation with the proportion of placed students with the educational qualification of the mothers (Table 4.10). The HGCs, however, showed a few exceptions. The case of the HGCs was unique because of a greater percentage of their students coming from lower socio-economic background.

Table 4.10: Mothers' education and the percentage of placed students across the colleges

No. of Students / Mothers' Education	HGCs		HPCs		LPCs	
	Placed (%)	Not-placed (%)	Placed (%)	Not-placed (%)	Placed (%)	Not-placed (%)
Illiterate	20	80	NA	NA	0	0
Primary	33	67	NA	NA	0	0
Secondary	38	62	0	100	8	92
Higher Secondary	29	71	14	86	11	89
Graduate	69	21	58	42	16	84
Postgraduate	50	50	78	22	40	60

Source: Field survey
NA: No student in the relevant income category

(C) Abilities of the students

(i) Academic performance in the university examination

Students with high marks seem to have been preferred by the employers in the campus-recruitment drives (Table 4.11). For instance, in the HGCs, among all the students who scored between 70 percent to 80 percent in the university examinations, 33 percent of them could manage to get a placement. However, in the higher category of marks, between 80 to 90 percent, almost 92 percent students got selected by the employers. Similar are the cases of the HPCs and the LPCs.

Table 4.11: Marks of the students and the proportion of placement across the colleges

College / Marks (%)	HGCs		HPCs		LPCs	
	Percentage of students Placed (%)	**Percentage of students Not-placed (%)**	**Percentage of students Placed (%)**	**Percentage of students Not-placed (%)**	**Percentage of students Placed (%)**	**Percentage of students Not-placed (%)**
Less than 50	NA	NA	NA	NA	0	100
50<= marks <60	0	100	NA	NA	0	100
60<= marks <70	0	100	0	100	2	98
70<= marks<80	33	67	79	21	46	54
80<= marks<90	92	8	90	10	100	0NA
marks=>90	100	0	NA	NA	NA	

Source: Field survey
NA: No student in the relevant category

(ii) The ranks in the WBJEE

In all the three sets of colleges, the proportion of students recruited by the employers in the campus-placement drives declined with the increase in WBJEE ranks of the students (Table 4.12). However, there were some exceptions in the HPCs. This might have occurred because of the some of the meritorious students' inclination towards pursuing higher studies in these colleges.

Table 4.12: WBJEE ranks and the percentage of placed students across the colleges

Placement in the Colleges / WBJEE Ranks	HGCs		HPCs		LPCs	
	Placed (%)	Not-placed (%)	Placed (%)	Not-placed (%)	Placed (%)	Not-placed (%)
Rank<1000	NA	NA	83	17	NA	NA
1000<=Rank<2500	88	12	91	9	NA	NA
2500<=Rank<5000	59	41	50	50	NA	NA
5000<=Rank<10000	29	71	31	69	NA	NA
10000<=Rank<20000	0	100	0	100	100	0
20000<=Rank<40000	0	100	0	100	16	84
40000<=Rank<60000	0	100	NA	NA	0	100
60000<=Rank<80000	NA	NA	NA	NA	0	100
Rank=>80000	NA	NA	NA	NA	0	100

Source: Field survey
NA: No student in the relevant category

(iii) Academic performance in higher secondary examination

Overall, the proportion of placements increased with the increasing percentage of Higher Secondary (HS) marks of the students in all the three colleges (Table 4.13). The only exception occurred in the HGCs, where only one student (out of two) with the HS-score less than 60 percent were recruited by the employer, thus showing the proportion of placed students to 50 percent in this category of HS-score. This case can be an outlier and may need further investigation for explanation.

Table 4.13: Scores in HS and the proportion of students placed across the colleges

Placement in the colleges / Scores in HS exam (%)	HGCs		HPCs		LPCs	
	Placed (%)	Not-placed (%)	Placed (%)	Not-placed (%)	Placed (%)	Not-placed (%)
score<60	50	50	NA	NA	0	100
60<=score<70	0	100	NA	NA	3	97
70<=score<80	38	62	0	100	30	70
80<=score<90	65	35	46	54	71	29
Score>=90	100	0	89	11	NA	NA

Source: Field survey
NA: No student in the relevant category

(d) Placement and other attributes

Other attributes like communication skill, extra-curricular activities and participation in non-academic activities in college may have some relation with the employability of the students in terms of ontributing their smartness, abilities to lead and to work in a team and foster enterprising attitude and creativity.

(i) Communication skill

In all the colleges, the increase in the proportion of the recruited students with the increase in the percentage of students with good communication skill is evident from Table 4.14. It should be noted that in the HPCs, no student with poor communication skill was selected by the recruiters. These are the colleges where the proportion of students with good communication skill was the highest.

Table 4.14: Communication skill and the proportion of students placed across the colleges

Placement in the colleges / Communi-cation skill	HGCs		HPCs		LPCs	
	Placed (%)	**Not-placed (%)**	**Placed (%)**	**Not-placed (%)**	**Placed (%)**	**Not-placed (%)**
Bad	2	92	0	100	3	97
Good	89	11	59	41	39	61

Source: Field survey

(ii) Participation in the non-academic activities

The students were asked to assess their confidence in communication skill during the interview. Taking all the twelve colleges and 309 students in the account, the following table (Table 4.15) shows that the students with a good command over communication skills were the ones who stood a better chance of being selected in the campus-placement drives.

Table 4.15: Participation in the non-academic events and the proportion of students placed across the colleges						
Placement in the colleges / Participa-tion status	**HGCs**		**HPCs**		**LPCs**	
	Placed (%)	**Not-placed (%)**	**Placed (%)**	**Not-placed (%)**	**Placed (%)**	**Not-placed (%)**
Yes	5	95	0	100	2	98
No	74	26	68	32	28	82
Source: Field survey.						

(iii) Extra-curricular activities (ECA)

The possession of extra-curricular skills seemed to be associated with an increase in the proportion of students placed in the campus-recruitment drives (Table 4.16).

Table 4.16: Extra-curricular activities and the proportion of students placed across the colleges						
Placement in the colleges / Communi-cation skill	**HGCs**		**HPCs**		**LPCs**	
	Placed (%)	**Not-placed (%)**	**Placed (%)**	**Not-placed (%)**	**Placed (%)**	**Not-placed (%)**
No	17	83	32	68	5	95
Yes	75	25	71	29	25	75
Source: Field survey.						

All the cross tabulations between college categories, placement and other variables or attributes presented above do give us some idea about the possible factors which might have a role to play in determining the possibility of employment of a student in campus recruitment drives in selected colleges. Now a similar exercise would be carried out for of the other important output under consideration namely “marks” in the next section.

4.4.2 Academic performance

(a) Academic performance and the college characteristics

The academic performance of the students means the percentage of marks obtained by the students in the university examinations during last three and a half years of their study. This variable is termed as "Marks". If we look at the distribution of percentage of the marks obtained in the university-examinations among the students included in the sample, the highest proportion of the students in both the HGCs and the HPCs fell in the category of marks between 70 to 80 (Table 4.17). In case of the LPCs, most of the students (66 percent) scored between 60 to 70 percent in these examinations.

Table 4.17: Academic performance and the proportion of students across the colleges

Number of the Students (%) / Marks in University Examination (%)	Number of students in the HGCs (%)	Number of students in the HPCs (%)	Number of students in the LPCs (%)
Less than 50	0	0	4
50<= marks <60	2	0	6
60<= marks <70	19	12	66
70<= marks<80	41	48	22
80<= marks<90	37	40	2
marks=>90	1	0	0
Total	100	100	100

Source: Field Survey

The results of the t-test examining the statistical significance of the differences between the percentage of marks obtained by the students in the Highly-preferred (including both the HPCs and the HGCs) and the Less-preferred colleges (LPCs) have already been discussed earlier. A similar exercise was also done for the government and private colleges (See Table A.5 and A.6 in the Appendix).

The results of the variance test allows us to accept the null hypothesis of equal variance and based on this, the t-test results show the mean percentage of marks obtained by the students in government colleges is higher than the private colleges and the difference is statistically significant.

(b) Performance in the previous examinations

The degree of linear association between the percentage of marks obtained in the university examinations , score of higher secondary (HS) examination and WBJEE ranks, can give us some idea about how closely they are related (Table A.7 in the Appendix).

There is a high positive correlation between the percentage of marks obtained in the university examinations and the scores in the HS examinations (75 per cent) meaning those who had done well in HS examination did fairly well in the university examinations. On the other hand, there is a high negative correlation among the percentage of marks obtained in the university examinations and WBJEE rank (71 per cent).

(c) The socio-economic background of the students

(i) Gender

Since the answer scripts are coded, cpresumably there annot be any bias in the evaluation process done by the university and hence, the proportion of male and female students the students should not affect the academic performance of the institutions. Still keeping the importance of the socio-economic factors on the academic performance of students in a developing country, the cross-tabulation between these two variables is presented below (Table A.8 in the Appendix). However, the highly preferred colleges (both the HGC and the HPC), showed an increasing proportion of male students in the higher category of marks, though the findings were not very clear at this stage.

(ii) The social categories of the students

Among all these colleges, only the HGCs strictly observed the reservation policy by restricting certain percentage of seats for the students belonging to the socially disadvantageous groups- SC, ST and OBC. Including all three categories, a combined category of “Socially Backward Groups” (SBG) has been created. If we look at the distribution of marks among the students

belonging to the general and the SBG categories in all three groups of the colleges, roughly an increasing representation of students coming from general groups in higher category of marks could be seen (Table A.9 in the Appendix).

(iii) Parental income and parental education

The degree of correlation between the percentage of marks obtained by the students in the university examinations and the income of their parents was negligible. Similarly, the degree of linear association between the percentage of marks of the students and the years of education of their parents was not on the higher side. See Table A.10 in the Appendix.

(d) Academic performance and the non-academic traits

(i) Communication skills

Though communication skill should not matter in scoring in university examinations, but it may indicate to the proficiency in reading and writing in English language. The lectures are delivered in English, but in engineering courses, the language skills do not play a key role in having any influence on the marks of the students. The distribution of percentage of marks obtained in the university examinations by the students revealed a rising proportion of students with the good confidence in communication skill in the higher categories of marks (Table A.11 in the Appendix).

(ii) Participation in the college activities

This variable, participation in college activities may not have any direct connection with students' academic performance, but it may be a good proxy for the students' general awareness and proclivity to take interest in issues other than the routine academic activites. These activities include a range of cultural as well as semi-academic events like debates, quiz, poster presentations, book fairs, innovations which can help a student's understanding of the subject in a broader sense (Table A.12 in the Appendix). There was an overall increase in the proportion of active students in the higher categories of marks, with a few exceptions in the LPCs.

4.5 Specification of the model

Based on the earlier studies which attempted to analyse the determinants of students' achievement and the discussion on EPF in Chapter 2, this study uses the following model:

$A_i = f(C_i, I_i, B_i, N_i)$

Where A_i = Achievement of the i^{th} student

C_i = vector of variables related to college inputs

I_i = vector of variables related to academic abilities

B_i = vector of variables related to socio-economic background

N_i = vector of variables related to non-academic traits

In this case the achievements are of two types, placement through the campus-recruitment drives and the percentage of marks obtained in the university examinations.

There are two issues need to be mentioned here. First, this would be a static model which would seek to capture the impact of identified independent variables on the determination of outputs at a certain point of time. It does not capture the transformation of the system over the years. Second, many of the inputs here have been proxied by their observable indicators as exact measurement of the variable was either not possible, or was beyond the scope of the study.

In order to analyse the determination of the outputs, namely placement and academic performance, the following variables are of concern:

Table 4.18: The List of Variables				
Sl. No.	**Name of the variable**	**Label of the variable**	**Nature of the variable**	**Type of the variable**
01	job_offer	Placement status of the student	Dependent	Binary (0: not-placed, 1: placed)
02	marks	Percentage equivalent of the DGPA obtained the student till the 7^{th} semester	Independent in Model 1 and dependent in Model 2	Continuous
03	clg_high	Rank of the college based on stduents' preference	Independent	Binary (0: Low, 1: High)
04	clg_govt	Funding type of the college	Independent	Binary (0: private, 1: government)
05	TLRI	Faculty qualification and experience score	Independent	Continuous
06	wbjee_rank	WBJEE rank of the student	Independent	Continuous
07	hs_score	Student's score in higher secondary examination	Independent	Continuous
08	gender_female	Gender of the student	Independent	Binary, (0: male, 1: female)
09	soc_cat	The social category of the students	Independent	Binary (0: General, 1: Socially backward groups)
10	Inc	Monthly family income in Rupees	Independent	Continuous
11	father_edu, mother_edu	Total years of schooling of fathers Total years of schooling of mothers	Independent	Continuous
12	com_good	Confidence in communication skill	Independent	Binary (0: bad, 1: good)
13	eca	Extra-curricular activities	Independent	Binary (0: no, 1: yes)
14	clg_activ	Participation in non-academic activities in the college	Independent	Binary(0: no, 1: yes)

There are a good number of categorical/binary variables in the list of explanatory variables. These variables have dummies for each category. If there are n categories, then (n-1) dummies are induced in the regression equations. Summary of the continuous variables are presented in the appendix.

4.5.1 Model 1: Analysis of the factors determining the placement of the students

In this section an effort has been made to estimate an econometric model the specification of which has been an outcome of an exercise with running regression with various combinations of independent variables in a non-random manner to arrive at the specifications which fit the data better. Since the dependent variable "job_offer" is a binary variable taking only two values, one for 'Placed' and zero for 'Not Placed', a Logistic Regression model has been estimated. But there is a high chance of correlation between some variables belonging to the same set of inputs. For example, let's take the vector of innate abilities into consideration.

I_i = (marks, wbjee_rank, hs_score)

Now, the correlation among three variables in this set has already been presented in earlier sections. The absolute values of the correlation coefficient among any two variables are higher than 0.7. Therefore, it is safe to take one at a time from this set to avoid the problem of multi-collinearity. For a group of categorical variables, theoretical and conceptual understanding has been involved to anticipate their relationship. For example, take the TLRI score and the reputation of the college.Since students with better WBJEE ranks select the colleges with better qualified and more experienced faculty-members, and measurement of reputation is based on this selection process, there would be a close association between these two variables. Similarly, since all the publicly funded colleges are of higher reputation in the sample, there can be a close association between the variables "clg_govt" and "clg_high". Also, there can be a close relationship between variables in the set I_i and C_i, because all the students with better WBJEE rank have selected the highly preferred colleges (the HCs, including both the HGC and the HPC) with higher TLRI score. The correlation coefficients between the TLRI score and "wbjee_rank" and between "TLRI" and "marks" and between "TLRI "and "hs_score" are all on the higher side and it would not be wise to take these variables together. However, the two variables between which the degree of association can be less are "hs_score" and "clg_pvt", since "hs_score" is a weak direct indicator of an engineering student's merit than "wbjee_rank" and "marks". Also it will be safer to put "clg_high" instead of "TLRI" and "clg_high" because students' decisions to go for a public funded college also got influenced in view of their financial background. But "TLRI" and "clg_high" are bound to be high for better WBJEE rank holders. The results are presented in the Appendix.

In the vector B_i, parental education and parental income may have a higher degree of correlation. When checked, the correlation coefficient between parental income and parental education comes to be 0.37.

In the vector N_i, "eca" and "clg_activ" may have close relation because students who are good at singing, reciting, sports, etcetera generally take part in various college functions and activities. However, if there is no reason to expect a relationship between any two variables, they can be taken together in the same equation initially. For example, gender and social categories are independent of each other and thus are included in the same equation. Following this logic, several regression models were formulated. In the initial model only one variable was taken from each of the input groups (if there is a high correlation among the variables in the same group) and then several other models with a little variation was formulated to see how the results change when the combination of inputs are changed. Some of the initial exercises are as follows:

R 1.1: job_offer = f [(marks, hs_score), (clg_govt, TLRI), (gender_female, soc_catinc, father_edu, mother_edu), (com_good, clg_activ, eca)]

R 1.2: job_offer = f [(marks), (clg_govt, TLRI), (gender_female, soc_cat, inc, father_edu), (com_good, clg_activ, eca)]

R 1.3: job_offer = f [(marks), (clg_govt), (gender_female, soc_cat, inc, father_edu, mother_edu) , (com_good, clg_activ, eca)]

R 1.4: job_offer = f [(marks), (clg_govt), (gender_female, soc_cat, inc, father_edu), (com_good, clg_activ, eca)]

R 1.5: job_offer = f [(marks), (clg_govt), (gender_female, soc_cat, inc), (com_good, clg_activ, eca)]

R 1.6: job_offer = f [(marks), (clg_govt), (gender_female, soc_cat), (com_good, clg_activ, eca)]

R 1.7: job_offer = f [(marks), (clg_govt), (gender_female, soc_cat), (com_good, clg_activ)]

R 1.8: job_offer = f [(marks), (clg_govt), (gender_female, soc_cat), (com_good)]

The results of these regressions are presented below in Table A.13 in the Appendix.

Now let us interpret the results with the help of one particular model, say, R1.5 in particular. Model R 1.5 suggests the following equation:

log(p/(1-p) = logit (p) = -20.68+0.22*marks + 0.70*clg_govt – 0.42*gender_female -0.86* soc_cat+ 0.01*inc + 2.25*com_good + 2.25*clg_activ +0.3*eca

The details of the exercise are given below (Table 4.19)

Table 4.19: Result of regression- R.1.5

```
. logit job_offer marks clg_govt gender_female soc_cat inc  com_good clg_activ eca, vce(robust)

Iteration 0:   log pseudolikelihood = -193.03358
Iteration 1:   log pseudolikelihood = -81.304842
Iteration 2:   log pseudolikelihood = -66.998157
Iteration 3:   log pseudolikelihood = -65.428931
Iteration 4:   log pseudolikelihood = -65.414249
Iteration 5:   log pseudolikelihood = -65.414247

Logistic regression                               Number of obs   =        309
                                                  Wald chi2(8)    =      81.12
                                                  Prob > chi2     =     0.0000
Log pseudolikelihood = -65.414247                 Pseudo R2       =     0.6611
```

job_offer	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
marks	.2206267	.0387017	5.70	0.000	.1447728	.2964806
clg_govt	.6986854	.5761972	1.21	0.225	-.4306403	1.828011
gender_female	-.4194823	.5553659	-0.76	0.450	-1.507979	.6690149
soc_cat	-.8557371	.9798515	-0.87	0.382	-2.776211	1.064737
inc	.0056827	.0117396	0.48	0.628	-.0173265	.0286918
com_good	2.248185	.7706483	2.92	0.004	.7377426	3.758628
clg_activ	2.253017	.6914513	3.26	0.001	.8977977	3.608237
eca	.3478202	.4635536	0.75	0.453	-.5607282	1.256369
_cons	-20.67663	2.9809	-6.94	0.000	-26.51908	-14.83417

These results can be interpreted in the following way[35]:

[35] The problems of multicollinearity and heteroscedasticity have been eliminated. The results are hetero-robust.

(i) marks: The result shows that for one unit increase in the value of “hs_score” there will be 0.22 increase in the log-odds of the dependent variable “job_offer”, holding all other independent variables constant. This is significant at 99 percent level.

(ii) clg_govt: The variable “clg_govt” is binary in nature and the zero value refers to the private colleges and one refers to the public colleges. The result shows that for one unit increase in the value of “clg_govt” (for moving to public colleges from private colleges), there will be 0.70 increase in the log-odds of the dependent variable “job_offer”, holding all other independent variables constant.

(iii) gender_female: The variable gender is also a binary variable where zero stands for male and one for female students. The result shows that for one unit increase in the value of gender (which means for going from male to female) there will be 0.42 decreases in the log-odds of the dependent variable “job_offer”, holding all other independent variables constant.

(iv) soc_cat: The variable “soc_cat” is a categorical variable referring to the socially backward group of the students. The result indicates that for changing from general to this group there will be 0.86 deccline and in the log-odds of the dependent variable “job_offer”. , holding all other independent variables constant.

(v) com_good: The variable “com_good” is a binary variable where zero refers to poor confidence in communication skill and one refers to high confidence in communication skill. The result indicates that for one unit increase in the value of “com_good” (which means for moving from poor to high communication skill) there will be 2.25 increases in the log-odds of the dependent variable “job_offer”, holding all other independent variables constant. This is significant at 99 per cent level.

(vi) clg_activ: This is also a binary variable where zero refers to “do not participate” and one to “participate”. The result indicates that for one unit increase in the value of “clg-activ” (which means for moving from ‘do not participate’ to ‘participate’) there will be 2.25 increases in the log-odds of the dependent variable “job_offer”, holding all other independent variables constant. This is also significant at 99 per cent level.

(vii) inc: The result indicates that for one unit increase in the value of monthly family income, there will be 0.0053 increase in the log-odds of the dependent variable “job_offer”, holding all other independent variables constant.

(viii) eca: This is also a binary variable where zero refers to "not having any extra-curricular activity" and one to "having extra-curricular activities". The result indicates that for one unit increase in the value of eca (which means for moving from "not having" to "having") there will be 0.35 increases in the log-odds of the dependent variable "job_offer", holding all other independent variables constant.

(ix) constant: This is the expected value of the log-odds of "job_offer" when all of the predictor variables equal zero. In this case, this is -20.68.

There are other regression models combining different sets of variables. Some of these are presented in the Appendix. Now, let us explore if there are any differences in this results when we account for the differences in three groups of the colleges. For this, the list of independent variables is modified a bit based on previous exercises. Those variables which fail to have significant impact for most of the time are not included in this model. Also, variables related to the mode of funding and positions of the college are not included in the list because they are treated as 'conditions' here. The regression model is:

job_offer = f (marks, TLRI, gender_female, social_cat, com_good, clg_activ)

It has been run six times based on the following conditions:

(a) For all the students
(b) For the students studying in the HPCs
(c) For the students studying in the HGCs (Only Government)
(d) For the students studying in the LPCs (Only less-preferred colleges)
(e) For the students studying in the HPCs and HGCs (Only highly-preferred colleges)
(f) For the students studying in the HPCs and LPCs (Only private)

The result is presented in the Table A.14 (Appendix)

4.5.2 Summary of the findings: Analysis of factors determining the job-placement of the students

(i) Individual abilities

This set of inputs include the variables like “marks”, “hs_score”, “wbjee_rank” denoting the percentage of marks obtained in the university examination till the beginning of the 8th semester, percentage of marks in the higher secondary examinations and the ranks in the WBJEE. Since they have strong correlation among themselves, one variable was taken at a time in the regression models. Overall, these variables show a positive impact on the possibility of placement. The importance of placement in students’ choice-making has been discussed in the earlier sections of this chapter. But the findings reveal that the students who already had a consistent good academic results in the secondary and higher secondary examinations, performed well in the university examinations as well as in the campus-recruitement sessions.

(ii) College characteristics

The impact of mode of funding, turned out to be a favourable factor for the government colleges when the regressions were run including all the three hundred and nine students. This may be due to the absence of a less reputed government college in the population as well as in the sample. The index of institutional charactersitics shows significant effects only when any other variables like students’ score or mode of funding of the colleges were not included in the model. This is because the linear relationship that exists between the TLRI score and these variables. The colleges with high TLRI had better students reflected through their academic abilities. Also, all the government colleges had relatively higher TLRI. There was not much of a variation among the highly ranked colleges. However, the effect of TLRI was mostly positive, excpt in the case of government colleges. Perhaps this is where the role of “process” assumes critical importance in the input-output analysis. The case of government colleges highlights the need to examine the variations in their governance processes given the inputs. This will be discussed in the next chapter.

(iii) Socio-economic background

Overall, there was a negative impact of social factors on the possibility of getting recruited in the sense that most of the results of the regression exercises show the students from the scheduled social categories and gender stand a less chance of being selected by the recruiters. The income and education level of the parents did not show any consistent effect on the possibility of placement faced by the student.

(iv) Other attributes

The attributes like communication skill, participation in the non-academic events and extra-curricular activities consistently showed significant positive impact on the students' possibility of being employed. These factors may help a person in being confident and smart. These non-academic traits help students acquiring some of the attributes which act as the "signaling" or "screening" factors (Stiglitz, 1975; Spence, 1975).

4.5.3 Model 2: Analysis of factors determining the academic performance of students

Academic performance here is measured by the percentage of marks obtained by the students in the university examinations till the beginning of 8^{th} semester. The dependent variable is the "marks". The set of explanatory variables include students' entry level test score, institutional factors and the socio-economic background of the students. The variable "hs_score" is basically the entry-point test score of the students with which then had entered into the institutions. On the other hand, the "marks" is obtained after 3.5 years of study in the colleges. To capture the impact of instititutional characteristics over the academic performance of the students, the flowing equations have been proposed:

R 2.1: marks = f [(TLRI), (hs_score), (gender_female, soc_cat, inc, father_edu, mother_edu) (com_good, clg_activ)

R 2.2: marks = f [(TLRI), (hs_score), (gender_female, soc_cat, inc, mother_edu)

R.2.3: marks = f [(TLRI), (hs_score), (gende_female, soc_cat, mother_edu)

Results are shown in the table below:

Table 4.20: Summary of regression (R 2.1 to R 2.3)

VARIABLES	(1) marks	(2) marks	(3) marks
TLRI	0.978***	0.976***	0.996***
	(0.123)	(0.121)	(0.121)
hs_score	0.327***	0.328***	0.321***
	(0.0444)	(0.0441)	(0.0439)
gender_female	-0.420	-0.421	-0.475
	(0.621)	(0.620)	(0.620)
soc_cat	-2.569***	-2.587***	-2.591***
	(0.814)	(0.796)	(0.798)
Inc	0.00141		
	(0.0127)		
father_edu	-0.196	-0.194	
	(0.132)	(0.131)	
mother_edu	0.306***	0.308***	0.193***
	(0.105)	(0.105)	(0.0707)
Constant	33.86***	33.88***	32.85***
	(2.478)	(2.467)	(2.372)
Observations	309	309	309
R-squared	0.650	0.650	0.648

Model R.2.3 presents the results after eliminating the problems of multi-collinearity and heteroscedasticity (Table 4.21).

Tble 4.21: Result of regression- R.2.3

```
. regress marks hs_score TLRI gender_female soc_cat  mother_edu, vce (robust)

Linear regression                               Number of obs =     309
                                                F(  5,   303) =  129.71
                                                Prob > F      =  0.0000
                                                R-squared     =  0.6478
                                                Root MSE      =  4.7547
```

marks	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
hs_score	.3211059	.053342	6.02	0.000	.2161382	.4260736
TLRI	.9958332	.1380956	7.21	0.000	.7240854	1.267581
gender_female	-.4750117	.6537417	-0.73	0.468	-1.76146	.8114371
soc_cat	-2.591274	.8527488	-3.04	0.003	-4.269334	-.9132144
mother_edu	.1926618	.0777926	2.48	0.014	.0395797	.345744
_cons	37.82702	3.075657	12.30	0.000	31.77467	43.87937

It can be interpreted in the following ways:

(i) hs_score: The result shows that for one unit increase in the value of ”hs_score”, there will be an increase of around 0.32 in the value of the dependent variable “marks”, holding all other independent variables constant. This is also significant at 99 percent level.

(ii) TLRI: This factor has a positive impact on the academic performance of the students when all other variables are held constant. There will be an increase of 0.99 in the value of the dependent variable “marks” following one unit in the TLRI score, *ceteris paribus*. This is significant at 99 percent.

(iii) gender_female: This is binary variable where the zero value refers to “male students” and one to the “female students”. The results indicate female students earn less percenge in the university examinations. However, this is not a significant impact.

(iv) soc_cat: This is a binary variable where the zero value refers to general and one to the socially backward groups including the SC, ST and OBC students. The result

indicates that for moving from general to socially backward groups, there will be a decline of 2.59 in the value of the dependent variable “marks”, holding all other independent variables constant. This is significant at 99 percent in case of all the models.

(v) mother_edu: The result indicates that for one unit increase in the total years of schooling of mothers, there will be an increase of 0.193 in the value of the dependent variable “marks”, holding all other independent variables constant. This positive sign of the coefficient is expected because supportive home atmosphere benefits a child’s capabilities.

(vi) constant: This is the expected value of “marks” when all of the predictor variables equal zero. In this case, it comes to be around 37.82.

(vii) The value of R-squared is around 64.8 per cent.

Now, let us explore if there are any differences in the results when the regressions are carried out for the students studying in different groups of colleges. The suggested regression model is

R 2.3: cgpa = g [(TLRI), (hs_score), (gender_female, soc_cat, mother_edu)

It has been run six times based on following conditions:

(a) For all the students
(b) For the students studying in the HPCs
(c) For the students studying in the HGCs (Only Government)
(d) For the students studying in the LPCs (Only less-preferred college)
(e) For the students studying in the HPCs and HGCs (Only highly-preferred colleges)
(f) For the students studying in the HPCs and LPCs (Only private)

The results are presented in the Appendix (A.15)

4.5.4 Summary of the findings: Analysis of factors determining academic performance

(i) Individual abilities and college characteristics

It has been already discussed that the students who performed well in the university examinations were those who consistently had done well in the past examinatons like secondary

and higher secondary examinations. There was not much of a difference between students' HS score and their marks in the B.Tech courses in any of the colleges[36]. This reitertes the circular nature of selection-based competition in this type of a market in higher education.

The institutional features captured by TLRI turned out to be positively significant in most of cases though it did appear to be a signficant factor in the case of the government colleges and the HPCs. The variations in the TLRI scores for institutions in these groups were less. However, when the HGCs and HPCs are put together, the impact of TLRI becomes significant.

The co-efficient of "hs_score" also reflects the role of institutions in transforming the students during the last 3.5 years. The variable "hs_score" is the percentage with which the students took admission in the institutions. The variable "marks" is the outcome of the teaching laerning process during the 3.5 years in the instituitions. The value of the co-efficient is less than one which means for one unit increase in the "hs_score", there will be less than one increase in the "marks. The value of the co-efficient is larger in the private colleges than the government colleges. This means for one unit increase in the students' entry level scores, there will relatively more increase in the percentage obtained in university examinations in the private colleges. Though specifically there was an overall fall in the "marks" compared with the HS score, the fall is less in the HPC than others, controlling for other factors. This indicates the role of the "process" or the governance structure which determines how far the potentials of the inputs (students, in this case) would be realised in the HEIs.

(ii) Socio-economic backgrounds

Income and fathers' education failed to show any significant positive impacts on the students' academic performance. However, mothers' education showed a positive effect in most of the cases. Specially in the private colleges, this effect is statistically significant. Students from backward castes faced a chance of poor performance in almost all the cases.

[36] There was only a difference of (-3.20) percentage points between students percentage of marks at the HS examination and at the university exminations.

