Cost, Efficiency, Equity and Quality of Higher Education in West Bengal

University Grants Commission Sponsored
Major Research Project
(Project F.No.-5-81/2014 (HRP) Dated, 23rd September, 2015)

Submitted to
University Grants Commission, New Delhi

Principal Investigator

Dr. Sebak Kumar Jana

Department of Economics with Rural Development
VIDYASAGAR UNIVERSITY
Midnapore, West Bengal, India, Pin- 721102

2018

Cost, Efficiency, Equity and Quality of Higher Education in West Bengal

(Project F.No.-5-81/2014 (HRP) Dated, 23rd September, 2015)

Major Research Project Sponsord by and Submitted to University Grants Commission, New Delhi

(Project F.No.-5-81/2014 (HRP) Dated, 23rd September, 2015)

Principal Investigator

Dr. Sebak Kumar Jana

Professor of Economics

Department of Economics with Rural Development

Vidyasagar University

Research Assistant

Mr. Siddhartha Sankar Manna

Deparment of Economics with Rural Development

VIDYASAGAR UNIVERSITY

Midnapore, West Bengal, India, Pin- 721102

2018

DECLARATION

This is to state that the UGC Sponsored Major Research Project, entitled "Cost, Efficiency, Equity and Quality of Higher Education in West Bengal" (Project F.No.-5-81/2014 (HRP) Dated, 23rd September, 2015), has been carried out by me as its Principal Investigator under the financial assistance from UGC, New Delhi. The work is based on my reading and understanding of the existing materials and on the data collected from primary survey. The books, articles, journals, newspapers and websites which I have used for this project are acknowledged at the respective place in this report. I further declare that the project report is my own work and research which I have carried out with the financial help from UGC, New Delhi under the Major Research Project Grant.

Dr. Sebak Kumar Jana
Principal Investigator of the Project
Professor of Economics
Department of Economics with Rural Development
Vidyasagar University
West Bengal
India
PIN-721102

Acknowledgements

It is my great pleasure to submit the Final Report of UGC sponsored Major Research Project entitled "Cost, Efficiency, Equity and Quality of Higher Education in West Bengal (Project F.No.-5-81/2014 (HRP) Dated, 23rd September, 2015). The work searches for the present condition of higher education in the state of West Bengal by looking into some important parameters in higher education and attempts to find the major areas of concern in the higher education sector in the state.

I must put forward my gratitude and thanks to University Grants Commission (UGC) for the kind approval and financial assistance towards this project which has given me the opportunity to learn various aspects in this field.

I am grateful to Hon'ble Vice Chancellor, Vidyasagar University, Professor Ranjan Chakrabarti for his kind inspiriation and generous support for the project.

I am thankful to Mr. Siddhartha Sankar Manna, Research Assistant of this project for his sincere involvement in the project.

It is really difficult for me to prepare a complete list of the persons to whom I am indebted directly or indirectly for the project.

I must acknowledge Mr. Adwaita Maiti, Mr. Tapas Payra and Mr. Pranjit Kr. Paul - M.Phil students of the Department of Economics, Vidyasagar University, who have helped me much in compiling and analysing the data.

I am also indebted to the Principals and teachers of different colleges from whom I have received enormous help.

Some other persons to whom I am thankful are Dr. Asim K. Karmakar, Professor Santanu Ghosh, Mr. Devkumar Nayek.

The secondary data has been accessed through different sources. I am indebted to the following Libraries – Vidyasagar University, Presidency College, ISI, National Library.

I am also deeply indebted to the faculty members of the Department of Economics with Rural Development, Vidyasagar University to which I belong for extending co-operation whenever I required.

I am also thankful to the officials of Vidyasagar University for their kind support for the project.

Last but not the least the role of my family members in completing the work can in no way be neglected.

Sebak Kumar Jana
Principal Investigator of the Project
Professor of Economics
Department of Economics with Rural Development
Vidyasagar University
West Bengal
India
PIN-721102

Contents

List of Tables

List of Figures

List of Appendix Tables/Figures

Abbreviations

AB : Accreditation Board
ADF : Augmented Dicky-Fuller approach
AIC : Akaike Information Criteria
AICTE : All India Council Technical Educations
AISHE : All India Survey on Higher Education
ANOVA : Analysis of Variance
APL : Above Poverty Line
ASI : Average number of Students per Institution
B.A : Bachelor of Arts
B.com : Bachelor of Commerce
B.Lib.I.Sc : Bachelor of Library Information Science
B.Sc : Bachelor of Science
BBA : Bachelor of Business Administration
BBM : Bachelor of Business Management
BCA : Bachelors in Computer Application
BHE : Budget Expenditure on Higher Education
BHM : Bachelor of Hotel Management
BMS : Bachelor of Management Studies
BPL : Bellow Poverty Line
BRIC : Brazil, Russia, India and China
CABE : Central Advisory Board of Education
CBCS : Choice Based Credit System
CGPA : Cumulative Grade Point Average
CII : Confederation of Indian Industry
CRS : Constant Returns to Scale
CSR : Corporate Social Responsibility
CSS : Centrally Sponsored Scheme
CTE : Career and Technical Education
DBIE : Database of Indian Economy
DDE : Directorate of Distance Education
DDO : Drawing and Disbursing Office
DEA : Data Envelopment Analysis
DMU : Decision Making Unit
DPMO : Defects Per Million Opportunities
ELLIM : Eastern Institute for Integrated Learning in Management
EXPTECH: Expenditure per household in the state on technical education
EXPVOC : Expenditure per household in the state on vocational education
FPE : Final Predictor Error
FTSR : Full time teachers and student ratio
FYUP : Four Year Undergraduate Programme
GATS : General Agreement on Trade and Services
GDP : Gross Domestic Product
GEN : General
GER : Gross Enrolment Ratio
GIS : Geographic Information System
GOI : Government of India
GPI : Gender Parity Index
GSDP : Gross State Domestic Product

HEA : Higher Education Academy
HEFA : Higher Education Financing Agency
HEI : Higher education institution
HEIL : Number of higher education institutes per lakh population
HEXP : Higher Education Expenditure
HQ : Hannan-Quin Criteria
HRP : Human Resource Planning
HS : Higher Secondary
ICAR : Indian Council of Agricultural Resea
ICCR : Indian Council of Cultural Relations
ICT : Information and Communication Technology
IDEN : Institutional Density
IFMS : Integrated Financial Management System
IGNOU : Indira Gandhi National Open University
IISc : Indian Institute of Science
IPR : Intellectual Property Right
IQAC : Internal Quality Assurance Cell
IRAHE : Independent regulatory authority for higher education
ISI : Indian Statistical Institute
IT : information Technology
ITES : Information Technology Enabled Services
ITI : Industrial Training Institute
IUG : Islamic University in Gaza
L.L.M : Master of Laws
LLB : Bachelor of Legislative Law
LR : Likelihood Ratio
M. Phil : Master of Philosophy
M.Lib.I.Sc: Master of Library Information Science
MBA : Master of Business Administration
MHRD : Ministry of Human Resource Development
MOOC : Massive Open Online Course
MOSPI : Ministry of Statistics and Programme Implementation
MOSPI : Ministry OF Statistics and Programme Implementation
MSW : Master of Social Work
NA : Not Available
NAAC : National Assessment and Accreditation Council
NBA : National Board of Accreditation
NCHER : National Commission for Higher Education and Research
NEP : New Economic Policy
NEP : National Education Policy
NGO : Non Governmental Organization
NIRF : National Institutional Ranking Framework
NKC : National Knowledge Commission
NMR : Narayan Murthy Report
NSDP : Net State Domestic Product
NSS : National Sample Survey
NSSO : National Sample Survey Office
NTSR : Non-teaching staff and student ratio
OBC : Other Backward Classes
OECD : Organisation for Economic Co-operation and Development

OER : Open Educational Resources
OLS : Ordinary Least Square
OPAC : Online Public Access Catalogue
PCA : Principal Component Analysis
PE : Physical Education
PFCE : Private Final Consumption Expenditure on Education
PG : Post Graduate
Ph.D : Doctor of Philosophy
PISA : Programme for International Student Assessment
POA : Programme of Action
PP : Phillips – Perron
PTR : Pupil-Teacher Ratio
PTSR : Part time teachers and student ratio
QA : Quality Assurance
RBI : Reserve Bank of India
RRSS : Restricted Residual Sums Squares
RUSA : Rashtriya Uchchatar Shiksha Abhiyan
SBTBS : School of Biotechnology and Biological Sciences
SC : Scheduled Caste
SCI : Science Citation Index
SDP : State Domestic Product
SET : School of Engineering and Technology
SIC : Schwartz Information Criteria
SKBU : Sidho-Kanho Birsa University
SOMS : School of Management and Sciences
SPSS : Statistical Package for Social Science
SSCI : Social Science Citation Index
SSSR : Support staff and student ratio
ST : Scheduled Tribe
SWAYAM: Study Webs of Active –Learning for Young Aspiring Minds
TE : Technical Efficiency
TLR : Teaching, Learning and Resources
TSR : Teachers and Student Ratio
UCS : Unified computer System
UG : Under Graduate
UGB : University of Gour Banga
UGC : University Grants Commission
UK : United Kingdom
URSS : Unrestricted Residuals Sums Square
US : United States
VAR : Vector Autoregressive
VECM : Vector Error Correction Model
VET : Vocational Education and Training
VIF : Variance Inflation Factor
VLAN : Virtual Local Area Network
VRS : Variable Returns to Scale
VU : Vidyasagar University
WBSCTE : West Bengal State Council of Technical Education
WTO : World Trade Organization

Chapter 1

Introduction

1.1 Higher Education in India

The role of education in facilitating social and economic progress is well recognised. It opens up opportunities leading to enhancement of both individual and group potentials. Education, in its broadest sense, is the most crucial input for empowering people with skills and knowledge, giving them access to productive employment opportunities. Improvements in education are not only expected to enhance efficiency but also augment the overall quality of life. The current growth strategy being pursued in India places the highest priority on education as a central instrument for achieving rapid and inclusive growth. It encompasses programmes designed to strengthen the education sector covering all segments of the education pyramid viz. (i) Elementary education, (ii) Secondary education, and (iii) Higher education.

Education contributes to building up what has come to be known as 'human capital'. Human capital formation, in turn, spurs economic growth. Higher education is a very important form of investment in human capital. In the present context of transformation into knowledge societies, higher education provides not just educated workers but knowledge workers. Higher education can play a very significant role in the development of societies – in terms of economic development and human development. India has a demographic advantage in the sense that the country will have the largest youth population in the world in the 2020s. To reap the benefits of this demographic dividend, it is extremely important for the nation to design judiciously effective strategies for equipping the youth to be at their best with competencies of the 21st century (Gurukkal, 2018). Developing country such as India would fail in achieving the goal of economic development if it is unable to realize the potential of demographic dividend by making adequate investment in capacity building among the youth and by addressing the problem of inequality in the access middle, high and professional education (Kundu, 2018).

A World Bank study on 192 countries revealed for the progress and economic development of a nation the human and social capital counts, for at least 64%. According to World Bank (2018), human capital was the largest component of wealth overall while natural capital made up nearly half of wealth in low-income countries. In specific terms, the factors that go to make the human and

social capital are as follows: (i) Opportunities for obtaining the highest of education in every field of knowledge, especially science and technology, (ii) Capacity for creation of new knowledge and (iii) Ability of the people to make use of the new developments, particularly in science and technology. The modern system of higher education in India started in 1857, when the three Universities of Calcutta, Bombay and Madras. The Constitution of India provides the basic framework for policies and the important provisions regarding higher education. The foundation of modern higher education in India was laid by the British colonial regime prior to independence in the mid-19th century. Modelled after the University of London, the colonial government established above three universities with many affiliated colleges. While universities were examining bodies, teaching and learning took place in colleges. With a view to consolidate and maintain their dominance in the country, the British needed clerical staffs that were well versed in English.

1.1.1 Growth of Universities and Colleges in India

The 21st century is an age of knowledge-based economy and the centre-stage of change. Higher education has not escaped the impact and is in the process of challenge, thereby challenging the traditional system of education. The disparity in wealth and quality of life between the developed and developing world has been attracting the attention of the world. The exponential growth of population in the developing countries is matched by the exponential growth of knowledge in the developed world. India's achievement in the field of higher education in post-independence period is remarkable. In the year 1950-51, there were only 30 universities, 695 colleges and 3.97 lakhs students in higher education. There has been a huge quantitative expansion of higher education in India in the post-independence period. In 2016-17, there were 864 universities, about 40 thousands colleges, 3.57 crores of students and 13.65 lakhs teachers (Statewise details of teachers in India are given in the Appendix Table A1.1) in higher education in India. The growth of higher education in India during the period 1950-51 to 2016-17 is given in the Table 1.1.