4.6 Concluding remarks: Mode of funding and the the relative contribution of the inputs

The analysis carried out in this chapter has tried to understand the role of various inputs (mainly characteristics of the students and the institutions) in determining the performances of the students in the institutions included in the sample[37]. The selection-based efficiency discussed in the literature (Glennerster, 1991; Winston, 1999) found strong evidence from the analysis presented in this chapter. It was observed that the students with better abilities select the institutions which had a record of good results and placement in campus-recruitment drives. Those institutions which were endowed with better quality inputs, were more likely to perform better than others who were not. Students' socio-economic background also played a role in determining their performance albeit by a moderate extent. The non-academic traits also matter for the placements. The combination of academic and non-academic attributes reflected a mix of human capital and signaling theories in explaining the placement of the students (Stiglitz, 1975; Spence, 1975). However, the role of the institutional characteristics in determining the placements could not be confirmed in one particular way across all the institutions. In case of academic performance, the entry-level test scores and the socio-economic background had a

[37] The purpose of this analysis is to find the effect of students' background variables on the probability of finding a job and their academic performances. However, many scholars have argued, running an ordinary least squares method with the above specification may yield biased estimates. This is because, education which is a personal characteristic of the students, may be correlated with some unobserved skill or trait of the student which is not observed by the econometrician. The unobserved skill thus gets absorbed in the error term in the above equation. In such a case, education becomes correlated with the error term that violates the assumption of strict exogeneity of explanatory variables required for ordinary least squares. In other words, education is endogenous in the above specification; thus, the causal effect of education on the probability of finding a job cannot be identified.

The literature focusing on endogeneity of education mainly aim to study the causal impact of education on earnings. Although we are not looking at estimating the wage equation, the endogeneity problem is similar to that discussed in the wage equation literature. The solution to the problem is to find an instrumental variable which is not related to the student's unobserved skill (or simply the probability of finding a job) but is correlated with the student's education.

A number of instrumental variables have been used in the literature to control for endogeneity of education. The list ranges from family background variables to accessibility of schooling Card (2001). Angrist and Keueger (1991) used quarter of birth of students as an exogenous instrument to control for endogeneity of education while estimating the wage equation. More recently, Hoogerheide *et al.* (2012) point out the problems in using family back ground variables as instruments for education. The main argument is that family background variables often is directly correlated to a person's income in which case, it may be hard to separate out the indirect and direct effect of father's education on wage. In my case, however, I argue that the number of private tutors during the Higher Secondary examination is a good instrument for education as it will not have any effect on the probability of performing better in university examinations. A regression equation using this instrumental variable is also presented in the Appendix (table A.16).

significant positive impact on the dependent variable (Dill and Soo, 2003). But the institutional chracteristics exhibited a significant positive impact on the academic performance of the students, though the value of the coefficient varied across different types of institutions. The value of TLRI across the institutions is dependent on its mode of funding as it determines the ability to select the inputs. The ability also depends on the applicability of the regulatory framework as well as the financial health of the institutions. However, the variations in the coefficients of TLRI in the regression equations may be related to the "process" of conversion of inputs into outputs for the institutions, which was mostly ignored in the Input-Output analysis discussed in Chapter 2 (Coleman *et al.*, 1966; Bowles, 1970). Given the inputs, the institutions can produce different types of outputs of varying quality because of the underlying differences in the different governance mecahanisms that exist inside the institutions (Chattopadhyay and Pathak, 2016). To capture a more complete picture of the role and the quality of inputs in improving students' performance, there is a need to understand the variations in the "process" that exist in the institutes. The next chapter looks into the internal governance mechanisms of the institutions to probe the problem in a deeper way.

Chapter 5: The internal governance mechanisms

5.1 Introduction

In the previous chapter, the relative contributions of the inputs in determining the performance of the higher educational institutions were examined in the context of this study. But this exercise did not explore the role of the "process" through which the inputs get converted into outputs in absence of a well-defined technology for conversion of inputs into output. Given the quality of inputs, the possibility of producing the best-quality outputs varies across the institutions depending on this "process". In the short-run, the quality of inputs are given, but an institution can govern the entire "process" of teaching-learning in such a way that it yields a better performance than the other colleges belonging to the same group. To understand this "process", one needs to understand how the internal governance mechanisms determine the performance of the institutions given inputs. The conceptual framework used in the previous chapter is rooted in the EPF where the achievement of a student is a function of three types of inputs. These three sets of inputs are related to the institutional characteristics, students'' socio-economic background and students' ability. Thus the functional relationship between the inputs and the performance of the students can be depicted as the following one-

$$\mathbf{A_i = f(X_i, Y_i, Z_i)}$$ [38]

[38] Hanushek (1979) has considered this form of an EPF as the generally accepted one.

Where, A_i denotes the test-score of the i^{th} student

X_i denotes the vector of the variables related to students' academic and non-academic abilities.

Y_i denotes the vector of the variables related to outside factors, like the socio-economic condition of students, parental income and their education, etc.

Z_i denotes the vector of the variables realted to the institutional charactersitics (for example, teachers' quality, infrastructure and other facilities).

The above model fails to capture the "process" which transforms the inputs into outputs. In other words, the nature of 'f' in case of a production function is assumed to be well-defined, but in the reality of an educational institute, neither can the technology (f) be universal nor be pre-determined. Here the process entails involvement of self-interest driven decision-making inputs decision making inputs like students and teachers. They have their own objectives and also they respond to the signals given by the other stakeholders in the institution. The policies mooted by the authorities of the institutions also have implications for them. All these together determine the attitudes and behavior of the human inputs (students and staff) inside the institutions which shape the entire process of teaching-learning inside the institutions (Chattopadhyay and Pathak, 2016). The unique nature of the "process" may partly explain why two colleges perform differently in spite of having similar quality of inputs and other characteristics. The "process" is so complex and fluid a concept which is difficult to be captured objectively. But looking into the internal governance mechanism of the institutions can be unravelling to understand the factors responsible for quality of education being delivered by an institution. As the characteristics of the inputs and their relative contributions in producing outputs vary across the HEIs, the internal governance mechanisms would also vary across the institutions depending on their mode of funding. As discussed in Chapter 2, the mode of funding is defined by the degree of centralisation and output-input orientation in the fund-disbursement mechanism (Jongbloed, 2007). These two factors can very well determine the way students and staff are "governed" within an institution. The staff and students in the institutions which compete for funding on the basis of their outputs are expected to be governed differently from those which get the input-oriented central funding. This chapter tries to examine how these internal governance mechanisms are different across the three sets of the colleges included in the sample (the HPCs,

HGCs and LPCs)[39]. Basically the two cross-cutting dimensions are the mode of funding and the relative position of the institutions. After compiling and analysing data collected from personal interviews with the teachers, administrators, directors/chairmen, principals of the colleges, and from the focus group discussions with the students and the teachers, and from the secondary sources like NAAC-SSR reports, mandatory disclosures, minutes of the meetings, balance sheets, prospectus, brochures, newspaper reports, etcetera, the variations in internal governance mechanisms in these three types of colleges are analysed and discussed in the following sections. Section 2 discusses the theoretical perspectives to study governance in this context. The roles of different internal stakeholders (Board of Trustees (BOT) and the Board of Governors (BOG), the director, principal, teachers and the students) and distribution of responsibilities among them, the participation in the decision-making process, accountability and autonomy of the teachers, role of different internal committees or boards, quality assurance mechanisms adapted by these institutions etcetera are discussed in the sections 3 to 9. Section 10 links the observations on internal governance mechanism to the performance of the institutions discussed in the previous chapter. Section 11 concludes the whole discussion.

5.2 The theoretical perspectives to study governance

This study follows the structural perspectives in order to study the internal governance mechanisms in the institutions as it shares a similar set of assumptions with the structural theories. It assumes the institutions have a set of established goals and objectives and work rationally to achieve these goals. The organisational structure is assumed to be designed in a way to increase the performance of the institutions which is also assumed by the structural theories of governance (Boldman and Deal, 2008). Being guided by these perspectives, the study examines how the authoritative power and responsibilities are shared with internal stakeholders inside a HEI. Studying the relationships between the Board of Governors (BoG), the Principal, administrative officers, faculty members and students can throw some light on the process of sharing of power and responsibilities in a HEI. The term 'shared governance' is thus important in the context of academic governance. There can be a legal authority that has the mandate to govern the institution, such as the BoG, the Trustees and the university administration. On the other hand, the teachers, being a crucial part of the teaching-learning process, also assume a key-

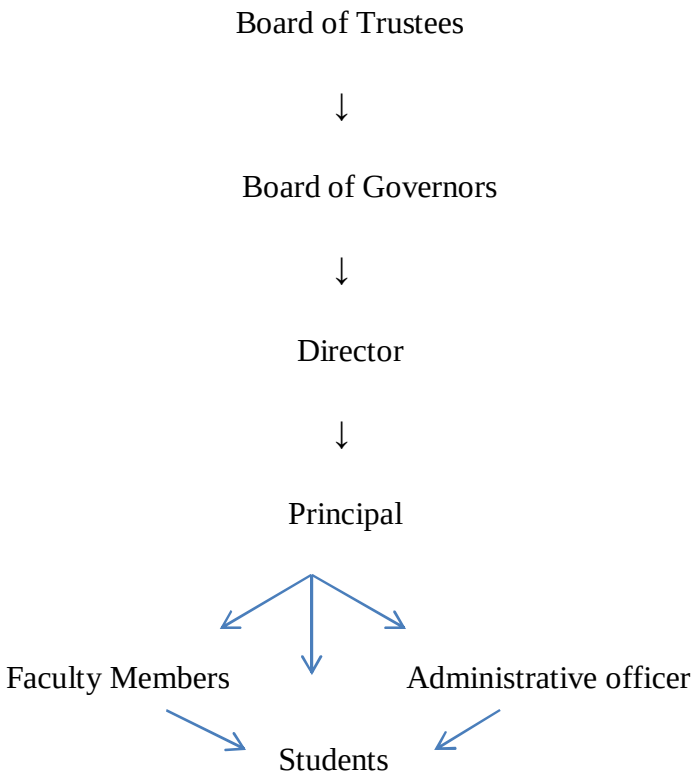
[39] There is no less reputed government college in the sample.

role in shaping the academic self-governance[40]. These two main part of the governance structure together take the major decisions through the process of discussion and consultation in the HEIs.

5.2.1 Shared Governance

The concept of "shared governance" is unique in case of universities (Hirsch, 2001). The main stakeholders who are at the most responsible positions in the decision-making process in these institutions are the Board of Trustees (BOT), Board of Governors (BOG), the director, principal, faculty members, administrative officers, and students. Here an attempt has been made to see how the tasks, duties, and responsibilities assigned to and distributed among the internal stakeholders. The can be done on the basis of "distinctive expertise and a bilateral division of power" (Rhoades, 2005). Generally, in case of the private colleges included in the sample, there had been one reputed industrialist/academician who had eventually collaborated with like-minded people and formed a Board of Trustees (BOT) with a dream of opening an institution. The actual founder then became the chairman of the same Trust which runs the college. Sometimes the founder is also called the Director of the institution. After getting permission from the central/state authorities for opening the college, the BOT then formed the Borad of Governors (BOG). The founder/director became a member of the BOG as the Trust nominee along with other five/six members of the Trust. The BOG has the power to initiate the process of recruitment of the principal, vice-principal and the main administrative officers such as the Registrar (in some colleges), Finance Officer, Controller of Examination and the like. The other posts are advertised eventually. The director bridges the gap between the BOT and the BOG and the principal does so between the BOG and the faculty, staff and students at the institution. In a very general sense, this management structure can be depicted in the following way:

[40] Academic boards or committees headed by faculty members are supposed to take important decisions regarding the curricula and methods of teaching.



In case of the government colleges, the BOT is not much relevant, as the state/central government takes the initiative to establish the college. The BOG is formed by following the directives of the Department of Higher Education under the state government. The process of recruitment of principals and other major administrative officers are conducted by the BOG under the rules and regulations levied by the higher authorities. In these cases role of state and central regulatory bodies are crucial which will be discussed in the next chapter in details. Here, the focus is on internal governance and its linkage with the performance indicators explained in the previous chapter. In the sections presented below, the roles of different internal stakeholders and relationships among them are analysed. First, an introduction about their formation/recruitment is provided and then the underpinnings of their 'shared' responsibilities and authorities enjoyed by them are examined. These are done keeping in mind the two dimensions of mode of funding and the relative position of the institutions. Thus the discussion is sectioned on the basis of three categories- the HPCs, the HGCs and the LPCs. The rationale for presenting the discussion based on the three groups of colleges lies in the argument that the ownership/mode of funding of the HEIs and their governance mechanism are closely

associated[41]. The input (or, output) orientation of funding and centralised (or, de-centralised) system of fund allocation discussed by Jongbloed (2007) have an impact on the institutions' objective function and the governance mechanism. Private HEIs (HPCs and LPCs in this case) receiving funds on the basis of their outcomes through a competition with other HEIs would have "performativity" and cost-efficiency as the main characteristics of their internal governance mechanism. As a consequence of the variations in the main goals of the service-delivery system, there could be a significant difference in the way institutional duties, responsibilities and power are shared in public and private colleges (HPCs and HGCs). Also, in spite of having the same mode of funding, since the HPCs and LPCs placed at the extreme top and bottom of the market, it is imperative to compare their governance mechanisms in order to explain why the former could succeed but the latter could not. A comparison of internal governance mechanisms of the private colleges (taking both the LPCs and the HPCs) can reveal the additional factors which determine the institutional functioning, apart from the mode of funding. Following this logic, the next section presents the main findings related to shared governance in HPCs, HGCs and LPCs. The variation in the roles of different internal stakeholders, starting from the Board of Governors (BOG) and the Board of Trustees (BOT), the principal and administrators, the faculty members, academic bodies, other committees and the students are discussed in the following sections. The variations in relationships among each of them across three groups of colleges are also analysed subsequently.

5.3 Role of the Board of Trustees (BOT) and the Board of Governors (BOG)

The role of the BOT and the BOG is extremely crucial in understanding the internal governance mechanism because these boards supervise/control the executive management of a HEI, either directly or indirectly (de Boer, Huisman, and Meister-Sceytt, 2010). Actually the BOT hands over the power to BOG to dissociate the ownership from the management of an institution in order to emit signal to the stakeholders about an impersonal decision-making process. The relationship between the owners (BOT) and the managers (BOG) is an extremely important dimension to analyse to the institutional behaviours (Massy, 2004). The members of the BOT in the private colleges included in the sample are mainly the industrialists or businessmen who do not have much experience regarding academic matters and thus handing over the power to the

[41] This has already discussed in Chapter 2 in the section on mode of funding.

BOG is essential for the benefit of the institutions. The BOG is constituted of the academic professional and the industry experts and the power of direct supervision remains in the hands of the members of the BOG. However, the owners, or the members of the BOT also exercise their powers by nominating a few trust-members in the BOG who would represent their interests. These boards have both the "strategic and supervisory functions" which influences the overall functioning of the institutions (de Boer *et al*, 2010). The proficiencies shown by the BOG members in controlling the owners' self-interest driven agenda help the board in maintaining their moral authority. The process of making the decisions and their consequences are fundamental to understand how these institutions are governed (Meister-Scheytt, 2007). In the literature on academic governance, there are various theoretical approaches associated with the role of the boards in the institutions. For example, the boards may assume the role of a "Principal" according to the Agency Theory, where the staff and students are perceived as the "Agents". The BOG members may also assume the role of the "Steward" according to the Stewardship Theory where the board shows the path of institutional development (Hung, 1998). On the other hand, according to the Stakeholder Theory, the board can negotiate with other stakeholders and take the best decisions on behalf of the institution (Hung, 1998). The Institutional Theory assumes the role of the boards is to deal with the environmental challenges posed by the various stakeholders (Ingram and Simons, 1995). Another possibility is that the boards can act like a "rubber stamp" and a "ceremonial body" without actually having any power to take/alter decisions taken by the owners or the administrators (Hung, 1998). The following sub-sections will discuss the role of these boards in three groups of colleges and examine the reasons behind the variations, if there is any.

5.3.1 The HPCs

There are two HPCs included in the sample and they would be referred to as the HPC1 and HPC2 depending on their rank calculated by the researcher on the basis of their students' opening and closing ranks. These colleges have been established by their respective Trusts which are nationally known in the field of education. Apart from the engineering college these Trusts also own several other educational institutes like higher secondary schools affiliated to CBSE or

Delhi Board, management colleges, law colleges, and universities[42]. In both the colleges, the BOTs are consisted of reputed industrialists, retired academicians and bureaucrats. Here the governing boards act like the board of directors in corporate bodies in terms of exercising control over the management. Both the colleges have professors and academicians along with industry-experts and bureaucrats as the members[43]. Surprisingly in both the colleges, no representatives of non-teaching staff and students are found in BOGs. The BOGs generally meet twice in a year, i.e., four times a year or whenever needed. The members of the BOGs are well-aware of the norms and regulations levied by the regulatory authorities and guide the institutions[44] to follow the rules in exact manner. In spite of the dominating role of the Director/Chairman, it is surprising to see that the BOGs have exercised their power to approve/disapprove many of the proposals or actions floated or taken by these institutions. In several occasions, the BOGs have raised their voices against an issue if it was not specified in proper format as mandated by the regulatory authorities. For example, in a meeting in the HPC1, the BOG insisted the institution to take up a resolution to change the designation of a few appointments as the nomenclature was not in conformity with the AICTE guidelines. Similarly, in the other college, the BOG rejected the proposals for increasing seats for a few programmes since the programmes are yet to be accredited by the NBA. Some of the senior members criticised the institution for trying to expand the capacity without following the AICTE guidelines. In another instance in the institution which aimed at establishing a new university in the state, the BOG wanted to make sure that every action should comply with the norms laid in the Act passed in the State[45]. Apart from reporting the routine matters (like the placement and the examination results of the students and the financial position of the institutions) to the BOGs, the institutions also ask for ratification for new appointments. The BOGs, also advised the institutions to raise more funds or cut unnecessary expenditures. The suggestions were made keeping the issue of cost-based efficiency in mind. Other issues like organising a cultural festival and seminars were also discussed in the BOG meeting for getting the formal approval. Even the name of the performers need to be

[42] The Trust which owned the HPC1 had opened up a private university in Rajasthan and was also in the process of establishing another one in West Bengal. The other Trust of HPC2 had plans for setting up a medical college, a design institute and a university in coming years.
[43] In HPC2, thirteen out of fifteen members were either professors or had a Ph.D degree.
[44] The term 'institutions' in the context of BOG meetings refer to the insiders like the Principal and other representatives of the colleges.
[45] They also made it clear that the meeting of BOG should not be considered as a platform for discussing issues related to the new university as they were not the competent authorities to do so.

ratified by the BOGs. The chairman and the other board members often encourage the institutions to attract funded research projects and make new patents for gaining reputation.

In case of HPCs, though the BOTs had actually established the institutions and they are the owners of the institutions, still the role of external members of the BOGs are surprisingly powerful in altering/negating/approving the agendas floated by the institutions. The power in the decision-making was concentrated in the hands of the members who are well-reputed, experienced and influential in the field of academia and industry. As already mentioned above, such behavior of governing boards can be explained through Stewardship Theory of academic governance where governing boards assume the duties of guiding the management to adopt strategies for fulfilling its missions and goals (Hung, 1998). The governing boards thus act as the 'stewards' in determining the decisions on behalf of the entire institution. As revealed through the discussions with a few board members in these colleges, one of the main agenda of these boards was to gain trusts from the stakeholders (students, parents and teachers, industry and government) who believe the boards would not compromise with the quality of service in these institutions (Kezar, 2006). Despite of knowing the fact that the reputed external members may not be amenable to every suggestions made by director or the, the owners had to approach eminent personalities to be a part of their BOGs in order to build up the reputation of the college and to give a signal to the potential students about the impartiality and credibility of the decision-making process.

5.3.2 The HGCs

The BOGs in the HGCs is generally constituted by the higher education department of the state in accordance with the stipulated guidelines. In the four HGCs included in the sample, the well-reputed academicians, professors, bureaucrats and the Member of Parliament or Legislative Assembly were selected as the members of the BOGs. The proportion of representatives of industry is less in these colleges compared to the HPCs. The representatives from students and non-teaching staffs were included in the BOGs in these colleges. Unlike the private colleges, here the BOGs mainly acted like a ratifying authority for formal approvals of new appointments, sanctioning leaves of the employees, for advancing new requisitions or any proposals related to the expansion of the institutions, approval of internal committees, etcetera. They were supposed to approve the annual budget and the schemes of utilization or the application for grants. The

BOG meetings, as reported by the faculty member interviewed in these colleges, were just like a formality as the role of BOG in decision-making is relatively limited. As noted in the minutes of the meetings, the BOGs had suggested a few measures to ensure the employability of the students and the competitiveness of the college but these suggestions were difficult to implement in reality because of various bureaucratic controls binding on the colleges.

The BOGs in the HGCs are mainly viewed to be performing the "maintenance role" as Ingram and Simons (1995) have explained in the framework of Institutional Theory of academic governance. The main role of this type of BOGs is to bridge the gap between external regulatory authorities and the college. They help the institutions to follow the guidelines laid down by multiple central and state regulatory bodies and the affiliating university. They guide the institution to cope up with the pressures and expectations of these external agencies and to maintain the institutional position within the defined regulatory structure.

5.3.3 The LPCs

In case of the six LPCs included in the sample, the BOT members were mainly the local businessmen and politicians apart from the district administrators (bureaucrats), and a handful of academicians. In most of the colleges, the founder/director of the institution was not an academician, but a businessman or a political leader. The academic qualifications of the members of BOGs in LPCs were much humbler than the HPCs and the HGCs. The political inclinations of almost all the members were similar to that of the founder's political affiliation. No one with a different political opinion/affiliation was included in any of the colleges, as revealed by some of the teachers in these colleges. A representative of non-teaching staffs was included in some of the BOGs, but no student representative was made a part of the governing body. The minutes of the BOG meetings in most of the LPCs showed that every agenda floated by the founder/director got approved unanimously without any scope of debate or voting. Noo single point of dissent was mentioned on any of the minutes of the meetings in the colleges. It was reported by some of the teachers that many of the critical issues were actually discussed unofficially before the commencement of the formal meeting at a personal venue. The informal negotiations had eroded the space for democratic discussions and thus the vested interests of the owners of the institutions got fulfilled in the BOG meetings without any hiccups. The role of the BOGs in these LPCs was to support the owners blindly. For instance, many of the LPCs did not

follow the UGC/AICTE guidelines for teachers' recruitment but the BOGs kept on signing on the papers without raising any issue. Similarly, the budgets, sanctions of casual and other leaves, proposals for physical expansion, hikes in the tuition fees got the approval from the BOGs who used to be a puppet body working on the behalf of the owners.

In short, the BOGs in these LPCs work in a superficial and ceremonial fashion without leaving any impact on the decision-making process. In these cases the BOGs do not even have adequate information about the rules and norms imposed by the higher authorities and about their own institutions which also restrain them from participating in decision-making process (Hung, 1998). Here, the owners select the members of the BOG in such a way that each and every agenda of their interest could easily get approved by the BOG. Possibly the members of the BOG became happy just being the 'member of the board' and were not at all interested in taking part in internal decision-making. The owners were not much bothered about the risk of losing credibility because of such incompetent BOG members. Most of them did not flash the list of the members of the BOG on the homepage of their websites like the HPCs did. Probably, the owner-body was very much sure that the reputation and qualification of the BOG members would not matter much to the clientele they had been catering to[46]. Also, the owners did not want to take any risk of getting challenged by including experienced and qualified members in BOG in order to avoid any hindrances that might be coming in the way of passing their own interest-driven agenda.

5.4 Role of the principal

The role of the principal in any educational institute is crucial to understand how the very essence of mission, vision and objectives of the institutions trickle down to the everyday practices in reality. It is the principal who bridges the gaps between the owners and /or the BOG on one side and the employees and the students on the other side. The significance of his/her role may depend on the statute of the institutions or the rules and regulations prescribed the government or other regulatory authorities. For example, the recruitment, terms and tenures of service, remuneration and the duties of the principal specified by the government regulatory

[46] As discussed in Chapter 4, the range of the WBJEE ranks of the students in the LPCs was worse than that of the HPCs. The priorities revealed by the students also explained that they were more concerned for a degree rather than the quality of teaching-learning.

authorities would be applicable in case of the public institutions. In private institutions, principals' recruitment process, the eligibility conditions, pay scale, duties and responsibilities are determined by the BOGs which may or may not conform to that of the public institutions[47]. In the private colleges, the principals' inability to deliver the duties in a way the owners want them to, or emergence of any divergence of their opinions from that of the owners, may lead to a termination of the contract. In the public colleges, the principal is the functional head of the institutions and the principal is directly accountable to the state/central government who has employed him/her. If these basic conditions are different among the three groups of colleges, the role of the principal would also vary in terms of his/her responsiveness to a crisis, pro-activeness to take new steps for development of the institutions, providing support to the staff and students and expressing accountability towards his/her employers. This is crucial in understanding the differences in the behavior of the principals in public and private colleges.

5.4.1 The HPCs

In the HPC1, the principal was the 'chief executive' while the director or the actual founder of the institution was the 'functional head', as clearly mentioned in its brochure. This explicitly reveals the relatively lower position of the principals in the institution. In both the HPCs the principals were well-reputed academicians having doctoral degrees with more than twenty years of experience in teaching and research. They had been recruited through a process of formal interview. The principals were in-charge of all academic and non-academic matters in the institution, holding immediate next positions to the directorsin the hierarchy. They were supposed to act like a link between the institution and the director. They had to inform and convince the staff and the students about new rules and regulations as per the instructions of the director and his team. In the HPCs, the principals had to meet other administrative officers like the Registrar and Controller of Examinations, and the Deans on a regular basis, in order to take an update of the current situation and report it to the directors. They actively supervised almost each and every aspect of the teaching-learning process in the institution. Students were free to walk in to their office and discuss anything which troubles them. Maintaining and improving the reputation of the institution were their foremost concern failing which their relationship with the

[47] If the BOG was not so powerful (as already explained in the case of LPCs) then the owners/BOT used to decide all of these and then get it ratified by the BOG.

management would have suffered[48]. In both the colleges, the senior teachers used to get unconditional support from their principals[49]. In both the colleges, the relationship of the principal with the senior teachers was more collegial, but in case of junior teachers it was more like a Principal-Agent relationship[50]. The principals used to interrogate the junior teachers about the course-coverage, teaching methods and class responses, even if the Heads of Departments (HOD) were officially responsible for such tasks[51].

Following the concepts of Agency Theory, it can be argued that the principal here assumed the duties to ensure zero or minimum deviation of his agents (junior teachers, students and staff) from the institutional norms. The junior teachers were less experienced and they had their own interests like preparing for Ph.D entrances, writing papers, applying for government jobs, etcetera which made them less trust-worthy in the eyes of the principal. Because of these, the principals expected a greater degree of compliance from them. On the other hand, senior teachers were trusted and given adequate freedom to make room for creativity and innovative practices essential for the betterment in the performance of the institutions. On the other hand, the principals in the HPCs themselves were the 'Agents' while the directors were the main 'principals'. The directors had appointed the principals with the approval of the BOTs and the BOGs who wanted to ensure the "Agents" (i.e., the principals of their colleges) were not driven only by their self-interests and utility-maximising agenda. Institutional interests should be given top priority and that is why the "Agents" (i.e., principals of their colleges) were supposed to feel accountable to the 'Principals' or their employers, i.e. the directors. The "Agents" (i.e., principals of their colleges) had to look after every academic and non-academic matter and regularly report it to their 'principals', i.e., the directors. By making such practice mandatory, the directors

[48] In HPC1, some of the students found their principal 'discriminatory' in some of his actions and they reported that the principal always selected the same group of students from each course/year to represent the institution in any external competitive platform. During interview, when the process of selecting representatives for state level programmes were discussed, the principal himself admitted that he personally checked the list of students before finalising because he believed only the "best" deserved to represent the institution.

[49] He allowed the senior teachers to avail on-duty leaves and travel grants if they were going to present their papers in some reputed seminars/conferences. Senior teachers were also given sabbatical leaves for writing books. But the junior teachers were not supported in these ways.

[50] In HPC1 many of the junior teachers felt the principal was very strict as he did not allow anyone to deviate from the schedule/tasks which sometimes put terrible pressure on them. For taking casual leaves, junior teachers officially need only HOD's approval but even if the HOD allowed it, it would not be granted unless the principal agrred.

[51] As reported by a junior teacher in HPC2, once in a group-meeting the principal asked them to explain why the library's list of borrowers had very few names of the junior teachers. Then he tried to motivate the junior teachers to explore the library more and make a habit of reading all kind of books.

wanted to ensure that the agents (i.e., principals of their colleges) were working for the institutional interests only. In other words, the agents (i.e. principals of their colleges) were also bound to follow a compliance structure to make sure that achieving institutions' betterment was also their only goal.

5.4.2 The HGCs

Out of the four HGCs included in the sample, three of them were fully government while the HGC2 was an autonomous college affiliated to the MAKAUT. In all the six colleges, principals had been recruited by the Public Service Commission and there was no role of any foundation trust like other private colleges. The principals' main expertise had always been in the field of teaching and research but their connection with the industry was not very strong compared to the HPCs. Here the principals had to abide by the rules of the several regulatory authorities but their role in decision-making was constrained by the bureaucratic process[52]. The principals seemed quite burdened with newer requirements frequently notified by the regulatory and funding agencies and they found it difficult to motivate the teachers and the non-teaching staff of the institutions to deliver the tasks within a stipulated time period[53]. However, on academic matters, they expressed their full trust on their fellow colleagues. They were observed negotiating with the students and motivating them in order to attend classes more regularly. Students also expressed their grudges against the principals regarding the unsatisfactory placement and other infrastructural issues. According to the students, the principals were not in a position of taking any decision due to the bureaucratic control and over-regulations[54]. The principals also acknowledged the limitations as there was not much of a scope for taking any pro-active step since the institution had to function on the basis of pre-specified rules from where they could not affod to deviate easily. For example, in one of the HGC, the faculty member responsible for organising the placements was termed as "inactive" by the students. The principal did not deny the acquisition but expressed his inability to solve the problem as the system did not allow him to take any measure against him for being not pro-active or less active. On the other hand, those

[52] The principal in HGC1 thought his main duties were to inform the staff of the colleges about several circulars and notices issued by the regulatory authorities and to ensure that they did not deviate from the rules.

[53] In HGC4 and HGC1, the principals pointed out that less number of teaching and non-teaching staffs and vacant posts posed greater challenges for them

[54] Some of the CSE final year students in HGC3 complained that in spite of having the best faculty, their placement opportunities were not good enough in comparison with the best HPCs. According to them, this was mainly because of the lethargic attitude of the teachers and lack of supervision by the principal.

teachers who were active in administration wanted a light load of the classes but it was difficult to manage the other teachers in the absence of a difference in the service-conditions. In the HPCs, there was a clear-cut division of senior and junior teachers based on their recruitment process, qualifications, experience and influence. But in the HGCs, the teachers were recruited similarly and the principals were not in a position to practice his authority officially against or in favour of anyone.

The lack of freedom associated with the decision-making process of the public institutions had limited the role of the principals in these HGCs. Since the institutions were dependent on the central/state government and other authorities for resources, it had to accept the rules and regulations as often explained by the Resource Dependency Theory. The principals used to inform the teachers, staff and the students about any changes in the regulatory policies, and try to strike a balance between the external and internal stakeholders. They also acted like the 'Stewards' in some instances where there was a scope to motivate the students and teachers to perform certain duties.

5.4.3 The LPCs

In the six LPCs included in the sample, the principals' highest qualifications varied from the LLM, MBA, M.Tech to Ph.D. In four of the LPCs, the principals accepted that they had some kind of prior connection or familiarity with the director/founder of the institution which had influenced his/her decision for applying for the post of principal in the institution. In other two colleges, the principals claimed their recruitments were done in fully impersonal ways. Only one of the six principals (in the LPC1) expressed his interest in academics and cited this as the main reason for leaving his previous job in the IT sector and joining in the institution. Others have either cited personal reasons like shifting to home-towns or excess work-related pressure in their previous jobs as the main driving forces behind their decisions. The principals in all these LPCs were found to have extreme dependence on the director/founder of the institution and mainly deliver what they have been asked by him/her. These principals used to supervise the faculty members and non-teaching staffs as per the guidelines levied by the director or the BOG[55]. In their views, since the teachers were hired to perform the managements' orders, there was limited

[55] For example, the principal in LPC 3, 4, and 5 regularly used to check the attendance sheets of the teachers and the timings of their entry and exit.

scope of any autonomy even in the academic matters[56]. Students were indifferent about their principals in these colleges, and only used to meet him/her if they have any problems. Another interesting point to be noted here is that in some of the LPCs, the principals had very little influence on the non-teaching staffs in these institutions. Because of the non-teaching staff's political affiliations and their close proximity to the director, they only deliver their duties when they were directly asked by the director[57]. The supervising role of the principal in LPCs was thus restricted to the teaching staff only in the colleges which were owned by politically influential people. The only duty performed by these principals was to supervise/monitor the activities of the faculty member and report it to the director/founder. All other academic and non-academic matters are handled by the director.

In these LPCs, the principals were the 'Agents' while the director/founder or the owners are the 'Principals' in the framework of Agency Theory. The only type of accountability expressed by the principals of these colleges was in favour of their employers. The owners had selected the principals of their colleges in such a way that they would work on behalf of them only without having any individual ability to think, act or resist. As an 'Agent', they had to be very loyal to their principals as the employers c had the authority to terminate the contract if he/she fails to perform the way they wanted him/her to. As a consequence, there was no 'leadership' role of the principals observed in this case.

5.5 Faculty autonomy and accountability

In the undergraduate colleges where the main focus is on teaching, the scope of autonomy among the faculty-members is pretty limited compared to the universities. But if we stick to the way academic freedom has been defined by Van Alstyne (1972) as a set of "basic vocational liberties" like teaching, investigating, doing research and publishing on any subject "as a matter of professional interest without any professional jeopardy or threats", there is no reason why the teachers of undergraduate colleges would not be enjoying these basic freedoms (p. 146). However, there can be variations in the degree of academic freedom enjoyed by the faculty members across the institutions depending on their mode of funding and relative position in the

[56] . In LPC 1 and 2, the principals acknowledged the need for faculty autonomy in academic matters but they doubt whether it could be adopted in a competitive and performative scenario.

[57] One assistant professor in LPC5 revealed that because of non-cooperation of these non-teaching staff, teachers were over-burdened and they had to do literally everything for maintaining the everyday activities in the college.

market. The performances are important if the institutions compete for funds in the market. Better performance would help them in generating more resources from the funding agencies attracting best inputs (students and teachers) and acquiring prestige and reputation. If the management of the institution is only concerned only about the performance, then the teachers would be treated more like a factory-worker to produce more and more in a given period of time. On the other hand, if the institution has an assured funding (input-based) which is not linked to their performance, the obsession with performance might be a little less compared to the earlier case. In this case it can afford to have some other types of goals which may not generate any immediate measurable outputs in the short run but may have long-term impact on the society. For instance, a centrally funded public institution may have priorities like serving the students from weaker socio-economic background, taking interest in fundamental research without worrying about the patents and sharing the know-how with the local people to strengthen the local economy. In this case, the teachers would be given more academic freedom to be creative and generate innovative ideas. The concept of academic freedom and accountability are also related to the concept of 'performativity'. Performativity can be conceptualised as a "technology, culture and mode of regulation" which compares performances and use the judgments as means of control (Ball, 2000). The more performative the teachers would be the less academic freedom they would enjoy. In a performative culture, accountability is defined only through the measurement of performances and failing to perform is tantamount to being not-accountable to the system. The other aspects of accountability, for example, accountability to the students, to the society, to the broader field of science and technology are insignificant in this framework. The internal governance mechanism of the colleges may reflect this performative culture or the culture of co-operation, or a mix of both depending on their objective function and the mode of funding.

5.5.1 The HPCs

The responses of the teachers in these institutions helped us having some idea about the ideologies that governed the surveillance system in these HPCs. There were two types of academic endeavors – teaching and research. Since a couple of years, research was gaining more importance in these institutions over teaching which led to a hierarchy and fragmentation among the faculty-members depending on their primary interest on teaching versus research. For

teaching, there was no autonomy enjoyed by the teachers as each and every decisions made by them need prior approval from the higher authorities. Any deviation from the schedule had to be justified in to the HOD who would report it to the Deans[58]. There was not much scope of modifying the syllabi as it was an affiliated college to the MAKAUT, but teachers had to try for adding something extra to the syllabi which was not offered by other colleges. This was advised by the principal in HPC1. The teachers used to face tremendous pressure to ensure good results of the students. The HODs had to present semester wise results for each of the papers to the principal and other senior administrative officers. If incidentally there was a poor performance of the students in any of the papers, the particular course-instructor would be questioned by the HODs, the Deans and sometimes by the academic advisory boards The junior teachers were at a more vulnerable position in this process as poor results in the papers taught by them used to be noted more seriously and often strong actions (like termination of contracts) had been taken against them[59]. A poor performance due to lack of infrastructural facilities like the inadequacy of instruments or equipment in the laboratory used to be noted very seriously and immediately reported to the higher authority for taking prompt action. For research, the proposals made by the senior professors were also subject to scrutiny by the Project Manager, the Registrar and sometimes by the Principal. In HPC2, every research proposal had to be approved officially by the Dean (Research), Project Manager and the Principal officially and unofficially by the Director/Chairman. These institutes used to encourage the teachers to do their research and publish papers and did not show any hesitation in granting leaves or financial assistance if they found it beneficial for the institutions[60]. If such 'beneficial' projects required too much of time from a faculty member, his/her class loads were adjusted accordingly. Suddenlyly these institutions had developed a greater interest in claiming patents and encouraging their teachers for doing such projects which could earn them more and more patents. But if some projects were

[58] Here the syllabi were fixed by the affiliating university, but teachers could decide upon the curricula and the methods and modes of teaching, introducing innovative practices like guiding small projects, arranging field trips and internships etcetera. These decisions need prior approval from the academic councils/academic advisory bodies, principal, and the Director/Chairman.

[59] In one of the colleges, students of CSE and IT did not do well in two of the papers compared to other HP institutes. One paper was taught by a senior faculty member and the other by a junior one. After the results and the explanations were presented in the academic council meeting, only the case of the junior teacher was sent for further consideration to the BOG. The BOG decided to terminate the contract with the junior teacher with immediate effect.

[60] The benefits to the institution mean both the financial gains as well as the gains in terms of status or reputation, for example an improvement in the rankings.

more relevant for the broader field of scientific and technological research, but not much gainful in the short-run, then these would not be passed to the higher authorities for approval. Projects in collaboration with the foreign universities, industry and the government departments used to be always welcome as these would help them in building reputation in the research field.

The lack of academic freedom in doing research was starkly evident in the responses of the teachers in the HPCs. The one and only type of accountability promoted in these colleges was that of being more productive and performative in delivering outputs which could be measured by the numbers. Even if all the teachers had to work in an environment where the culture of performativity was being nurtured and promoted, there was not much of a unity, rather a sense of segmentation and hierarchy were apparent among the teachers. The senior-junior distinction among the teachers was designed institutionally and maintained throughout from the beginning. The difference was all the more evident in the ways their performances used to be evaluated. This does not mean the senior teachers were kept outside the purview of the performance-assessment framework. Their contribution was measured through their instrumental role behind signing of the Memorandum of Understanding (MOUs) with the foreign/industrial collaborators, the number of research grants they could attract, the number of employers they could approach for placement, etcetera. Failing to fulfill the expectations would lead to a curb of "academic freedom" of the senior teachers whatever little they used to enjoy, if not a termination of contracts. Here "academic freedom" was used as an incentive for performing better and the power of granting this freedom was concentrated among the managerial authority of the institutions. The surveillance mechanism of governance inside the HPCs perfectly maintained the hierarchy among the teachers and the incentives/punishments were designed by keeping the hierarchy in mind. As a result, the strength of teachers' collective voice against the management's decisions got weakened in the process.

5.5.2 The HGCs

In the HGCs, the concept of accountability of the teachers was entirely different from that of the HPCs. In the HGCs, the teachers used to feel accountable mostly to the students. Meritorious students coming from the moderate or poor socio-economic background used to make the

teachers more responsible toward their duties[61]. The principal used to delegate the duties among the teachers and tried to motivate them but never interfered into the academic matters unless there was a crisis. The teachers could experiment with newer methods of teaching following the guidelines of their academic councils and they enjoyed basic academic freedoms within the structure of an affiliating system. They could apply for a new project and unlike the HPCs, there was no such posts of project managers in most of the HGCs who would review their proposals. On-duty leaves for attending seminars were granted easily. However, after the introduction of API (Academic Performance Indicators) system for promotion of teachers, some restrictions on the teachers seem to have been imposed. The new system has made the junior teachers more concerned about selecting research areas and publishing papers to score more points. Following the recent circular about the NIRF, these institutions were encouraged to report their performance records to the NIRF. Though the process was voluntary, but it suddenly made them more focused in research relative to teaching. This has also put pressure on the teachers to perform in a way that could help the institution to score better ranks in the NIRF[62].

These colleges were in a transition moving from a traditional trust-based system of governance towards a performance-oriented governance structure as the main elements of the New Public Management (NPM) such as accounting and auditing of performances were in the process of being implemented in these HGCs. Though the PBAS (Performance Based Appraisal System) and the API had already been officially implemented in the public institutions a few years ago, but the academic culture did not undergo an immediately transformation towards a performative one. This was also because of the presence of a few senior professors who were outside the the purview of the PBAS-API system. In these colleges the faculty-members as a community expressed a tint in favour of the ethical framework of teaching-learning rather than the performative system. For instance, there were a few professors voluntarily working hard for ensuring the placement for the students even if they were not a part of the placement committee or their efforts were not being acknowledged officially. These efforts did not earn them any score in API, but when questioned, they explained their efforts in terms of their sense of accountability to the students and the institution as a whole.

[61] The placement in-charge in HGC4 shared that in spite of having resource crunch he tried to communicate to the employers in every possible way to support the students coming from economically weaker sections.

[62] Though the initial survey was done during 2013-14, some of the responses related to the NIRF and API was gathered during a second field visit in 2016.

5.5.3 The LPCs

Here, teachers used to feel accountable only to the the director and higher administrative officers who were their employers. Teachers' timings of entry and exit, duration of stay inside the institution, number of classes per day, invigilation duties, number of leaves, etcetera were minutely noted by the principal and vice-principal and were also reported to the director/chairman either officially or unofficially. In all the LPCs, teachers' applications for leaves or demands for new equipment, books or other items were very strictly scrutinized by the principal and reported to the director who had the main verdict on these issues. In two of the colleges, which topped the list of the LPCs, the process of doing research had started following the management's order. As the management had felt the need to promote research, it had selected a few potential teachers and asked to make research proposals to apply for grants. Regarding the subject of the research, teachers did not have much of a say here. These colleges had suddenly started spending a lot of money in developing the infrastructural facilities and developing the research wing. In the other colleges, no travel allowance was granted ever, and the on-duty leaves had been denied without showing any proper reason. Granting the permission for taking a leave was a purely discriminatory practice according to most of the teachers interviewed in these colleges.

In spite of following a strict surveillance mechanism, the institutions failed to deliver any significant output both in qualitative as well as in quantitative terms. The main difference between the HPCs' and the LPCs' monitoring systems were that the former's aim was to maximise the revenue by improving the performances of its teachers while the latter wanted to minimise the costs[63]. In the economic sense, internal efficiency can be achieved by minimising costs given the output. Perhaps the LPCs had achieved this economic effieciency but it did not make much sense in the field of education. Often the advocates of neo-liberal reforms argue in favour of fostering competition among the HEIs to make them more efficient by using the resources more efficiently. But here, the case of LPCs clearly indicate that minimising costs by implementing a tight surveillance mechanism on various activiites of the processes which made little sense in this context as this concept of efficiency has little correspondence with the quality

[63] If HPCs could perform better, best of the students and teachers would be attracted to these colleges, which in turn would raise its ability to attract more funding in the form of tuition fees and research grants.

of service they deliver. Because cost and quality are positively related, cost cutting is inimical to quality (Chattopadhyay, 2012).

5.6 Collegiality

The faculty-members are the main pillars of the teaching-learning system and without the participation of the faculty members; the institutional governance system in a HEI cannot be effective in fulfilling its main purpose (Austin and Jones, 2016). Collegiality is a collective process for decision-making in which academicians play an integral role. The "teachers have to engage in debate and discussion to resolve conflicts among the different stakeholders of the institutions. This makes room for democratic participation in decsion-making (Baldridge, Curtis, Ecker, & Riley, 1978). It also percolates the sense of sharing of the collective responsibilities among the teachers in an institute (Burnes, Wend, & By, 2014). Collegiality is reflected through the practices of sharing of views and exchanging opinions, collaborating and co-operating with the fellow-researchers and colleagues in an institution. It can be understood as a culture, as a structure and as a behavior (Bess, 1988). Culture is about the academic beliefs of the teachers while structure is about formalizing the rules of decision-making and both of these together determine the behavior. Following the same line of argument made in the subsection 5.5 above, one can expect there would be variations in the degree of collegiality across different HEIs on the basis of their objective functions and the mode of funding. As the nature of job-contracts of the teachers and the culture of performativity vary across institutions (as discussed in the earlier sections), these would also lead to variations in the degree of collegiality across the HPCs, the HGCs and the LPCs.

5.6.1 The HPCs

In the HPCs, collegiality as a culture was observed only among the senior teachers and it was confined within a small group of teachers only. There was an explicit hierarchical structure among the teachers in these colleges and the senior teachers did not consider the juniors as a part of their collective entity[64]. The senior teachers did share their ideas, exchange their views, raise their voices against anything inappropriate committed by the management but they did not feel

[64] The ratio of senior reputed faculty members to the junior teachers was around 1 is to 4 in my sample.

comfortable to get engaged in discussions with the junior teachers[65]. Though no contract was permanent in these institutions, but seniors used to enjoy a greater degree of job-security than the juniors. The class schedules were adjusted according to the preference of senior teachers and relatively lesser class-loads use to be assigned to them. Junior teachers were over-burdened with class-lectures and other duties like invigilation, paper-setting and checking scripts, making presentations for board meetings, designing brochures, holding remedial classes and what not! But none of them had ever complained about the work-load because they knew if they could perform well, the chances of getting a more stable contract would be higher[66]. Even among the senior teachers, there was a hierarchy in terms of influence and power held by them. But this hierarchy did not originate from the seniority or the qualification of the teachers but was based on the ability to exercise influence on the partners in the industry, academia and research. Even if all the HODs were part of the Academic Council (AC), the distribution of power in decision-making was not equal at all[67]. As a structure, there are provisions for teachers' representation in the BOG meetings, academic advisory body, and other committees. But none other than these influential senior teachers felt free to open their mouths in these meetings. Teachers' council was also dominated by the influential group. Though officially all the teachers used to be notified

[65] Junior teachers mostly with M.Tech and without Ph.D degrees were recruited on temporary basis and their contract had to be renewed after every 6 months or 12 months. On the other hand, senior teachers were those who had served the industry or the academia for a span of 10-15 years or more and then joined the institute either for personal reasons (like shifting to home-town, interest in teaching, stressful working environment in the previous job etcetera) or simply for a hike in remuneration.

[66] The junior teachers interviewed had actually compared the working-condition with that of the IT firms, and explained that the type of treatment they get is very 'natural' in the competitive job-scenario.

[67] For example, among two HODs of similar age, experience and qualification interviewed by me, one thought his primary job was to teach, did not have much influence on the university or on the industry. He used to take his classes regularly, clear doubts of his students outside classrooms, get engaged in discussion with his students but never got included in any of the committees or never asked for suggestions for the betterment of the college. The other one was quite influential as he wasa member of academic council of the affiliating university, and a member of the BOG of another private engineering college and a consultant for a highly reputed software firm. He had good connections with heads of other industrial firms and he himself revealed that college need him not for teaching, but for maintaining relations with other partners. He said, "I have joined here after serving the IT industry for 25 years. I was the regional head of my firm. This college has hundreds of good young teachers and I think anyone with an M.Tech degree can easily handle the syllabi. This post was offered to me because they need my name and contacts". He communicates with other industrialists for getting projects, arranging placements and organising conferences with reputed international speakers.

about the meetings, junior teachers did not attend these meetings and they followed this norm as the "custom"[68].

The hierarchy among the teachers' community in the HPCs limited the effective role of collegiality in the decision-making process. In short, the effective role of collegiality became weaker by the unequal distribution of power among the teachers depending on their experience and influence and this, in a way, also weakened the power of the collective (Burns *et al*, 2014). Brunsson and Sahlin-Anderson (2000) argued as the governance system gets more centralised the decision-making process also becomes more vertical in nature reflecting the hierarchies. The case of the HPCs was an example of this.

5.6.2 The HGCs

In the HGCs, teachers were recruited through the Public Service Commission and they have full tenure and their jobs are secured. The common terms of their appointments had ensured them equal rights in the decision-making process. There was no official ground to discriminate the teachers on the basis of their service conditions. Debates and discussions used to be a common phenomenon in the staff room and teachers felt free to raise their voice against anything they found difficult to accept. There was no explicit hierarchy among the permanent teachers, though the ad-hoc teachers maintained a distance from them. Relatively junior teachers were often encouraged by the seniors for making more active participation during the meetings. The collegial culture also got reflected in the structure of decision-making system in the HGCs. A few senior faculty members used to be elected for representation in the Governing Body, all HODs were part of the Academic Councils and almost all the teachers were included in other non-statutory committees. Teachers' Council's secretary held a powerful post in the HGC2. According to him, in spite of having different political views among the teachers, the council could stand as a collective structure. But the active participation of teachers had been declining due to the frustration built up from long bureaucratic process of sanctions and approvals from higher authorities which delayed the actual materialization of the decisions in these colleges. The excessive resource dependence on external agencies (state and central government and the regulatory authorites) created an uncertainty in decision-making within the institution (Hatch and

[68] If there are issues for which a mass approval/disapproval is needed, then these junior teachers are asked by the seniors to be present in the meetings and cast their votes in their favour.

Cunliffe, 2012). The HODs, the secretary of the teachers' council or any other teacher who could handle these uncertainties associated with critical resources, became influential over time and started enjoying more power than others (Pfeffer and Salancik, 2003).

5.6.3 The LPCs

In most of the LPCs, teachers did not seem to be much interested in sharing and discussing ideas and expressing their views in an open forum[69]. Almost all the teachers expressed a fear or insecurity for losing their jobs due to low demand of seats. They were trying to save their own jobs by pleasing the management explicitly. Each of them was competing with others, and hence there was not much of a scope for co-operation. On paper there was an ample scope of raising voice against the management, but in reality nobody used to say anything. Teachers' council was ineffective in most of the colleges[70]. In these colleges, teachers who were politically influential were selected as the representatives at the BOGs. Formation of the internal committees was done in a biased manner as reported by a few teachers in some of the LPCs. Those who were closed to the principal and director/chairperson, used to get included in several internal committees. Others never got a chance to work in these committees and expressed frustration about the entire process. Unlike the case of HPCs, here "closeness" to the Principal/Director/Chairperson did not refer to the degree of influence teachers had on industry, academia or research community. Here this "closeness" was defined in terms of political affiliation, as revealed by the respondents. This was not the case of the HPCs and the HGCs in the sense that none of the teachers openly talked about these issues when interviewed. But in case of the LPCs, both the sympathizers of ruling party and the opposition clearly reported about these[71]. Not only in case of forming the internal committees, but in each and every activity, those who used to support the political affiliation of the management, used to enjoy preferential treatments[72]. Even the senior teachers kept their mouth shut in order to please the management and continue to enjoy the benefits.

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[69] In one of the LPCs in Mursdhidabad, one assistant professor revealed that even the principal and teacher-in-charge did not like when teachers engage in a discussion or debates during working hours.

[70] According to some of the teachers in LPC5, they do not care about these meetings as long as their salary component and loads of classes remain unchanged.

[71] Sympathisers of the ruling party justifies the system of including teachers with a particular political opposition by terming it "natural" and a "historical trend" in the state.

[72] For example, in a LPC in Hooghly, only a group of teachers got classes scheduled between 12 am to 3 pm which was convenient for them as they travel from Kolkata every day. Regarding this, other teachers were literally angry but they had to accept this in fear of getting sacked by the administration.

In short, as there was no culture of co-operation and collegiality, the superficial structure of democratic decision-making made no sense in case of the LPCs. As a result the behaviors of the teachers became extremely self-centered and narrowly focused. The competition among the teachers to please the management and save their jobs circumscribes the space for building an academic collegiality. There was no trust on each other and the management utilised this breach of trust to promote their own interests.

5.7 Role of the Academic Boards/Councils

The Academic Boards/Councils are the highest decision-making body in academic matters in an institution. These are the main bodies through which the faculty-members get to participate in the academic matters which are an essential part of academic governance (Melear, 2013; Minor, 2004). Also, these boards are given more importance when the institution has an objective of improving the teaching-learning process. The role of these boards varies accordingly depending upon the mandate and the objective of the institutions. Since the public institutions operate under a regulatory structure imposed by the state and/or state governments, the role of these boards may be restricted in comparison to the private or autonomous colleges.

5.7.1 The HPCs

These institutions had active academic advisory bodies which held their meetings twice a year. A few reputed personalities such as the corporate managers/consultants of the renowned IT firm or other core-engineering firms, industrialists, professors, ex-vice chancellors of state universities, retired bureaucrats were selected as the members of external advisorsof the academic bodies. Though the syllabi was determined by the affiliating university, but the senior teachers including the HODs took up the responsibilities to revise the teaching methods and the curricula in the beginning of a semester following the recommendations made by the academic bodies. The administrative and executive heads of the institution did not take much interest in these core academic matters and used to leave it to the faculty members only.

The role of these academic boards was crucial in maintaining the competitiveness of the institution. All the institutions in the market offer the same course under the syllabi designed by the university, but to mark their “product” different from the rest, the institutions had to invent the innovative teaching methods. For instance, HPC1 used to impart training to its students with

a large number of software-packages which were not required as per the rules. The "product-differentiation" was done with these extra benefits that helped them in attracting better students and enhance the stock of prestige and reputation.

5.7.2 The HGCs

In these colleges, the Academic Boards/Councils used to hold meetings once in a semester. The reputed professors and a few industrial experts were part of these Boards apart from the principal and the HODs. But some of the professors expressed a feeling that the role of this board was exrtremely limited as the syllabus had been already designed by the university. The process of revising the syllabus was also controlled by the university. The HGC2 had the scope for revising the syllabi as it had received the autonomous status. In HGC2, with the feedbacks from all the professors in the respective fields, the syllabi were reviewed once in a year by the Board of Studies (BOS) of different departments. The Academic Council (AC) was the highest academic body in the institution. After getting inputs from the BOS, the AC had to take a final call on the syllabi. In other colleges, there was not much scope of revision of the syllabi but the suggestions were duly reported to the University for considering it in the next academic year.

5.7.3 The LPCs

In almost all the LPCs, there were the Academic Boards or Committees involving the principal, Deans, HODs and a few external experts. But these bodies were only established to follow the requirements of the accrediting agencies. Forming such committees is a pre-requisite for writing a Self Study Report (SSR) for submission to the accreditation agency. When interviewed, the teachers were clueless about the roles and functionalities of such academic bodies in their colleges. However, the LPC2 located in North 24 Parganas (a district in the vicinity of Kolkata), was found to be a little different. The college was taken over by a large educational group a few years ago. Since the take-over, there was a huge shift in the objective function of the management. Under the new management a functional academic board was established and its decisions used to be taken very seriously by the management. The aim for getting accreditation was the most important reason for this. In a nutshell, the roles of academic boards in the LPCs were extremely limited as the syllabus was formulated by the university and there was not much of an expertise among the faculty members to suggest any changes in the syllabus,

5.8 Internal Quality Management CELL (IQAC)

5.8.1 The HPCs

In both the colleges, there was Internal Quality Assurance Cells (IQAC) established for effective quality management. In HPC1, the IQAC had three tiers. The BOG members were at the first tier of the cell, the principal and the Deans were at the second tier while the HODs and the senior faculty members were at the third level. The second tier used to make plans which need approval from the first tier. Once approved, the third level of the cell was responsible for the successful implementtaion. There were three or four external members in the IQAC cell consisting of professors, and the regional heads of some reputed IT firms or other engineering/manufacturing firms. The IQAC used to review the recommendations made by the AC regarding practical classes, industrial visits, and project works, etcetera. The IQAC looked after the entire teaching-learning programme in the institution as a whole. In a meeting held at the HPC1, the IQAC has strongly recommended the teachers to attend workshops for learning new soft-skills. However, the exact ways in which the IQAC dealt with the quality issues were not clear from the responses of the teachers in these colleges. Sometimes the jurisdiction of the IQAC seemed overlapping with the AC as they both look into the curricula and teaching methods. In these colleges the IQAC was a relatively new body established in order to fulfill the accreditation requirements. These bodies were yet to structure the clear-cut roles and responsibilities in order to improve the quality of education. Faculty-promotions and assessing faculty-performances were still kept under the purview of the principal, administrative officers and the director. They had their own systems of evaluating teachers' performance. Students' feedback was still the most powerful factor in assessing a teacher's teaching abilities. In fact these used to be taken more seriously than the suggestions given by the IQAC.

5.8.2 The HGCs

To cope up with the new circulars of accrediting agencies and central and state regulatory bodies, these colleges had to set up the IQACs. In HGC2, after getting the autonomous status, the IQAC had taken up a particular interest in looking into the career-development of the students coming from weaker socio-economic background, apart from dealing with teachers' Career Advancement Scheme (CAS). In the HGCs, internal quality is actually managed in an informal

basis before the introduction of PBAS-API scheme. The IQAC had taken up the issues related to promotion of the faculty members and used to suggest guidelines to the teachers.

5.8.3 The LPCs

Except LPC1 and LPC2, the other four colleges did not have any IQAC. Since LPC1 and LPC2 were aiming for the NAAC accreditation, they had no other choice but to establish these cells. However, these bodies were notional and superficial. The principal and HODs were the members of the IQACs with one or two external members. But none of them were clear about what they were supposed to do[73]. In these institutions, the performance of the teachers and the students were never assessed systematically. Though teachers were under tremendous surveillance but there was no proper impersonal system of evaluating their contributions. Instead, this process was discriminatory. The IQACs in the LPC1 and LPC2 had no effective intervention till the date of the second round field survey which was done after two years of their establishment.

5.9 Role of the students

Generally from the perspectives of Economics of Education and neoliberal thinking, the students have been envisaged as the "consumers". But the importance of the students' participation in institutional governance is well-acknowledged in the literature of academic governance (Planas, Soler, Fullana, Pallisera, & Vila, 2013). Generally the students participate in the institutional decision-making through their collective bodies like unions or councils or associations. In most of the colleges included in the sample, politically affiliated student bodies were not present. These student-associations tried to keep a distance from the national and regional political parties and focused more on their respective problems. They were more worried about the immediate issues related to their placement or examination in these institutions. The effectiveness of students' participation in decision-making is mainly determined by their commitment to the institutional mission and their engagement with the institution (Rochford, 2014). This also explains why the role of students would vary across institutions depending on the type of the institution. As Austin and Jones (2016) put it,

[73] One teacher of the LPC expressed his belief that the IQAC was the "grievance redressal body" of the institution.

"*The role that students play in university governance is to some extent shaped by the type of university and its traditions, the extent to which contemporary managerial forces are influencing an institution, and the way in which students are perceived by a university*." (pp. 141).

Students are the most crucial inputs who also determine the outputs of the institutions. They can be envisaged as the partners to the teachers in the entire teaching-learning process. Alternatively they can be treated the way the consumers are treated in the commodity market. The latter is more probable when the students have to pay a high tuition fee to get admission in a self-financed course in a private institution. This type of a client-provider relationship between the students and the teachers was not found to be present in the government colleges. On the other hand, the perception of the role of students may be entirely different in the institutions guided by the performative culture (discussed in earlier sections). The following section discusses these issues.

5.9.1 The HPCs

In these colleges, students are to be treated as the most important stakeholder and the institutions tried to take every possible step in order to satisfy them. Any complaint related to the teaching, completion of the syllabus, behavior of the staff, availability of the books in the library and placements used to be taken up very seriously by the authority in both of these colleges. Students' demands have always been considered by the authority but at the same time students were also treated like the powerful customers[74]. It was accepted by the principal in the HPC2 that the students must have a right in demanding a certain quality of service they were being offered[75]. But the, students' role in decision making was extremely limited in these colleges[76]. Even for organising their own cultural festivals, they had to assume a passive role. Students' relationship with their institutions was based on a certain type of contracts where the students had paid the tuitions in return of good grades and placements (Bergan, 2004; Boland, 2005). Here, the role of student bodies in decision-making process is 'tokenistic' as mentioned by Trowler (2010). But, the students were also perceived as the "performative" inputs. They were

[74] Special coaching classes for GATE, training for spoken English, grooming for campus interview etcetera were arranged on students' demands.
[75] This was actually rooted in the belief that students are the consumers.
[76] In an incident in HPC2, students protested when one teacher who was very popular among the CSE batch was suddenly terminated by the authority for raising his voice against some malpractice. When the students demanded explanation from the management, administrative officers and the Dean refused them by saying it is none of their business.

kept under tremendous pressure to attend every academic events organised by the institutions such as special lectures, seminars and talks by visiting professors. If they failed to attend these, a percentage of marks associated with class performance used to be deducted. A number of extra classes were conducted by the teachers and all the students had to attend these[77]. No deviation from the rules used to be tolerated by the principals. Some of the students cited their unhappiness about the excessive pressure and academic tasks, but majority of the students justified this kind of strict policies in the context of competition in the labour market.