Table 1.1: Growth of Higher Education in India during 1950-51 and 2016-17

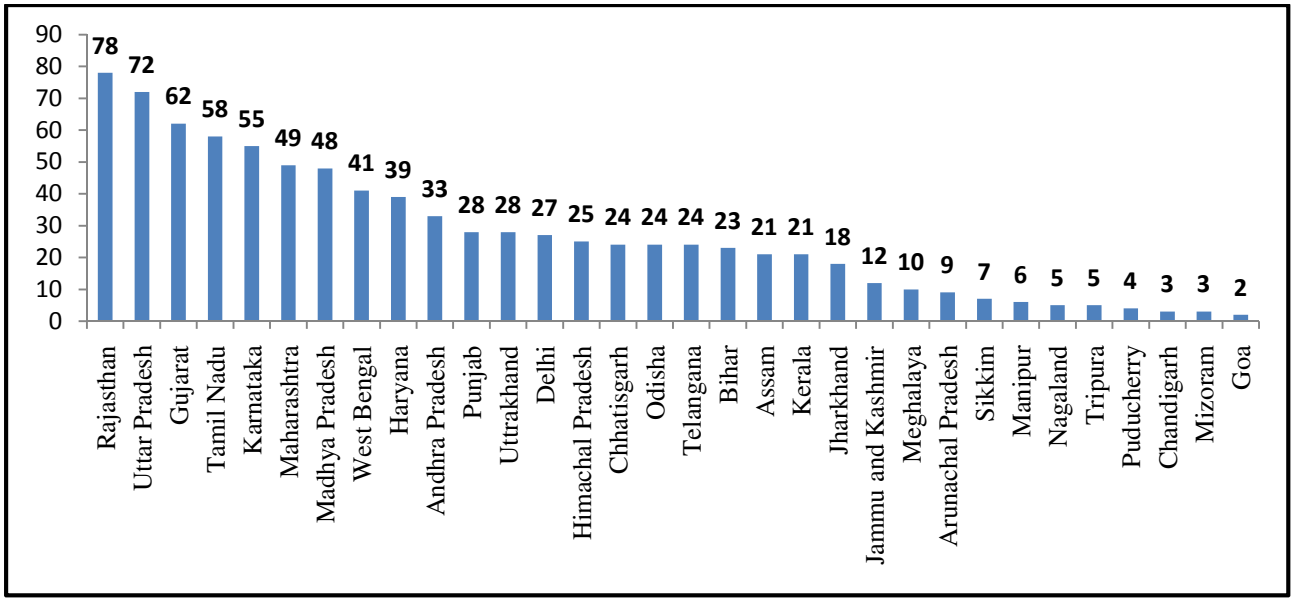
Year	Universities	Colleges	Teaching staff	Total Enrolment	Girls Enrolment
1950-51	30	695	23549	397000	43000
1960-61	55	1542	59673	1050000	170000
1970-71	103	3604	128876	1954000	431000
1980-81	133	4722	193341	2752000	749000
1990-91	190	7346	263125	4925000	1437000
2000-01	256	12806	411628	8399000	3306000
2010-11	621	32974	765349	27499749	12033190
2011-12	642	34852	1247453	29184331	13010858
2012-13	667	35525	1308571	30152417	13535123

2013-14	729	36634	1367535	32336234	14840840
2014-15	760	38498	1473255	34211637	15723018
2015-16	799	39071	1518813	34584781	15990058
2016-17	864	40026	1365786	35705905	16725310

Source: Annual Report, Department of Education, AISHE (various years)

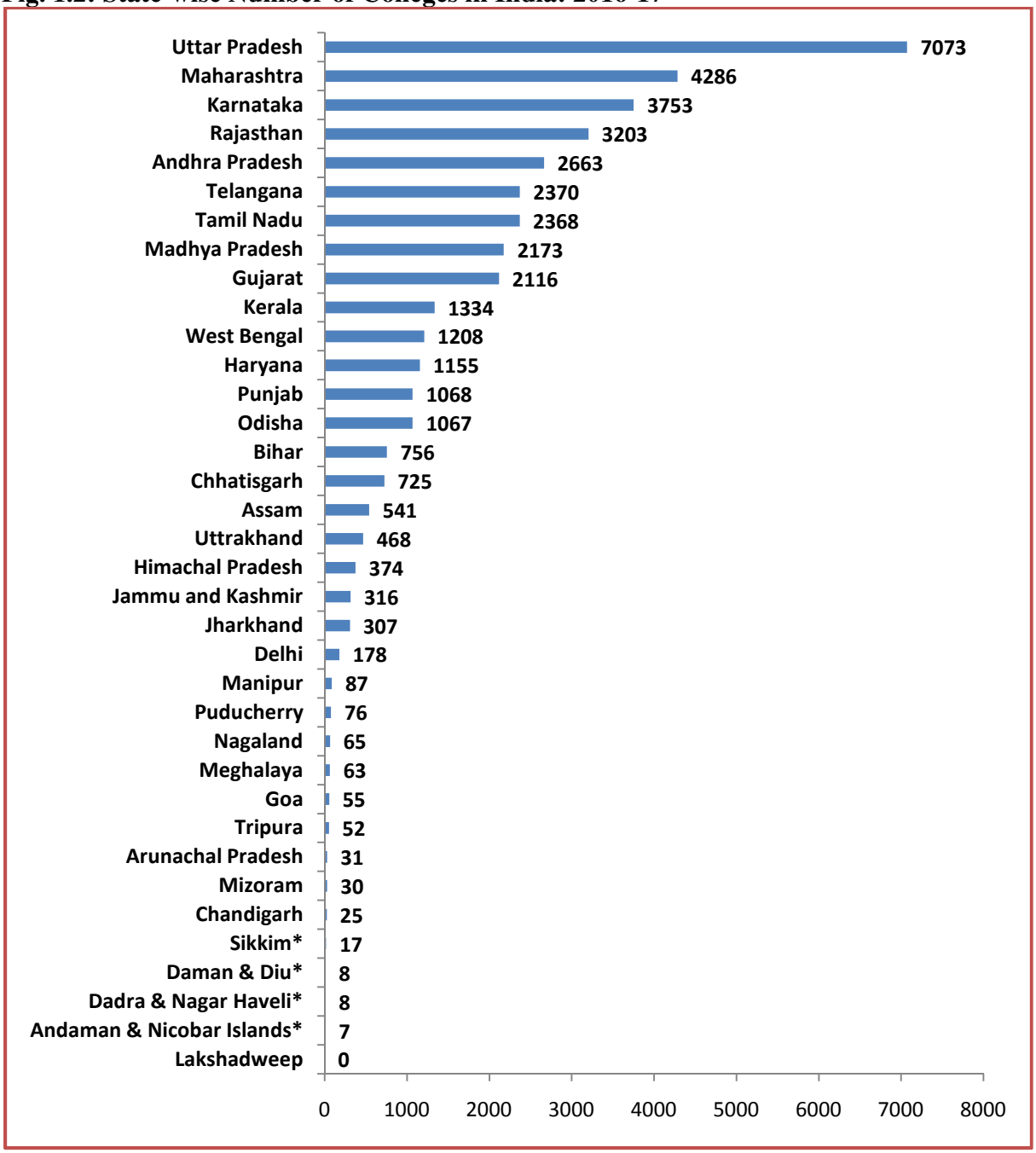
Though the number of colleges and institutions related to higher education has increased enormously over the years, there is disparity in the growth of higher education at the state level in India. Fig. 1.1 reveals the disparity in the growth of Universities and University level institutions in the country for different states. Universities and University level institutions were highest in Rajasthan (78) followed by Uttar Pradesh (72), Gujarat (62). It means 24.5% Universities and University level institutions were in these three states. Universities and University level institutions were lowest in Goa (2) preceeded by Mizoram (3), Tripura (5). Fig. 1.2 reveals the state wise disparity in the number of colleges in the country. Fig.1.2 gives state wise number of colleges in 2016-17. Number of colleges was highest in Uttar Pradesh (7,073) followed by Maharashtra (4,286), Karnataka (3,753). It means that 37.75% colleges were in these three states. Number of colleges was lowest in Sikkim (17) proceeded by Mizoram (30), Arunachal Pradesh (31).

Fig. 1.1: State-wise Number of Universities / University Level Institutions in India: 2016-17



Source: AISHE 2016-17

Fig. 1.2: State-wise Number of Colleges in India: 2016-17



Source: AISHE 2016-17

1.1.2 Enrolment in Higher Education in India

State-wise percentage share of student enrolment in higher education in India through regular mode and distance mode is shown in Table 1.2. In 2016-17, a total number of 3.57 crores of students were enrolled in several modes of higher education at various types of institutes spreading over the states of India. The highest number of students were enrolled in Uttar Pradesh (61,57,971) followed by Maharashtra (40,16,309), Tamil Nadu (33,71,351), West Bengal (20,15,996). The Lowest number of

students were enrolled in Sikkim (29,110) preceded by Mizoram (31,719), Nagaland (31,719) and Arunachal Pradesh (46,564).

Out of total number of 357.05 lakh students enrolled in higher education in India, 88.5% were regular mode students and the remaining 11.5% were distance mode students in 2016-17. Table 1.2 shows state wise variations in percentage of regular mode and distance mode. Distance education has become a useful mode of obtaining degrees for a large number of students who are staying in far off and remote areas and for whom accessing universities on regular basis is still a dream. Looking at the State wise variation, out of the total reported enrolled students pursuing studies through distance education, Delhi has a maximum number of students (61.2%) enrolled in distance mode followed by Sikkim (36.5%) and Arunachal Pradesh (35.0%). In West Bengal 90.5% students enrolled in regular mode and 9.5% students enrolled in distance mode in 2016-17.

Table 1.2: State-wise Percentage of Regular and Distance Enrolment in India: 2016-17

		Total Enrolment	**% of Regular mode Enrolment**	**% of Distance mode enrolment**
1	Andaman and Nicobar Islands	10857	59.7	40.3
2	Andhra Pradesh	1799433	83.1	16.9
3	Arunachal Pradesh	46564	65.0	35.0
4	Assam	640270	85.3	14.7
5	Bihar	1645518	91.8	8.2
6	Chandigarh	100849	73.1	26.9
7	Chhatisgarh	500046	85.7	14.3
8	Dadra and Nagar Haveli	5626	99.7	0.3
9	Daman and Diu	3119	100.0	0.0
10	Delhi	1027806	38.8	61.2
11	Goa	48669	87.5	12.5
12	Gujarat	1458104	94.5	5.5
13	Haryana	925290	81.0	19.0
14	Himachal Pradesh	270210	85.0	15.0
15	Jammu and Kashmir	337850	71.7	28.3
16	Jharkhand	671037	91.8	8.2
17	Karnataka	1871294	96.6	3.4
18	Kerala	1033143	77.2	22.8
19	Lakshadweep	524	100.0	0.0
20	Madhya Pradesh	1773253	91.1	8.9
21	Maharashtra	4016309	82.6	17.4
22	Manipur	101062	93.5	6.5
23	Meghalaya	80292	89.1	10.9
24	Mizoram	31719	80.3	19.7

25	Nagaland	40762	86.2	13.8
26	Odisha	972285	95.5	4.5
27	Puducherry	66918	86.0	14.0
28	Punjab	917550	94.2	5.8
29	Rajasthan	1808451	91.7	8.3
30	Sikkim	29110	63.5	36.5
31	Tamil Nadu	3371351	85.2	14.8
32	Telangana	1438737	96.7	3.3
33	Tripura	83244	85.7	14.3
34	Uttar Pradesh	6157971	98.1	1.9
35	Uttrakhand	404686	90.1	9.9
36	**West Bengal**	**2015996**	**90.5**	**9.5**
	All India	**35705905**	**88.5**	**11.5**

Source: AISHE 2016-17

1.2 Higher Education in West Bengal

History of the modern education system in West Bengal dates as far back as to 1817 when the Hindu College was founded in Calcutta, which was later renamed as the Presidency College. The bulk of the higher quality colleges in West Bengal were bunched along the banks of the Ganga-Bhgirathi, whose essentially mono crop and stagnant agriculture made it inevitable that large numbers of indigent lower gentry from higher status families would seek alternative occupations in whatever few opportunities there were, for junior service in trade, commerce and petty administration (Government of West Bengal 1984). Although the Hindu College was established in 1817 through the joint efforts of David Hare and Rammohan Roy and as carried on by a non-official body, it was taken over by the Government in 1855 and developed into the Presidency College. For nearly half a century after establishment of this college all significant attempts of extension of higher education were made by two agencies -the Government and the Christian Missions. Pandit Iswar Chandra Vidyasagar founded the Metropolitan institution in 1869. It was the first private college undivided Bengal, which still continues with the name Vidyasagar College in Kolkata. It may be poined out that the province of Bengal, undivided till 1947, and later the state of West Bengal, had played a leading role in the country in spreading education at all levels, beginning with mass education and culminating in higher, professional and specialized education thanks to the colonial legacy and renaissance in the state (Jana and Ghosh, 2011).

1.2.1 Growth of Higher Education Institutes in West Bengal

Table 1.3 shows the growth of higher education institutes (universities and colleges) in West Bengal during the period 1950-51 to 2016-17. In the year 1950-51 the number of universities was 2 which

went up to 41 in the year 2016-17. The list of universities in West Bengal is given in the Appendix Table A1.2. In the year 1950-51 the numbers of colleges in West Bengal were 121 which increased to 1208 in the year 2016-17. The increase in the colleges for the above mentioned period was 10 times. This growth in the universities and colleges was due to massive efforts and policy decisions taken by the central government and the state governments in India during the period of 2002-03 to 2016-17.

Table 1.3: Year-wise Number of Universities and Colleges in West Bengal

Year	Universities	Colleges
1950-51	2	121
1960-61	5	165
1970-71	7	283
1980-81	9	325
1990-91	9	394
2000-01	13	484
2002-03	14	537
2003-04	14	541
2004-05	15	603
2005-06	15	621
2006-07	15	774
2007-08	18	805
2008-09	18	889
2009-10	20	891
2010-11	26	857
2011-12	26	901
2012-13	26	955
2013-14	27	985
2014-15	31	1051
2015-16	34	1082
2016-17	41	1208

Source: MHRD, AISHE

In all developing countries, efforts are being made by the respective governments to promote higher education. Central Government and state Governments are trying to nurture talent through focusing on the number of universities and colleges for expansion of higher educations. During 2016-17, out of the 41 universities in West Bengal, 24 were state public universities, 8 state private universities, 1 deemed university and 1 central university as shown in Table 1.4. The state public universities comprised of a larger proportion of universities than other types of universities in West Bengal as well as India. In 2016-17, about 80.4 percent universities were state universities (state public university, state private university and state open university) in West Bengal.

Table 1.4: Type-wise Distribution of Universities / University level Institutions in India and West Bengal: 2016-17

	West Bengal		India		Share of West Bengal in India
	Number	%	Number	%	
Central University	1	2.4	44	5.1	2.3
Central Open University	0	0.0	1	0.1	0.0
Institute of National Importance	6	14.6	100	11.6	6.0
State Public University	24	58.5	345	39.9	7.0
Institute under State Legislature Act	0	0.0	5	0.6	0.0
State Open University	1	2.4	13	1.5	7.7
State Private University	8	19.5	233	27.0	3.4
State Private Open University	0	0.0	1	0.1	0.0
Deemed University-Government	0	0.0	33	3.8	0.0
Deemed University-Government Aided	0	0.0	10	1.2	0.0
Deemed University-Private	1	2.4	79	9.1	1.3
Grand Total	41	100.0	864	100.0	4.7

Source: AISHE, 2016-17

In Table 1.5, we have presented the growth of number of colleges in West Bengal and India during the period 2002-03 to 2016-17. Table 1.5 and Fig. 1.3 reveal that though a number of colleges have been established in West Bengal in recent years, its share in India has only been slightly improved. It is a challenge for the government to enhance the access to higher education keeping in pace with the increasing number of students passing out in Higher Secondary Examination which has increased from 1.49 lakhs in 2001 to 6.22 lakhs in 2017. Fig. 1.4 presents percentage share of colleges in West Bengal in respect to India.