The HPCs revealed an interesting case where the perception of the students as the consumers got juxtaposed with a performative framework. This is a unique feature of the process of service-delivery in higher education. In these institutions, students had to be treated as the consumers but unless they also actively participate in the process of teaching-leaning, the teachers and the administrators would not be able to improve performance. Thus, the principal and the management of these institutions used to keep the students under a surveillance mechanism so that they could not escape from the "performative" framework. Thus the culture of "performativity" was not only restricted among the teachers here, but the students were also viewed to be an essential constituent of it. To ensure that the students feel satisfied and help the institutions building a stock of reputation and prestige by sharing their experiences, the institution had to keep them under a close watch. In the market of goods and services, the consumers have the right to demand the specified qualities of a product purchased by them, but here the students do not have any such ground unless they actively participate in the process of delivering the service. To build the reputation in the market, the HPCs were ready to ensure that the students feel satisfied with their quality of their service, but they knew delivering a better performance was possible only when the students would be a part of their performative culture. Students were the consumers here, but they had no choice but to participate in the making of the same service which they had already purchased with their tuition fees!

5.9.2 The HGCs

In these colleges, the students used to consider themselves as a part of their institutions. The believed there was no difference among the institutional objectives and their individual goals.

[77] Teachers used to arrange the extra classes if they felt the need. They wanted to ensure a good performance of the students to save their own jobs.

Most of the students in the HGCs included in the sample were from the humble socio-economic background and they could study this course because of the low fee structure of these colleges[78]. They were well aware of the limitations of their institutions and did not want to compare the facilities with the HPCs. The student representatives and the placement-coordinators helped the faculty-members and the placement officer in communicating with the employers[79]. In all these colleges, students used to enjoy a greater degree of decision-making power compared to the HPCs and LPCs. The students' union or council were relatively more active in these colleges. In organising the annual cultural programmes, sports, excursions, these bodies had a functional role and had the ability to decide the matters on their own.

The students in these colleges had a feeling of collective unity as they were a part of the academic community involving the teachers and other staff of the college who jointly produce knowledge in these institutions (McCulloh, 2009). At least they could raise their voice against anything and forced the principal, the teachers or the BOG to initiate a talk with them. Even in the BOG, there was a post for students' representative. At the "structural" level, the institutions had accepted the right of the students in the decision-making process. However, how far this becomes successful at the "behavourial" level that depends on the leadership and collegial culture of the institution.

5.9.3 The LPCs

In the LPCs, students were not sure about their position in the decision-making process. They were like the miss-informed and ignorant customers who remained clueless about the quality of the products they had purchased. The issues realted to the internal and external governance, decision-making and the process of teaching-learning in the institution did not matter much to them. During the FGD, students expressed their irritation about their principal, teachers, the BOG and other infrastructure but they had never raised any voice against the malpractices in the institutions. Any of their rights was not acknowledged by the institution. Their complaints were never taken seriously by the principal, their doubts were never cleared by the teachers inside the

[78] In spite of a regulated fee structure, the public colleges demand lower fees compared to the private colleges.
[79] Students and teachers used to work together to prepare the list of students, make brochures or communicating with the recruiters.

classrooms and outside, and their demands were never reached to the BOG[80]. Some of the students also felt humiliated by the teachers' habits of pointing out towards their weaker family backgrounds and poor academic performances inside the classrooms[81]. Students dis not have any active student bodies like unions or councils[82]. Even in organising events like sports, cultural programmes or Republic Day's functions, only a few students close to the director and the principal used to decide about everything.

The scope of students' participation in democratic decision-making process is extremely limited in this case. On the other hand, students felt they were the 'consumers' but their complaints and grievances were never taken seriously by the service-producers. This is an interesting case where students are neither a part of the academic community nor are consumers from the institutions' perspectives. Their basic participatory rights were also not acknowledged by the management. Students here are like the ignorant clients who had already paid the fees without judging the quality of the service and cannot get the refund even if the service is not satisfactory. This type of examples can have severe implications for policy-making in the field of higher education in India.

5.10 A summary: The role of funding and the internal governance mechanisms

In the production of educational service, the quality of output depends on the quality of inputs and also on the "process" which transforms the inputs into outputs (Chattopadhyaya and Pathak, 2016). The conventional EPFs and the Input-Output analysis did not pay enough attention to the role of the "process" in its entirety. As mentioned in the beginning of this chapter, understanding the differences in the "process" across different institutions becomes necessary for understanding the differences in their performances. The "process" gets reflected through the internal

[80] In LPC4, the classrooms and laboratories meant for B.Tech students had to be shared with the students of other courses (BCA, MCA etc) and they did not get any space for studying when the class is over. Hostels did not have internet connections as the bill for wi-fi was not paid in time. In spite of complaining several times, the Director did not listen to them. In LPC2 and 3, classes were regular but students were not happy with the teachers. The institution did not help them for arranging internships.

[81] One IT student of fourth year in LPC3 said, "Even if I have a question in the class, I cannot dare to ask. Sir would definitely tease me as my father is a farmer and I am trying to be an engineer."

[82] In LPC1, students raised concerns about placements and accused the college management for not paying enough attention to the students' welfare. They observed a strike in the campus a few years back. However, the results were not much fruitful. Many of the students were show-caused by the authorities and they were forced to apologize.

governance mechanism of the institutions. Analysing the information gathered from the various sources in these institutions helped in understanding the main differences in their internal governance mechanism in these three types of institutions included in the sample, namely, the HPCs, the HGCs and the LPCs. But the variations in the internal governance mechanisms can be explained with the help of the mode of funding of the institutions. In this context, it would be pertinent to recall the discussion on the mode of funding as discussed by Jongbloed (2004) which has been presented in Chapter 2. According to the framework, the mode of funding can be characterised by the two aspects of funding. These are: the degree of input versus output orientation of the funding mechanism and the degree of centralisation versus competition in the disbursement of funds among the institutes. The first factor pertains to what is being funded, and the second factor reflects how it is being funded.

The private colleges (HPC and LPC) offer self-financed courses and by definition they do not receive any assured funding from the public authorities. These institutions generated their resources through tuition fees and the research grants for which they have to compete in the respective markets. They also apply to the government and private funding agencies for research grants. This mode of funding is broadly speaking output-oriented. The outputs are generally measured with the help of a few indicators of performance, such as: the proportion of students recruited from the campus placement initiative, the number of publications produced by the faculty members, the amount of research grant mobilised, etcetera. On the basis of the performance, the institutions compete among each other in the market for funding. On the other hand, the revenue generated from the tuition fees is a product of the number of students enrolled in various courses offered by the institutions and the price charged as the tuition-fee. Since the intake-capacity is generally regulated in this market by the regulatory authorities, the private colleges cannot earn more revenue by increasing the number of seats. Instead they try to hike the level of fees[83]. However, in the market of engineering education in West Bengal, fees in the B.Tech courses are also regulated by the state government. But in order to generate revenue the institution can offer other courses in which fees are not regulated. To attract more students in these courses, they need to build up a good reputation of the institution which is also related to the performance of the institutions. In education, better quality students and teachers are needed

[83] If the number of applicants is lower than the sanctioned intake, then the institutions may try to attract more students keeping the fee unchanged.

for better performance. To attract the better students and teachers, the institutions have to offer scholarships and higher remuneration which needs a sustained source of funding. In short, the institutions have no other choice except focusing on the performance in order to sustain in the market. This funding mechanism, following Jongbloed's framework, can be termed as competitive and output-oriented. This mode of funding determines the way institutions govern their internal operations. As a consequence of the funding mechanism, the idea of "performance" becomes the most essential operational concept which also gives rise to a culture eventually.

In case of HPCs, the idea of performativity had taken the central position in the entire governing mechanism in both explicit and implicit ways. Lyotard (1984) explained the terms like "accountability" and "competition" which are closely associated with the concept of "performativity" and these are used to create a framework of judgment. Needless to say, the owners of the institutions (the BOT, director and his team) were the self-appointed 'judges' of this performative system. The Board of Governors and the Director assumed a role of leadership to maximise prestige in these institutions. The managerial authorities in these HPCs had established a competitive environment where teachers had to compete for their tenures and promotions by delivering good performances. The managements had tried to float an idea of accountability where teachers are only accountable to the management. They have no other choice but to comply with the rules and regulations framed by the management at the cost of foregoing their own academic freedoms. The structure of the monitoring system used by the managements in these HPCs had two layers: the upper one dealt with the senior teachers while the lower layer controlled the junior teachers. The established institutional hierarchy among the teachers helped the management in curbing the collective voice of the faculty-members. Incentives and dis-incentives were designed in accordance with these two levels of monitoring structure. Apart from these incentives, a culture of performativity has been created where teachers had been made to feel a sense of pride or guilt based on their performance as pointed out by Willmott (1992). The culture of "collegiality" and the trust-based interactions were missing in these institutions. The Principal-Agent relationships were evident among the stakeholders. Here the students were treated as the 'customers' and brought under the framework of "performativity" along with the teachers to ensure co-production of the service.

The same mode of funding is also applicable in case of the LPCs. The funds are disbursed on the basis of outputs and have to be earned through a competition with other providers in the market. In spite of the same mode of funding, there were a significant difference in the internal governance mechanisms among the HPCs and the LPCs. In case of the latter, surveillance and monitoring were implemented only to reduce the cost of operation, while in the HPCs, it was meant for ensuring a good performance. The difference of focus on performance and cost-cutting among the two sets of private colleges could be explained in terms of the poor quality inputs in the latter. The performative structure of governance was absent here because of the lack of qualification and ability of the teachers' and absence of leadership of the Director/Principal or the Board of Governors. The management failed to instill pride in the teachers as there was no prestige maximising objective function the institutions endeavoured to highlight and pursue. The authorities were more interested virtually in selling degrees without paying due attention to the quality of service being delivered. The teachers' role in decision-making was monitored and effectively controlled by the authorities. Students' rights were not acknowledged and they were just treated as the ignorant consumers. Here the internal governance mechanism revealed an excessive obsession with the cost-cutting which was necessary to generate more revenue as the other options of getting more students and increasing the tuition fee were not feasible. Their poor endowments in the absence of the input-based funding left no choice but to take recourse to cost minimization of operation. The institutions got trapped in the cycle where poor endowment and poor investment would lead to the delivery of poor quality and failure to earn reputation. With the poor quality outputs and low reputation, the institutions were not in a position to overcome the problems associated with the lack of resources. The internal governance mechanism in these LPCs can be "efficient" but did not make much sense in the field of higher education.

On the other hand, the HGCs receive funds through a centralised system. The funds are granted by the state and central government authorities on the basis of pre-sanctioned budget. The budget-estimates are arrived at keeping the cost of inputs in mind. Irrespective of the performance of these institutions, the funds are assured to a large extent. This is the input-based funding with a high degree of centralisation, according the the framework of Jongbloed (2004) discussed earlier. Naturally, the focus on the performances would be less in these institutions which receive such an input-based centralised funding. The HGCs did not use any performative system to monitor the teachers on their own, until the PBAS-API system was implemented.

Though there were evidences of lack of motivation among a few teachers, the rest used to feel accountable to the students and the society and work hard driven by "intrinsic motivation". Here the students were considered as an integral part of the process. The recent changes in the government regulatory systems, mainly the introduction of the API, however ushered in some changes in the system. The external regulatory bodies have therefore fostered a culture of "performativity" among the public institutions. This is nothing but an effort to infuse the New Public Management (NPM) in order to reform their internal governance mechanism. As a consequence, the degree of academic freedom and collegiality had declined a bit as the teachers became more interested in earning points in accordance with the changes in the regulatory system[84]. Also, after noting the suggestions made in the recent policy documents in favour of performance-based grant disbursement system, these institutions also started focusing on the performance, albeit slowly. Their poor rankings in the newly introduced NIRF, made some of them concerned about the performance. To sustain the prestige, and to cope up with the changes, the HGCs started forming the committees in the wake of improvemnets in the ranking and performances like the HPCs. The transformation process was slow but extremely crucial in understanding the implications of the mode of funding on the internal governance mechanism.

5.11 Concluding remarks

In this Chapter, an attempt has been made to study the process or the institutional governance on quality of education and research in the engineering colleges in the state of West Bengal produce. In the context of our investigation of quality based on the input-output analysis in Chapter 4, we studied the role of the inputs in determining the quality of the institutions. However, as argued, the input-output analysis cannot provide a complete analysis of the factors responsible for quality. A critique of the EPF provided a rationale for the study of governance, the process of converting inputs to outputs by the optimizing decision making individuals, the motivated students and the teachers and the administration including the authority within a set of rules and established norms that exist within an institution. As mentioned in Chapter 2, many studies and reports indicated the role of governance on quality in the Indian context but attributing the role of governance on quality requires an analysis of the input-output of an

[84] A little bit of change in the governance mechanism over time was captured through analysing the findings in two round of field visit.

institution recognizing the inputs' ability to take decisions and their agency. This Chapter sought to highlight the importance of mode of funding of the institutions and their positions in the ranking tables and reputations and objectives of the authorities or the principal in contrast to the agents, the students and the teachers in conditioning the governance structure.

The framework of "shared governance" was elaborated and exemplified in this chapter is argued to provide a more comprehensive diagnosis of the factors that beset the delivery of quality education and research of the institutions. In order to bring out the variations in the governance structures in view of the distinction between government and private funding and the distinction between high and low reputation, we structured the discussion around the roles of the Board of Trust and the Governors, the Director and the Principal, and the "agents" like the teachers and students vis a vis the management in the framework of "shared governance". Some of the main distinctions are mentioned below.

Governing boards: For the HPC, the BOG played an active role in ensuring compliance with the requirements as desired by the regulatory bodies, the functioning of the institute and envisaging the future in order to strategise. However, it depends on who the members of the BOG are. As argued, the role of the BOG could be explained better by the stewardship theory (Hung, 1998). As observed, the BOT approached eminent individuals with high credibility and expertise to be members of the BOG despite knowing that BOT would have to give up some authority in the process as BOG members would often have their ways, of course in the interest of the institutions. For the HGC, the BOGs are more of a maintenance role (Ingram and simon, 1995) ostensibly to strengthen the link between the regulatory authorities and the colleges. Whereas for the LPC, the objective and the interest shown by the BOT in the functioning of the institutes becomes evident from the choice of the members of the BOG who, it was found as individuals of not comparable caliber and positions in the society and the academia as it was the case for the HPC. Apart from the possibly of meek response from the reputed individuals and experts to be the members of the BOG, it became evident that the BOT did not want an assertive BOG either. Because of their professional background and interest shown, the role played by the BOG became ceremonial and this had an impact on the functioning of the institutions, the agency of the principals, the non teaching staffs, and the students.

Role of the principal: The terms and conditions in determining the appointment of the principals matter. The differences between the government funded and the private ones in this regard made a difference in their assertion and agency which influenced the functioning. In the HPC, principals had academic credentials worthy of their designations but the management retained control over the principals which subsequently limited delegation of power down the hierarchy and therefore on the functioning. The teachers received differential treatment depending on their seniority because it is important to retain the senior teachers to run the colleges and maintain reputation. But when it came to the junior teachers, they seemed to matter less and they were treated more as agents typically as the Principal-Agent theory predicts. The principals were also the agents of the BOG in the LPC which dented their agency and undermined their command. For the LPC, it is a mixed picture. The principals were not only the agents, they hardly had authority over even the non-teaching staff which was partly attributable to the occasional intervention by the directors in their attempt to retain control. In comparison, in the HGC, the principals had very little scope for being proactive due to bureaucratic control and over regulations.

Role of the teachers: The autonomy is expected to be limited as the management would try to run the colleges to produce more and address their mandates in a cost efficient manner. For the HPCs it is much less than that of the HGCs. This affected the collegiality in the three sets of colleges. In the HPCs, the diffreences in contracts created a divide between senior and junior faculty members which establish the hierarchy and limited the scope of the collective decision-making process. In the LPCs, the teachers were considered as the "workers" who had to compete with each other to save their jobs. The culture of "performativity" had also instilled fear among the teacher-community. In the government colleges, the idea of accountability is different from that of the private colleges. Instead of the Director, here the regulator-state wanted to infuse the reforms through implementing performance-based promotion systems which had bought in a change in their role in internal governance structure.

Role of the students: In the HPCs, the relationship among the students and the institutions was based on a certain type of "contracts" which empower the students to demand the best service (Bergan, 2004; Boland, 2005). The basis of these contracts can be tuion fees, but in this case this

is based on meritocracy[85]. The students made an informed decision to study in a particular institution and he/she also participated in the co-production of quality -service. Being aware of that, students were extremely conscious about the facilities they ought to receive. Students were a part of the "performative" culture there. In the LPCs, the students with a poor educational background were mostly aloof from the decision-making process. Their relationship with the institution was based on a transaction where they students just wanted to buy the degree. But the government colleges acknowledged the rights of the students through offerring a post of student-representative in the BOG.

The governance of an institution is rather a complex interplay of various actors often driven by conflicting objectives at various levels of operation of an institution which hs to respond to the signals given by the institutional authority and the regulatory bodies. It was pointed out that the distinction between high and low in the ranking and reputation and mode of funding in terms of government and private are important because of differences in the "agency" of the teachers and the students and the objectives of the authorities. These are crucial to understand governance and its impact on the delivery of education and production of research. This is however inadequately stressed in the literature on academic governance (Austin and Jones, 2016). Because of the differences in funding in a government institution based on assured grants in contrast with the private where the cost recovery is the compelling force which becomes the guiding principle for the management and their expectations from the teachers and the students. The selectivity mechanism that exists in case of educational institutions is crucial as it determines them.

[85] As the fees are regulated.

Chapter 6: Competitive strategies in a regulated market

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6.1. Introduction

After analysing the role of the internal governance mechanisms in determining the performances of the students and the overall quality of education in the three sets of colleges in the previous chapter, this chapter examines the strategies being adopted by the institutions to improve the performances so as to compete in the market and gain in the term of reputation. The last chapter discusses the internal environment of the institutions while in this chapter the role of the external environment and its impact on governance reforms are examined in a detailed fashion. The most crucial elements constituting the external environment for the institutions are the state, the national and global competitors in the market and the community to which they are accountable. According to Dale (1997), there is a dynamic interaction between three co-ordinating institutions like state, market and community and three governance activities like funding, regulation and provision/delivery. He also argues that "*together with funding, regulation provides the framework within which provision is possible"* (pp. 278*).* The external environment undergoes continuous changes which throw new challenges to the institutions tocope up with it and do better. The changes in the external environment can emanate from the changes in the regulatory structure, and/or changes in the features of competition (for example, if a competitor introduces a new degree course). Kotler and Murphy (1981) envisaged the strategic planning done by the organisations as a necessary process for adjusting to the 'changing market opportunities'. For example, with the increasing popularity of rankings, institutions have to find their own ways to get a position in the league tables as it would guide the student preferences in the coming years. With the introduction of the NIRF and more emphasis being given to accreditation, almost all the

institutions have to try harder to perform better in the wake of the changes in the regulatory structure. As the market becomes more and more competitive, challenges posed by the competitors become stiffer. If one institution arranges for the students' internship in a reputed multinational firm, or teaches a new-age software out of the syllabi, others face an increasing pressure to innovate and differentiate their offerings in order to retain and expand their market share. The most important inputs are the students who are the active decision-makers who make informed choices. Unless the institutions make strategies to cope up with the new challenges and evolve, even survival can be an issue. Thus, the strategies play a key role in the dynamic process of delivering output in this market. In the static Input-Output framework discussed earlier, the quality of inputs is fixed, and so is the nature of their internal governance process. Getting better quality of inputs (students and teachers) and bringing in some necessary changes in the internal governance mechanism were not considered within that short current period (say, an academic year). But to attract better students and teachers in the next period and to build up a favourable academic environment inside the institutions with these motivated students and teachers, institutions need to start strategizing in the current period itself. Examining these strategies is important to understand the dynamic process of delivering quality in higher education. However, in this study, the main focus would be on the strategy of resource allocation which is the most important one because any step taken towards improving the service-quality would require an investment of financial resources. The resources are allocated on the basis of certain pre-specified priorities in each of the institutions. Studying the allocation of resources would automatically reveal these priorities specified by the leaders in these institutions. The ability to utilise resources in a strategic way depends on the following two factors- mode of funding and the relative position of the institution in the market. These are discussed below:

(a) Mode of funding

The most crucial strategy of the institutions is to allocate resources for investment given the maintenance expenditure. The ability to allocate resources for investing mainly depends on the initial endowment and the nature of subsequent flows of funding. A start-up institution with huge endowment (for example, a new venture of an existing business group) has the ability to invest without worrying for cost recovery in the initial years of operation. Similarly, the newly established public institutions, funded by central/state governments on the basis of

pre-sanctioned budget, generally receive the input-based funding which is not contingent upon their performance. This helps them in expanding the scale even with a relatively poor performance at the nascent stage. On the other hand, it is extremely difficult to invest for the newly established private institutions with poor endowment. They are more likely to be trapped in the vicious cycle of poor endowment-poor investment-poor quality-low revenue, while well-endowed institutions have an advantage in this market (Winston, 1999). As already discussed in Chapter 2, the mode of funding is defined by the degree of centralisation and degree of output orientation in funding mechanism (Jongbloed, 2007). In India, the private institutions are more likely to be funded by a competitive output-oriented system while the public institutions receive input-centric centralised funding. But the privately funded institutions enjoy more freedom and flexibility in allocating resources than their public competitors because of the applicability of various stringent regulations on the former. After utilizing the funds for basic operating costs, the private institutions can use the discretionary revenue for investments depending on their priorities. The ability to allocate resources on strategizing thus depends on the ability of the institutions to generate discretionary revenue, the nrelative positions and reputation of the instititions.

(b) Relative position of the institutions in the market

As Simon Marginson (1995) argued, seats in the educational institutes are mainly 'positional goods' as there is a vertical segmentation of highly reputed and less reputed institutions in this market. For example, in spite of having the same B.E./B.Tech degree, the students are treated differently by the employers depending on the brand-value of the institutions. In the presence of information asymmetry regarding the quality of the service, institutions use the existing stock of prestige and reputation to emit non-price signals to the external stakeholders such as potential students, teachers, industrial partners, research-funding agencies and government authorities (Brewer *et al.*, 2009). It is always easier for the institutions with higher positional value in the market to make strategies with a long-term vision because of their established credibility among the stakeholders. They are more likely to receive better returns out of their investments in both monetary and non-monetary terms compared to the institutions with lower positional value. The monetary returns refer to the increase in the revenue (due to a hike in the tuition fees, or due to an increase in the number of intakes,

and/or from the research fundings). The non-monetary returns refer to an increase in the stock of prestige and reputation which would help them to signal the potential stakeholders about the quality of their service in the next period.

Having understood the importance of these two dimensions- the mode of funding and the relative position of the institutions, this chapter examines the resource allocating strategies of the institutions keeping in mind the structure of the regulated market in which they operate and their objectives. The basic analytical framework used here is inspired from the study of Brewer, Gates and Goldman (2009) on the higher education market in the context of the United States. They have followed an Industry Study Framework to understand the 'structure-conduct-performance paradigm' as described by Scherer and Ross (1990). As Brewer *et al.* explained,

"*The industry study framework posits that the industry performance is determined by the conduct of firms under the influence of market structure, the basic supply and demand conditions in a particular market, as well as public policy related to the industry"*(pp. 4; 2009).

Following this framework, this chapter starts with a brief discussion about the basic features of this particular market in Section 2. As the freedoms of consumers and producers are influenced by the design of regulations in this market, Section 3 and 4 discuss the role and structure of regulations in this market. Section 5 discusses the resource allocating strategies of the institutions with respect to three specific case studies. The case studies involve three top-ranked institutions taken from each of the three groups of colleges mentioned earlier. This also helps us in analysing the impact of the two dimensions, i.e., the mode of funding and relative position of the institutions, on their performances. These in-depth case studies would help us in understanding the resource allocating strategies in more details. After analysing the strategies, Section 6 presents a simple game theoretic model of strategy-making in higher education market. Section 7 concludes the whole discussion.

6.2. Features of the market of engineering education in West Bengal

This section briefly discusses the basic conditions regarding the structure of the market as it influences the conduct and behavior of the providers. The market of higher education has some unique characteristics (as discussed in the review of the literature in Chapter 2) which lead to the market-failure. The sources of such market-failure are also briefly discussed below.

6.2.1 Structure of the market

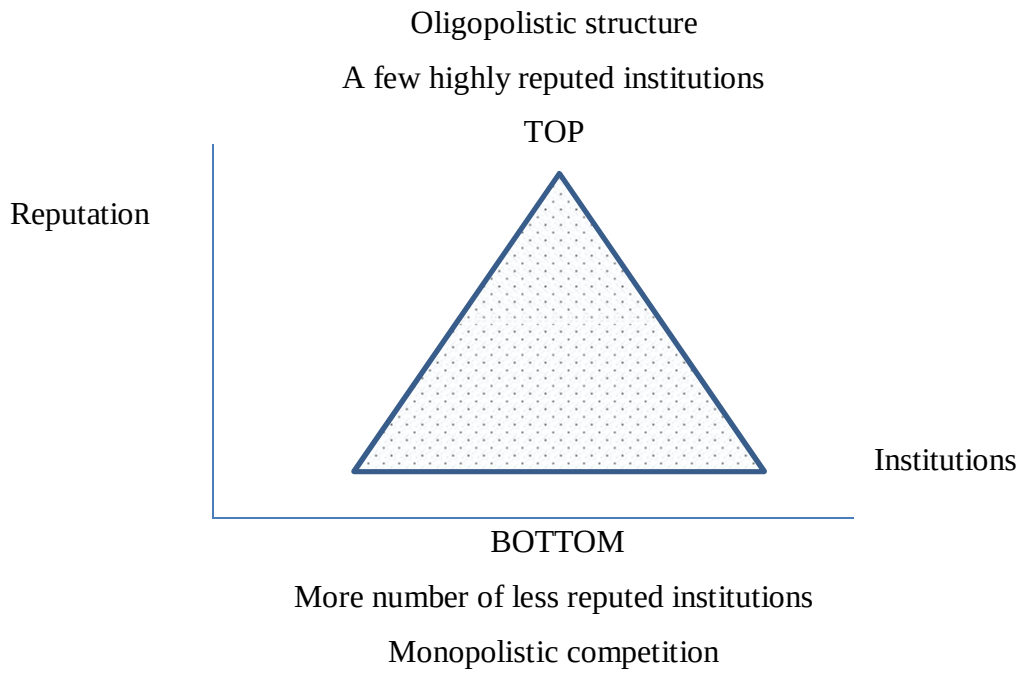
There are around 80 AICTE approved engineering colleges in West Bengal, and among them, eight are funded by the government and the rest are private. Among the eight government colleges, six are affiliated to MAKAUT. If we look at the ownership of the private colleges in this state, we find the Trustees headed by large business groups are mostly the owners of large colleges. Among these, a few have more than one engineering colleges and also other types of educational institutions[86]. In general, when a group successfully runs one institution and makes a good amount of revenue, then it tries to expand and establish a few more institutions or to take over other existing institutions from the groups which could not do a good job. Expansion may also be related to the economies of scale, as sometimes the groups use the same campus for offering several courses. In this market the product (B.Tech degree) is differentiated by its quality depending on the brand-value of the institutions. At the top, there are a very few highly reputed institutions which are preferred by the students because of their ability to attach higher positional values to the degrees they offer (Marginson, 1995). At the lower level, there are relatively a larger number of institutions with lower brand-values competing only within the group. Hence it is more like an oligopolistic structure at the top, but at the lower level it is more like a monopolistic competition.

All the sellers offer the B.Tech degree-courses, but the service quality is widely varied across the institutions, and the ability to fix the price lies in the ability to deliver a service-quality which is better than the others. This ability elevates a particular seller to a higher position in the market, earn better reputation and prestige, and create a brand. The best two institutions (HPC1 and HPC2) charge Rs. 60,000 per semester as the tuition fee while the average tuition fee charged by the LPCs is around Rs. 40,000 per semester[87].

[86] For example, JIS group owns seven engineering colleges in the state, Techno India group has six higher educational institutes and a university, IEM/UEM group has established universities in two states of India, SETGOI has four colleges offering courses in technology, architecture, polytechnics, and medicine, Brainware group has a school, computer academies and more than one engineering colleges, the Heritage Group has five institutions apart from one engineering college.

[87] Not to forget that the state government of West Bengal has imposed a cap of Rs. 75,000 per semester on tuition fees in private engineering colleges.

Figure 6.1: Structure of the market



6.2.2 Information asymmetry

The higher quality of service in HPCs is possibly signaled to the potential students by the assessment of their performances done by government agencies like the NAAC, the NIRF and rankings done by other private agencies. But the LPCs provide very little information about their performance in their websites and brochures. Most of their programmes are not even accredited by the NBA. The AICTE requires each and every engineering college to provide information under the Mandatory Disclosures, but only a handful of them actually publish this information in their sites. Even among those who do, most of them fail to update it regularly. For example, LPC5 provides a mandatory disclosure in its website which contains information uploaded in the year 2010 which has not been updated during the last seven years. In some cases, the basic information and the pictures provided in the websites did not match with the responses of the teachers and students and observations made during the survey done in these institutions. Even when the information is available, it is not easy to process the information by the students or the parents because it needs a good amount of cost in terms of money for having the facilities

(internet) and the time spent on gathering information[88]. Hogan (1999) argues that having "market capacities" is essential for participating in the market meaningfully. Apart from the informational resources, one needs to have various other types of capitals, social, cultural and financial, in order to make an informed choice. It is not easy to determine whether the quality of education provided in the institutions would justify the cost of investment before taking the admission. The valuation of the degree earned in exchange of Rs. 40,000 per semester for four years (apart from other fees) cannot be even calculated immediately after graduation. Education, being an "experience good" is intrinsically associated with a significant amount of information asymmetries (McPherson and Winston, 1999; Dill and Soo, 2004). Imperfect information is another important feature of this market (Stiglitz, 2000).

6.2.3 Spill-over effects of higher education

The "externalities" of education are well-acknowleged in the litearure (Psacharapolous and Patrinos, 2004). The contributions of engineering education can spill over to other segments of the economy and society. Externalities are, strictly speaking, the missing markets. However, the calculations of the contributions to the economy can be mediated through the market, which are, strictly speaking, not externalities. But by focusing on the externalities alone, the social rate of return will be higher than the private rate of retun. Since the private colleges are not subsidised, the cost is high and hence there will be a fall in the private rate of return.

6.2.4 Equity and access

To ensure that the positive externalities get percolated among all the layers of the society, participation from all types socio-economic and gender groups is essential. In India, according to AISHE (2011-12), the GER in undergraduate programme in engineering and technology is 24.71 but for female it is only 12.00 while for male it is 18.89. In West Bengal, the GER in higher education is 14.71, while it is 10.00 and 7.20 for the SC and ST students respectively. Enrollment statistics for private sector also show that it attracts more students from higher economic class and upper caste groups because of higher fee structure. Without any government intervention, if the market for engineering education is left alone to equate demand and supply, the high-quality institutions would inevitably charge higher fees as the cost of education is

[88] Also, it has a bias in favour of the students coming from higher income groups.

generally positively related with the quality of education. In that case, only those who have the ability to pay would get a chance in studying in these institutions given their eligibilities. This is not desirable for a developing nation and diverse society like India.