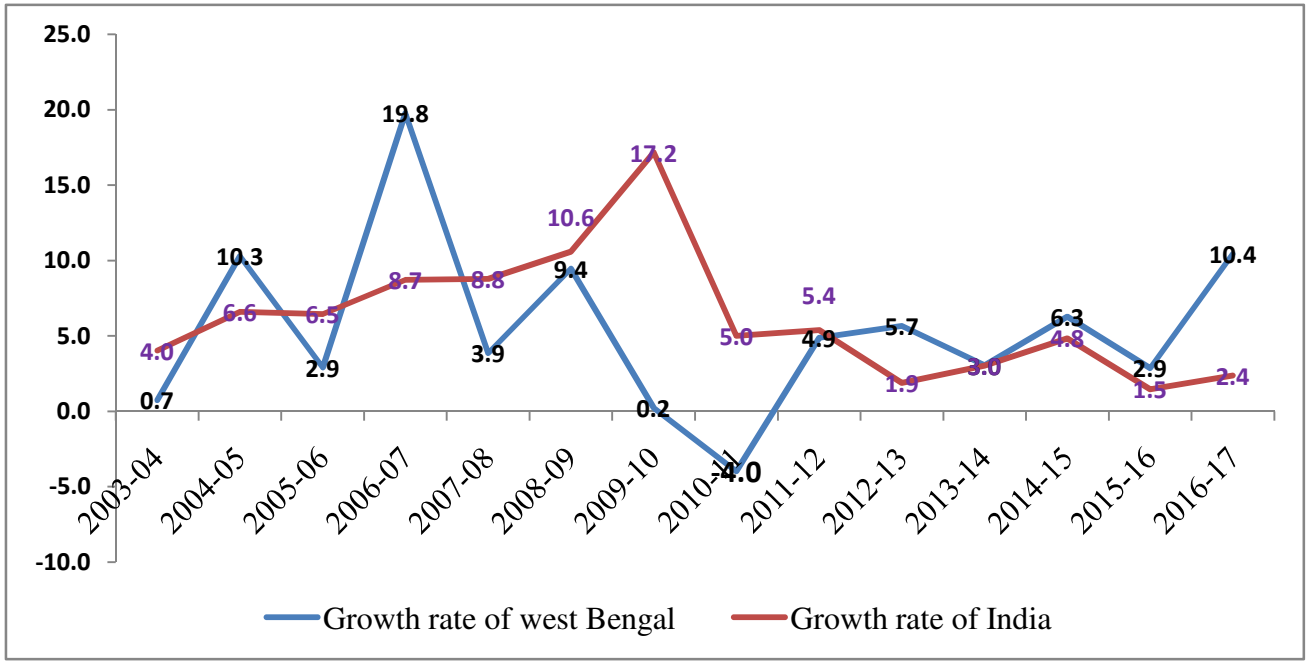
Table 1.5: Annual Growth Rate of Colleges in West Bengal and India

	West Bengal		India		
Year	Number of Colleges	Growth rate	Number of Colleges	Growth rate	Share of West Bengal
2002-03	537	-	16206	-	3.3
2003-04	541	0.7	16888	4.0	3.2
2004-05	603	10.3	18080	6.6	3.3
2005-06	621	2.9	19327	6.5	3.2
2006-07	774	19.8	21170	8.7	3.7
2007-08	805	3.9	23206	8.8	3.5
2008-09	889	9.4	25951	10.6	3.4
2009-10	891	0.2	31324	17.2	2.8
2010-11	857	-4.0	32974	5.0	2.6
2011-12	901	4.9	34852	5.4	2.6
2012-13	955	5.7	35525	1.9	2.7
2013-14	985	3.0	36634	3.0	2.7
2014-15	1051	6.3	38498	4.8	2.7

2015-16	1082	2.9	39071	1.5	2.8
2016-17	1208	10.4	40026	2.4	3.0

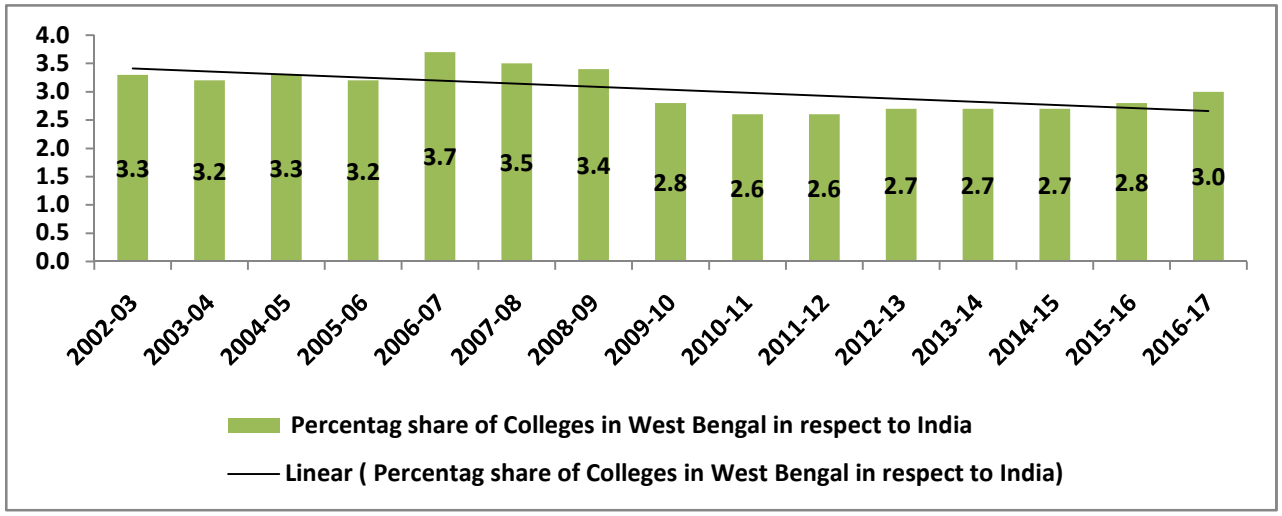
Source: AISHE (Various Years)

Fig. 1.3: Annual Growth Rate of Colleges in West Bengal and India



Source: AISHE (Various years)

Fig. 1.4: Percentage Share of Colleges of West Bengal in India



Source: AISHE (Various Years)

1.3 Policies and Recommendations in Higher Education in India

The modern system of higher education in India started in 1857 when the three universities of Calcutta, Bombay and Madras were established. In 1892, the Indian Universities Commission was appointed to inquire into the conditions and prospects of Universities. The recommendations of the

Commission were embodied in the Indian Universities Act, 1904 and the functions of the Universities were centralized. Free India inherited a system of higher education which was an integral part of the colonial system (Pillai 2009). Some important recommendation in the field of higher education in India in the post independence period is given below.

Radhakrishnan Commission: In 1948, the University Education Commission was set up under the Chairmanship of Dr. S. Radhakrishnan. The commission suggested an improvement and extension of university education to suit the present and future requirements of India. The commission discussed all aspects of university education, particularly the changes required in the curriculum, examination and organization.

Kothari Commission: In 1964, an Education Commission under the chairmanship of Professor D. S. Kothari was appointed to advise the government on 'the national pattern of education and the general principles and policies for the development of education at all stages and in all aspects'. The Commission submitted its report to the government in 1966. On the basis of the recommendations made by the commission, the government issued a resolution on National Education Policy in 1968.

The National Policy on Education (1968): The National Policy on Education (1968) is considered to be a major landmark in the history of education in the post-Independence period. It became the basis of reforms in the educational system in India. A radical reconstruction of the education system was emphasized in the policy.

The National Policy on Education (1986): In 1980, the Congress government came to power and resolved to promote the National Policy on Education, 1968. The National Policy (1986) recommended for (1) consolidation and expansion of institutions, (2) development of autonomous colleges and departments, (3) redesigning of courses, (4) strengthening of research, (5) training of teachers, (6) improvement in efficiency, (7) creation of a structure for co-ordination at the state and national levels, and (8) mobility, (9) Establishment of a National Testing Service (NTS) with a view to delinking degrees as a requirement for recruitment to services.

Acharya Rammurthy Commission (1992): The Commission recommended that privileged class should pay more and it was justifiable to increase the fees of the students in higher education and increase must be related to the cost of higher education and income level of the parents.

Revised National Policy on Education (1992): The committee under the chairmanship of Janardhana Reddy submitted the revised National Policy of Education of 1986 in 1992 for a planned development of higher education. The committee recommended for planned development of higher education through different measures like the establishment of a State Council of Higher Education, as statutory body in all stated during the Eighth Plan period (1992-97), strengthening of IGNOU, development of autonomous colleges etc.

Ambani Birla Report (2000): Ambani and Birla submitted their report *'A Policy Framework for Reforms in Education'* on April 24, 2000. The Report says, "the Government should play the role of a facilitator" and "the Government's role should be maximum at the primary stage and minimum at the higher education stage." The report recommended "user pays principle" will be "enforced strictly for higher education supported by loan schemes as well as financial grants for economically and socially backward sections of society."

The UGC Model Act (2003): The Act recommended for the mobilisation of financial resources to become self-sufficient through different schemes like sponsored R and D projects by companies, consultancy services etc.

C.N. Rao Committee (2005): Rao committee recommended tough norms for foreign universities wanting to open institutions in India.

The Approach Paper to the Eleventh Five Year Plan (2006): The Approach Paper to the Eleventh Five Year Plan pointed out that only 10 per cent of the addressable global IT/ITES (Information Technology/ IT-enabled Services) market has been realised. The approach paper recommended full exploitation of private sector initiatives in higher learning through public private partnership (Sharma 2006-1).

National Knowledge Commission (NKC) Report (2006): The report advocates expansion of higher education to attain at least 15% by 2015 and an increase in government support to at least 1.5% of GDP for higher education. The report points out, good institutions are not coming to India and NKC recommends that "all rules that apply to domestic institutions should also be applicable to foreign institutions." Economic barriers to higher education can be addressed, according to the Report, by scholarships or cross-subsidies. The NKC proposes the establishment of an independent regulatory authority for higher education (IRAHE) (Sharma 2006-2).

Yash Pal Committee Report (2009): The committee emphasized for the devise of imaginative ways for complementary sources of funds**.** The Committee suggested for the establishment of National Commission for Higher Education and Research (NCHER), an overarching single autonomous body which will subsume all regulatory bodies in higher education in India. Although recommendations of Yaspal Committee on academic reforms are premised on decentralisation of decision-making process, the formation of NCHER tend towards decentralisation.

Narayan Murthy Report (2012): The areas identified by the Narayan Murthy report are quality deficiency, quantity mismatch and funding gaps. The NMR argues that many challenges faced by the government remain unsolved because of the scarcity of resources which is the biggest factor for alluring corporate sector to invest in higher education through direct ownership, collaboration through research, faculty development, infrastructure creation, student scholarship and governance

National Policy for Skill Development and Entrepreneurship (2015): National Policy for Skill Development and Entrepreneurship 2015 supersedes the policy of 2009. The primary objective of this policy is to meet the challenge of skilling at scale with speed, standard (quality) and sustainability. It aims to provide an umbrella framework to all skilling activities being carried out within the country, to align them to common standards and link skilling with demand centres. In addition to laying down the objectives and expected outcomes, the policy also identifies the overall institutional framework which will act as a vehicle to reach the expected outcomes. Skills development is the shared responsibility of the key stakeholder's viz. Government, the entire spectrum of corporate sector, community based organizations, those outstanding, highly qualified and dedicated individuals who have been working in the skilling and entrepreneurship space for many years, industry and trade organizations and other stakeholders. The policy links skills development to improved employability and productivity in paving the way forward for inclusive growth in the country. The skill strategy is complemented by specific efforts to promote entrepreneurship in order to create ample opportunities for the skilled workforce. The objective is to create a workforce empowered with improved skills, knowledge and internationally recognized qualifications to gain access to decent employment and ensure India's competitiveness in the dynamic Global Labour market. It aims at increase in productivity of workforce both in the organized and the unorganized sectors, seeking increased participation of youth, women, disabled and other disadvantaged sections and to synergize efforts of various sectors and reform the present system. One of the key objectives is to safeguard the skilling needs of SCs, STs, OBCs, minorities, and differently abled persons, as well as those living in difficult geographical pockets.

NSQF is a framework under which skills are mainstreamed into the education system at the national level. There are several advantages to NSQF, over the modular courses offered by the MSDE. First, it streams students according to their aptitude and capacity into the general or vocational line from Class IX itself. Whereas the certificates and diplomas granted by the MSDE and others are terminal in nature, NSQF can lead a student to a bachelor's degree in vocational education (B.Voc). Second, it seamlessly provides pathways between education, skills and the job market, thereby de-stigmatising vocational education by making it part-and-parcel of the school and university system. General education subjects such as reading, writing, arithmetic and basic science provide the necessary glue. NSQF also recognises prior learning, through which an estimated 20 million school dropouts can get a second chance (Bhalla, 2018).

University Grants Commission (UGC): The University Grants Commission (UGC) which came into existence on 28th December, 1953, became a statutory organisation by an Act of Parliament in

1956. It is a national body for the coordination, determination and maintenance of standards of University education. It serves as a coordinating body between the Union and State Governments and the institutions of higher learning. It also acts as an advisory body to these Governments and institutions on issues relating to higher education.

Central Government Policy on Higher Education in Recent Years:

Central Government of India is responsible for major policy relating to higher education in the country. It provides grants to the UGC and establishes central universities in the country. The Central Government is also responsible for declaration of Educational Institutions as 'Deemed to be University' on the recommendation of the UGC. The coordination and cooperation between the Union and the States is brought about in the field of education through the Central Advisory Board of Education (CABE). As per the Special Constitutional responsibility of the Central Government, education is on the 'Concurrent list' subject to Entry 66 in the Union List of the Constitution. This gives exclusive Legislative Power to the Central Govt. for co-ordination and determination of standards in Institutions of higher education or research and scientific and technical institutions. Department of Higher Education is the department under Ministry of Human Resource Development, that oversees higher education in India.

By the 1980s, improvements in basic education and Indian society's growing's aspirations had resulted in a huge capacity gap in higher education. The changing structure of the economy demanded new skills which the public institutions were not able to provide. Because of a general rise in income levels, private higher education was within reach for many who wanted it. The private sector had already proven itself with successful forays into the primary and secondary education market and was poised to venture into the awaiting higher education market. In India both public and private institutions operate simultaneously. (Upadhyaya and Agrawal, 2015).

In Indian scenario the 1990s saw a major turn in the history of contemporary higher education. The decade was one of the turmoil, with an important development being the sustained efforts towards privatization of higher education in India. The Government of India's 1997 discussion paper on Government Subsidies in India provided a revealing insight into government thinking. For the first time, higher education (as well as secondary education) was classified in the discussion paper as a "non merit good" (and elementary education as a "merit good") government subsidies for which would need to be reduced drastically. It reclassified higher education into a category called "merit good" which need not be subsidized by the state at the same level as other merit goods. Page 165 (Upadhyaya and Agrawal, 2015)

Further, Rashtriya Uchchatar Shiksha Abhiyan (RUSA), a Centrally Sponsored Scheme (CSS), provides strategic funding to eligible state higher educational institutions. The objective is to achieve the target of Gross Enrolment Ratio of 30% by the year 2019-20 with equity and inclusion.The Department of Higher Education has a scheme called Central Sector Interest Subsidy Scheme on education loan for students belonging to Economically Weaker Sections. The objective of the Scheme is to encourage poor students aspiring to pursue Higher Education especially in Technical and Professional education. Government of India bears full interest subsidy during the Moratorium period (The Business standard, March 21, 2018).

The 12th Plan Document has fixed targets of 25.2 GER by 2017-18 and 30 GER by 2020-21. As per All India Survey on Higher Education (AISHE) 2017-18, the Gross Enrolment Ratio (GER) in higher education has increased from 24.5 in 2015-16 to 25.8 in 2017-18.

In order to increase the enrolment in higher educational institutions, various measures have been taken by Government which include:

- ✓ Issuing of new UGC regulation for Open and Distance Learning that allows entry of reputed institutions to offer education on the distance mode.
- ✓ Using of ICT technology- SWAYAM portal to reach out of people and allow them to secure good quality education.
- ✓ Opening of more centrally funded institutions.
- ✓ Encouraging opening of institutions by State Governments through the Rashtriya Uchchatar Shiksha Abhiyan (RUSA) which aims to achieve equity, access and excellence in higher education. The scheme supports components such as upgrading autonomous colleges to universities, clustering colleges to establish a university, setting up of new professional colleges in un-served and underserved areas as well as providing infrastructure grants to universities and colleges to scale up capacity.
- ✓ More scholarship programmes to supplement the cost of education.

Moreover, Higher Education Financing Agency (HEFA) has been established under the Companies Act, 2013 to leverage funds from market to finance improvement in infrastructure in top institutions of education.

1.4 Literature Review

After Independence, many of the universities in our country are getting a low estimation in the eye of public, In spite of several commissions and committees set up since the Independence and headed by the educational experts, the sad and deplorable state of affairs in the field of higher education is still persisting. Although Higher Education has expanded several times since independence, the major issues of access, equity, and quality continue to be areas of concern. In the following sections we have made the literature survey on the theme of the project title under the headings of public expenditure, efficiency, equity, quality, household expenditure and policy issues on higher education.

1.4.1 Public Expenditure on Higher Education

Tilak (2003) reviews the relationship between higher education and development, including human development and finds significant effects of higher education on development. It pleads that without expanded reasonably well its higher education system no nation could achieve high level of economic development. It underlines the need for increased public financing and warns against excessive reliance on cost recovery measures and privatization of higher education. The exploration of alternative sources of financing higher education should have examined further the traditional sources like the state and families of students.

Chakraborti and Joglekar (2006) using a panel of 15 major states from India it has been found that education expenditure at all levels has been significantly lower after liberalization vis-à-vis the pre-economic reform era. This is particularly detrimental for the vulnerable sections of the population, i e, for females and backward social groups. It is evident that even after controlling for the economic reform process, privatization exerts a negative significant impact on expenditure on higher education.

Archibald and David (2006) presents new evidence on the conflict between two competing explanations of the increase in college costs, the cost disease theory of William Baumol and William Bowen and the revenue theory of cost of Howard Bowen. Using cross section data, the paper demonstrates that the cost disease explanation dominates.

According to *Balakrishnan (2006)* the fall of the publicly-funded higher education system in India has its origins in the fact that there has been a steady expansion of institutions without any concern for quality of the faculty. Unless such issues are addressed, merely increasing the number of seats will prove counterproductive.

According to *Chattopadyay (2007)*, keeping in mind India's imperatives the government has to continue to play a leading role in the provision of higher education. Among the measures suggested, fee enhancement and education loans are of limited significance in a country like India.

According to *Prasad (2008)*, state funding is essential to ensure that adequate talent from all the sections can gain access. The attempt to privatize higher education on the present narrow educational base would not present viable alternative. Developing countries have special academic needs that require to be protected.

According to *Shah (2008)*, the state is yet to keep to its promise of increased spending and university fees should at least be indexed to inflation.

According to *Tilak (2008)*, the allocations to the education sector in the union budget for 2008-09 are substantially more than in 2007-08, but the hike is not as large as in previous years. The budget marks a shift in priorities in a number of areas – (i) higher priority to secondary, technical and higher education and less to elementary education, (ii) a preference for expansion of elite over mass-based system. And, three, a preference for funding from cesses over allocations from the general budget.

Going by the reduced non-plan expenditure for higher education institutions, increased emphasis on interest subsidy on educational loans, a steep cut in the allocation for the National Means-cum-Merit Scholarship scheme, and reliance on public-private partnership modes for setting up of model schools in the Union Budget, Tilak (2010) infers that the State intends to continue reducing its role in funding education and relying on the private sector.

According to *Davis educational foundation (2012)*, the reasons mentioned for unsustainable cost increases were both cultural and structural.

Nitza et al (2013) indicate that the most profitable fields are computer sciences and mathematics, engineering, and architecture.

Li (2013) aims to set up a supply and demand framework to analyze the various forces that may be driving the price of higher education to rise above the Consumer Price Index over time.

According to *Anand (2014)*, spending on tertiary level of education in general and technical education in particular is much below the desired level across major states. There exists wide inter-state disparity in terms of amount of spending on these two sub-sectors of education

Johnstone (2016) examines the nature and the dynamics of higher educational costs and summarizes some trends and patterns that are observable worldwide as institutions and governments deal with rising costs and faltering revenues.

Dolan & Schmidt (1987) examined the relationship between achievement and expenditure in primary and secondary public education. The data were from Virginia, a four-year cross-sectional

panel aggregated at the school district level. The results were relatively insensitive to cost-of-living adjustment. Among the policy inferences, they found that expenditure effects on achievement may be stronger at the primary school level.

1.4.2 Efficiency of Education Institute

Using Data Envelopment Analysis, *Calhoun and Hall (2013)* looked at the efficiency of a majority of the institutions of higher learning in the United States. Using two different approaches, they find some evidence that private institutions of higher learning are more efficient than public ones.

Johnes (2006), the purpose of this paper is to examine the possibility of measuring efficiency in the context of higher education. The possibility of differences in the production frontier (and hence the distribution of efficiencies) of three distinct groups of HEIs is explored using a test proposed by Charnes, Cooper, and Rhodes [1981. Management Science, 27(6), 668–697] but no significant differences are found. Bootstrapping procedures, however, suggest that differences between the most and least efficient English HEIs are significant.

According to *Tóth (2009)*, the aim of the higher education reform process both in Hungary and in the European countries is establishing a competitive, qualitative higher education with efficiently operating institutions. The author examined whether their efficiency is influenced by the extent of the contribution of the state and the private sector or socio-economic factors like GDP per capita and education level of parents.

Agha et al (2011) evaluates the relative technical efficiencies of academic departments at the Islamic University in Gaza (IUG) during the years 2004-2006.

The purpose of this paper of *Cvetkoska (2011)* is to describe Data Envelopment Analysis as a new way for organizing and analysing data and to present the applications of this methodology in information and communication technologies.

According to *Mirabent and Parellada (2012)*, globalization and the knowledge-based society have driven universities to an intense competition for the best professors, researchers and students. They did an exhaustive review of the indicators used in DEA empirical studies in the last decade, classifying them according to their nature and use.

Using data envelopment analysis (DEA) Daghbashyan (2013) compares technical efficiency among university units at the Royal Institute of Technology (Stockholm). An interesting result is that there seems to be a complementary relationship between efficiency of resource utilization in teaching and in research.

Cristian and Zotti (2013) apply data envelopment analysis (DEA) to assess the efficiency, technical and scale, of both departments and faculties at University of Salerno in the South of Italy. The

findings, based on data from 2005 to 2009, suggest that the ST sector is more efficient in terms of quality of research than the HSS sector, that instead achieves higher efficiency in teaching activities.

Nazarko and Šaparauskas (2014) describes a comparative efficiency study of 19 Polish universities of technology. The economies of scale were also studied in relation to the efficiency achieved. Sensitivity of the model to data errors was tested.

Johnes and Johnes (2009) estimated multiproduct cost function for English higher education institutions using a panel of data from recent years. The panel approach allowed estimation by means of a random parameter stochastic frontier model which provided considerable new insights in that it allows the impact on costs of inter-institutional differences in the cost function itself to be distinguished from inter-institutional differences in efficiency.

According to *Gronberg (2012)*, Charters represented an expansion of public school choice, offering free, publicly funded educational alternatives to traditional public schools. Their main findings showed that charter schools were able to produce educational outcomes at lower cost than traditional public schools — probably because they face fewer regulations.

de Mello et al (2006) using Data Envelopment Analysis (DEA) models evaluated 12 programmes co-ordinated by the Institute for Engineering Post-Graduate Studies and Research (COPPE) at the Rio de Janeiro Federal University (UFRJ) were used as evaluation units.

Worthington and Lee (2008) estimated productivity growth in 35 Australian universities is investigated using non-parametric frontier techniques over the period 1998–2003. The five inputs included in the analysis are full-time equivalent academic and non-academic staff, non-labour expenditure and undergraduate and postgraduate student load while the six outputs are undergraduate, postgraduate and Ph. D. completions, national competitive and industry grants and publications.

1.4.3 Equity in Higher Education

According to *Tilak (2004)*, recent trends indicate a growing public apathy for higher education that becomes evident with falling public expenditure in the sector.

Gujar (2006) examines the parallel evolution of higher education and economic growth in the country since independence. It also analyses the efficacy of government initiative in this regard.

Agarwal (2006) discusses the various types of inequalities under the new WTO paradigm. According to him open market reinforces the inequalities that already exist. Higher education is a very costly affair. Though the number of higher educational institutions as well as the enrolment has

increased considerably in recent years yet they have not been able to keep pace with the every growing demand for higher education.

Prakash (2007) gives an overview of trends in the expansion of higher education and examines variations in participation across states, gender and social groups.

Mikkola and Miles (2007) review economics literature on the relationship between gender equality and economic development and conclude that gender equality does not seem to follow automatically from development, but there is a need for active policies.

Upadhyay (2007) examines whether it is the demand-side constraint in terms of lack of demand for higher education or the supply-side constraint in the form of inadequate access to higher education that is more important in explaining the low level of enrolment.

India is estimated to require at least one million new faculties for its colleges and universities if it is to meet the government's ambitious target to offer higher education to 20% of all young people by 2020. But the output of the current Indian higher education system falls far short of meeting this need.

According to *Collins and Rhoads (2010),* there are several dimensions of changes that have taken place since 1991, the most important of which is in the position of the government which is reflected in the reduction of state funding to higher education, entry of private players, the increase in the individual cost of higher education, i e, the self-financing of higher education, the entry of foreign institutions.

The study of *Krishnaveni and Meenakumari (2010)* has been undertaken to identify the various functional areas to which ICT is deployed for information administration in higher education institutions and to find the current extent of usage of ICT in all these functional areas pertaining to Information administration.

According to *Basant and Sen (2010)*, an individual's participation in higher education is dependent on her religious affiliations, socio-economic status and demographic characteristics. It has been argued that an appropriate measure of "deficits" in participation should inform the nature and scope of affirmative action. If reservation policy for some groups is to be justified only on the basis of low participation, it may require a review.

The primary objective of this research by *Mangnale and Potluri (2011)* is to explore the perceptions of both the higher education institutions and students on the various quality deliverables in the Indian higher education system along with careful observation of the role of Internal Quality Assurance Cell (IQAC) in sustaining quality delivery of education service in Pune district of Maharashtra state.

According to *Finegold (2011)*, return of Indians who are currently undertaking or have completed graduate studies in the United States is a good option.

According to *Gani (2010)*, in today's competitive higher education world, the growth of Open Educational Resources (OER) initiatives offer real opportunities for improving access and transfer of knowledge and information to a wide range of users

Ritimoni (2012) has discussed how the accessibility of education can be promoted to all through a convenient mode of education system and how the disparities in education can be minimized, and also focus on the various strategies for strengthening higher education system in the country.

Gupta and Gupta (2012) present the development and present scenario of higher education in India by analysing the various data and also identify the key challenges that India's higher education sector is facing. This paper also presents the key initiatives by the government and recommendations to meet these challenges.

According to *Toro and Joshi (2012),* Information and Communication Technology (ICT) is a vehicle to enhance the quality of the education.

Bordoloi (2012) discusses how the accessibility of education can be promoted to all through a convenient mode of education system and how the disparities in education can be minimized, and also focus on the various strategies for strengthening higher education system in the country.

Despite some improvement in enrolment rates over the decades, at the end of 2002 hardly 9.28 per cent of boys and 6.71 per cent of girls belonging to the relevant age-group population in the country had been enrolled in higher education institutions.

Goswami (2013) highlights the policies for higher education in India within the context of neo-liberal economic reforms and how these neo-liberal agendas have increased inequalities and diminished democratic accountability. It analyses some effects of neo-liberal policies on goals, motivations, methods, standards of excellence and freedom in Indian higher education system.

Mishra (2013) has made a systematic attempt has been made to describe academic qualification framework, institutional framework and regulatory framework regarding higher education in this era of globalization.

According to *Misra and Bal (2014)*, persistent disparity exists across States, Religious Minorities and Backward Castes. A proactive state initiative to look at education in a holistic manner, revamping the regulatory character, augmentation in allocation can foster excellence while improving equity through higher access of disadvantaged segments of the society.

According to *Agrawal (2014)*, India's GER(Gross Enrolment Ratio) not only significantly lags behind that of developed nations such as US, Switzerland, Japan and UK but also that of developing countries including China, Brazil, Malaysia and Philippines.

According to *Kontic Ljiljana (2014),* the main aim of this study is to investigate the potential to apply the SERVPERF scale for assessing service quality during the Bologna Process and Higher Education reform in Serbia. The research sample consisted of 109 students of a Faculty of Management at one Serbian University.

According to *Dey and Halder (2014)*, education plays a crucial role in social- economic development of a country. It can also help in the development of human civilization through reducing poverty, ignorance, exclusion, etc. This paper also shows some suggestions on the basis of findings to reduce the gender gap in higher education.

According to *Pujar (2014)*, higher education is a very important sector for short and long term economic growth and development of human resource which can take responsibility for social, economic and scientific development of the country.

According to *Virmani (2014)*, the changing financing patterns have altered regulations, equity, efficiency and quality aspects of higher education of Higher Education.

In the broad context of inclusive growth policies in India, an examination of the growth and inequalities in the country's higher education is attempted in the article by Tilak (2015) with the help of rich data available from the National Sample Survey (NSS) in several rounds between 1983 and 2009–10. The article is primarily concerned with inequalities in higher education by gender, by social groups—caste and religion, by region rural and urban and by economic groups of population classified by monthly per capita household expenditure.

Jahan and Selvarani (2015) holds an immediate significance of creating awareness of many issues of concern to be taken care of by the stakeholders in the national as well as the global levels. Their study throws a gainful insight on financing schemes and enrolment aspects of higher education in India.

Indian economy is compared with other Asian economies in the framework of shortfalls in the Higher Education system. Chahal (2015) concludes here is need of plans requires solutions that combine, employers and youth need of Expectations of from various stakeholders Students, Industry, Educational Institutions, Parents and Government.

India must be one of the very few countries in the world (along with its Subcontinental neighbours) where the average good quality high school education costs more than five times the average good quality college education. In most civilised economies, the ratio is the opposite.

According to *Bhalla (2018)*, India is one of the very few countries in the world, where the average good quality high school education costs more than five times the average good quality college education. In most civilised economies, the ratio is the opposite. At present, there are close to 5.5 lakh students studying abroad, with over 2 lakhs in the US alone. Average tuition cost in a US

college (state and private) is around Rs 0.2 crore a year. His estimate reveals that about Rs 25 crore spent by Indians abroad each student year. The central government, as shown above, spends approximately this same amount.