In short, the market for engineering education in West Bengal has an oligopolistic structure at the top and a monopolistic structure at the bottom level. There is information asymmetry regarding quality of the service and equal access to all eligible students is not ensured. It is actually a quasi-market with subsidies provided to the public institutions, some special grants provided to the private institutions and vouchers provided to the students from lower economic strata by the government.

6.3 Role of regulations in this market

As discussed above, the three major sources of market failure, imperfect competition, information asymmetry, and externalities are present in this market. Also, there is a concern for equity and inclusivity. Jongbloed (2004) argues in this kind of a market there is a need to frame the regulations in order to tackle some of the problems. These are discussed below:

(a) To ensure equal access

As already discussed in Section 6.2, without government intervention, the students coming from weaker socio-economic background may not get a chance to take admissions in elite private colleges given their eligibility. But the criteria for eligibility have to be understood in the context of the history of deprivation in our society, which may require relaxation of some of the conditions to make higher education more inclusive. However, the existing regulations for admission, for example, the reservation policy, are only applicable in the public institutions while the private institutions enjoy the freedom to admit students on the basis of merit given higher tuition fees assuming there is no capitation fees. Private institutions also sell their seats through various other channels like NRI quota and management quota where the admission-fees are higher than the normal students.

(b) To protect the future of the youths

In a commodity market, consumers can quickly shift to other product if the current one is not suitable. But in case of education, students or their parents make a huge investment in terms of

money and time. It is not possible for the students to shift to other institutions even if they realize the quality provided in the institution is not up to the mark. Most of the time, students do not realise after graduation that the quality was poor. Having known this, sometimes private institutions charge hidden fees, but do not provide basic infrastructural facilities and subvert the norms in various ways. The cases of abrupt closures of many private engineering colleges have shattered the dreams of many youths in the state. The regulations imposed on the HEIs for providing basic information about the quality try to minimise the ex-ante uncertainties while the regulations for maintaining basic minimum standards try to handle the problem of ex-post uncertainty associated with the quality of education. Public institutions have to follow these regulations strictly, while private ones often subvert norms and take corrupt measures to generate more surplus.

(c) Preventing socially morally and politicallyundesirable activities

In a country like India, the relationship between students and teachers has not been envisaged as a relationship between client and service-provider historically. Education, devoid of quality, does not mean anything and the quality of education is jointly produced by teachers and students inside and outside the classroom (Krishna Kumar, 2010; Patnaik, 2013). Indian Constitution has barred profit-making in education and in the subsequent orders given by the Supreme Court have clearly mentioned that generation of 'reasonable surpluses could be allowed but the surplus need to be re-invested in developing the very institution (Kapur and Khosla, 2017). Thus, regulatory authorities audit the HEIs in order to keep a check on their financial matters.

(d) Protecting some of the fields

This point is more valid for streams like fine arts and history which face low demand from the labour market and eventually from the students. Without government intervention, market would never encourage private institutions to provide such courses for which there is no or less number of applicants. In case of engineering, during the IT boom, core streams like civil, mechanical, chemical engineering faced such a problem as all the students wanted to study IT or CSE. Government intervention is necessary in such cases.

6.4 Type and structure of regulations in this market

The classifications of regulations are taken from Jongbloed (2004) and then in the context of this particular market, the degree of compulsion with which these regulations are applicable to the HEIs are examined. Three main types of regulations are: "Regulation of structure", "Regulation of conduct", "Regulation of performance". However, some of the regulations may seem overlapping across the main heads.

The various types of regulations designed by multiple regulatory authorities applicable on the HEIs in this market can be classified as follows:

Mandatory: If this regulation is not followed, there will be strict action against the HEI.

Applicable: Institutions are supposed to follow these regulations, but generally no action is taken even if they do not.

Applicable to some extent: The applicability of these regulations depends on the status of the institution (autonomus, affiliated, etc.).

Not-applicable: These regulations may not be followed by the institutions.

6.4.1 Regulation related to the structure of the market

As Jongnbloed (2004) explained, the "regulation of structure" generally refers to the regulations imposed on entry and exit of the players, selection of students, teachers and sources of funding, physical infrastructure, couse-programmes and financial matters. The following table presents an overview of the regulations related to the structure of the market and the relative applicability of the regulations for the public and private providers.

Table 6.1: Regulation of structure and their applicability		
Regulations related to	**Public**	**Private**
Entry and exit	Mandatory	Mandatory
Selection of students (Reservation)	Mandatory	Not-applicable
Selection of sources of funding	Mandatory	Not-applicable
Infrastructural requirements (size, location, condition of the buildings, laboratories, libraries, etc.)	Applicable	Applicable to some extent (s.t. minimum requirements)
Recruitment of staff (salary and eligibility)	Mandatory	Not-mandatory
Regulation of programmes (Accreditation)	Mandatory	Applicable to some extent (minimum requirements)
Financial matters (Budget and auditing)	Mandatory	Mandatory

6.4.2 Regulation related to the conduct of HEIs

These regulations are related to behavior and conduct of the HEIs. It is directly linked to the organisational aspects of the institutions. The internal governance process discussed in the previous chapter depends on the degree of applicability of these regulations. The degree of applicability will depend on the institutions' ownership and mode of funding. Table 6.2 presents a brief description of the conduct-regulations and their relative applicability on public and private colleges.

Table 6.2: Regulations of conduct and their applicability		
Regulations related to	**Public**	**Private**
Pricing (fees)	Mandatory	Mandatory
Quantity (number of intake)	Mandatory	Mandatory
Capacity (New courses)	Mandatory	Mandatory
Quality (Assessment and accreditation)	Mandatory	Not-mandatory
Inputs (Selecting teachers and students)	Mandatory	Applicable to some extent
Behavior in output market (placement)	Not-applicable	Not-applicable
Doing R & D and consultancy	Applicable to some extent	Not-applicable
Marketing strategies	Applicable to some extent	Not-applicable
Academic matters (syllabus)	Applicable to some extent	Applicable Applicable to some extent
Innovative practices	Not applicable	Not applicable

6.4.3. Administrative regulation

These regulations are related to the auditing and tax. Table 6,3 presents an overview of these regulations.

Table 6.3: Administrative regulations and their applicability

Regulations related to	Public	Private
Tax and fiscal rules	Mandatory	Mandatory
Access to revenue/capital markets	Applicable to some extent	Not-applicable

Jongbloed (2004) further classified these regulations as the state-imposed, self-regulation, and the enforced self-regulation.

(a) **State-imposed regulations:** Most of the exit and entry barriers, minimum eligibility of teachers, terms of employment, selection of students, minimum requirements of physical infrastructure, regulation of fees are under the first category- state-imposed regulations. Since HGCs are operating under state-funding, they are supposed to follow these state-imposed regulations very strictly, while many of these are not mandatory for private colleges.

(b) **Self-regulation:** These are generally based on the conventions or norms decided by a majority of the providers in order to maintain the standards of their service. For example, though there are no strict regulations about the number and qualification of the members of BOGs of private institutes (apart from ex-officio posts), these are generally constructed in a manner to render the organisational structure of the private institutions valid and legitimate.

(c) **Enforced self-regulations:** To maintain the prestige, sometimes the HEIs themselves tale measures to maintain the quality of their service. For example, many reputed private institutes follow the teacher recruitment policies which are in accordance with the UGC requirement, though in some cases these are not binding on these institutions. Similarly,

following the UGC requirements applicable in case of public institutes, many of the private institutions also formed IQAC in their institutes.

6.5 Freedoms enjoyed by consumers and producers

In India, the producers and consumers in higher education market do not enjoy complete 'freedoms' as they have to adhere to some of the basic regulations applicable for both, the public and private institutions. The degree of compulsion in following the regulations varies between the institutions depending on their ownership and funding as discussed in the earlier section. Generally in this market, regulations are designed to check or control for some of the undesirable outcomes of competition in case of a market failure, and to ensure the fulfillment of the broader purpose of higher education in a developing nation like India. The regulatory structure and the features of the market have a huge impact on the conduct or behaviour of the institutions.

Now, the eight freedoms as explained by Jongbloed (2003) with respect to this regulated market are explained in the next section.

6.5.1 Freedom for consumers

(i) Freedom to choose the provider

Freedom to choose the provider is dependent on two requirements- first, eligibility (merit) and second, the ability to pay. A student cannot take admission in any of the colleges in this market unless he/she fulfills these two conditions. The top-ranked colleges get applications from best of the students and the mediocre ones go for the mediocre colleges. The nature of selection-based competition (as discussed in Chapter 2) creates conditions of this kind of a hierarchical pattern. Regarding the ability to pay, state government provides vouchers to the students coming from weaker socio-economic strata and they can select any institution of their choice subject to fulfillment of the eligibility. The institutions would provide a fee-waiver to the students having the vouchers and would receive the amount directly by the government. However, such vouchers are limited in numbers and a degree of uncertainty is also associated with it. Sometimes students apply for the fee-waiver scheme but receive the vouchers only after taking admission in a college. To avoid such uncertainties, students from weaker economic background prefer the public institutions as discussed in Chapter 2. Therefore, though officially the consumers

(students) are free to choose the provider if they have the eligibility, the 'choice' is actually somewhat restricted as it is desirable and expected in a market of higher education.

(ii) Freedom to choose the product

The product, a B.Tech degree in a specific stream of engineering from a particular institution, can create a dilemma among the consumers (students). They may prefer the stream (CSE/IT or other core streams) over the institution (Public/Private). For taking the decisions regarding the streams, one needs to be sure about the job-market opportunities associated with that stream. Regarding the institution, the fee-structure can be one guiding factor; otherwise it is assumed that given the chance, being a rational decision-maker, the student would always go for the higher ranked institution. For analysing the possibilities of employability or the quality of the institution, the students need information. As discussed in earlier sections, the constraints of gathering information, especially in case of education, make this freedom restricted.

(iii) Adequate information on prices and quality

As already argued in earlier sections, it is difficult for the consumers to collect adequate information on prices and quality. Even the Mandatory Disclosures are not uploaded/ updated in the college websites regularly. Most of the institutions are not NAAC accredited, and most of the programmes are not accredited by the NBA. Non-compliance with the rules and regulations has made the situation murky. Except for a few top institutions, it is extremely difficult to gather information about quality. About price, except the HGCs, no other college provides the exact information. The HPCs do provide fee structure in the websites, but after admission, students are charged various other types of fees which were not mentioned in the fee-structure earlier.

(iv) Direct and cost-covering prices

The public colleges are subsidized but the private colleges are self-financed. Though the fee structures are supposed to be provided in the websites, very few of the colleges actually provide information about it. The break ups for semester wise fees, hostel fees, library fees and admission fees etcetera are provided but no information is provided whether they are based on any estimate of cost. In West Bengal, fee structure is regulated by the state government, which

has been able to rein in rampant commercialisation particularly by the low reputed institutions to a large extent.

6.5.2 Freedoms of the providers

(i) Freedom of entry

In India, a Society registered under the Registration of Societies Act 1860 through the Chairman/President or Secretary of society or a Trust registered under the Indian Trust Act, 1882. A company established under Section 25 of Companies Act 1956 or the Central or State Government / UT Administration or by a Society/Trust registered by them can open an technical institution with prior approval from the AICTE. A minimum of Rs. 100 lakhs for operational expenses in the name of the Trust/Society has to be shown as a proof of the ability to bear the expenditures. For offering the undergraduate programmes, the institution should be established on at least 1.5 acres of land in a metro city, 2.5 acres in urban areas and 7.5 acres in rural areas. There are many other similar requirements for approving the applications of the new entrants in this sector. The minimum qualifications of the Principal/Director are also mentioned by the AICTE. The state government and the affiliating university have to forward the applications to the AICTE with an expression of their views about the application. An expert team visits the site and physically examines the merit of the applications.

For exit, institutions may apply for a complete closure or a progressive closure in a phased manner. The permission may be granted after verifying the security of students and staff of the institutions and the pending cases against the institutions, if any. The applicant has to make an affidavit in front of a first class judicial magistrate/a notary officer/an oath commissioner saying that he/she owns no liability with respect to the staff and students of the institution.

(ii) Freedom to specify product

The institutions can offer a maximum of five courses at the degree level (UG or PG), but a combination of UG/PG/Diploma is not allowed. The institutions have to select a minimum number of courses pre-specified by the AICTE and after fulfilling the minimum requirements,

they may offer other courses, subject to the approval of AICTE. The guidelines of AICTE regarding offering courses are presented in the Table A.17 in Appendix.

(iii) Freedom to use available resources

Institutions getting government grants have limited freedom to utilise the funds according to their will, because the grants are allocated on the basis of specific 'heads'. Private institutions have relatively more freedom regarding utilization of resources.

(iv) Freedom to determine prices

The Justice B.N. Sri Krishna Committee Report on Technical Education (2015) has made recommendations to regulate the way the institutions charge their fees. The calculation of the maximum fees in an institution should be based on the cost of providing and maintaining infrastructure. The committee has felt the need for promoting excellence by allowing the better ones to charge 20 per cent higher than the maximum fees calculated[89]. In the state of West Bengal, the government has a detailed circular on charging fees in engineering education. Apart from the capping the tuition fees in the range of Rs. 75000 to 80,000 per year (no development fee can be charged), one time Admission Fee (Rs. 5,000/-), Library cum Book – Bank Fee (max Rs. 4,000/- for the entire course period) Students' Welfare and Sports and Games Fee (not exceeding Rs. 1000/-annually) a reasonable amount as refundable Caution Money, fees charged by the University for welfare of students and Development, other usual University Fees like Registration Fee, Examination Fee, etcetera. Therefore the private providers do not enjoy much freedom in determining the prices. Government institutions can alter their fee structure but cannot charge exorbitant prices. According to the recommendations made by the Justice B.N. Srikishna Committee, an institution offering 4 years B.E/B.Tech programmes can charge tuition and development fee not exceeding the range of Rs. 1,44,900 to Rs. 1,58,300 per year depending on the location of the institution.

6.6 Competitive strategies of the institutions

In the context of this regulated market, institutions need to develop strategies to negotiate with the continuous changes unfolding at the regional, national and global level. Since the

[89] The institutions who have got accreditation for at laest two thirds of their eligible approved courses/programmes.

competition in this market is overtly hierarchical, the strategic planning is needed even for maintaining the status-quo. This is because the relative positions of the institutions are extremely volatile as the students, the most valuable input into the system, respond quickly to the new information pertaining to the quality of the institutions while making choices. It has already been argued that the institutions depend largely on the students as the performance of the institutions mostly depends on the quality of its students. If an institution fails to cope up with the changing demands of time, potential students with better marks would prefer the alternatives over it in the next period, which would adversely affect the performance of the former institution in the coming years. In order to avoid a fall in the relative position, the institutions must be ready with the strategies to tackle the challenges posed by the new developments in the external environment. But implementing any of the strategies needs a good deal of financial resources and so, the most crucial strategy is of resource allocation. However, as discussed in the earlier section, the ability to make successful strategies depend mainly on the mode of funding and the relative position of the institutions. Keeping these two dimensions in mind, the following section examines three case studies to understand the process of strategy-making in more details. With the help of three case studies, this study examines why and how the institutions are allocating resources in certain key areas.

6.6.1 Introduction to the three HEIs

(a) HGC2

This college has an expertise in one of the core streams of engineering and is situated in the city of Kolkata. It was established in 1941 and has a rich history of serving the society and economy by transferring the knowledge to local artisans and mechanics. One particular objective behind establishing this institution was to make the refugees of East Bengal economically independent by training them in a particular technology. Lately this institution has started offering courses in newer streams like CSE and IT and has also gained autonomous status from the UGC. The institution offers graduate and post-graduate courses in engineering. This is the second most-preferred HGC in the relevant group.

(b) HPC1

This college is associated with the first private university in the state of West Bengal. It was established in 1989 and located in North 24 District but in the vicinity of Kolkata. The institute began its journey with the MBA program and after a few years it started offering engineering courses from 1997. This is the first private engineering college to get sanction for opening up post-graduate courses along with under-graduate courses in the state. It has recently managed to secure the 79th rank in the country and 4th rank in the state of West Bengal (after IIT Kharagpur, NIT Durgapur and IIEST Shibpur) in the NIRF published by MHRD. This is the most-preferred HPC in the relevant category.

(c) LPC1

This college was established in the year 2000 and is situated in the district of Hooghly. Even though it has secured a lower rank in terms of students' perception (ranked 21 out of 90 colleges), this college in the process of chalking out a survival strategy by altering some of its internal policies with the changing demands from the market and the newer requirements from the regulatory authorities will make an interesting case worth studying. This college is the best among all the LPCs in the sample.

Before discussing how they are designing their strategies in order to survive or make a mark in the market, the next section begins by giving a brief idea about their current performances which is also related to the and reputation and their relative positions in this market. This will help us in to build up a backdrop against which their strategies can be understood.

6.6.2 Outputs of these three institutions

Performance as measured by the outputs can be generated through teaching and research in these HEIs. The immediate outputs which will be observable after completion of the four year-long B.Tech/B.E. course, are the academic performance of the students (through their grades) and degree of their employability reflected in the proportion of placement. Research outputs, completion of projects and publications of papers/books in recent years may give us some idea

about the degree of priority of the teachers and the management in allocating their time and resources. The main outputs are presented in the tables (6.4 to 6.6). The tables on citation and impact factor is presented in the appendix.

Figure 6.2: Outputs of the HEIs

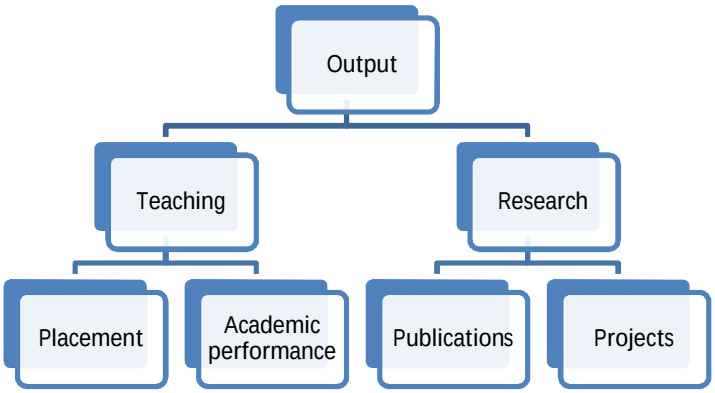


Table 6.4 : Academic performances of the institutions			
Academic performances (2013-14)	**HGC2**	**HPC1**	**LPC1**
Total number of students appeared in the final exam	180	314	232
Total number of students passed in the final exam	179	311	201
Total number of students failed in the final exam	1	3	31
Per cent of students having "marks" >90	10	16	1
Per cent of students having "marks">80	63	65	33
Per cent of students having "marks" >60	27	24	65
Source: Field Survey			

Table 6.5: Placement status of the institutions			
	HGC2	**HPC1**	**LPC1**
Percentage of students placed	54	76	36
Average pay package offered (Rs.)	3.5-4 lakhs p.a.	3.5-4 lakhs p.a.	2.5- 3.5 lakhs p.a.
Source: Field survey			

Table 6.6: Research outputs of the institutions			
Research outputs (2013-16)	**HGC2**	**HPC1**	**LPC1**
Number of papers with ISSN and chapters in books with ISBN	160	133	99
Number of books, monograph and edited volumes with ISBN	2	4	2
Sponsored research projects completed	17	18	-0
Sponsored research grant fetched (Rs. Lakhs)	84.85	89.97	0
Number of consultancy projects completed	3	12	0
Consultancy research earnings (Rs. Lakhs)	8	36	0
Number of patents earmed	2	0	0
Number of seminar or workshops organised by the institution	17	14	2
Total number of PhD awarded (supervised by faculty members)	16	-	-
Guiding Phd Programme/Project	20	1	1
Collaborative research work	18	7	3
Source: Secondary data collected from the field			

6.6.3 Understanding the strategies of the institutions

In this context, we may recall the distinctions between 'missions', 'objectives' and 'goals' of the institutions clarified by Kotler and Murphy (1981). While the 'mission' is related to the basic purpose of the institution's service, the short-run and long-run 'objectives' reflect the path needs to be taken to achieve this purpose. The 'goals' are more specific, and 'operational' and 'measurable' in nature. For example, an institute may decide to set up a goal for achieving a position in the top hundred list of institutions in the NIRF next year. This goal may have emerged as a consequence of the increasing popularity and importance of rankings among the students. To negotiate with this new challenge and to realize the goal, institutions need to develop their respective strategies. The strategies of resource allocation discussed can be used as a key to explore the black-box of institutional strategic planning. The amount of investment/expenditure on certain heads and sub-heads indicates towards the respective priorities in these institutions. After analysing the responses of the directors, the principals and the teachers, and corroborating their responses from the secondary sources like the balance sheets, annual reports, minutes of the meetings, notifications and circulars issued in these institutions etcetera, a few main priorities of the owners/leaders of the institutions have been identified. After compiling the qualitative and quantitative data collected from the primary and secondary sources, a few major goals could also be discerned. These goals and the subsequent steps needed to realize those are discussed below:

Goal-I: Achieving a higher rank in popular rankings published by private and government agencies. The required steps are:

(i) Ensuring a good placement and good academic performance by
   (a) Attracting the best quality students and teachers
   (b) Strengthening the industry-academia relationship
   (c) Providing the adequate infrastructure
   (d) Maintaining a close connection with the industry

(ii) Increasing focus on research outputs by
   (a) Attracting qualified teachers and researchers
   (b) Incentivizing them to perform
   (c) Investing on infrastructure

Goal-II: Building prestige, reputation and creating brand-value

The required steps (in addition to the above-mentioned ones):

(a) Promoting non-academic events (sports, annual day, etcetera)
(b) Advertising the performances in websites, newspapers, social media.

The major steps mentioned above are also inter-connected in the sense that one impacts the other and some of the steps are common for all the goals. If we summarize the above discussion, the main key steps for realizing the goals can be listed as the followings:

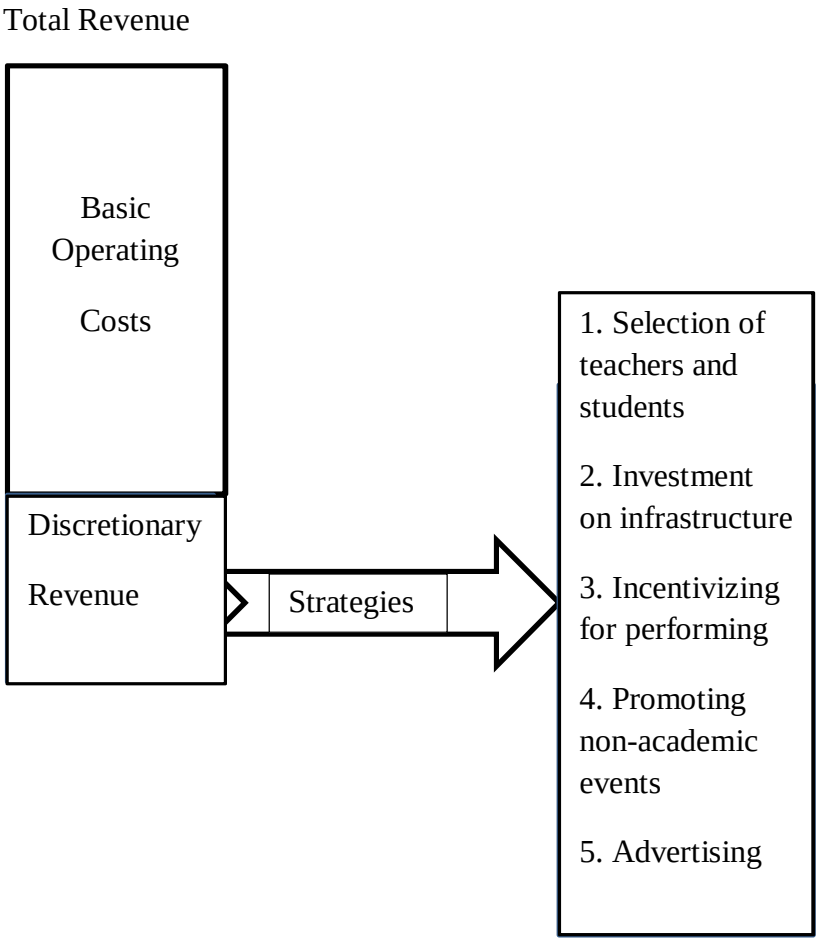
1. Attracting the best quality students and teachers
2. Investing on infrastructure for research and teaching
3. Incentivizing the students and teachers to perform
4. Promoting non-academic events
5. Advertising the performances

Keeping this framework in mind, the next section examines the process of strategy-making in the three institutions. In case it is found that any one is not involved in any such process, then it would try to understand the reasons behind it. The specific case studies may deviate from or add to the above-mentioned structure depending on their respective mode of funding and the relative position in the market.

(a) Endowment

Needless to say, implementing all the above mentioned strategies which have assumed critical importance need adequate financial resources to sustain or improve the relative position of the institutions in the future. The total revenue earned by an institution generally comes from the tuition fees and the grants from the government and the income from doing research and consultancy projects. A part of this revenue is utilised for financing the basic operating costs of the institutions. The additional expenditures or investments are generally financed from the discretionary revenue, which is nothing but the total revenue minus the basic operating costs in these institutions. After modifying the diagram of dynamics of institutional strategy presented in Brewer *et al.* (2009), the following diagram is presented below:

Figure 6.3: The process of strategy making



However, to finance the investments required for achieving specific goals, the institutions generally rely on the discretionary revenue. The size of the box indicating discretionary revenue can be expanded either by generating more revenue or by reducing the basic operating cost. It has already been discussed that minimising the cost of operation can achieve economic efficiency, but the quality is likely to suffer unless cost is reduced by curtailing wastage of resources. Therefore, the only option left with the institutions, which is willing to improve the position in the market by delivering better quality service, is to generate more revenue. Since the institutions are non-profit, there can be two sources of generating the revenue (Hansman, 1980). One source is the donations, or grants from the government, and the other is through the sale of its products or services, i.e., through earning from tuition fees and research grants in this case. To

sustain the long term operation, Winston (1999) argues, the institutions have to ensure that the total cost does not exceed the total revenue. But unlike the business firms, he further explains, these institutions may sell their services at a price lower than the cost of production. This 'continuing ability of a college to subsidize all its customers is a defining characteristic of higher education, both public and private' (Winston, 1999; pp.17). But, he explains, the ability to sell the services at "a lower price, or with higher production cost and quality" varies across the institutions depending on their financial health. The institutions which have a relatively higher level of initial endowment and wealth, and a greater ability to generate more resources over the years, are the ones who can sell the better quality services at a subsidized rate (Winston, 1999). This is just a way of attracting the best students and teachers by offering scholarships and higher remuneration to ensure the best performances in the institution. But the way institutions maintain their financial health is also directly related to the mode of funding of the institutions and the applicability of the regulatory measures for them. For instance, in this case, a public college cannot explore alternative sources of revenue generation (other than the traditional options) like its private counterpart. Now, let us have a look at the financial health of the three institutions.

(i) HPC1

The institution had a total income of Rs. 40.58 crore (before subtracting the cots) in the last financial year. Being a part of a giant educational group, the institution has a relatively large 'capital fund' accumulated over the years. It has a sum of more than Rs. 75.23 crore (approximately) as the total 'capital fund' in the beginning of the financial year 2014-15. The sum includes the surplus generated in the past financial year and the surplus generated by the other institutions owned by the same group. Since the owner group has several other educational institutes, cross-subsidizing one with the surplus of others is quite natural. The institution has a few 'secured loans' from the government as well as from the commercial banks. The total amount of secured loans is around Rs. 51.26 crore (approximately). The building and some of the properties have been mortgaged by the institution to be eligible to receive the 'secured loans'. In addition, it also has an amount of Rs. 3.10 crore as the 'unsecured loans'. The total value of assets and properties adds up to Rs. 148 crore 38 lakh 79 thousand (approximately). The 'cash in hand and bank deposits' is around Rs. 12.92 crore approximately. This has placed the institution in a much favourable position for undertaking any further investment for the betterment and

development of the institution. The institution has several courses under various universities other than the B.Tech course under MAKAUT. In total, it receives Rs. 34.85 crore (approximately) per annum from the various types of fees paid by the students enrolled in the B.Tech, BBA, BCA, M.Tech, MBA, MCA and other PGDM courses under various universities. The fees received from the students enrolled in the B.Tech courses under MAKAUT amount to Rs. 1.56 crore approximately. Though the fees in the B.Tech courses are regulated in the state of west Bengal, the fees for other courses are not so. The institution charges relatively higher fees for the other courses which help them in generating revenue.

(ii) HGC2

In the last financial year, the institution receives grants from the state government, which is around Rs. 3.69 crore. Income from tuition fees adds up to Rs. 78.48 lakh approximately. The UGC has supported the institution with Rs. 10 lakh. The institution has also received Rs. 46.45 lakh as the block grants. Income from the other bodies including the GATE forum sums up to Rs. 8 lakh approximately. In total, the institution had an income of Rs. 5.11 crore 88 thousand approximately in the last financial year. After subtracting the expenditures from the income, the surplus comes to be around Rs. 30 lakhs approximately. In the year, the institution has received around Rs. 32 lakh from the UGC and DST for major research projects, apart from Rs. 15 lakh from the consultancy projects which have been sponsored by the industry.

(iii) LPC1

Summarizing the above discussion, it can be said that the HPC1 is at a relatively better position to finance the necessary expenditures and investments required for achieving the goals, compared to the HGC2 and LPC1. Because of the huge capital fund and endowment, the HPC1 can easily get new loans from the market. It does not have to be worried much about the recovery as it has already established a clientele. In spite of a regulated fee structure, the HPC1 can easily cross-subsidize its B.Tech courses because of its ability to generate revenue from other courses and other institutions. On the contrary, the HGC2 depends mainly on the government grants as the main source of income though it could succeed to attract a good amount of research grants from the government as well as the private funding agencies. The success in doing research has become possible because of the well-qualified teachers and

adequate infrastructure. The cost of recruiting qualified teachers and developing infrastructure has been defrayed by the government. On the other hand, the LPC1, a six year old institution without the patronage of a large educational group, finds it difficult to generate resources in the short-run.

(b) Expenditure on human resources

The two main markets for revenue generation in this sector are the markets of student enrollment and research funding. Students select the institutions and pay the tuition fee which is one of the main sources of revenues for the institutions. They also compete for research grants for basic and applied projects which can earn them some revenue. But the market for student enrollment is most crucial because quality of students plays a key role in determining the quality of outputs, both teaching and research. So it is expected that the institutions would try to attract the best of the brains (teachers and students) to ensure the best output. An educational institute is supposed to generate skills or increase productivity and inculcate values in students through a teaching-learning process such that these training would transform them into educated, skilled, productive and responsible citizens. This task is easier for an institution if the students have a 'peer group' of other students who are more capable, intelligent, hardworking, disciplined, diligent, and sincere (Rothschild and White, 1995). It is also found that some HEIs try to substitute other infrastructural facilities by the positive effect generated from peer groups (Winston, 1999). To attract the best brains, institutions have to offer lucrative remuneration and perks to the teachers and scholarships/fee waivers to the students. The pattern of spending on human resources inside the institutions can give us some hints about the way these institutions treat their most precious inputs. The characteristics of the inputs in HPC1, HGC2 and LPC1 are presented in Table 6.7.