Hajj and Panizza (2009) used individual-level data and a differences-in-differences estimation strategy to test whether the education gender gap of Muslims is different from that of Christians. In particular, the paper used data for young Lebanese and shows that, other things equal, girls (both Muslim and Christian) tend to receive more education than boys and that there is no difference between the education gender gap of Muslims and Christians.

Ganegodage and Rambaldi (2011) evaluated the contribution of investment on education to Sri Lanka's economic growth during the period 1959–2008. The results indicated a need for an appropriate strategy to allocate resources on education to improve its returns to the economy.

Agrawal (2014) presents estimates of educational inequality for the major Indian states. We compute the education Gini index separately for the rural and urban sectors and examine the changes in inequality during past two decades. The estimates show the high extent of educational inequality; though the inequality declined between 1993 and 2009 the Gini index is above 50% in 2009.

Bal (2004) argues that market economics often does not take cognizance of the need for inclusivity. Most of reports suffer from a utopian and elitist bias. The author strongly recommends that development has to be dispersed and social philanthropy of private corporate sector through Corporate Social Responsibility (CSR) can play a stellar role in this regard.

Deshpande (2018) shows that over time, diversity in educational institutions has increased, particularly for woman and OBCs. As the increased presence of OBCs in graduate programmes is higher than that of Muslims, he argues that affirmative action might be contributing to these differential group outcomes.

Wankhede (2016) conducted in five Maharashtra districts, examines the factors that are significant in Scheduled Caste students' access to higher education. It looks at the problems they face during the admission process and takes stock of the difficulties they confront after securing admission. The article finds that SC students strongly feel the absence of guidance and support in academics and in making career choices.

1.4.4 Quality of Higher Education

According to *Kapur (1999)*, the quality of higher education can be assured by an intense drive to convince everyone, students, teachers, educational administrators, politicians, general public that quality of higher education is worse than no education.

Gosai (2004) has suggested that NAAC's policies and practices should be fine tuned to its acting at the local level down to the lowest rung, where challenging complexities have to be faced in uplifting the long-neglected quality of education in a large number of vulnerable rural and semi-urban colleges.

The fact that standards of higher education and research in universities in India have declined during the last few decades is widely recognized, but the fear that there are no signs of improvement is growing. Solutions have been sought mainly at higher levels of funding, particularly for hardware, and in minor administrative changes. According to Shah (2005), any attempt to devalue the social sciences and humanities compared with the physical sciences would be unfortunate.

According to *Abdullah (2006)*, measuring the quality of service in higher education is increasingly important, particularly as fees introduce a more consumerist ethic amongst students. This paper aims to test and compare the relative efficacy of three measuring instruments of service quality within a higher education setting.

According to *Altbach (2010),* India and China aiming to build more sophisticated economies, both countries are giving priority to higher education to produce highly educated personnel and high quality research. China and India will, at the least, not see significant reform in the overall academic quality of higher education. An effective quality-assurance system can help to ensure standards, but neither country has such a system in place currently capable of overall supervision.

According to *Malhotra (2007),* higher education has no more remained a social service to provide to provide quality manpower to the society. The indicators of business behaviour of higher education in India are 1) Changing the logos (like from 'Lead me to Light' to 'Hundred per cent placement'). (ii) Shifting to privatization, (iii) shifting to consumerism, (iii) seeking relationship with productive sectors, (iv) shifting to consumerism, (iv) marketing the course, (v) selling courses at different rates. One of the chief aims of higher education is to search for truth. This requires conducting research works of a high order. It should be an original contribution to the fund of knowledge. But unfortunately, research is suffering both in standard and quality.

Autonomy should be the main criteria of educational institutions. Institutions should be free to create academic atmosphere. Merits alone should be the basis for filling up the teaching posts. Teachers and students should be free in academic matters. It has been argued that without appropriate policy interventions in school education, it would be of little use to have interventions at the higher educational level, which discriminate in favour of girls, SCs and STs (Prakash 2007).

Chaturvedi and Gupta (2009) discuss about the quality of higher education which is to be treated as design feature. For delivering desired level of quality the following things are needed according to them: (i) Create system and structure: Systems include policies, procedures, methods and processes.

Structure encompasses vertical linkages and horizontal linkages. Systems act as software and structure act as hardware. (ii) Develop cultural setting where value is intended to be developed, (iii) Invest fund to sustain quality assurance.

According to Sunder (2010), there is little theoretical or empirical evidence that supports the prospects of success of a for-profit model in building quality higher education.

According to *Vijay (2013),* students' rating of teaching is one of the most widely accepted methods of measuring the quality in Higher Education worldwide. Accordingly, a six point Quality rating system was developed customizing to each sigma values. This study brings a new, innovative student driven Quality rating system for the Higher Education Institutions in India.

According to Kumar (2013), the University Education Report had set goals for development of higher education in the country. Quality can be defined as an outcome, a property, or a process. Therefore it is hardly surprising that the phrase "quality teaching" has been given several definitions because definitions of quality are "stakeholder relative".

The research sample *of Kontic (2014)* consisted of 109 students of a Faculty of Management at one Serbian University. The questionnaire was designed based upon the SERVPERF survey. The factor analysis showed that the modified questionnaire is adequate for assessing the service performance in higher education in Serbia. The main areas for quality improvement for course management teams are suggested.

In 2017, the University Grants Commission (UGC) published a list of over 32,000 "approved journals" on its website, with the meaning that articles published in these listed journals would be considered in recruitments and promotions. UGC had earlier asked universities to recommend journals for the list — an exercise that allowed several poor-quality publications to pass. As objections were raised, the UGC slashed 4,305 journals from the list, bringing the number of approved journals down to 25,784 in Yadav (2018).

Giambona et al (2011) used the PISA 2006 results to analyse students' proficiency in EU countries with regard to two indexes that represent the home background, viz the educational resources available at home and the family background of students.

Certa and Hopps (2015) proposed a structured methodology to evaluate the results of an academic training course addressed to postgraduate students. The evaluation process intended to identify the efficacy of an education course by means of a comparison between the general objectives and the results expected by the students.

According to *Borooah (2018)*, quality is an amorphous concept and two proxies for quality were used in this paper: first total expenditure on education and, second, the proportion of students

studding courses with English as the Mol. As regards expenditure, he argued that there was considerable difference between the social groups.

The note by *Heyneman (2004)* described the distribution of educational quality around the world and point out that even in nations with full enrollment and high educational expenditure the impact of investments varies considerably.

1.4.5 Household Expenditure on Education

Very few studies are available household expenditure on education specifically in higher education.

Tilak (1991) found that family expenditures on education are sizeable. Family and government investment in education are positively correlated, and they complement each other; they are also elastic to the size of respective total budgets. Among the determinants of household expenditures, household characteristics- particularly household income and the educational level of the head of the household – are found to be important.

Another study by *Tilak (2002)*, very important finding is that if the government wishes to mobilise household finance for education it is important that the govt. increase its own allocation to education considerably.

Another study by *Tilak (2009)*, average household expenditure of the top expenditure group on education is 6.1 times the expenditure of the bottom quintile.

A Study by *Rao (2014)*, examine that household expenditure in all levels of education shows, tuition fees forms the highest proportion and highly increased over the period of time.

Saha (2013) observed that significant gender disparity exists in intra-household educational expenses and that this discrimination is not confined to the backward and developing states in India.

Sarkar (2017) reveals that the parental education and household income play pivotal role in determining households' educational expenditure.

Another study by *Chandrasekhar et al*, *(2016)* analyse data from two recent NSSO surveys to provide estimates of expenditure on higher education and loans availed for higher education. Expenditure on higher education to total household expenditure is 15.3 per cent and 18.4 per cent for rural and urban area.

Tansel and Bircan (2006) gave an overview of private tutoring centers. They also examined the determinants of private tutoring expenditures in Turkey using the results of the 1994 Household Expenditure Survey.

1.4.6 Policy Issues in Higher Education

According to *Kumar (2013),* the participation of private parties in higher education in India dates back to the days of the British Raj. However, after Independence, the ability of the private sector to provide the infrastructure necessary for development was doubtful and so the government took higher education into its own hands although a good number of educational institutions, known for philanthropy and quality education were established by private parties.

According to *Agarwal (2006)* and *Tilak (2008)*, till the 1980s, the government not only supported higher education and its expansion but also extended helping hands to run the institutions set up by the private sector. After the 1980s, the country witnessed a profusion of private professional education in the name of meeting the prevalent unmet demand of business and industry. The economic crisis towards the end of the 1980s and subsequent adoption of the New Economic Policy (NEP), characterised by liberalisation, privatisation and globalisation in 1991 added to the impetus for the private sector to view higher education as a potential venture. The NEP paradigm still continues to guide policy making in India and the NMC can be seen as a mere reflection of that paradigm.

Full autonomy of all kinds – financial, administrative and academic – are recommended for new institutions engaging the corporate sector to offer world-class education. Accordinng to *Pathak* (2014), autonomy, a double-edged sword, may either encourage excellence or lead to the proliferation of substandard but expensive education.

This expansion of higher education is not equally felt in all regions of the country. According to *Sinha (2018)*, massification hypothesis needs much deeper analysis especially as such a transition must necessarily transform the educational system towards catering to skill development and vocationalisation. This dimension is very weak in India.

According to *Khare (2018),* sustainable employability has three elements – ability to gain initial employment but of a desired quality and matching with individuals education level; ability to sustain in today's stressful highly competitive labour market, make transitions within or outside organization; and ability to rise higher in career. The higher education system is expected to mould itself quickly in the above framework to act as a single window service provider for employability.

According to *Gurukkal (2018),* it is extremely important to analyze the socio-economic factors contributing to low GER as well as the poor quality with a view to expose the political economy of the legislative remedy in general. The main cause of low GER in not the insufficiency of the number of institutions and their low quality as often made out, although they are the problems. The central cause of low GER and poor quality of higher education is socio-economic.

Awasthi and Bhat (2016) test returns to higher education in rural areas, correlating it with agricultural productivity. The results show a steep rise in returns to higher education after the higher secondary level. The corresponding policy implications are also discussed.

Badsant and Sen (2014) explores the role of socio-religious affiliations in determining participation in higher education in India, and whether the importance of these affiliations changes over time. According to them Eligibility seems to be the key factor in participation, and a better understanding of the constraints on school education is critical if participation in higher education is to be increased.

Kapur and Mehta (2017) touch upon several points, such as democratic goals of mobility and stability, training for varied and unpredictable labour markets, India's demographic bulge, as well as trust and governance crises across the board.

According to *Witenstein (2017),* whether the affiliated system of colleges by Univerity remains or greatly changes, their inputs and daily knowledge can greatly affect what is known about quality and how it is implemented.

According to *Bairagya (2018)*, one of the reasons for higher unemployment among the educated is that the educated are not willing to join in low-grade informal jobs, but at the same time, sufficient regular salaried jobs are also not available for them. Both educated and uneducated individuals with vocational training (formal or informal) are more likely to find jobs. Besides promoting skills through technical and vocational education, creation of jobs through enhancing capital formation is important to reduce both educated and uneducated unemployment.

According to *Bhushan (2013),* Twelfth Plan has chosen an approach to promoting private capital in a manner that will allow profit generation. It has not considered the alternate path of garnering resources through the NEFC. On the positive side, the decentralisation implicit in the state higher education plan may be a better option, provided a fund sharing formula is weighed heavily in favour of the centre for the next two five-year-plans.

According to *Deshpande (2016),* even if the Draft NEP 2016 is treated as the authorised version of the government's stance, there is too much uncertainty associated with this process and it is likely that the ultimate shape of policy

According to *Niranjana (2013)*, there is a widening gap between the growing knowledge resources in the world and the conceptual universe of the students. The gap can be bridged not through marginalising local languages in favour of English but by strengthening Indian language resources. Such strengthening would have a dual purpose: it would help the student enter new domains of knowledge through a familiar medium, and it would eventually lead to the domains themselves becoming more context-sensitive.

Robinson et al (2016) examined the caste, class, gender, religion and region-based determinants of students' disciplinary choices of all students who took admission into the university's postgraduate programmes in 2013, and analysed these against academic achievements measured by semester-wise examination outcomes. By correlating marks and grades, the study examined the efficacy of grading systems to evaluate students fairly.

According to *Tilak (2012)*, many of the recent initiatives in policy reforms mark a transition in the history of higher education in independent India – from a system embedded in welfare statism to a system partially based on quasi-market principles and finally to a system based on a neo-liberal market philosophy. Sadly, the transition seems to be complete and dangerously irreversible.

Tilak (2013) focuses on this aspect of development of higher education, and examines its real effects on access, quality, equity and funding, and attempts to draw a comparative picture among the BRIC member-countries.

According to *Tilak (2014),* an education bazaar, no matter how big, is no substitute for a public higher education system. A strong, vibrant, high-quality public higher education system, accessible to all, is the solution to many of the ills plaguing the country. Along with this, a philanthropy-based private education ought to be encouraged.

According to *Pathak (2014)*, the NMC recommendations might serve the purpose of achieving expansion in absolute terms but it does not give serious consideration to the other two objectives. The second objective – equity – cannot be achieved with rising cost of education and relaxations in reservations for disadvantaged groups. It is well accepted that mere provision of a few scholarships and education loans cannot address the issue of equity in access to higher education.

Thakur (2016) inferred that governments are in a haste to privatise the public higher education system under pressure from the private sector and the WTO. By imposing "reforms" through the FYUP and CBCS, the governments are adopting a centralised topdown approach rather than bottom-up approach in initiating the reforms.

According to *Agarwal (2006)*, for the greater acceptability of the Indian graduates in the global labour markets, standards of Indian higher education have to be benchmarked with the global standards. This would give the Indians and India a distinctive competitive edge and public policy needs to be geared to this.

According to *Krishnan (2016),* higher education cannot remain a rarefied realm of higher thinking unconcerned with employability and innovation. If a university is a site for building the values of citizenship and raising the stakes for participation in the country's future, it has to nurture critical thinking, employable skills and creative entrepreneurship all at the same time. A higher education

system that feeds India's much touted knowledge economy cannot rest on facile splits and policy-induced chasms.

Brown and Park (2002) analyzed household and school survey data from poor counties in six Chinese provinces to examine the effects of poverty, intra-household decision-making, and school quality on educational investments (enrollment decisions) and learning outcomes (test scores and grade promotion).

Moenjak and Worswick (2003) added new evidence to the debate on the relative benefits of upper secondary vocational education and of general education at the same level. Using a probit model, the study finds that an individual from a well-to-do family is more likely to undertake vocational education.

The results of the paper by Abbott and Doucouliagos (2003) showed that regardless of the output–input mix, Australian universities as a whole recorded high levels of efficiency relative to each other.

Neuman and Ziderman (2003) examined the efficacy of vocational education in raising the wage levels of four such groups: recent immigrants, Jews of Eastern origin, Israeli Arabs and females.

Self and Grabowski (2004) examined the impact of education on income growth in India for the time period 1966–1996. Time series techniques are used to determine whether education, for each category of education namely primary, secondary, and tertiary, has a causal impact on growth. Furthermore, the education variables were also broken down by gender and analysis was carried out to determine whether the causal results varied by gender.

Peet et al (2015) used 61 nationally representative household surveys from 25 developing countries between 1985 and 2012 to assess whether returns to education are systematically higher in developing countries. They found no evidence of systematic "excess returns" in developing countries, and estimated an average return to schooling in the represented countries of 7.6%.

1.5 Research Gap

India has the second largest higher education system in the world. Although the Indian higher education has already entered a stage of massification, the Gross Enrolment Ratio in higher education remains low at 23.6 percent in 2014-15. The 12th Plan Document has fixed targets of 25.2 GER by 2017-18 and 30 GER by 2020-21. As per All India Survey on Higher Education (AISHE) 2017-18, the Gross Enrolment Ratio (GER) in higher education has increased from 24.5 in 2015-16 to 25.8 in 2017-18.

It need not mention that the province of Bengal, undivided till 1947, and then the state of West Bengal, had played a leading role in the country in spreading education at all levels, beginning with mass education and culminating in higher, professional and specialised education. However, West Bengal lags behind other states in terms of different parameters of higher education. There is lack of studies on the different issues and the current status of higher education in West Bengal. The present study attempts to highlight those issues. The major aim of the project is to assess the status of higher education in West Bengal in terms of cost, quality, efficiency and equity.

1.6 Conclusion

In this Chapter we have presented the background of the study. We have presented growth of higher education institutes in West Bengal in comparison to India. We have presented different policy recommendations in higher education sector in India. We have given brief literature review in the context of different issues relevant to our present study. The literature survey has been presented by five sub themes – public expenditure on higher education, efficiency, equity, quality and policy issues. Research gap has also been given in this Chapter.

Chapter-1: Appendix

Table A1.1: State-wise and Caste-wise Number of Teachers in India (2017-18)

	Name of the state	SC	ST	OBC	Muslim	Other minority community	Total
1	Andaman and Nicobar Islands	3.3	4.9	22.7	5.5	16.7	366
2	Andhra Pradesh	13.5	1.6	35.7	4.7	4.3	90239
3	Arunachal Pradesh	4.0	44.6	12.4	2.7	43.6	1113
4	Assam	5.9	10.9	24.0	13.0	2.3	19728
5	Bihar	3.9	0.6	34.3	9.0	1.2	22651
6	Chandigarh	7.6	0.6	5.2	0.6	24.7	3402
7	Chhattisgarh	8.4	6.3	26.9	2.8	7.5	19640
8	Dadra and Nagar Haveli	3.9	5.9	14.1	2.9	10.2	205
9	Daman and Diu	9.4	2.7	17.5	1.3	2.7	223
10	Delhi	8.9	2.4	9.6	6.9	6.8	17513
11	Goa	1.0	1.7	8.4	2.2	26.8	2889
12	Gujarat	5.6	4.7	18.6	2.8	3.5	54263
13	Haryana	5.9	0.1	11.0	1.4	4.3	31072
14	Himachal Pradesh	8.3	3.4	5.8	0.7	3.9	10159
15	Jammu and Kashmir	4.3	3.6	3.0	56.7	5.7	9773
16	Jharkhand	4.1	9.0	26.7	6.6	8.1	11633
17	Karnataka	8.1	2.0	36.1	5.8	8.2	120128
18	Kerala	3.5	0.2	37.4	12.0	32.9	55277
19	Lakshadweep	17.8	42.2	37.8	71.1	0.0	45
20	Madhya Pradesh	6.3	2.2	21.4	4.4	5.2	54497
21	Maharashtra	11.0	1.4	22.3	4.8	7.3	152602
22	Manipur	5.7	10.9	15.1	2.2	13.7	3400
23	Meghalaya	2.0	67.2	3.6	2.7	67.7	2804
24	Mizoram	2.5	81.8	5.1	0.9	82.7	1733
25	Nagaland	1.7	79.9	4.0	1.2	83.9	2267
26	Odisha	4.3	2.3	13.6	1.0	1.2	36481
27	Puducherry	11.5	0.8	56.8	2.3	10.6	5413
28	Punjab	6.6	0.1	4.9	0.8	52.6	46284
29	Rajasthan	7.8	3.2	28.8	2.7	3.4	60045
30	Sikkim	4.1	23.2	23.9	1.9	25.3	1483
31	Tamil Nadu	10.6	0.2	72.2	2.9	12.8	192300
32	Telangana	10.8	3.4	44.3	8.4	3.5	74350
33	Tripura	13.5	14.8	10.8	1.1	6.4	2450
34	Uttarakhand	6.5	0.7	10.8	3.0	2.4	15770
35	Uttar Pradesh	7.9	0.2	26.2	6.1	2.2	107425
36	West Bengal	10.4	1.2	8.7	7.7	1.1	55152
37	All India	8.6	2.3	32.3	5.3	9.4	1284775

Source: AISHE, 2016-17,

Table A1.2: Universities / University level Institutions in West Bengal (2016-17)

Sl. No	Institutes	Address	Establishment	Location	Type
1	Adamas University	Kolkata	2014	Rural	State Private University
2	Aliah University	Kolkata	1880	Urban	State Public University
3	Amity University	Kolkata	2015	Rural	State Private University
4	Bankura University	Bankura	2014	Rural	State Public University
5	Bidhan Chandra Krishi Vishwavidyalaya	Nadia	1960	Rural	State Public University
6	Brainware University	Barasat	2016	Rural	State Private University
7	Cooch Behar Panchanan Barma University	Cooch Behar	2012	Rural	State Public University
8	Diamond Harbour Women's University	Sarisha	2012	Rural	State Public University
9	Indian Institute of Engineering Science and Technology	Shibpur	1856	Urban	Institute Of National Importance
10	Indian Institute of Science Education and Research	Kolkata	2006	Urban	Institute Of National Importance
11	Indian Institute of Technology	Kaharagpur	1951	Rural	Institute Of National Importance
12	Indian Statistical Institute	Kolkata	1931	Urban	Institute Of National Importance
13	Jadavpur University	Jadavpur	1905	Urban	State Public University
14	JIS University	North 24 Paraganas	2014	Rural	State Private University
15	Kazi Nazrul University	Asansol	2012	Urban	State Public University
16	Maulana Abul Kalam Azad University of Technology	Kolkata	2000	Urban	State Public University
17	National Institute of Pharmaceutical Education and Research	Kolkata	2007	Urban	Institute Of National Importance
18	National Institute of Technology	Durgapur	1960	Urban	Institute Of National Importance
19	Netaji Subhash Open University	Kolkata	2002	Urban	State Open University
20	Presidency University	Kolkata	1817	Urban	State Public University
21	Rabindra Bharati University	Kolkata	1962	Urban	State Public University
22	Raiganj University	Raiganj	2014	Rural	State Public University
23	Ramakrishna Mission Vivekananda Educational and Research Institute	Belur	2005	Urban	Deemed University-Private
24	Seacom Skills University	Birbhum, Kolkata	2014	Rural	State Private University
25	Sidho-Kanho Birsa University	Purulia	2010	Urban	State Public University
26	Techno India University	Kolkata	2012	Urban	State Private University
27	The Neotia University	Sarisha	2015	Rural	State Private University
28	The West Bengal National	Kolkata	2004	Urban	State Public University

	University of Juridical Sciences				
29	The West Bengal University of Health Sciences	Kolkata	2002	Urban	State Public University
30	The West Bengal University of Tearchers Training, Education Planning and Administration	Kolkata	2015	Urban	State Public University
31	University of Burdwan	Barddhaman	1960	Rural	State Public University
32	University of Calcutta	Kolkata	1857	Urban	State Public University
33	University of Engineering and Management	Kolkata	2015	Urban	State Private University
34	University of Gour Banga	Malda	2008	Rural	State Public University
35	University of Kalyani	Nadia	1960	Rural	State Public University
36	University of North Bengal,	Darjiling	1962	Rural	State Public University
37	Uttar Banga Krishi Viswavidyalaya	Cooch Behar	2001	Rural	State Public University
38	Vidya Sagar University	Midnapore	1981	Rural	State Public University
39	Visva Bharati	Shantiniketan	1921	Rural	Central University
40	West Bengal State University	Kolkata	2008	Urban	State Public University
41	West Bengal University of Animal and Fishery Sciences	Kolkata	1995	Urban	State Public University

Source: AISHE, 2016-17

Chapter 2

Objectives, Methodology and Data Source

2.1 Objectives of the Study

The main objectives of the present project are to find cost, efficiency and quality of the higher education in West Bengal. The detailed objectives are as follows:

(i) Assessing the public expenditure pattern on higher education in West Bengal and testing whether there is any relation on the expenditure on higher education in the state with its State Domestic Product (SDP).

(ii) Estimating the household expenditure pattern on higher education and finding the determinants of it.

(iii) To assess the efficiency of higher education institutions and identifying the factors affecting efficiency of the institutions and suggesting ways how the efficiency could be improved.

(iv) Assessing different disparities and inequalities in higher education in West Bengal in terms of access and equity like regional imbalances and social disparities. State-wise differences for the different parameters of higher education will be also assessed.

(v) Assessing nature of participation in higher education for different social and economic classes. Assessing for the drop-out of students in higher education with focus on tribal and minority students and also poor in the backward zones of West Bengal.

(vi) To assess the quality of higher education in West Bengal and identifying the problem areas in maintaining the quality. The quality of higher education will be assessed through the feedback from students, teachers and community. The performance of the students in examinations will also be assessed.

(vii) Assessing the other dimensiosns of higher education like - current scenario in distance learning in West Bengal, of innovative practices like using ICT in higher education, status of the vocational courses and scope of vocational education in new fields, participation of students in co-curricular activities etc.

(viii) A case study on one particular university i.e. Vidyasagar University will be made on different academic and financial aspects of it.

2.2 Methodology

We have used different methodologies including graphs, charts, keeping in mind the objectives of the study. Some of the methodologies used for analysis are given below.

2.2.1 Public Expenditure on Higher Education

In Chapter 4 we have analysed public expenditure on higher education in West Bengal. According to Wagner's Law, public expenditure is functionally related to economic growth captured by SDP. We have estimated regression model of logarithm of expenditures on higher education (log BHE) on the logarithms of SDP (log SDP). Here we have tried to find the relationship between public expenditure on higher education and state domestic product in West Bengal using the data of 37 years.

We have employed time series analysis to see the relationship between higher education expenditure, and NSDP in West Bengal over time. The methodology employed in this study is time series analysis which involves first performing unit root test before running the main model of Granger Causality Tests and VAR.

2.2.2 Efficiency of Higher Education Institutes

We want to do efficiency and performance analysis of the higher education institutes. In Chapter 5 we have analyzed efficiency of higher education institutions in West Bengal. We have used DEA for judging the efficiency of the colleges under Vidyasagar University, West Bengal, India. DEA is a linear programming technique initially developed by Charnes, Cooper and Rhodes (1978) to evaluate the efficiency of public sector non-profit organizations (Coelli 1996).It is a non-parametric approach that involves the use of linear programming methods to construct a non-parametric frontier and to evaluate the relative Input-Output efficiency of a Decision Making Unit (DMU). For the implementation of DEA, we need to define some inputs and outputs. Following the literature on the measurement of efficiency of higher education institutes (HEIs) we have selected inputs and outputs. Depepending upon the availability of data we have selected different inputs and outputs.

For our efficiency study of colleges in West Bengal, we have here considered three inputs – (i) Full time teachers and student ratio (FTSR) (ii) Part time teachers and student ratio (PTSR): (iii) Non-teaching staff and student ratio (NTSR): As regards to outputs of colleges, we have considered five outputs: (i) Average marks attained by passed honours students of all courses in the final examination (MARKS): (ii) Number of first class (above 60% in aggregate) achieved by honours students (1CLASS), (iii) Percentage of honours students passed in the final examination in relation to intake capacity (PERCENTP) and (iv) Number of Departments in the college (DEPT). For the

calculation of efficiencies of the Universities, we have considered three inputs – For the implementation of DEA, we need to define some inputs and outputs.

Depending upon availability of data, for our efficiency study of Universitites in West Bengal, we have here considered three inputs – (i) Unit cost of education with salary (*UCS*), (ii) Permanent Full time teachers and student ratio (*TSR*): Ratio of full time teachers and total enrolment of the university, (iii) Support staff and student ratio (*SSSR*): Ratio of non teaching staff and enrolment. These inputs work as the main resources required for the normal performance of universities. As regards to outputs of universities, we have considered three outputs: (i) NAAC Assessment Score (*NAAC*). (ii) The total number of students enrolled (*Students*). (iii) Total number of current programmes going on in the university (*Programme*).

2.2.3 Equity in Higher Education

In Chapter 6 we have analysed equity issues in higher education in West Bengal. A primary survey has been conducted on about three thousand students across different regions belonging to different income classes, castes and religions in West Bengal on the issue of participation in higher education. Particularly we are interested whether the students from economically backward communities are getting opportunities in different courses.

We have estimated the following regression equation to find the determinants of gross enrolment ratio across different states in India.

$GER_i = a + b_1\ HEIL_i + b_2 EXPTECH_i + b_3 EXPVOC_i + u_i$

GER_i = Gross enrolment ratio of the state

$EXPTECH_i$ = Expenditure per household in the state on technical education

$EXPVOC_i$ = Expenditure per household in the state on vocational education

2.2.4 Quality of Higher Education

For the quality analysis of higher education in West Bengal, we have used secondary data and primary data. For the secondary data, we have used NAAC data and NIRF data. A primary survey has been conducted on about three thousand students across different regions belonging to different income classes, castes and religions in West Bengal on the issue of participation in higher education. We have used the ordered logit model (Hill, Griffith, Lim 2008) for the analysis of the performance of the institutes in NAAC Assessment. In Chapter 7 we have analysed quality of higher education in West Bengal the main objective of this section is to find the determinants of the different grades of colleges as assessed by NAAC. We have collected the data for grades of our sample 191 colleges in West Bengal assessed during the period 2016-17. Here the dependent variable is ordered into three

categories namely high grade (getting A++.A+ and A grad), medium grade (getting B++ and B+ grade) and low grade (B and C grade). The dependent variable grade is treated as an ordered variable with 3 representing high grade, 2 representing medium grade and 1 representing low grade.

By using NIRF 2018 data, we calculate number of colleges and universities in top 100 for respective states in India. Using cluster analysis on the above state-wise data we prepared a dendogram by using SPSS statistical package (SPSS-16).