Table 6.7: Characteristics of the inputs			
Inputs at a glance	**HGC2**	**HPC1**	**LPC1**
Teacher student ratio	1:12	1:20	1:15
Percentage of teachers with PhD	43	18	10
Number of visiting faculty	12	8	0
Number of regular teachers	30	114	60
No of part-time /guest teachers	18	23	30
Students' lowest opening rank	1257	816	23295
Students' highest closing rank	9707	7006	86689
Source: Secondary data collected from fieled			

As per the rule of the state government of West Bengal, there is a cap on tuition fees for all private engineering colleges and they are not allowed to charge fees higher than the said limit. However, while the HGC2 charges Rs. 24,000 per year for IT courses, the HPC1 charges around Rs. 60,000 per year and the the LPC1 charges around Rs. 40,000 per year for the same course. Of course, there are other paid facilities like hostel, skill development, internet, software trainings, special coaching classes, internships and many more which can alter the net cost of education of the students depending on the particular college. Sometimes the colleges also offer a few scholarships or fee waivers on their own to reduce the net cost of education of the meritorious students. But these are limited in number. The nature of S-competition noticed in this market is partly different from that of Glennerster (1991). Here the institutions use a set of non-monetary facilities (a hundred percent placement, free GATE coaching classes, industrial tours etcetera) to signal the best students so that the most meritorious ones apply in the next year. Now, let us look at the institution' spending pattern on its human resources.

(i) HPC1

The institution pays Rs. 9.83 crore per annum (approximately) to all the teaching and non-teaching staff as remuneration, out of which almost 99 per cent has been spent on the teaching staff only (more than Rs. 9 crore). This includes the faculty members for all the courses. In addition, Rs. 84 lakh has been spent as "incentives'' to the teaching and non-teaching staff. The faculty members of all the courses have received honorariums which has a total of Rs. 14.24 lakh approximately. Among this, the teachers of the B.Tech courses have received Rs. 8.97 lakh. An amount of Rs. 40 thousand has been spent as honorariums to the resource persons who have been invited to deliver talks in the institution. The institution has also incurred an expenditure of Rs. 2.52 crore approximately on the 'staff and students welfare' head. The institution contributes to various funds for the teaching and non-teaching staff such as the family pension funds, deposit linked insurance, medical insurance etcetera. The total contribution by the institution amounts to Rs. 70 lakh. For training and academic project development, a sum of Rs. 1.12 crore has been spent. Out of this, student and faculty development training costs have been around Rs. 38.31 lakh approximately. Travelling expenses have summed up to Rs. 13.90 lakh (approximately) part of which has been received by the teachers and students to present papers in the national and international seminars and for field trips. Approximately Rs. 66 lakh has been used for students' scholarships. In this college, 30 per cent teachers have teaching and/or research experience above 15 years and many of them have served the industry for more than 20 years. The college has offered higher remuneration than their previous pay-package to attract them and also offered an adjustment in their class loads and/or other duties according to their individual preferences. The rest (70 per cent) of teachers are mostly are fresh Master's degree-holders and they are paid either at government approved pay scale or lower than that depending on their class loads. While the senior experienced teachers enjoy a secure tenure of contract, the junior ones are most vulnerable as their contracts last for only six months to one year. But this college has strictly maintained the minimum eligibility conditions laid down by the AICTE for teachers' recruitment. An amount of Rs. 80,000 has been spent for organising industrial trips. For placement, the institution has spent Rs. 14 lakh approximately.

(ii) HGC2

As the remuneration to the teaching staff, the institution paid Rs. 2 crore 46 thousand approximately. To the non-teaching staff, the institution paid Rs. 64 lakh. Surprisingly, there was no expenditure on the visiting faculty or invited industry experts. The HGC2, on the other hand, are bound by government rules and regulation and all its posts and pay scales are determined in accordance with the government approved pay scale. The recruitment process is done by the Public Service Commission in the state of West Bengal and there is no autonomy enjoyed by the college in this regard. It has 30 teaching posts and the salary component in its budget dedicated for teaching and non-teaching staff amounts to Rs. 32 lakhs in the recent year.

(iii) LPC1

Rs. 22 crore is spent on the salary of teaching and non-teaching staff of the institution. Rs. 18 lakh has been spent for travel allowances. The LPC has 60 regular teachers but their posts are not sanctioned by UGC/State Government/University, rather sanctioned by their own management or BOG. Only 10 per cent of teachers have a Ph.D. degree in this college. Their recruitment policies are quite arbitrary. The teachers whose names are published in the college prospectus and websites do have the M.Tech/M.E. degree but a group of fresh graduates (B.E./B.Tech) are also employed who are called the "guest teachers" to take the practical classes and tutor the students and paid a paltry amount as salaries. If we include 30 guest teachers, the total number of teachers would be around 90. The college heavily compromises on the teachers' salaries by employing fresh graduates as tutors instead of recruiting at least Master's degree holders. In their last year's balance sheet, total expenditure on teaching and non-teaching staff is shown as Rs. 25 crore approximately.

(c) Physical Infrastructure

The following table presents the key numbers related to the infrastructure in these three colleges.

Table 6.8: Infrastructure in the colleges			
	HGC2	**HPC**	**LPC**
Number of printed books in library	18622	24876	16879
Number of printed journals in library	57	68	-
Number of e-journals and e-books in library	9247	12891	754
Special collection	241	-	-
Computer student ratio	1:2.5	1:4	1:6
Proprietary softwares/open source softwares	40	28	-
Percentage of computers with Internet facility	75	100	100
Unit cost of education with salary (Rs.)	86941	102435	62127
Unit cost of education without salary (Rs.)	28741	33039	29148
Source: Secondary data collected from field survey			

(i) HPC1

The HPC1 has kept on investing a huge amount in improving the physical infrastructure including the library, laboratories and buildings. Its yearly expenditure for the maintenance of computers and other equipment is quite higher than the LPC and HGC. During 2011 to 2016, it has spent Rs. 89.43 lakhs on library and Rs. 150 lakh in laboratories. In the last financial year, the institution has spent Rs. 9 crore 41 lakh (approximately) for renewals and replacement of computers and Rs. 38 lakh on the maintenance of the running computers. The expenditure incurred for running the laboratories and the workshops is around Rs. 95 lakh (approximately). The total expenditure on repair and maintenance adds up to Rs. 57 lakh approximately. On maintaining the connectivity, the institutions spent Rs. 2 crore 69 lakh in the last financial year. The amount spent on buying new books, periodicals and journals for library is around Rs. 11.94

lakh (approximately). Apart from this, another sum of Rs. 1 lakh has been spent for the development of library.

(ii) HGC2

In the last financial year, the institution has spent Rs. 24 lakh on the library. On laboratory equipment, an amount of Rs. 70 thousand has been spent in the last financial year. Rs. 5 lakh has been spent on the maintenance of the building. Other miscellaneous expenditures cost around Rs. 50 lakh.

Table 6.9: Expenditure on library in the HGC2

	2010-2011		2011- 2012		2012-2013		2013-2014	
Head	**No**	**Cost(Rs)**	**No**	**Cost(Rs)**	**No**	**Cost(Rs)**	**No**	**Cost(Rs)**
Books added	04	625	238	6,06,420	1068	5,06,375	93	30,618
E-Books added	-	-	460	1,15,545	460	1,20,622	460	1,41,050
Journals added	10	8,55,119	10	9,36,520	21	15,91,315	30	11,49,138
E-Journals added	4212	5,12,426	4212	5,38,163	4212	6,53,708	8787	11,08,192
Grand total		**13,68,170**		**21,96,648**		**28,72,020**		**24,28,998**

(iii) LPC1

The institution is still at the stage of building its foundations. In the year 2014-15, it has spent Rs. 1.11 crore (approximately) on acquisition of land and establishing new buildings. Recently the institution shifted its focus on research and incurred an additional expenditure to encourage research in the institution. As reported, the institution is spending 5 per cent of the total budget on research now. An amount of Rs. 2.5 lakh has been spent to build up the infrastructure for a dedicated R & D centre. In fact, for organising seminars and workshops, it has spent more than the budgeted amount (Rs. 1.25 lakh) as compared to a sum of Rs. 10 thousand spent on it in the previous year.

Table 6.10: Expenditure on different heads in the LPC1

Sl.No	Particulars	Expenditure (Rs.)
1	R&D Center Infrastructure	2,50,000
2	Conferences/Workshops/Seminars/	4,70,000
3	Training	4,23,240
4	Journals subscribed	22,000

On laboratory equipment, there has been an increase in the expenditure which is more than double from the previous financial year (2013-14). On library resources, the institution has spent Rs. 9.75 lakh approximately. On laboratory equipment, a sum of 40 lakh has been spent, though the budgeted amount was Rs. 1 crore. There has been an increase in the budgeted amount in the last year keeping the need to encourage research in the institution. For other maintenance expenditure, Rs. 25 lakh has been spent in the year 2014-15. For procurement of computers and the accessories, the institution has spent Rs. 6 thousand in the year.

Table 6.11: Expenditure in the LPC1

Expenditure Table

SL.NO	INFRASTRUCTURE	AMOUNT
1	BUILDING	24,00000/-
2	FURNITURE	5,00,000/-
3	EQUIPMENT	3,00,000/-
4	COMPUTERS	4,00,000/-
5	LAB CONSUMABLES	3,50,000/-
6	REPAIRS AND MAINTENANCE	1,00,000/-

The authorities felt the need of setting up of a decent laboratory in order to attract research funding as a response to growing market pressure and NIRF. In the maintenance head, there has been a slight decline in the actual expenditure

(d) Incentivizing for performance

The main differences in the governance process of the three sets of institutions have already discussed in Chapter 5. It has been observed that the HPCs are guided by performative governance structure while HGCs follow a collegial model. On the other hand, LPCs are competitive and more concerned about cost-minimising rather than performing. Here, the distinct observations regarding the three case studies are presented.

(i) HPC1

Apart from adopting a ‘performative’ structure for ensuring zero-deviation from the proposed norms in the teaching-learning process, the HPC1 has identified Research and Development (R

&D) as the key sector for enhancing prestige. In the market of research funding, the undergraduate institutions are relatively new entrants compared to other reputed institutions like the elite institutions in engineering education sector like IITs, NITs, deemed universities and a few departments of prestigious universities. But with the introduction of National Institutional Ranking Framework (NIRF) prepared by the Ministry of Human Resources Developments (MHRD), the undergraduate engineering colleges are now being ranked on the basis of their performances. One particular parameter named Research and Professional Practice (RP) is assigned 30 per cent of weightage and this seeks to assess quantity and quality of publications (PU and QP), IPR and patents (IPR), Footprint of Projects, Professional Practice and Executive Development Programs (FPPP). Following this change, the HPC1 immediately started investing in a big way in research infrastructure and attracting qualified and experienced teachers in order to pursue research. Attracting students in post-graduate courses is also another strategy as the research projects done by these M.E./M.Tech students with their guides help them in advancing their research further. The institution has opened up PG courses after realizing this. The performative structure is also applicable in this field. Teachers and researchers are increasingly encouraged for publishing more papers with SCOPUS or in other formats which are required by the ranking agencies. Huge investment has been made for arranging for international seminars in the institute. The PG students/researchers have been sponsored a trip to Japan for vising the laboratory in a reputed technical university. The scholars and teachers are incentivized for making presentations in internal seminars as well. They are also engaged in collaborations with the foreign institutions. Partnerships with foreign counterparts are important for HPCs in order to fabricate and advertise their research portfolios. It has applied for government funding agencies as these projects are helpful for increasing their status or reputation. The HPC1 has been able to open up a DST funded research cell inside the campus. On the other hand, it has continued doing consultancy for several industrial firms for earning revenue. It has dedicated research units for some of the regular clients inside the institution. .

(ii) HGC2

This institution has not changed its focus from teaching to research in the wake of new ranking requirements. Since ages, has been doing sponsored research with grants from funding agencies like UGC, AICTE, DST. The institution has PG courses, and it has also collaborated with other

public institutions having expertise on core streams and IT –oriented streams. However, the teacher expressed more preference for the fundamental projects in comparison to projects funded by industrial agencies. Doing research is a part of its academic endeavor, not a conscious strategy of building reputation. HGC1 has been doing consultancy for local artisans to exchange their expertise and make the local economy stronger. Their efforts have been acknowledged by various historical reports but not publicized widely in order to gain reputation. Because of its serious and sustained endeavor, this institute still has a huge stock of prestige but does not have much of a brand-value. However, as mentioned in Chapter 5, the newly introduced API under PBAS by the UGC has made an impact on the teachers who are now responding in a manner to gain more points in API with little regard for quality of publication. This performative structure imposed by the government authority has changed the behavior of the teachers in shifting their focus from teaching to research to some extent. They are now showing more interest in publishing papers or selecting research areas which will get them more API scores.

(iii) LPC1

Having understood the importance of ranking in this market, his college has recently made some changes in its policies to become more performative. It has initiated setting up of better laboratories and research infrastructure. The resource allocated under these heads has increased a number of times in recent years. However, with the quality of teachers and students, it has a limited scope in getting a higher rank in immediate years, but it has started the process of incentivizing teachers for publishing and presenting papers in national seminars. Unlike other LPCs which are most concerned about cost-cutting, this college has started spending on the heads related to recruitment of experienced teachers and providing adequate infrastructure in recent years.

(e) Industry-Academia linkage

(i) HPC1

The HPC1 has established a close network with industry by signing MOUs, collaborating for research, teaching and exchanging ideas. The institute has conveyed its concerns regarding the gaps between what is being taught and what is being sought by the employers. To overcome this problem and ensure employability of its students, visits and special lectures by industrial

specialists/managers are arranged frequently. Industrial partners' views are taken very seriously by the management because the placement possibilities are also linked with their responsiveness to it. On the basis of industrial partners' recommendations, various software training programmes have been initiated to make the students more employable. The BOG itself has many influential members from the industry, mainly from those software firms who recruit a large number of students every year from this institute. The investment in terms of money and energy devoted to strengthen the bonding with its industrial partners has helped it in building reputation and getting positive feedbacks from the employers which are crucial for doing well in the rankings. An amount of Rs. 80,000 has been spent for organising industrial trips. For placement, the institution has spent Rs. 14 lakh approximately.

(ii) HGC2

Not much explicit linkage has been noticed in the HGC1 with the industrial partners in the terms of placement and recruitment. However, regarding the collaborations in research, many of core engineering firms are closely associated with the college. Being a government college, the HGC1 faces some regulatory bindings with respect to directly approaching the firms for placement.

(iii) LPC1

This college does not have any strong linkage with the industry. But recently, with the recruitment of a new placement officer, the college has been able to attract some of the nationally reputed IT firms to visit their campuses for placement. The BOG is consisted of local industrialists who are unable to contribute in the curriculum design or research collaborations. On the other hand, the institute lacks in the motivations to invite well-reputed industrialists for collaboration because of its constraints regarding input (teachers and students) quality and financial constraints. Even if the institute has recently decided to invest in arranging industrial visits and special lectures by some of the industry experts, it would not be able to raise the reputation immediately with the given quality of students and teachers. The principal, during his interview, clearly mentioned about his goals of making the college the best in its own district, not at the state and/or national level, and this has shaped the way it has made its strategies.

(f) Non-academic events and advertising[90]

The HPC1 spends a large amount of money on building reputation through the followings: publishing international journals, taking membership of international organisations, organising international conferences, highlighting students' performances in international students' meets, updating the websites regularly and fabricating information. The establishment of the first private university in the state of West Bengal has taken the central space in websites. Rs. 3.94 lakh has been spent on organising seminars. Sports and cultural events have cost Rs. 1.22 lakh approximately. Rs. 71 thousand has been spent as the registration and participation fees of various competitions and events in which students participate. For rewarding the students, Rs. 1.42 lakh has been spent. Each of the two most elaborate annual events has cost round Rs. 8 lakh each, but 90 per cent of the cost was borne (sponsored) by the industrial partners. Similarly, international conferences were sponsored by government and private agencies. Out of Rs. 7.84 lakh spent on hosting such conferences, half was sponsored by the external partners. Rs. 35 lakh has been spent on advertising in the last year.

On the other hand, the HGC2 maintains a low profile in terms of publicising its performances and non-academic events. It cannot allocate the resources under new heads which were not pre-approved by the funding agency. The pictures of annual festivals are presented in the website under the student section.

The LPC1, provide very less information about their performances. Probably right now they do not have much to show off. But the glossy pictures of the ministers and politicians inaugurating the new laboratories are presented in their websites.

(i) HPC1

The website of HPC1 conducts anti-robot test of visitors before leading them to the homepage while the URLs of websites of HGC1 and LPC1 lead directly to their homepages. As the three colleges provide engineering education, the anti-robot test which involves quite a few clicks of mouse and requires the visitor to apply his/her mind and might attract a prospective student while it sometimes irritates a general visitor. On entering the homepage of the HPC1, photos about the newly established university is observed. The rotating pictures present images of a

[90]I am benefited from the discussions with Mr. Binay Kumar Pathak, Doctoral Student, ZHCES, JNU, New Delhi.

Nobel naureate and the governor of a state visting the institutions. Above the rotating picture, a visitor will find the links for NIRF, placements, NAAC SSR, news reports, etcetera, which mean the institution is willing to disseminate information about their performance. The prospective engineering students are expected to be aware of the NAAC assessment so that they find the details of faculty from the SSR submitted to NAAC. The links for details of the approval process are also present in the website. The news of students' trip to a reputed steel plant in a neghbouring state, and for reports published in the leading regional and national dailies are provided. Also, the link for news-reports on achieving the awards, and other performance of the students are provided. All the links for press-releases are presented in the right hand corner of the homepage. At the bottom, links for admission, financial statement, information of various events are provided. There is also another link for media. The website is desined in a way to focus on the reports published in the media. To attract the best minds, it has tried to be transparent by providing links for financial statement, NAAC SSR report and approval details.

(ii) HGC2

In the website of HGC2 the first fold of the homepage welcomes the visitor with the images of college library, classroom, building and the platinum jubilee celebration at the college. The main focus is on the infrastructural facilities and long history of operation. Above this, all useful links for "academics", "infrastructure", "training and placement" are provided. Below the pictures, the links for "why you should study with us", "experiences of students", "alumni" and "latest rews and reports about the college" are provided. However, the link for news and reports is a broken one. In the second fold, links leading to more information about the institute is provided. The links for NAAC-SSR report and the Annual Report are there. On the left side, links for messages from the principal, alumni and the placement cell are given. In the third fold, links for NIRF details, admission related issues, and for the basic contact information is present. The institution seems to share information about its performance through the annual reports and NAAC-SSR reports, but no links for newspaper reports are provided on the homepage.

(iii) LPC1

In case of the LPC1, the first fold of the homepage welcomes the visitor with attractive rotating pictures which include a classroom. Other pictures rotating successively to the visitor are images

of Sourav Ganguly, a popular cricketer, as one of the *thought partners* of the institution; an idol of Goddess Saraswati, the goddess of knowledge; pictures of students in laboratories and library; different buildings and a college-bus. The album, thus presented to a visitor, appears to showcase the activities at the college, the infrastructure it has and the way it values education. Above the rotating picture, a visitor will find the links for 'About Us', 'Academics', 'Campus Life', 'Admission', 'Corporate Relations',' Gallery' and 'Contact'., The links from NAAC-SSR to Technophilia-2017 are sliding in nature, that is, they slide down the folds as the visitor goes down. Just below the rotating pictures, a rotating notice runs for prospective students mentioning spot booking for JEXPO candidates and provides contact numbers. The homepage of LPC1 has more than three full folds, that is, three and half folds. The half fold of the homepage presents rotating logos of recruiters. The most important information for prospective engineering students finds its place at the bottom of the homepage. Just below the rotating logos, the links for "Our Dream", "Library Online" and "Hostel" find their places. The emphasis on catchy pictures to attract prospective students in the first fold and mentioning the crucial information for the students such as Hostel and Recruiters at the bottom not only reveals strategy of information processing but also the strategy of the institution towards education. The links to Dreams, Vision and Mission are repeated thrice- first under About Us, second in the second fold and third time at the bottom under "Our Dream". This shows the intensity with which the institution seeks to showcase its vision and vision. The link for Hostel seems to be conspicuously placed at the bottom and not in the second fold under "Our Facilities". While the link for Hostel finds some place even at the bottom, there is no link leading to details of the faculty members which is available only in the downloadable file under NAAC-SSR.

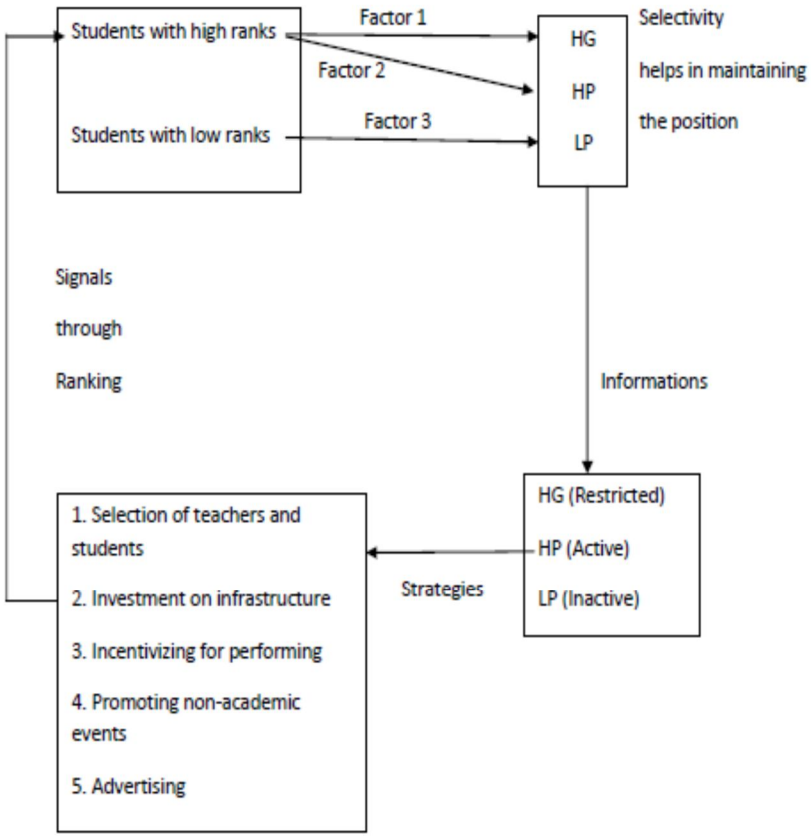
6.6.4 Summarising the strategies

In this particular market, students with a valid WBJEE rank and a minimum percentage in higher secondary examination can apply to the institutions of their choice. Then the institutions prepare a merit list based on the WBJEE ranks of the applicants and the sanctioned intake capacity. Here the students have the power to select the institutions. The fee-waiver schemes of the state government for socially and economically weaker section of students act like a voucher system where the financial aids are given to the institutions directly. Students studying in any of the approved institutions (public as well as private) can apply for the financial aids and other

scholarships via their institutions. Students can make informed choices about the best colleges given their ranks by looking at the popular rankings, college information sheets, mandatory disclosures, and the information about admission published by JEE board, etc. So, theoretically here the students have the 'choice' to select an institution without worrying about the fees. As discussed in earlier sections, the main set of factors behind selecting the instititions (as revealed by the students) are of three types: The first set (Factor 1) is related to the ranking, infrastructure and reputation of the college. Second set (Factor 2) is related to the main concern for the ability to pay. The third factor (Factor 3) is related to the availability of stream and location of the college. Factor 1 is more pertinent for the HPCs, while Factor 2 for the HGCs and Fcator 3 for the LPCs. The providers prioritize on certain areas of investments and advertise a set of visible achievements like placements and producing university toppers to give a signal to the eligible students who then accordingly select the list of institutions before applying. The signals can be emitted by investing in key areas like faculty requirement, ensuring 100 per cent placement, developing physical and digital infrastructure, organising special classes for additional skill development etcetera. The LPCs, on the other hand, either being not interested in making any effort to attract students or being constrained by their low endowment, mostly remain inactive (Figure 6.4).

In India, applicability of government regulations varies across the private and public colleges, and private colleges have more freedom in selecting their strategies. The relative position and the endowment of the institutions also determine the strategies.Highly reputed institutions with better quality inputs and with greater endowment are more likely to make successful strategies than public institutions and the less reputed institutions in the sector.

Figure 6.4: Dynamics of strategic intervention



Source: The Researchers' understanding based on the field survey

6.7 A simple game theoretic model of strategic investment

Since the nature of competition in higher education market is "positional", the institutes make strategies to improve the relative positions in the market. Strategies involve marshalling of additional resources to spend on key strategic inputs and other policy decisions which do not entail any expenditure, reallocation of resources to improve performances to score more on the ranking parameters. Every strategy entails a cost and an expected additional gain arising out of the decisions. As a result of their investment in the current period, the institutions seek to

improve their relative positions (rankings) over a period of time. But depending on the nature of strategic investment, it may require that the investment has to be sustained over a long period of time. As a consequence of their improved ranking, institutions will be able to generate more revenue and improve their financial health. There are in general two ways of achieving this: by expanding the capacity and raising the intake of students and/or raising the tuition fees. In case both of these are regulated, they may look out for other options like offering of other courses in which fees are not regulated or through research consultancy.

Even though the HPCs are better placed in the ranking, they will try to still improve their positions, compete globally and in the process, widen the gap in their relative positions with the LPCs (competitors) by making strategies. The LPCS are unlikely to remain where they are in the ranking table. They may try to climb up and narrow down the gap by making strategies. Even in the competitive scenario, maintaining the status-quo requires strategy and investment. For the LPCs the present discounted value of the net benefit of strategy-making will only be positive if they are able to narrow down the gap in the relative positions over time because improvement in the net gain is likely to follow improvement in the ranking For the HPCs, the present discounted value of the net benefit will be positive if they are able to widen the gap in their relative positions over the years assuming that the size of the market does not shrink. The decisions to strategize or not depend on their current positions in the market as indicated in the ranking, ability to sustain in the market and the objective functions which reflects the planning horizon. Here, by the term "strategies" we mainly refer to the strategies meant for improving the ranking and the relative position in the market. The strategies needed for maintaining status-quo are not under focus at this point of discussion.

Let us start with a HPC and a LPC who are considering the options to strategise to improve the ranking and the relative position in the market the or not.

Let us define

PV_i^H = the present discounted value of the net benefit for the HPC in case i

PV_i^L = the present discounted value of the net benefit for the LPC in case i

Table 6.12: The pay-off matrix I

		LPC	
		Strategise	**Not strategise**
HPC	**Strategise**	Case 1 PV_1^H, PV_1^L	Case 2 PV_2^H, PV_2^L
	Not strategise	Case 3 PV_3^H, PV_3^L	Case 4 PV_4^H, PV_4^L

The figure 6.6 depicts that the improvement in the revenue will not be high in the short run as a consequence of the additional investment, but it will gather momentum after consolidation.

Institutions make strategies to improve their rankings being fully aware that it takes time to improve performances and it will take some time to get reflected in the rankings. Now, present discounted value of net benefit (PV) = f (gap in the relative position or rankings).

Figure 6.5: Making of the strategies: The case of HPC and LPC

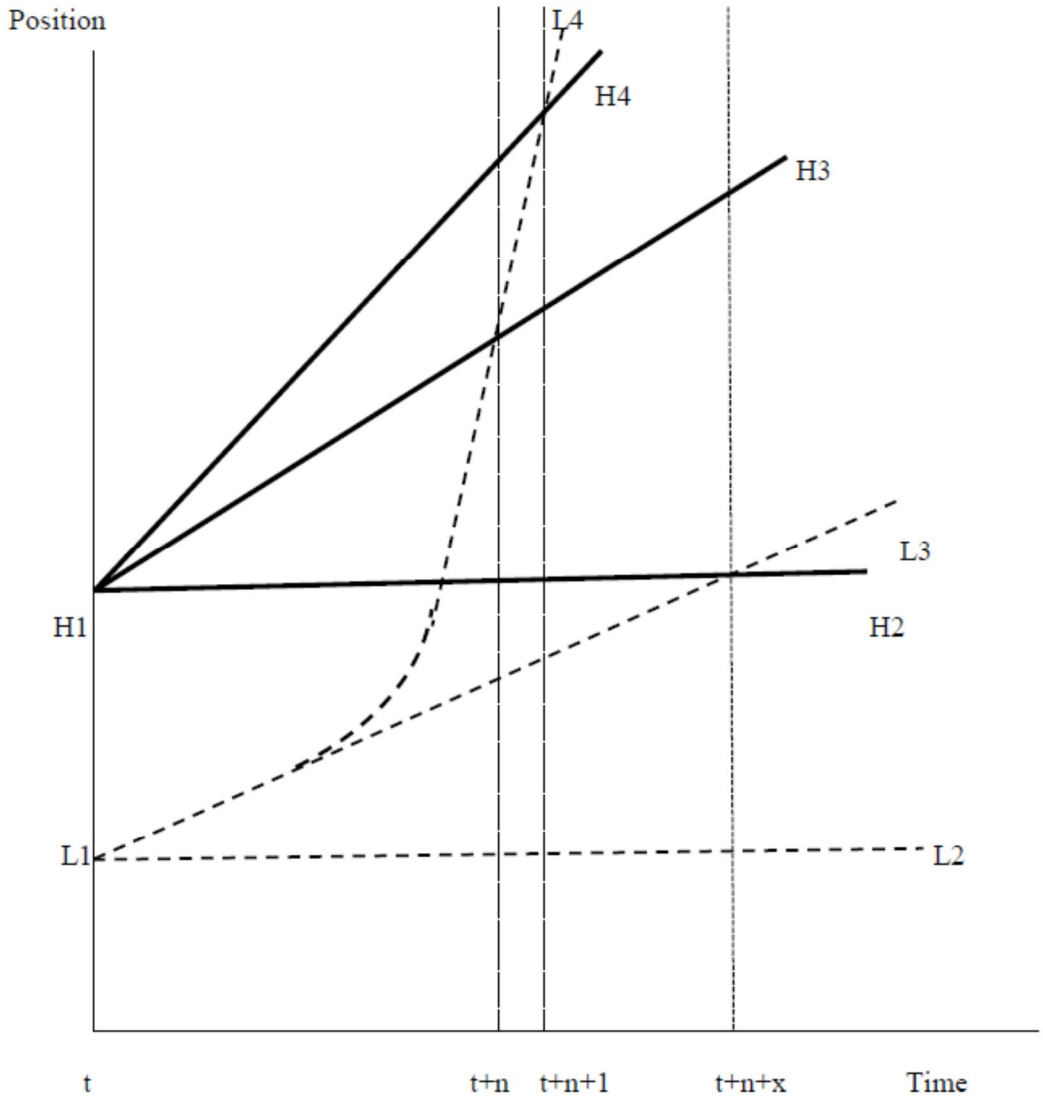
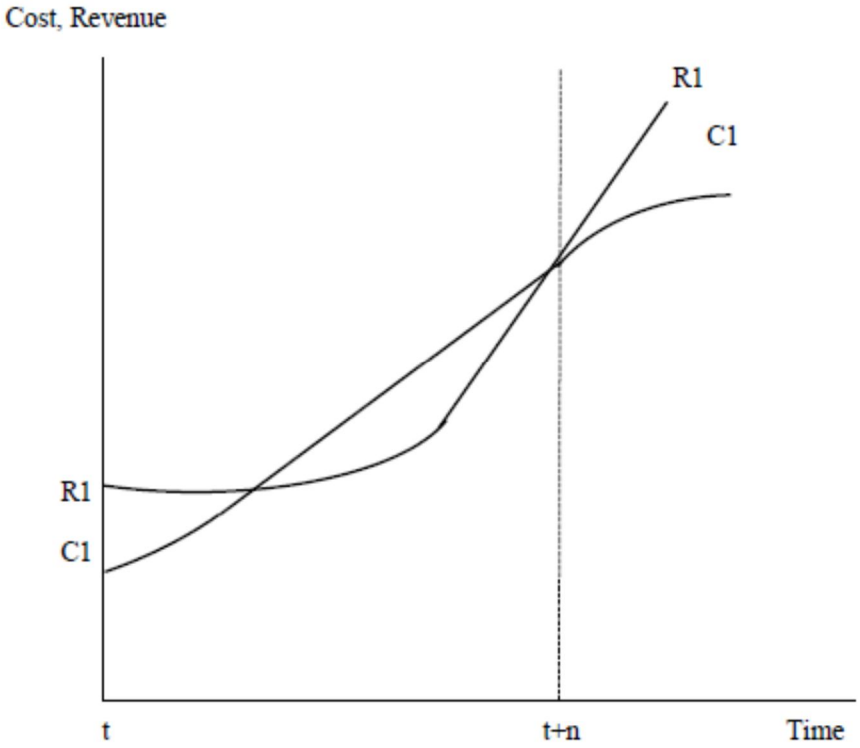


Figure 6.6: The cost and revenue of the instititutions



Case 1 (HPC invests, LPC invests)

(i) In this case, when both invest, there could arise some possibilities. One, the gain of the HPC is in terms of improvement in ranking the LPC gains but not commensurately. The gap between them can remain the same. But the gap between them remains the same after t+n years.