To facilitate this study, questionnaire was prepared by covering three important elements of the academic status with specific focus on education at the bachelor degree level. The three elements consist of (i) Teaching and Evaluation Method adopted in the college (ii) Effectiveness of the Teaching Faculty, which indicates the intellectual capital of the college (iii) Availability of Resources. The questionnaires consist 34 items with five response options (1-5 scale) with a statement in ascending order: 1= Very Bad; 2= Bad; 3= Moderate; 4= Good; 5=Very Good. The questionnaire contains 34 variables related to: 1.Teaching and Evaluation Method, 2.Effectiveness of the Teaching Faculty and 3.Availability of Resources. We have used six sigma analysis and principal component analysis to analyse the quality of higher education as perceived by the students.

Six Sigma Analysis: We have used six sigma analysis to assess the quality of higher education in West Bengal from the perception data of the students. The six sigma scale is universal measure of the performance of any business or organisation. Higher sigma score indicates batter performance or more precise result. In other words, if the output is defective sixty-nine percent of the time, it implies that performance is one Sigma compliant. On the other hand if it is defective thirty-one percent of the time, it means that the performance is demonstrating two sigma compliance.

Prinncipal Component Analysis: The quality of the higher education in is affected by many factors. We may consider 34 variables in judging the quality of the higher education. The data have been collected on 1-5 scale on all the variables. The Principal Component Analysis (Myers 2006) has been used to identify the main factors in quality of higher education in West Bengal.

2.2.5 Household Expenditure on Higher Education

We have analysed household expenditure on higher education using regression analysis. We have used the following variables as determinants of household expenditure.

- Per Capita Household Income (Annual)
- Income Class (APL = 1, BPL = 0)

- Major Source of Income of the Household (Agriculture, Non Agricultural Labour, Business
- Permanent job of the head of the household (Yes = 1, No= 0)
- Caste of the household GEN (GEN =1, Others= 0)
- Religion of the household (Hindu = 1, Others = 0)
- Education level of household's head (schooling Years)
- Region (Urban = 1, Rural =0)
- Gender (Female = 1, Male = 0)
- Level of study (UG=1, PG=0)
- Type of education the student pursuing(Professional= 1, General = 0)
- Marks obtained at previous level (% of marks obtained at HS or UG)
- Private Tuition (Yes = 1, No=0)
- Distance between institute to home (Kms.)
- Scholarship received by the student (Yes = 1, No= 0)
- Family size (Number of family members)

2.3 Data Source

The present research project is based on the primary and also the secondary data.

2.3.1 Secondary Data Source

The secondary data on public expenditure (plan and non plan, revenue and capital) have been collected from various reports of Goverment of India and Goverment of West Bengal. The data on enrolment pattern, teaching learning process, financing pattern, research projects and their outputs has been collected from reports of AISHE, NAAC reports, Web sites of different universities and colleges in West Bengal. We have collected data from other states for comparison with West Bengal. The secondary data sources are as follows.

1. All India Survey of Higher Education (AISHE), MHRD, GOI, http://aishe.nic.in/aishe/home,
2. Department of Higher Education, Government of West Bengal
3. Reports of NSSO, CSO, MOSPI
4. Websites of different universities and colleges
5. Economic review, Government of West Bengal
6. UGC Annual Report, Various years
7. Government of West Bengal, District Statistical Handbook
8. Website of NAAC

2.3.2 Primary Survey

In the previous sub section we have given various secondary sources from which we have collected data. As for the primary data, our sample consist of a total number of 3,135 undergraduate and post graduate students selected from the urban and rural areas scattered over four districts namely Purulia, Paschim Medinipur, Purba Medinipur and Kolkata. We have selected some subjects and have collected primary data from students studying different subjects on different items relating to cost, equity and quality of higher education. A major part of the primary data have been collected from the students studying in backward areas of West Bengal. The details of the primary survey have been presented in Chapter 7.

2.4 Conclusion

In this chapter we have presented objectives of the present study, methodologies used in the study and the data source for the study. We have used methodologies according to our objectives. We have used both primary data and secondary data for the present study. A brief outline of the methodologies used in different chapters is also given here. The data sources for the present work have been given in this chapter.

Chapter 3

Primary Survey: Study Area and Characteristics of the Households of the Students Surveyed

3.1 Location of Surveyed Colleges

We have carried our primary survey on the 3135 students of eighteen colleges from four districts in West Bengal. Out of eighteen colleges surveyed, nine colleges belong to Paschim Medinipur district, four colleges belong to Purba Medinipur, three colleges belong to Purulia, one college belong to Jhargram and one college belong to Kolkata. We also made survey on some students (378 Nos) continuing PG Studies in Vidyasagar University on their perception about UG Studies in colleges. Out of these eighteen colleges, fourteen colleges are government aided colleges, one is Government College and three colleges are private colleges. The surveyed institutions with their affiliations and locations are given in Table 3.1.

Table 3.1: Location of the Institutions under Survey

Sl. No	Institution	Under University	District	Location	Institutions type	Establishment Year
1	Arsha College	SKBU	Purulia	Rural	Govt. Aided	2009
2	Bandwan Mahavidyalaya	SKBU	Purulia	Rural	Govt. Aided	2010
3	Belda College	Vidyasagar University	Paschim Medinipur	Rural	Govt. Aided	1963
4	Bhattar College	Vidyasagar University	Paschim Medinipur	Rural	Govt. Aided	1963
5	Eastern Institute for Integrated Learning in Management (ELLIM)	Vidyasagar University	Kolkata	Urban	Private	1995
6	Haldia Management College	West Bengal University of Technology	Purba Medinipur	Urban	Private	1996
7	Hijli College	Vidyasagar University	Paschim Medinipur	Rural	Govt. Aided	1995
8	J.K. College	SKBU	Purulia	Urban	Govt. Aided	1948
9	Jhargram Raj College	Vidyasagar University	Paschim Medinipur	Urban	Govt.	1949
10	Khejuri College	Vidyasagar University	Purba Medinipur	Rural	Govt. Aided	1999
11	Midnapore College	Autonomus	Paschim Medinipur	Urban	Govt. Aided	1873

12	Midnapore Law College	Vidyasagar University	Paschim Medinipur	Urban	Private	2002
13	Panskura Banamali college	Autonomus	Purba Medinipur	Urban	Govt. Aided	1960
14	Prabhat Kumar College	Vidyasagar University	Purba Medinipur	Urban	Govt. Aided	1926
15	Raja Narendra Lal Khan Women's College	Vidyasagar University	Paschim Medinipur	Urban	Govt. Aided	1957
16	Santal Bidroha Sardha Satabarsiki Mahavidyalaya	Vidyasagar University	Paschim Medinipur	Rural	Govt. Aided	2005
17	Subarnarekha Mahavidyalaya	Vidyasagar University	Paschim Medinipur	Rural	Govt. Aided	1988
18	Sukumar Sengupta Mahavidyalaya	Vidyasagar University	Paschim Medinipur	Rural	Govt. Aided	2004
19	Vidyasagar University	-	Paschim Medinipur		State Public University	1981

Source: Primary Survey
(SKBU: Sidho-Kanho Birsa University)

3.2 Course Wise Surveyed Students

We have conducted primary survey on total of 3,135 students from various colleges and universities as mentioned in Table 3.2. Out of this total number of students, 1242 students were boys and 1893 students were girls. The course-wise and gender-wise distribution of the sample students is given in Table 3.2. Surveyed students consist of 2712 nos. from general degree course. Out of these 989 were male students and 1723 were female students. In professional course 423 numbers of students were surveyed. Out of these, 253 were male students and 170 were female students. The total students from Arts faculty and Science faculty are 1733 and 905 respectively. Within Arts faculty, 584 are male students and 1149 are female students. Within Science faculty, 343 are male students and 562 are female students. In our survey, the number of male students is less than female students in general course but female students are less than male students in professional course.

Table 3.2: Course-wise Distribution of Surveyed Students

	Female	**Male**	**Grand Total**
General	**1723**	**989**	**2712**
PG	**232**	**146**	**378**
M.A	180	110	290
M.SC	52	36	88
UG	**1491**	**843**	**2334**
B.A	969	474	1443
B.com		10	10
B.Sc	510	307	817
BCA	12	52	64

Professional	**170**	**253**	**423**
PG	**83**	**183**	**266**
Management	83	183	266
UG	**87**	**70**	**157**
Law	28	32	60
Management	59	38	97
Grand Total	**1893**	**1242**	**3135**

Source: Primary Survey

3.3 Subject-wise and Level-wise Distribution of Surveyed Students

Subject-wise distribution of students is presented in Table 3.3. The number of students participated in the primary survey for different subjects are as follows : Bengali– 608, Education- 53, English-357, Geography-181, History-117, Philosophy-199, Political Science-2, Sanskrit-182, Santali-100, Sociology-70, Anthopology-68, Aquaculture-27, Botany-112, Chemistry-129, Computer Application-66, Computer Science-46, Mathematics-122, Nutrition-100, Physics-102, Zoology-18, Accountancy-10, Physiology-43, Law- 60, Management- 363. In most of the general degree course subjects, number of surveyed male students is less than surveyed female students except Education, Santali, Aquaculture, Chemistry and Physics.

Table 3.3: Subject and Gender-wise Distribution of Students

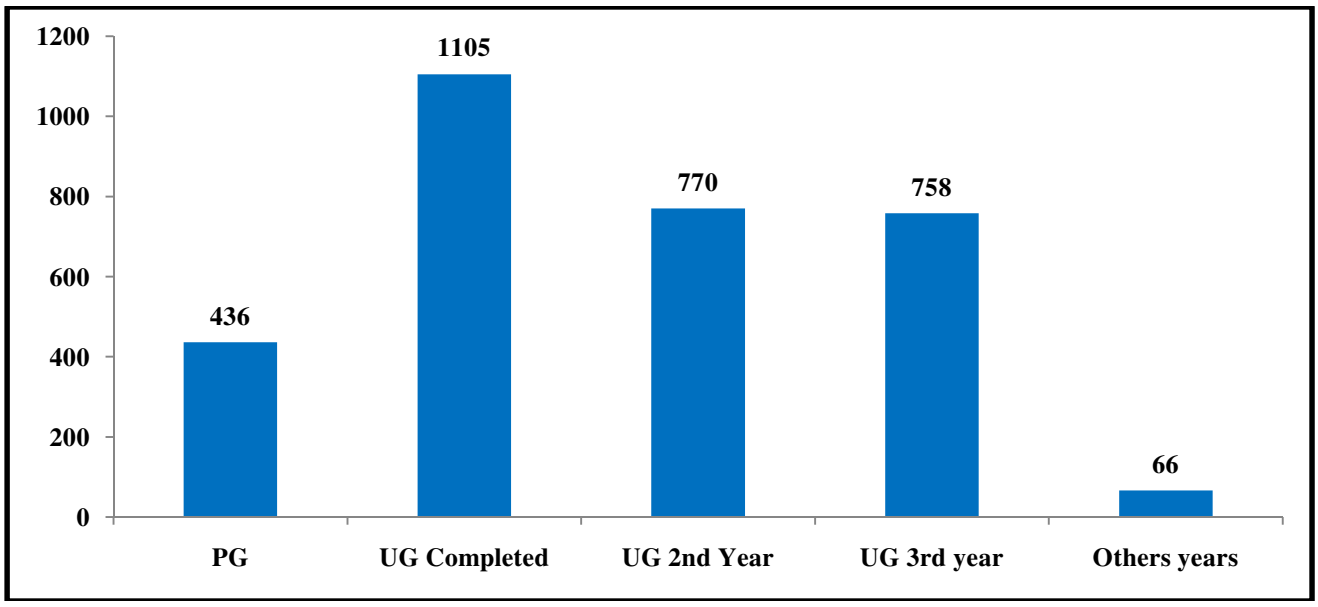
	Female	**Male**	**Grand Total**
Arts	**1149**	**584**	**1733**
Bengali	430	178	608
Education	21	32	53
English	266	91	357
Geography	135	46	181
History	70	47	117
Philosophy	134	65	199
Political Science		2	2
Sanskrit	127	55	182
Santali	42	58	100
Sociology	41	29	70
BCA	**14**	**52**	**66**
Computer Application	14	52	66
Commerce		**10**	**10**
Accountency		10	10
Law	**28**	**32**	**60**
LLB (H)	28	32	60
Management	**142**	**221**	**363**
BBA	10	12	22
BBM	10	3	13

BHM	37	15	52
BMS	2	8	10
MBA	83	183	266
Science	**562**	**343**	**905**
Anthropology	46	22	68
Aquaculture	11	16	27
Botany	87	25	112
Chemistry	49	80	129
Computer Science	10	36	46
Mathematics	82	40	122
Nutrition	80	20	100
Physics	37	65	102
Physiology	33	10	43
Zoology	8	10	18
Grand Total	**1893**	**1242**	**3135**

Source: Primary Survey

The stage-wise distribution of surveyed students as presented in Fig. 3.1 is as follows: UG 2nd year - 770, UG 3rd Year - 758, UG Completed- 1105.PG – 436, Others years-66.

Fig. 3.1: Education Level-wise Number of Students Surveyed



Source: Primary Survey

3.4 Institutions-wise Distribution of Surveyed Students

The gender-wise distribution of surveyed students in different colleges has been presented in Table 3.4. Out of total 3135 students, number of male students is 1242 and number of female students is 1893. Only one college is a Girls' college namely Raja N L Khan Womens' College.

Table 3.4: Institutions-wise Distribution of Surveyed Students

Sl.No	Institutions	Female	Male	Grand Total
1	Arsha College	42	38	80
2	Bandwan Mahavidalaya	63	56	119
3	Belda College	14	39	53
4	Bhatter college	34	43	77
5	Haldia Management College	59	38	97
6	Hijli College	18	21	39
7	J K College	43	39	82
8	Midnapore College	54	86	140
9	Midnapore Law College	28	32	60
10	Panskura Banamali college	44	48	92
11	Khejuri College	94	63	157
12	Jhargram Raj College	15	19	34
13	ELLIM	71	169	240
14	Prabhat Kumar College	99	64	163
15	Raja N L Khan Women's college	609	0	609
16	Subarnarekha Mahavidyalaya	73	77	150
17	Santal Bidroha Sardha Satabarsiki Mahavidyalaya	45	27	72
18	Sukumar Sengupta Mahavidyalaya	43	24	67
19	Vidyasagar University	244	160	404
20	Others Institutions	201	199	400
	Grand Total	1893	1242	3135

Source: Primary Survey

3.5 Information about Surveyed Colleges

We have presented selectd information of surveyed colleges in Table 3.5. Out of 18 colleges surveyed, one college is womens' college and others are co-ed colleges. The information about colleges contain area, number of Departments, number of teachers. The area of the colleges varies from 5.1 acres to 46.82 acres. The number of department varies from 7 to 22 in survey colleges. Number of teachers varies from 12 to 90. Bandwan Mahavidyalaya, Arsha College are situated backward region in Purulia. In Arsha College out of 21 teachers, there was only one permanent teacher and Badwan Mahavidyala, there were three permanent teachers.