$[R(HPC)_{t+n} - R(LPC)_{t+n}] \approx [R(HPC)_t - R(LPC)_t]$

In diagram 6.5, the line L1 L3 depicts the the LPC's path of improvement. Eventually it is able to improve its ranking but the gap in the relative position remains more or less the same because the HPC has also invested. The HPC's path of improvement is depicted as H1 H3 line. The HPC stands to gain more from investment than the LPC as the HPC is better endowed in terms of human capital than the LPC. Maintaining position at the top of the ranking table is tougher than at the lower end of the ranking table.

(ii) If the HPC is extremely concerned about its "prestige" and in a position to follow an aggressive strategy to improve its position along the path H1 H4 while the LPC can continue on L1 L3 path. This may happen if a HPC wants to compete in the global competitors, for example. In this case,

$[R(HPC)_{t+n+x} - R(LPC)_{t+n+x}] > [R(HPC)_{t+n} - R(LPC)_{t+n}] > [R(HPC)_{t} - R(LPC)_{t}]$

(iii) If the LPC begins with a long term vision and is ready to incur the cost of a proportionately large investment in realizing strategies, it will follow the aggressive strategy to improve along the path L1 L4. This may happen if the LPC is funded by a large business group which offers cross-subsidisation. In this case the relative gap may become negligible at the (t+n) period if the HPC follows H1 H3 path. In this case,

$[R(HPC)_{t+n} - R(LPC)_{t+n}] \approx 0$

(iv) If the HPC follows H1 H4 path, while the LPC follows L1 L4 path, then the LPC will take relatively longer to catch up the HPC. In this case,

$[R(HPC)_{t+n+x} - R(LPC)_{t+n+x}] \approx 0$

Therefore, it is impossible for the LPC to narrow down the gap before (t+n) period without an aggressive strategy. If it does not have the capacity to adopt such aggressive strategy, it would not be able to narrow down the gap ever.

Case II (HPC Invests, LPC does not invest)

(i) The LPC will remain on L1 L2 line while the HPC will improve along the H1 H3 line. The gap between their relative positions will keep on increasing over time.

$[R(HPC)_{t+n} - R(LPC)_{t+n}] > [R(HPC)_{t} - R(LPC)_{t}]$

$[R(HPC)_{t+n+1} - R(LPC)_{t+n+1}] > [R(HPC)_{t+n} - R(LPC)_{t+n}]$

$[R(HPC)_{t+n+x} - R(LPC)_{t+n+x}] > [R(HPC)_t - R(LPC)_t]$

(ii) If the HPC follows H1H4 strategy, then the gap will increase all the more.

$[R(HPC)_{t+n} - R(LPC)_{t+n}] > > [R(HPC)_t - R(LPC)_t]$

$[R(HPC)_{t+n+1} - R(LPC)_{t+n+1}] >> [R(HPC)_t - R(LPC)_t]$

$[R(HPC)_{t+n+x} - R(LPC)_{t+n+x}] > > [R(HPC)_t - R(LPC)_t]$

Conclusion: it is impossible for the LPC to narrow down the gap.

Case III (HPC does not invest, LPC invests)

(i) The HPC will stay on H1 H2 line. The LPC will improve along with L1 L3 line.

Only after considerable period of time, it will be able to catch up with the HPC. But the sustainability of operation till the point (t+n+x) is unlikely for the LPC unless it is guided by a long term vision.

$[R(HPC)_{t+n} - R(LPC)_{t+n}] < [R(HPC)_t - R(LPC)_t]$

$[R(HPC)_{t+n+x} - R(LPC)_{t+n+x}] \approx 0$

(ii) In case the LPC is guided by a long term vision and ready to invest a lot, it might follow the aggressive strategy along the L1L4 path. In this case, it will take less time to catch up the HPC.

$[R(HPC)_{t+n} - R(LPC)_{t+n}] \approx 0$

Conclusion: It is impossible for the LPC to narrow down the gap before (t+n+x) period without an aggressive strategy.

Case IV (HPC does not invest, LPC does not invest)

The HPC will stay along H1 H2 line.

The LPC will stay along L1 L2 line.

The gap in relative position will continue to remain the more or less same over time. The LPC may not have a vision, may not be keen to move up the ladder. However, it is difficult to reconcile with the fact that the HPC ranks high after taking the plunge in investment in higher education would be happy to stay put instead of expanding the empire nationally and if possible even globally. The fact that HPC does not have a vision implies that the overall quality of the private sector engineering colleges is not of good quality.

$[R(HPC)_{t+n+x} - R(LPC)_{t+n+x}] \approx [R(HPC)_{t+n} - R(LPC)_{t+n}] \approx [R(HPC)_{t} - R(LPC)_{t}]$

Conclusion: It will impossible for the LPC to narrow down the gap.

Summary

If the LPC is guided by the long term vision, prestige maximising objective function and if it has the ability to incur the cost of the investment in the initial years, and the ability to sustain till the point when revenue will start exceeding the cost, it will invest to strategise. This is the case of new institutions established by big educational groups. These may have huge endowments and do not bother about the initial losses. They have the facility of being cross-subsidized. They will be able to sustain in the market till the long run even with the losses.

Table 6.13: The Pay-off matrix II

		LPC	
		Strategise	**Not strategise**
HPC	**Strategise**	Case1 $\underline{\mathbf{PV_1^H}}, \underline{\mathbf{PV_1^L}}$	Case 2 $\underline{\mathbf{PV_2^H}}, PV_2^L$
	Not strategise	Case 3 $PV_3^H, \underline{\mathbf{PV_3^L}}$	Case 4 PV_4^H, PV_4^L

The other case of LPCs might be a local player with not much of an endowment. They are not much bothered about reputation. They want to generate surplus in order to sustain. They only want to sell degrees with a low scale of operation.

Table 6.14: The Pay-off Matrix III

		LPC	
		Strategise	**Not strategise**
HPC	**Strategise**	**Case1** $\mathbf{PV_1^H, PV_1^L}$	**Case 2** $\mathbf{PV_2^H, PV_2^L}$
	Not strategise	Case 3 PV_3^H, PV_3^L	Case 4 $PV_4^H, \mathbf{PV_4^L}$

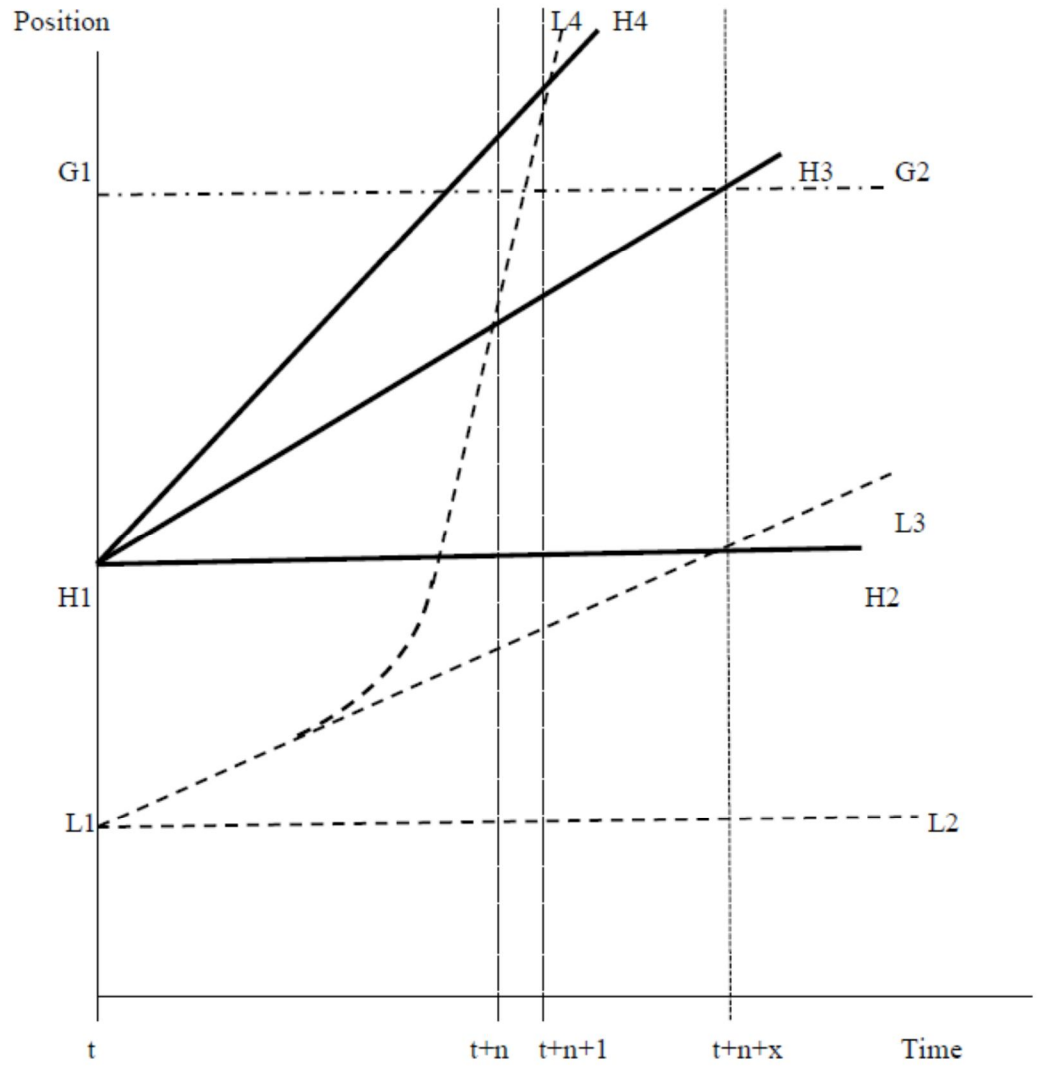
Now, let us consider a case where there is a government institution with high reputation. It has other social objectives. It does not care much about loss or gain. It has certain missions to fulfill. The objective function is guided by the "pursuit of prestige".

Due to strict regulatory framework, it has the faculty with higher qualification and experience. It has a long history of operation in the field. It does not strategise much, maintain a stable strategy and remain on the path of GI G2 over the years in the diagram.

The HPC can narrow down the gap in the relative positions and can catch up with G by following the strategy H1 H3 at the (t+n+x) time period. If it follows an aggressive strategy, it may catch up at an earlier time period Even a LPC can catch up with G if it follows a more aggressive strategy. However, G's ability and willingness to strategise will depend on the regulatory structure and the objective functions.

If the initial positions of both the government and the HPC colleges are the same (H1), then eventually G will suffer for not making strategies, because HPC will widen the gap between their relative positions by making strategies. This is the case of HGC1 and HGC2 in my study.

Figure 6.7: Positional Competition: Government versus the private



6.8 Concluding remarks: Strategy and the role of funding

This chapter looked at the market for engineering educationin West Bengal as a whole. As discussed in Chapter 2, an education market is inherently imperfect because of the differences in the quality of education. In this market, a few good institutions are found at the top and many ordinary institutions at the bottom. In this market, regulation is also necessary because students are not really the customers and the process is vulnerable to subversion of norms. Based on the framework suggested by Jongbloed (2007), this chapter has discussed how the market is regulated in order to address the problems related to the information asymmetry and to control and monitor the process. While regulation needs compliance, competition requires strategies. Though the education market does not exist in the true sense of the term, but it needs to be regulated. The purpose of regulation is to uphold the objectives of education towards society, and to improve quality. The public-private divide is crucial for understanding how the degree of applicability of various regulations varies across the mode of funding. The market of education is peculiar by its very nature. Improving quality needs resources to invest on infrastructure, salaries and scholarships, since raising fees may compromise with merit and quality of the students. Performnaces are dependent on the quality of inputs and the strategies which are detrermined by the mode of funding-the public-private divide among the institutions.

The market of technical education in West Bengal is segregated on the basis of reputation of the providers. At the top, there are only a handful of institutions whereas at the bottom, there are many. The regulations designed for ensuring compliance with the rules for maintaining the basic minimum standard of education, restrict some of the freedoms of the customers and producers in order to protect socially undesirable outcomes. Facing this competition, both the public and private institutions try to strategize in order to retain/improve their positions in the market. The main key areas of strategising are selection of inputs, investments on infrastructure, shifting focus on teaching versus research, maintaining a close connection with industrial partners, promotion of non-academic events. The main important strategy is to allocate resources on all or some of the above, depending on the respective priorities. A simple game-theoretic model shows the importance of the role of funding and the scheme of objective function in strategy making. Unless a new institution with relatively low endowment is guided by prestige maximising

objective, it is very unlikely that it would make strategies to improve its ranking in the market. Instead it would be busy in operating at the local level and selling degrees to the "customers" without having any prestige maximising objective function. If the new institution is owned by an already established educational group which can cross-subsidise it, then the institution might be ready for incurring the initial cost of investment. A huge endowment and a sustained flow of funding are necessary for adopting such strategies over the coming years. The relative positions of the institutions will also determine the feasibility of success of these strategies. Lastly, the competition for gaining reputation in higher education market requires the players to make strategies and it has very little concern for the "use values" generated in public institutions (Marginson, 1995). In other words, the strategies are the new rules of the market which have set the new norms for achieving new goals. The longing for brand-names and shifting of students from public to private institutions (given the eligibility to pay) somehow legitimizes the dominance of positional value over use value in this market. This study finds that in spite of having comparable performances, the highly endowded and already reoutated private institutions are gaining more and more reputation because of their strategies. Thus the hiearachy in the market is getting re-inforced due to the competition.

Chapter 7: Summary and conclusions

7.1 Introduction

The technical education sector in India was set up in the pre-independence period and it had an instrumental role in economic development of the nation. In the 90's, a huge demand emerged for skilled manpower from the national and global labour market. To bridge the gap between the demand and supply of skilled labour, an expansion of the technical education sector was the need of the hour. Since government failed to meet the rising demand owing to the resource crunch, private sector was encouraged to establish engineering colleges. Eventually the number of private colleges offering undergraduate engineering courses achieved a new high in terms of yearly intake and enrollment. However, after the initial euphoria, problems of poor employability as a consequence of poor quality have raised critical question about the quality of education in the context of the rising private participation. The role of regulatory agencies has been questioned as most of these colleges were unapproved and unregulated by the AICTE. Many scholars have considered this deterioration in quality of technical education as an inevitable consequence of privatisation and commercialisation in the higher education sector (Kothari, 1986; Tilak and Varghese, 1991; Ved Prakash , 2007, Anandkrishnan , 2005; Altbach, 2005; Chattopadhyay, 2010; Tilak , 2014; Ghuman, 2014; Dhanura and Kumar, 2014; Gupta, 2015). But, the problem of poor quality is not confined to these private institutions only. Public institutions also face the challenges of maintaining quality in their service. On the other hand, the failure to produce excellence was exemplified by the fact that very few Indian institutions feature in the top lists of global rankings. Quality is more about maintaining the basic minimum while excellence is about producing the outstanding quality (Bleiklie, 2011). The reasons of poor quality in public and private institutions are different, while it is the resource crunch and poor

governance for the former, rampant commercialisation is the main reason for the latter (Singh, 1975; Dandekar , 1991; Tilak, 2006; Kapur, 2008; Hatekar, 2009; Chattopadhyay , 2012, 2016; Sharma, 2014; Ayyar , 2015; Bhushan, 2015; Thorat, 2016; Meherotra, 2016; Chandra, 2017). A set of scholars have also found private sector to be more efficient in managing the institutes and they suggest introduction of performance-based funding to public institutions to eliminate the problem of poor governance and lack of motivation in these institutions (Kapur and Mehta, 2004; Agarwal, 2006, 2009; Kaul, 2006). The recent policy changes in higher education show three clear trends: The first one is related to the creation/expansion of the market in higher education by acknowledging the role of private providers and encouraging them to enter the mark*et al*ong with shrinking the scope of public institutions. The second one is related to helping the potential consumers (students) in this market to make informed choices by providing information about quality through ranking and accreditation of the HEIs. The third one is implementing a governance reform to make the system more 'efficient'. Kapur and Mehta (2017) talked about the 'trilemma' of the policy makers as they think it is impossible to produce quality unless cost is allowed to go up and/or massification is controlled. There continues to be a dearth of empirical studies investigating the problem of poor quality in Indian technical education sector. Most of the studies focused on the placement and the performance of the technical institutions without looking at their functioning, or governance (Fuller and Narasimhan, 2006; Gereffi *et al.* 2008; Prathap and Gupta, 2009; Gokuladas, 2010; Das, Sarkar, Ray, 2012; Prathap and Gupta, 2009; Subbarao, 2013). There are some studies which tried to investigate the specific cases but overall understanding of the unique features of higher education was lacking (Varshney, 2006; Banerjee and Muley, 2007; Blom and Cheong, 2010; Sohoni, 2012, 2016; Gupta and Gupta, 2014; Goel, 2006; Singh, 2010; Bedi, 2014; S. K. Sharma, 2014; Ghuman, Singh and Mohammad, 2014; N. Sharma, 2014; Chatterjee, 2014; Mehrotra, 2015). In particular, there were a really few number of studies done in the case of West Bengal (Chatterjee, 2014; Moitra, 2011).This study, 'Quality and the role of funding in higher education: A study of engineering colleges in West Bengal' seeks to understand the relationship between the mode of funding and the process of delivering quality in higher educational institutes (HEIs). It tries to analyse the roles of inputs, essentially the human resources, i.e., the students and the teachers, internal governance mechanisms and the influences of external factors such as the regulatory framework and market structures in determining the performances of HEIs in respect to a set of

select engineering colleges in West Bengal. It also seeks to examine the applicability and efficacy of the policies formulated in order to improve quality in higher education in India. This study adopted a conventional approach as it features in the policy discourse and common parlance to conceptualise quality which is measurable and narrow. It connects three crucial factors - selection of students and the teachers, internal governance mechanisms of the institutions, and the structure of a regulated market into the framework of Input-Output analysis to understand the notion of quality in higher education and its determinants. Being guided mainly by the post-positivist research paradigm, it has used mixed methods by using a convergent model of triangulation. It involves a purposive sample of 12 engineering colleges affiliated to the MAKAUT based on their reputation and the mode of funding. All the engineering colleges under MAKAUT were initially categorised on the basis of mode of funding, i.e., government and private. Then they were ranked separately on the basis of students' preferences as reflected through the opening and closing WBJEE ranks published by the WBJEE Board. Eventually, 4 public and 8 private colleges were selected in this study. The students (309), teachers (45) and the administrators and principals were interviewed using structured and semi structured questionnaires, and one FGD was conducted in each of these colleges. Data were collected and analysed separately by adopting qualitative and quantitative methods and then the findings are contrasted and complemented to gain a more comprehensive understanding of the research-problem in this study.

7.2 A reflection on the theories

In the literature of Economics of Education, the most popular approach of studying quality in education is based on the model of Educational Production Function (EPF) which focused on the concept of 'efficiency'. However, this concept is often interchangeably used in place of 'quality', which is not tenable[91]. Having understood the critiques of this approach, this study modifies the assumptions associated with the notion of a reasonably predictable process of conversion of inputs into outputs in higher education[92]. It admits that the technology in education is mainly driven by the inputs which can be selected differently by the institutions depending on their objective functions, mode of funding and reputation. Throughout the analysis carried out

[91] See Hanushek, (1986), Kingdon (1996), Ferrera *et al.* (2008).
[92] See Majumdar (1983), Patnaik (2007), Chattopadhyay and Pathak (2016).

involving 309 students and 45 teachers in the 12 institutions in the state of West Bengal, this study observes the most crucial role of decision-making inputs (students and teachers) in the entire process of production of educational outputs. Selection-based competition explained in the literature finds evidence in this case where inputs play a key role in determining the performance of these institutions[93]. This study was designed in a way to acknowledge the possibility of variations in the process of converting inputs into outputs depending on the mode of funding and the relative positions of the institutions in the market[94]. It finds evidence of three different types of internal governance mechanisms in the three sets of colleges, categorised as the highly reputed government colleges, the highly reputed private colleges and the less reputed private colleges. Thus, apart from looking at the inputs, this study also examines the variations in the internal governance mechanisms in different group of HEIs and explains the differences through the differences in the mode of funding and the relative position of the institutions in the market. It also emphasizes on the role of prestige and strategies for competing in a regulated market structure and explores the variations by keeping the dimension of mode of funding in mind[95]. The strategies are important as it determines the input selection and the governance process in the next period which in turn would influence the reputation and mode of funding in a dynamic way. This study inter-connects the issues of selection of inputs, variations in the internal governance mechanisms and competitive strategies in a regulated market (which have been treated separately so far in the previous studies) to understand the factors determining quality in higher education keeping the dimensions of the mode of funding and reputation in mind. In short, this study formulates an analytical framework where the state and the market influences the the process of conversion of inputs into outputs in the higher educational institutions which are already guided by certain objectives and mode of funding. The mode of funding, along with other factors, will determine the institutions' ability to make strategies to attract the best inputs which are crucial for delivering better quality service. This study, therefore, combines the input-output analysis with the selectivity mechanism to understand the role of inputs better as elaborated in the analytical framework developed in Chapter 2.

[93] See Glennerster (1991).
[94] See Jongbloed (2004) and Marginson (1995), Chattopadhyay and Pathak, (2016).
[95] See Brewer *et al.* (2009).

7.3 A brief summary of the findings

The main finindings of the analyses done in the study in order to address the main three research objectives are summarized below.

(i) The role of inputs

The main three inputs in the production of higher education are the students, teachers and infrastructural facilities. Out of these three, it is the students who feature as both the inputs and the outputs in the system and the quality of outputs depends mostly on the students. The selection-based competition discussed in the literature found strong evidence in this study. The analysis carried out in Chapter 4 examines the role of students' individual characteristics and the institutional characteristics in determining the performances of the students in the sample colleges. It has been observed that the students with better abilities select the institutions which already have a history of good performance as argued in the literature (Glennerster, 1991; Winston, 1999). The students in highly reputed colleges have relatively higher level of innate abilities reflected through the scores obtained in past examinations (before the admission in the college), and favourable socio-economic background, better communication skill and a higher rate of participation in the college events. However, the impact of the role of institutions (indicated by a composite index of teachers' qualification and experience, institutions' unit cost of education and linkage with industry) on students' academic performance is significant, but the impact on placements is not certain and there are variations depending on the mode of funding and reputation of the three sets of colleges. It should be noted that both the highly reputed government and private institutions have similar score in teachers' qualification and experiences, and the resources, but in the index of industry-academia linkage, private colleges are doing far better than the government colleges. The mode of funding and reputation, these two factors are crucial in understanding the variations in the inputs' quality because the ability to attract good students and good teachers and to invest in creating better infrastructural facilities and closer connections with industry depends on these two. The initial endowment matters, as the study finds the HEIs funded by the public authority or by a private business group which has no

resource constraints are in a better position to create the avenues for getting better quality inputs in comparison to the newly established institutions with poor endowment in this particular market.

(ii) The role of internal governance mechanisms

Given the quality of inputs, the quality of outputs depends on the way HEIs govern the process of decision-making and teaching-learning inside the institutions. The role of internal governance mechanism was mainly ignored by the earlier studies which made an attempt to measure "efficiency" in educational institutes. From the perspectives of the structural theories of governance, this study explains the variations in the internal governance mechanisms through the variations in the mode of funding and the reputation of the institutions in this market. The degree of centralisation in decision-making, role of leadership, sharing of responsibilities among various internal stakeholders, participation of teachers and students in the decision-making process, responsiveness to the external pressures – all of these depend on the mode of funding and the position of the institution in the market. The institutions which have to compete for funding on the basis of their performances are guided by a "performative" agenda reflected in their governance process in comparison to those who get public-funding on the basis of their pre-sanctioned budget. The role of decision-making inputs such as students and teachers in these colleges is extremely crucial as they generate 'peer-group effects' and motivate and inspire each other. In highly reputed private colleges, students act as both the 'consumers' and the 'partners' (with teachers) in maintaining the quality of their service. On the other hand, the institutions which are not so well-reputed and well-endowed follow a governance mechanism which reflects a monitoring or surveillance system designed in order to minimise the cost and avoid deviation from the said rules. Teachers are treated as the 'agents' by the management who is the 'principal' as explained in the Principal-Agent Theory. Students are treated as the ignorant 'customers' who cannot judge the quality of the service and, do not even deserve a better quality according to the management. These also complement the findings mentioned in the above section by emphasizing on the role of inputs in determining the performance of the HEIs. The selection of inputs becomes very crucial in determining the performances as the inputs are the decision-making individuals who play a key-role in shaping the internal governance mechanisms inside the HEIs.

(iii) The role of competitive strategies

The market of technical education in West Bengal has an oligopolistic structure at the top but a monopolistic structure at the bottom, where the vertical scale is designed on the basis of reputation. The market is regulated by the central and the state government, and other regulatory bodies. Given the structure, the institutions make strategies to compete with each other and to out-perform others. Strategies are necessary for coping up with the sudden changes in the external environment posed by the regulatory authorities or by other national and global competetors, or by the students who often express new types of demands over time. The study analyses the competitive strategies and relates it to the mode of funding of the institutions with the help of three case studies on three institutions holding the top ranks in their respective sample groups. The main strategy of the leading private institute, as found in this study, is to achieve a higher rank in national as well as global rankings, which can be deconstructed under the three main sub-heads. These are - ensuring good placements, attracting more research grants, and advertising the performances. For this, it needs to attract the best of the minds, invest more in providing adequate infrastructure especially for research, build close connections with the industrial partners, and sponsor several academic and non-academic events and the like. These require the most important strategy of resource allocation among these heads based on the respective priorities. This study argues that the ability to make strategies is mainly determined by the mode of funding and position of the institutions. The private providers enjoy more 'freedom' as producers (as explained by Jongbloed, 2007) than the public providers. The highly reputed institutions can afford to take the risk of investing because of their better endowment, better quality of human resources and higher positional values attached to their degrees[96]. On the other hand, the leading public institutions, despite of getting good students and teachers, face lack of freedom and flexibility in using the resources because of the regulatory structure. Also the mission and vision of these institutions are entirely different from the private players as the formers were established with a purpose of helping national development through generation and transfer of technical knowledge. On the contrary, the less reputed private institution, tied by the shackles of poor endowment and poor quality human resources, make its own strategies with the

[96] As argued by Winston, 1999.

moderate aim of being the topper in the district. Thus, the market is segmented where the institutions at the top compete with each other and the institutions at the bottom compete with their group-members. However, this study finds that the top government college is associated with lesser degree of reputation (as defined by Brewer *et al.*, 2009) compared to the highly reputed private player, even after producing comparable outputs measured by proportion of students placed, proportion of students passed with the first class, number of research projects completed, number of papers published etcetera. This is because of the ability of the highly reputed private provider to design more effective strategies for achieving higher positions in the market.

7.4 Limitations of the study

After surveying the literature on quality in education, it becomes clear that studying quality in higher educational institutes is an extremely difficult task because the definition of quality is transcendent in nature. The definition of quality is based on the broader purpose of education and any effort to measure quality of education on the basis of strict parameters is meaningless because quality should be assumed as an inherent characteristic of the education system. However, after surveying the methods of analyses in the studies on quality of education, an indicator of quality in terms of performances is used in this study. I admit the indicator cannot capture the actual quality in any sense, but it can give us some preliminary ideas and insights which would help us to look at the problem from a closer proximity. Similarly, the efficacy of teaching-learning in an institution can never be measured through the qualification, experiences and publication of the teachers as their teaching abilities and motivation can never be quantified. But again, a composite indicator of teaching learning resources has been used in this study to have some ideas about the impact of these on the students' performances.

This study involves twelve institutions in the sample categorised by two factors, mode of funding and reputation. However, there was no less reputed government college in the population which made it impossible to study the variations across highly reputed and less reputed government colleges. Among eleven private institutions initially included in the sample, three of them could

not be studied because they did not grant permission to the researcher. The constraints in sampling may restrict the possibility of generalizing the findings to some extent.

Collecting data from the private institutes included in the sample was the most difficult part of the research. Various sources of data had to be compiled to avoid discrepancies. For example, in some cases, the number of publications by the faculty member was directly collected from the annual reports, while in other cases I had to rely upon the faculty-profiles published in the websites of the institutions. The credibility of these sources may not be similar, but there was not much of a choice as the institutions do not provide information in the format prescribed by the AICTE. In some cases, the responses of the interviewees could not be cross-checked.

Being guided mainly by the post-positivist framework, there are certain assumptions inherent in the methodologies which may not be fully applicable in the actual reality. The disciplinary perspectives underpinning this study have emerged from the literature of Economics of Education, which have its own areas of interest and its own ways of looking at the problem which may be different from other disciplines of social sciences. This may have limited the scope of the research to capture the complex social reality to some extent.

7.5 Conclusions

The market of technical higher education in India emerges as a unique case for investigation mainly because of the not-for-profit nature of the sector and the structure of regulatory framework[97]. The mode of funding expectedly has emerged to be crucial because it determines two important aspects, (a) the way the institutions function, governance and its impact on the deliver of their service, and (b) the quality of what they deliver along with the degree of 'publicness'[98]. This study was initiated primarily to address these issues. It uses the concept of mode of funding as an anchor to understand the ways institutions function and seek to deliver quality. The study made an attempt to explain the variations in quality among the public and private higher educational institutes and variations within the private colleges based on a study of

[97] On paper, all HEIs are not-for-profit, and the private HEIs are also kept under a certain degree of regulation.
[98] Marginson, 2007

selected engineering colleges in the state of West Bengal. The study finds that the performance of institutions depends on the mode of funding, which determined the selection of inputs, the internal governance mechanisms and the strategies in a regulated market which has become highly competitive in the wake of increasing importance being assigned to the ranking and reputation. The objective functions, initial endowments and the reputation of the institutions also determine the process to some extent. However, after analysing the phenomenon at the micro and meso level involving the individual institutions and the particular market of technical education in West Bengal, it also finds the inter-connectedness between the two major issues related to the mode of funding mentioned above, that is how the funding is channelized and its orientation in terms of the blend between input and output. The institutions with higher 'positional values' set the new standards of 'quality' in this market associated with an increasing tendency to define 'quality' in terms of ranking and reputation only. In spite of producing a similar quality of outputs, the public institutions in general fail to build up higher reputation and assign higher positional values to their degrees because of the absence of the compelling force of earning revenue and compete because of assured funding to a large extent. They also seem to be less inclined to make competitive strategies by keeping the objective of getting a higher rank in mind like the private players do. The well-advertised and sometimes 'fabricated' performances of the highly reputed private players create the illusion of being a 'better quality' institution among the students who eventually get tempted to prefer these institutions over the public ones, given their ability to pay[99]. The contributions of government technical institutions in West Bengal, in terms of catering to a more diverse group of students from various socio-economic backgrounds and sharing the technical knowledge with local people to strengthen the economy, are thus undermined by the new rules of competition in this market where the only institutions which attain higher ranks in national rankings are considered as the "best". The nature of this type of strategic competition has the potential to limit the "publicness" of the knowledge generated in this sector and promote the concept of quality in accordance with the weights assigned in ranking which has its own limitaions. The increasing tendency to file for patents has been observed among the institutions in order to get higher ranks. The impact factor assumes critical importance to assess quality of research at the expense of other no less valuable objectives. Also, closely linked with these obsessions with higher rankings are the way teachers and students are selected

[99] Marginson, 1995, Ball, 2000.

and treated in the institutions which make them competitive, enterprising and narrowly focused. The selection-based competition and a culture of “performativity” being instilled into the system in both the public and private institutions have the possibility of strengthening the vertical stratification among the institutions, limiting the ‘publicness’ associated with the higher education system in India and effecting a tansformation in the way quality is conceptualized in the wake of rising competition fomented by the ranking agencies and policy interventions by the regulatory agencies.

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Appendix

Section I

Table A.1: Parameters and Weights used by NBA		
Parameters	**Weights for Undergraduate College (per cent)**	**Weights for Diploma (per cent)**
Organisation and Governance	8	3
Financial Resources, Allocation and Utilization	7	7
Physical Resources	5	5
Human Resources including Faculty and Staff	20	20
Human Resource of Students	10	10
Teaching Learning Process	35	45
Supplementary Processes	5	5
Research, Development and International Efforts	10	5

Source: *www.nba-aicte.ernet.in/parameter.doc (accessed 18 March 2012).*

Table A.2: Results of sd-test of “marks” across colleges

```
. sdtest marks, by (clg_high)

Variance ratio test
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
Less rep	157	65.1465	.4343017	5.441784	64.28863	66.00437
Highly r	152	75.71316	.519905	6.40982	74.68593	76.74039
combined	309	70.34434	.4520302	7.945967	69.45488	71.23379

```
    ratio = sd(Less rep) / sd(Highly r)                          f =   0.7208
Ho: ratio = 1                                  degrees of freedom = 156, 151

    Ha: ratio < 1               Ha: ratio != 1                 Ha: ratio > 1
  Pr(F < f) = 0.0215         2*Pr(F < f) = 0.0431           Pr(F > f) = 0.9785
```

Table A.3: Results of the t-test of mean “marks” across colleges

```
. ttest marks, by (clg_high) welch

Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
Less rep	157	65.1465	.4343017	5.441784	64.28863	66.00437
Highly r	152	75.71316	.519905	6.40982	74.68593	76.74039
combined	309	70.34434	.4520302	7.945967	69.45488	71.23379
diff		-10.56666	.6774357		-11.89983	-9.233492

```
    diff = mean(Less rep) - mean(Highly r)                        t = -15.5980
Ho: diff = 0                     Welch's degrees of freedom =  297.709

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000

.
```

Table A.4: Placement and the social category across the colleges						
	HGC		**HPC**		**LPC**	
	Placed	**Not placed**	**Placed**	**Not placed**	**Placed**	**Not placed**
ST		6				1
SC		19		2	3	10
OBC	1	5		1		4
General	49	22	27	20	18	121
Total	50	52	27	23	21	136
Source: Field Survey						

Table A.5: Results of sd-test of" maks" across public and private colleges

```
.
. sdtest marks, by (clg_govt)

Variance ratio test
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
Private	207	67.89952	.5113213	7.356633	66.89142	68.90761
Governme	102	75.30588	.6645542	6.711669	73.98759	76.62418
combined	309	70.34434	.4520302	7.945967	69.45488	71.23379

```
    ratio = sd(Private) / sd(Governme)                            f =   1.2014
Ho: ratio = 1                                 degrees of freedom = 206, 101

    Ha: ratio < 1               Ha: ratio != 1                 Ha: ratio > 1
  Pr(F < f) = 0.8497         2*Pr(F > f) = 0.3006           Pr(F > f) = 0.1503

.
```

Table A.6: Results of the t-test of mean "marks" between public and private colleges

```
. ttest marks, by (clg_govt) welch

Two-sample t test with unequal variances

------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
 Private |     207    67.89952    .5113213    7.356633    66.89142    68.90761
Governme |     102    75.30588    .6645542    6.711669    73.98759    76.62418
---------+--------------------------------------------------------------------
combined |     309    70.34434    .4520302    7.945967    69.45488    71.23379
---------+--------------------------------------------------------------------
    diff |           -7.406366    .8384998               -9.058867   -5.753864
------------------------------------------------------------------------------
    diff = mean(Private) - mean(Governme)                         t =  -8.8329
Ho: diff = 0                     Welch's degrees of freedom =  220.446

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

Table A.7: Correlation between the percent of marks obtained in the university examinations, HS score and WBJEE rank

```
. pwcorr marks hs_score wbjee_rank

             |   marks hs_score wbjee_~k
-------------+---------------------------
       marks |  1.0000
    hs_score |  0.7487   1.0000
  wbjee_rank | -0.7114  -0.7164   1.0000
```

Table A.8: Academic performance and gender of the students across colleges

Categories Of Colleges / Marks in University Examination (in %)		HGC	HPC	LPC
Less than 50	**Male**	NA	NA	86
	Female	NA	NA	14
50<= marks <60	**Male**	100	NA	80
	Female	0	NA	20
60<= marks <70	**Male**	68	50	72
	Female	32	50	28
70<= marks<80	**Male**	79	63	69
	Female	21	37	31
80<= marks<90	**Male**	84	75	100
	Female	16	25	0
marks=>90	**Male**	100	NA	NA
	Female	0	NA	NA

Source: Field Survey
NA: No student in the relevant category

Table A.9: Academic performance and social category of the students across colleges				
Categories Of Colleges / Marks in University Examination (%)		**HGC**	**HPC**	**LPC**
Less than 50	**Gen**	NA	NA	57
	SBG	NA	NA	43
50<= marks <60	**Gen**	0	NA	60
	SBG	100	NA	40
60<= marks <70	**Gen**	33	100	90
	SBG	67	0	10
70<= marks<80	**Gen**	60	88	91
	SBG	40	12	9
80<= marks<90	**Gen**	88	100	100
	SBG	12	0	0
marks=>90	**Gen**	100	NA	NA
	SBG	0	NA	NA
Source: Field Survey NA: No student in the relevant category SBG: Socially Backward Categories (SC, ST and OBC)				

Table A.10: Correlations between marks and socio-economic background

```
. pwcorr marks inc mother_edu father_edu
```

	marks	inc	mother~u	father~u
marks	1.0000			
inc	0.1111	1.0000		
mother_edu	0.2973	0.3541	1.0000	
father_edu	0.1925	0.3534	0.7684	1.0000

Table A.11: Academic performance and communication skill of the students across colleges

Categories Of Colleges / Marks in University Examination (%)		HGC	HPC	LPC
Less than 50	**Good**	NA	NA	8
	Bad	NA	NA	92
50<= marks <60	**Good**	0	NA	11
	Bad	100	NA	89
60<= marks <70	**Good**	16	67	16
	Bad	84	33	84
70<= marks<80	**Good**	33	92	71
	Bad	67	8	29
80<= marks<90	**Good**	97	100	100
	Bad	3	0	0
marks=>90	**Good**	100	NA	NA
	Bad	0	NA	NA

Source: Field Survey
NA: No student in the relevant category SBG: Socially Backward Categories (SC, ST and OBC)

Table A.12: Academic performance and participation of the students in the non-academic events

Categories Of Colleges / Marks in University Examination (%)		HGC	HPC	LPC
Less than 50	**Yes**	NA	NA	25
	No	NA	NA	75
50<= marks <60	**Yes**	50	NA	32
	No	50	NA	68
60<= marks <70	**Yes**	29	33	37
	No	71	67	63
70<= marks<80	**Yes**	75	75	71
	No	25	25	29
80<= marks<90	**Yes**	80	100	67
	No	20	0	33
marks=>90	**Yes**	100	NA	NA
	No	0	NA	NA

Source: Field Survey
NA: No student in the relevant category

Table A.13 (i): Summary of the regression-results (R1.5-R1.8)

VARIABLES	(1) job_offer	(2) job_offer	(3) job_offer	(4) job_offer	(5) job_offer	(6) job_offer	(7) job_offer	(8) job_offer
marks	0.274***	0.280***	0.227***	0.221***	0.221***	0.222***	0.227***	0.247***
	(0.0689)	(0.0633)	(0.0423)	(0.0402)	(0.0387)	(0.0395)	(0.0396)	(0.0362)
hs_score	0.0104							
	(0.0344)							
clg_govt	1.047	1.017	0.658	0.686	0.699	0.602	0.608	0.534
	(0.657)	(0.646)	(0.629)	(0.617)	(0.576)	(0.537)	(0.544)	(0.523)
TLRI	-0.185	-0.172						
	(0.128)	(0.119)						
gender_female	-0.249	-0.260	-0.372	-0.416	-0.419	-0.428	-0.432	-0.713
	(0.582)	(0.576)	(0.580)	(0.566)	(0.555)	(0.548)	(0.554)	(0.483)
soc_cat	-0.617	-0.627	-0.816	-0.856	-0.856	-0.908	-0.873	-0.939
	(1.083)	(1.074)	(0.987)	(0.979)	(0.980)	(0.971)	(1.005)	(0.885)
inc	0.00671	0.00683	0.00751	0.00587	0.00568			
	(0.0132)	(0.0132)	(0.0130)	(0.0121)	(0.0117)			
father_edu	0.0735	0.0827	0.0745	-0.00858				
	(0.117)	(0.113)	(0.109)	(0.0826)				
mother_edu	-0.0940	-0.0986	-0.0880					
	(0.105)	(0.104)	(0.103)					
com_good	2.430***	2.466***	2.283***	2.255***	2.248***	2.340***	2.383***	2.982***
	(0.770)	(0.771)	(0.764)	(0.761)	(0.771)	(0.746)	(0.743)	(0.702)
clg_activ	2.315***	2.318***	2.225***	2.249***	2.253***	2.275***	2.326***	
	(0.688)	(0.686)	(0.686)	(0.694)	(0.691)	(0.695)	(0.664)	
eca	0.397	0.362	0.375	0.351	0.348	0.369		
	(0.489)	(0.482)	(0.480)	(0.472)	(0.464)	(0.478)		
Constant	-23.28***	-23.19***	-21.19***	-20.60***	-20.68***	-20.51***	-20.72***	-20.70***
	(3.534)	(3.582)	(3.053)	(2.913)	(2.981)	(2.921)	(2.935)	(2.768)
Observations	309	309	309	309	309	309	309	309

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A.13 (ii): Summary of the regression-results

VARIABLES	(1) job_offer	(2) job_offer	(3) job_offer	(4) job_offer	(5) job_offer	(6) job_offer	(7) job_offer	(8) job_offer
marks	0.274***							
	(0.0689)							
hs_score	0.0104	0.0878**	0.0886***	0.0885***	0.0898***	0.0902***	0.0862***	0.0933***
	(0.0344)	(0.0404)	(0.0254)	(0.0255)	(0.0248)	(0.0247)	(0.0250)	(0.0241)
clg_govt	1.047	1.572***	1.581***	1.579***	1.543***	1.455***	1.560***	1.595***
	(0.657)	(0.561)	(0.549)	(0.546)	(0.513)	(0.484)	(0.489)	(0.459)
TLRI	-0.185	0.00381						
	(0.128)	(0.121)						
gender_female	-0.249	-0.386	-0.385	-0.372	-0.360	-0.375	-0.344	-0.637
	(0.582)	(0.515)	(0.508)	(0.504)	(0.489)	(0.484)	(0.484)	(0.395)
soc_cat	-0.617	-1.358	-1.356	-1.354	-1.350	-1.393	-1.446	-1.764*
	(1.083)	(1.022)	(1.012)	(1.009)	(1.006)	(1.012)	(0.983)	(0.921)
inc	0.00671	0.00383	0.00380	0.00440	0.00502			
	(0.0132)	(0.0101)	(0.00998)	(0.00979)	(0.00933)			
father_edu	0.0735	-0.00833	-0.00874	0.0218				
	(0.117)	(0.116)	(0.114)	(0.0800)				
mother_edu	-0.0940	0.0311	0.0314					
	(0.105)	(0.0986)	(0.0987)					
com_good	2.430***	2.842***	2.846***	2.869***	2.878***	2.962***	3.148***	3.886***
	(0.770)	(0.801)	(0.774)	(0.791)	(0.795)	(0.784)	(0.762)	(0.692)
clg_activ	2.315***	2.529***	2.530***	2.513***	2.499***	2.529***	2.633***	
	(0.688)	(0.665)	(0.667)	(0.652)	(0.643)	(0.646)	(0.608)	
eca	0.397	0.773*	0.776**	0.782**	0.793**	0.814**		
	(0.489)	(0.399)	(0.396)	(0.393)	(0.387)	(0.396)		
Constant	-24.21***	-12.68***	-12.72***	-12.78***	-12.59***	-12.40***	-11.82***	-10.81***
	(3.858)	(2.779)	(2.378)	(2.396)	(2.331)	(2.238)	(2.259)	(2.265)
Observations	309	309	309	309	309	309	309	309

Table 4.14 (i): Summary of the regression-results (across different types of colleges)

VARIABLES	(ALL) job_offer	(HPC) job_offer	(HGC) job_offer	(LPC) job_offer	(HGC+HPC ALL HIGH) job_offer	(HPC+LPC ALL PVT) job_offer
TLRI	0.295***	0.677	-4.897	0.231*	0.785***	0.224***
	(0.0668)	(0.414)	(3.897)	(0.129)	(0.295)	(0.0767)
gender_female	-0.606	-1.957	1.950	-0.662	-0.581	-0.584
	(0.544)	(1.295)	(1.767)	(0.930)	(0.735)	(0.645)
inc		-0.00510	0.0302	-0.000832	-0.00397	0.00514
		(0.0202)	(0.0360)	(0.0189)	(0.0137)	(0.0119)
mother_edu	0.0147	1.096***	-0.647	-0.0158	0.00641	0.134
	(0.0459)	(0.419)	(0.418)	(0.0746)	(0.0779)	(0.146)
o.soc_cat		-				
o.com_good		-				
o.clg_activ		-				
soc_cat	-1.536*		-9.373*	1.379	-3.572***	0.0834
	(0.850)		(5.199)	(1.172)	(1.136)	(1.220)
com_good	2.836***		18.03*	2.573***	4.160***	1.881**
	(0.620)		(10.37)	(0.972)	(1.376)	(0.804)
clg_activ	2.586***		3.381*	2.070**	3.381***	2.571***
	(0.583)		(1.750)	(0.804)	(0.884)	(0.805)
Constant	-8.306***	-23.91***	67.97	-6.663***	-16.95***	-9.094***
	(1.319)	(8.497)	(59.17)	(1.603)	(5.137)	(2.386)
Observations	309	37	102	157	152	207

Table A.14 (ii): Summary of the regression-results

VARIABLES	(All) job_offer	(HPC) job_offer	(HGC) job_offer	(LPC) job_offer	(H) job_offer	(P) job_offer
TLRI	0.295***	0.677	-4.897	0.231*	0.785***	0.224***
	(0.0668)	(0.414)	(3.897)	(0.129)	(0.295)	(0.0767)
gender_female	-0.606	-1.957	1.950	-0.662	-0.581	-0.584
	(0.544)	(1.295)	(1.767)	(0.930)	(0.735)	(0.645)
inc		-0.00510	0.0302	-0.000832	-0.00397	0.00514
		(0.0202)	(0.0360)	(0.0189)	(0.0137)	(0.0119)
mother_edu	0.0147	1.096***	-0.647	-0.0158	0.00641	0.134
	(0.0459)	(0.419)	(0.418)	(0.0746)	(0.0779)	(0.146)
o.soc_cat		-				
o.com_good		-				
o.clg_activ		-				
soc_cat	-1.536*		-9.373*	1.379	-3.572***	0.0834
	(0.850)		(5.199)	(1.172)	(1.136)	(1.220)
com_good	2.836***		18.03*	2.573***	4.160***	1.881**
	(0.620)		(10.37)	(0.972)	(1.376)	(0.804)
clg_activ	2.586***		3.381*	2.070**	3.381***	2.571***
	(0.583)		(1.750)	(0.804)	(0.884)	(0.805)
Constant	-6.832***	-20.52***	43.48	-5.508***	-13.02***	-7.974***
	(1.077)	(6.923)	(39.70)	(1.486)	(3.738)	(2.346)
Observations	309	37	102	157	152	207

Table A.15 : Summary of the results of regressions (across different types of colleges)

VARIABLES	(1) marks	(2) marks	(3) marks	(4) marks	(5) marks	(6) marks
TLRI	0.996***	0.307	0.482	0.511***	0.865**	0.462***
	(0.121)	(0.559)	(0.586)	(0.173)	(0.370)	(0.159)
hs_score	0.321***	0.469***	0.160**	0.452***	0.180***	0.447***
	(0.0439)	(0.166)	(0.0800)	(0.0688)	(0.0647)	(0.0536)
gender_female	-0.475	-0.267	-0.173	-0.324	-0.603	-0.270
	(0.620)	(1.510)	(1.355)	(0.732)	(1.001)	(0.648)
soc_cat	-2.591***	-0.809	-6.064***	-1.380	-4.811***	-1.364
	(0.798)	(2.977)	(1.388)	(1.050)	(1.225)	(0.995)
mother_edu	0.193***	0.637	0.249**	0.207**	0.212*	0.224***
	(0.0707)	(0.496)	(0.124)	(0.0827)	(0.116)	(0.0830)
Constant	32.85***	22.52**	54.52***	27.87***	46.78***	28.39***
	(2.372)	(10.64)	(10.91)	(3.963)	(6.821)	(2.596)
Observations	309	50	102	157	152	207
R-squared	0.648	0.386	0.401	0.463	0.353	0.687

Table A.16: Regression using Instrumental Variable

```
. ivreg marks TLRI gender_female soc_cat mother_edu (hs_score= hs_pt)

Instrumental variables (2SLS) regression

      Source |       SS       df       MS              Number of obs =     309
-------------+------------------------------           F(  5,   303) =   88.17
       Model |  11619.9525     5  2323.99049           Prob > F      =  0.0000
    Residual |  7826.67044   303  25.8305955           R-squared     =  0.5975
-------------+------------------------------           Adj R-squared =  0.5909
       Total |  19446.6229   308  63.1383861           Root MSE      =  5.0824

------------------------------------------------------------------------------
       marks |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    hs_score |    .032545   .2760794     0.12   0.906    -.5107307    .5758208
        TLRI |   1.586824   .5720006     2.77   0.006     .4612279    2.712421
gender_female |  -.7500313   .7115368    -1.05   0.293    -2.150211    .6501479
      soc_cat |  -4.148416   1.697717    -2.44   0.015    -7.489225   -.8076066
   mother_edu |   .2879525   .1174211     2.45   0.015     .0568884    .5190165
        _cons |   46.07657   12.72746     3.62   0.000     21.03117    71.12197
------------------------------------------------------------------------------
Instrumented:  hs_score
Instruments:   TLRI gender_female soc_cat mother_edu hs_pt
------------------------------------------------------------------------------
```

Table A.17: AICTE guidelines for offering new courses

Total number of courses opted by New Technical Institute	Number of courses to be selected from group 'C'	Courses listed in group 'C'
5	3 or more	• Applied Electronics and Instrumentation • Chemical Engineering / Technology • Civil Engineering / Technology, Construction Engineering / Technology • Computer Science, Computer Science and Engineering, Computer Science and Information Technology, Computer Technology • Electrical Engineering or Electrical and Electronics Engineering • Electronics and Communication Engineering • Information Technology • Instrumentation and Control Engineering • Mechanical Engineering • Production Engineering
4	3 or more	
3	2 or more	
2	1 or more	
1	1	

Table A.18: Publication Index for the HGC				
	Faculty 1	**Faculty 2**	**Faculty 3**	**Faculty 4**
Average citation index per year for the period (2009-2014)	60	95	50	
Range of impact factor	0.1-4.5	1-5.23	0.9-3.8	0.9-1.20
H-index for the period (2009-2014)	13	15	0.9-3.0	
Source: The annual report of the respective college				

..

Table A.19: Publication Index: LPC1			
	2015-16	2014-15	2013-14
Citation index	5	7	-
SNIP/SJR	-	2	-
Impact factor	2	35	7
H-index	-	-	-
Source: The annual report of the respective college			

Table A.20: Publication Index: HPC1				
	Title	**Total number of publications reported**	**Total number of citations reported**	**Total number of publications with outside collaborators**
2012-14	Indian Citation Index	10	1	0
2012	Scopus	52	161	
2013	Scopus	34	84	
2014	Scopus	26	20	97
2012	Web of Science	2	5	
2013	Web of Science	6	24	
2014	Web of Science	3	10	10
Source: The annual report of the respective college				

A.21: Statement of account of a HGC

YEAR-WISE STATEMENTS OF ACCOUNT (REGULAR STATE GOVT. GRANT)

Head of Accounts	2010-11			2011-12			2012-13			2013-14		
	Grant Received (Rs in lakh)	Expen-diture (Rs in lakh)	Balance (Rs in lakh)	Grant Received (Rs in lakh)	Expen-diture (Rs in lakh)	Balance (Rs in lakh)	Grant Received (Rs in lakh)	Expen-diture (Rs in lakh)	Balance(Rs in lakh)	Grant Received (Rs in lakh)	Expen-diture (Rs in lakh)	Balance (Rs in lakh)
NON-PLAN												
1)Salary	33.491	26.701	6.790	39.156	29.863	9.293	34.397	30.296	4.101	36.900	32.190	4.710
2)Medical Reimburse-ment	0.480	0.000	0.480	1.000	0.000	1.000	1.090	1.279	(-) 0.189	0.893	1.011	(-) 0.118
3)Block Grant (Consumables & Contingency)	39.177	37.154	2.023	43.530	36.824	6.706	47.450	45.881	1.569	46.450	53.796	(-) 7.346
4)Grant-in-aid for Hostel Employee	3.918	3.715	0.203	3.052	3.052	0.000	3.303	3.303	0.000	3.635	3.635	0.000
PLAN	33.592	33.592	0.000	38.384	37.313	1.071	72.506	65.805	6.701	92.810	92.810	0.000

YEAR-WISE STATEMENTS OF ACCOUNT (OTHER THANSTATE GOVT. GRANT)

Head of Accounts	2010-11			2011-12			2012-13			2013-14		
	Ammount Received (Rs in lakh)	Expen-diture (Rs in lakh)	Balance (Rs in lakh)	Ammount Received (Rs in lakh)	Expen-diture (Rs in lakh)	Balance (Rs in lakh)	Ammount Received (Rs in lakh)	Expen-diture (Rs in lakh)	Balance (Rs in lakh)	Ammount Received (Rs in lakh)	Expen-diture (Rs in lakh)	Balance (Rs in lakh)
UGC GRANTS										10.110	10.110	
ADMISSION FEES	1.4000	-	1.400	1.500	-	1.500	1.450	-	1.450	1.435	-	1.435
TUTION FEES	68.040	-	68.040	75.120	-	75.120	78.900	-	78.900	60.840	-	60.840
EXAMIANTION FEES	78.880	78.880**	Nil	86.400	86.400**	Nil	11.240	3.762	7.478	11.380	3.980	7.400
SPONSORED RESEARCH GRANTS	9.28	9.28	Nil	25.182	23.464	1.718	14.485	14.131	0.354	0.373	0.362	0.011
INTERNAL REVENUE GENERATION	1.36		1.36	0.4		0.4	2.46		2.46	2.08		2.08

** Whole of the examination fee was transferred to the affiliating university

Source: The annual report of the respective college

A.22: Summary of budget and actual expenditures of the LPC1

- Summary of current financial year's budget and the actual expenditures incurred (exclusively for the institution) for three preceding financial years

Item	Budgeted in Rs 2015-16	Expenses in Rs 2015-16	Expenses in Rs 2014-15	Expenses in Rs 2013-14	Expenses in Rs 2012-13
Acquisition of land; new buildings and infrastructural built-up	10000000.00	90085865.00 (Apprx)	11179703.07	16231121.23	-
Library	900000.00	885000.00 (Apprx)	974955.00	870490.00	643408.00
Laboratory Equipment	10000000.00	9000000.00 (Apprx)	4073588.00	4360969.00	2324084.00
Laboratory consumables			40671.00	-	4540.00
Teaching and Non-Teaching staff salary	25000000.00	23500000.00 (Apprx)	22665298.90	18695020.00	8835583.00
Travel	2000000.00	1845000.00 (Apprx)	1844088.75	1581764.21	274535.00
Maintenance, spares and miscellaneous expenses for academic activities	2500000.00	2145500.00	2444799.00	929639.00	278934.00

Source: The annual report of the respective college

Section II

Calculation of TLRI (Based on NIRF)

A. FSR (Faculty-student ratio)

Regular appointment means faculty on full-time basis with no time limit on their employment. However, faculty on contract basis for a period of not less than three (3) years, on gross salary similar to those who are permanent can also be included.Faculty members with Ph.D. qualifications and NET or SLET-qualified with Master's degree will be counted. Visiting faculty (with a Ph.D.) who are visiting the institution on a full time basis for at least one semester can be included in the count for that semester.

The benchmark is set as a ratio of 1:20 for scoring maximum Marks. Assessment metric will be the same for University and Colleges.

Here,

N: Total number of sanctioned students in the institution considering all UG and PG Programs, including the Ph.D. program.

F =F1 + 0.3F2

F1: Full time regular faculty of all UG and PG Programs in the previous year.

F2 : Eminent teachers/ faculty (with Ph.D.) visiting the institution for at least a semester on a full time basis can be counted (with a count of 0.5 for each such visiting faculty for a semester) in the previous year. Expected ratio is 1:20 to score maximum Marks.

FSR= 20 x (F/N)

For F/N < 1: 50, FSR will be set to zero.

B. Combined Metric for Faculty with Ph.D. and Experience (FQE)

Doctoral Qualification

This will be measured on the basis of percentage of faculty with Ph.D. in a relevant field. NET-qualified faculty registered for Ph.D. may also be counted. However, faculty with only post-graduation, i.e. MA / M.Sc. / M.Com cannot be counted.

Assessment metric for Colleges on Ph.D. Qualification is as follows:

FQ =15× (F/95), for F≤95%

FQ = 15, for F > 95%.

Here,

F is the percentage of Faculty with Ph.D.

Experience Metric

Experience should normally be assessed based on the relevant experience of the faculty members. Relevance here means experience pertaining to the subject area being taught by the faculty member. More specifically,

$$E = \frac{\Sigma E_i}{F}$$

Here,

Ei denotes the experience of the **i^{th}** faculty member.

For simplicity, however, **E_i** may also be calculated from the age profile of the faculty members as follows:

E_i = Ai – 30, for Ai ≤ 45 years

E_i =15, for Ai ≥ 45 years.

Assessment Metric for Experience:

FE = 15×(E/15), for E ≤ 15 years
FE = 15, for E > 15 years.

Here, **E** is the average years of experience of all faculty members as calculated above. This implies that the benchmark experience is to be 15 years to score maximum marks, decreasing proportionately otherwise.

FQE= FQ+FE

C. Unit cost of education without salary (UCC) (Measured in terms of Rs. 1 lakh)

TLRI= FSR + FQE +UCC

Example

If in an institute, the number of students =1200

Number of regular faculty members=55

Then, F/N=0.045

And, FSR= 0.9

If FQ=2.50 and FE=11.50

Then, FQE=FE+FQ=14.00

UCC= 0.25 (Unit cost of education without salary is Rs. 25,000 per student)

Then, TLRI= FSR+FQE+UCC

=0.90 +14.00 +0.25= 15.15

Section III

Poster of GATE coaching classes in a HGC

Newspaper report for English tutorial classes in a LPC

English for survival

Knowing exactly which aspect of the communication skill needs to be improved upon can make English language teaching more effective.

ALBERT P'RAYAN

SOFT SKILLS

In the age of globalisation, everyone needs to enhance their communication skills in English in order to cope with the increasingly tough competition in the job market. Mere subject knowledge in their chosen field, be it engineering, science, commerce or humanities, is not going to be a guarantee for them to get a good job or excel at the workplace.

David Crystal in his book *English as a global language* states that 85 per cent of the world's international organisations use English as their official language in transnational communication, and 90 per cent of the published academic articles are written in English.

EFFECTIVE: *One-size-fits-all doesn't work in English language teaching.* PHOTO: M. PERIYASAMY

Field survey in a LPC