Table 3.5: Information about Surveyed Colleges

	Institution	Area (in acres)	Number of Departments	Number of teachers (Permanent and Part time)		
				Male	Female	Total
1	Arsha College	11.47	12	18	3	21
2	Bandwan Mahavidyalaya	5.10	7	11	1	12
3	Bhatter College	10.00	16	44	15	59
4	Hijli College	10.36	17	49	19	68
5	J.K.College	22.00	19	45	14	59
6	Khejuri College	20.23	14	28	17	45
7	Prabhat Kumar College	17.86	22	71	19	90
8	Raja Narendra Lal Khan Women's College	46.82	22	38	52	90
9	Santal Bidroha Sardha Satabarsiki Mahavidyalaya	2.00	17	37	23	60
10	Subarnarekha Mahavidyalaya	1.62	12	34	6	40
11	Sukumar Sengupta Mahavidyalaya	5.00	16	37	18	55

Source: AISHE, 2014-15

Enrolment pattern in some surveyed colleges (11 out of 18) is presented in Table 3.6 with maximum enrolment of surveyed college in Pravat Kumar College (5344) followed by Khejuri College (5107) and minimum in Bandwan Mahavidyala (827) followed by Arsha College (1121). Four colleges (Arsha College, Bandwan Mahavidyalaya, Subarnarekha Mahavidyalaya and Sukumar Sengupta Mahavidyalaya) have no hostels facilities and the intake capacity of the hostel varies from 44 to 434.

Table 3.6: Enrolment and Hostel Facilities in Surveyed Colleges

		Enrolment			Number of Hostel	
	Institution	Male	Female	Total	Number	Intake Capacity
1	Arsha College	817	304	1121	0	0
2	Bandwan Mahavidyalaya	446	381	827	0	0
3	Bhatter College	1360	1425	2785	2	90
4	Hijli College	708	428	1136	2	50
5	J.K.College	1516	721	2237	2	104
6	Khejuri College	2577	2530	5107	1	100
7	Prabhat Kumar College	3109	2235	5344	2	300
8	Raja Narendra Lal Khan Women's College		3156	3156	6	434
9	Santal Bidroha Sardha Satabarsiki Mahavidyalaya	1572	1155	2727	1	44
10	Subarnarekha Mahavidyalaya	1385	1433	2818	0	0
11	Sukumar Sengupta Mahavidyalaya	1967	1659	3626	0	0

Source: AISHE, 2014-15

3.6 Characteristics of the Households of Students Surveyed

As reveled from the primary survey, we present here some characteristics of the households of the students surveyed.These include family size, education level of the head, occupation, religion, income etc.

3.6.1 Average Family Size and Education of the Households

Region-wise (Rural and Urban) some information about student's families is shown in Table 3.7. The average family size in rural and urban area is 4.4 and 4.3 respectively. The average number of the male member in rural area and urban area are 2.2 and 1.9 respectively. The average number of female member in rural and urban area is 2.2 and 2.4 respectively. Overall, average number of female member (2.3) is higher than average male member (2.0). Average age of head of the households in rural area is little lower than urban area. The average age of all members of the households in rural area (31.9 Yrs.) is lower than urban area (33.1 Yrs.). Average education of households in rural area (10.2 Yrs.) is lower than urban area (17.7 Yrs.). Average father education and mother education in rural area is lower than urban area.

Table 3.7: Some Information about Students' Families (Average)

Sl. No	Information's	Rural	Urban	Grand Total
1	Family Size	4.4	4.3	4.3
2	Male Member	2.2	1.9	2.0
3	Female Member	2.2	2.4	2.3
4	Age of Head of the households (Yrs.)	50.0	51.5	51.0
5	Average Age of all members of the households (Yrs.)	31.9	33.1	32.7
6	Education of households (Yrs.)	10.2	17.7	15.2
7	Education of Father (Yrs.)	8.9	11.8	10.8
8	Education of Mother (Yrs.)	7.5	10.5	9.5

Source: Primary Survey

3.6.2 Occupation of the Heads of the Households

Occupation-wise distribution of the household's heads is shown in Table 3.8. The major occupation of most of the households is agriculture in rural areas. In the rural areas, 77.5 % heads of the household are engaged in agriculture sector, 6.7% heads are in business sector, 7.6% heads are in service sector. For students studying in urban and semi urban areas, 52.0% heads of the households engaged in the agriculture sector, 22.7% heads are in business sector and 27.5% heads are in service sector.

Table 3.8: Occupation-wise Distribution of the Heads of the Households

		Number		Percentage			
Sl. No.	**Occupations**	**Rural**	**Urban/semi urban**	**Rural**	**Urban/semi urban**	**Grand Total**	**Percentage**
1	Agricultural	811	818	77.5	39.2	1629	52.0
2	House Wife	23	37	2.2	1.8	60	1.9
3	Business	70	475	6.7	22.7	545	17.4
4	Govt. service	79	575	7.6	27.5	654	20.9
5	Non Govt. Service	6	51	0.6	2.4	57	1.8
6	Student	0	3	0.0	0.1	3	0.1
7	Non Agricultural	56	124	5.4	5.9	180	5.7
8	Unemployed	1	6	0.1	0.3	7	0.2
	Grand Total	**1046**	**2089**	**100.0**	**100.0**	**3135**	**100.0**

Source: Primary Survey

3.6.3 Caste-wise Average Education Level

Caste-wise average education level of households is shown in Table 3.9. Average education level of the households in rural area (10.2 Yrs.) is found to be less than the urban area (12.0Yr.). Overall average educations level of all the members of the households are 11.4years.

Table 3.9: Caste-wise Average Education (Yrs.) of the Households

Cast	**Rural**	**Urban**	**Grand Total**
General	11.0	12.3	12.0
OBC	9.8	11.6	10.9
SC	10.2	11.3	10.8
ST	8.5	10.5	9.4
Grand Total	**10.2**	**12.0**	**11.4**

Source: Primary Survey

3.6.4 Religion-wise Average Education Level

Religion-wise average education year of all the members of the households is shown in Table 3.10. Average education of the households in urban area (12.0 Yr.) is greater than rural area (10.2 Yr). Average education of the households in rural *Hindu* (10.3 Yr.) lower than urban *Hindu* (12.0Yr.). Average education of the households in rural *Muslim* (9.9 Yr.) is lower than urban *Muslim* (11.4 Yr.). Average education of the *Hindu* households (11.5 Yr.) is greater than *Muslim* households (11.0 Yr.).

Table 3.10: Religion-wise Average Education (Yrs.) of the Households

Religion	Rural	Urban	Grand Total
Hindu	10.3	12.0	11.5
Muslim	9.9	11.4	11.0
Others	8.7	10.1	9.2
Grand Total	**10.2**	**12.0**	**11.4**

Source: Primary Survey

3.6.5 Income Class-wise Average Education Level

Income class-wise average higher education year of the households is shown in Table 3.11. Average education of the APL households in rural area (11.0 Yr.) is lower than urban area (12.3 Yr.). Also average education of the BPL households in rural area is lower than urban area. Overall average education year of the APL households is 12.0 and for BPL households it is 10.1 years.

Table 3.11: Income Class-wise Average Education (Yrs.) of the Households

Income Class	Rural	Urban	Grand Total
APL	11.0	12.3	12.0
BPL	9.5	10.9	10.1
Grand Total	**10.2**	**12.0**	**11.4**

Source: Primary Survey

3.7 Annual Income of the Households

3.7.1 Caste-wise Average Annual Income

Caste-wise average annual income of the households is shown in Table 3.12. Average annual income of the rural households is Rs. 81,204 and that for urban households it is Rs. 2,25,246. Overall annual income of the sample households is Rs. 1,77,186. Average annual income of the households in rural area is lower than urban households.

Table 3.12: Caste-wise Average Annual Income (Rs.) of the Households

Caste	Rural	Urban	Grand Total
General	93609	251870	211944
OBC	67220	159052	120935
SC	79433	208060	155984
ST	71454	184652	118975
Grand Total	**81204**	**225246**	**177186**

Source: Primary Survey

3.7.2 Religion-wise Average Annual Income

Religion-wise average annual income of the households is shown in Table 3.13. Overall, average annual income of the *Muslim* households (Rs. 2,00,428) is found greater than *Hindu* households (Rs.177802). But average annual income of the urban *Hindu* households is greater than urban *Muslim* households. Average annual income of the rural *Muslim* households (Rs.1,43,211) is almost double than rural *Hindu* households (Rs.79435).

Table 3.13: Religion-wise Average Annual Income (Rs.) of the Households

Religion	Rural	Urban	Grand Total
Hindu	79435	226456	177802
Muslim	143211	219500	200428
Others	66409	159692	101057
Grand Total	**81204**	**225246**	**177186**

Source: Primary Survey

3.7.3 Income Class-wise Average Annual Income

Income class-wise average annual income of the households is shown in Table 3.14. Overall average annual income of the APL households and BPL households is Rs. 2,20,717 and Rs. 78,855 respectively. Average annual income of the APL rural households almost double than rural BPL households and average annual income of the APL urban households is almost 2.5 times higher than urban BPL households.

Table 3.14: Income Class-wise Average Annual Income (Rs.) of the Households

Income Class	Rural	Urban	Grand Total
APL	103719	256506	220717
BPL	59863	102852	78855
Grand Total	**81204**	**225246**	**177186**

Source: Primary Survey

3.8 Income Group of the Households

3.8.1 Regional-wise Income Group of the Households

Table 3.15 displays the number and share of households with income by income class. For the students in rural areas, 49.9% of households had incomes between Rs. 25001 and Rs.50000. On the other hand in urban areas, 22.5% of households had incomes between Rs.25001and Rs.50000, 23.2% of households had incomes between Rs.50001 and Rs.100000, 15.4 % of households had incomes between Rs.100001 and Rs.200000, 25.5 % of households had incomes between Rs.200001 and 5 Rs.00000, 11.2% households had income more than 500000 income group. The concentration

of income among the relatively few households in the upper tail as well as lower tail of the income distribution can be seen both rural and urban region.

Table 3.15: Regional-wise Distribution of Surveyed Students in Different Income Group

Income Group	Rural (N=1046)	Urban (N=2089)	Grand Total	Percentage
>25000	10.0	2.2	150	4.8
25001-50000	**49.9**	**22.5**	**992**	**31.6**
50001-100000	21.4	23.2	708	22.6
100001-200000	9.6	15.4	422	13.5
200001-500000	8.3	25.5	620	19.8
500000<	0.8	11.2	243	7.8
Grand Total	**100.0**	**100.0**	**3135**	**100.0**

Source: Primary Survey

3.8.2 Caste-wise Income Group of the Households

Caste-wise distribution of surveyed students for different income groups is shown in Table 3.16. For General castes, 28.3% of households had incomes lower bottom of the income group (lower than Rs. 50000) and 10.3% of households had incomes more than 500000 (Rs.). For OBC category, 45.1% of households had income lower bottom level. In SC category, 47.3% households had income lower bottom level and 6.5% households had income more than Rs. 500000. In ST, 49.6 of households had income lower bottom level and only 2.4% households had income more than 500000(Rs.).

Table 3.16: Caste-wise Distribution of Surveyed Students in Different Income Group

Income Group (Rs.)	General	%	OBC	%	SC	%	ST	%	Grand Total	%
Below 25000	60	3.4	54	8.0	17	3.4	19	9.0	150	4.8
25001-50000	438	25.0	251	37.1	217	43.9	86	40.6	992	31.6
50001-100000	399	22.8	157	23.2	106	21.5	46	21.7	708	22.6
100001-200000	252	14.4	103	15.2	47	9.5	20	9.4	422	13.5
200001-500000	423	24.1	86	12.7	75	15.2	36	17.0	620	19.8
Above 500000	180	10.3	26	3.8	32	6.5	5	2.4	243	7.8
Grand Total	**1752**	**100.0**	**677**	**100.0**	**494**	**100.0**	**212**	**100.0**	**3135**	**100.0**

Source: Primary Survey

3.8.3 Religion-wise Income Group of the Households

Religion-wise distribution of surveyed students in different income groups is shown in Table 3.17. In *Hindu* category, 46.8% of households had incomes lower bottom of the income group (lower than 50000 Rs.) and 7.7% of households had incomes more than 500000 (Rs.). In *Muslim* category, 23.7% of households had incomes lower bottom of the income group and 11.8% incomes more than

500000 (Rs.). Overall, 46.4% of households had incomes lower bottom of the income group and 7.8 % of households belongs to the upper tail income group.

Table 3.17: Religion-wise Distribution of Surveyed Students in Different Income Group

Income Group	Hindu (N=2913)	Muslim (N=152)	Others (N=70)	Grand Total	Percentage
>25000	4.9	1.3	8.6	150	4.8
25001-50000	31.9	22.4	42.9	992	31.6
50001-100000	22.5	21.1	31.4	708	22.6
100001-200000	13.3	21.7	2.9	422	13.5
200001-500000	19.8	21.7	12.9	620	19.8
500000<	7.7	11.8	1.4	243	7.8
Grand Total	**100.0**	**100.0**	**100.0**	**3135**	**100.0**

Source: Primary Survey

3.9 Income Group-wise Average Education Level of the Households

Average number of education years of the households in different income group is shown in Table 3.18. Table 3.18 show that positive relation between income and average education year of the households. Lower income group households had low education level and higher income group households had high education level.

Table 3.18: Average Education (Yrs.) of the Households in Different Income Group

Income Group (Rs.)	Rural	Urban	Grand Total
>25000	9.4	11.4	10.0
25001-50000	10.0	10.8	10.4
50001-100000	10.3	11.4	11.1
100001-200000	10.4	12.1	11.7
200001-500000	11.8	12.8	12.7
500000<	13.1	13.4	13.4
Grand Total	**10.2**	**12.0**	**11.4**

Source: Primary Survey

Average number of education years of the heads of the households in different income groups is shown in Table 3.19. Table 3.19 shows that positive relation between income and average education year of head of the households.

Table 3.19: Average Education (Yrs.) of Head of the Households in Different Income Group

Income Group	Rural	Urban	Grand Total
>25000	7.6	10.7	8.5
25001-50000	8.3	9.7	9.0
50001-100000	8.8	10.5	9.9
100001-200000	10.2	12.3	11.8
200001-500000	11.9	13.5	13.2
500000<	14.4	14.6	14.6
Grand Total	**8.9**	**11.8**	**10.8**

Source: Primary Survey

3.10 Conclusion

In this Chapter, we have presented the characteristics of the households of the students surveyed. We have carried our primary survey in eighteen colleges from four districts. We have conducted primary survey on total of 3,135 students from various colleges and universities. The total numner of students from Arts faculty and Science faculty are 1733 and 905 respectively. Number of students surveyed were as follows: UG 2nd year -770, UG 3rd Year - 758, UG Completed- 1105, PG – 436. The average family size in rural and urban areas was 4.4 and 4.3 respectively. As for the students in the rural areas, 77.5 % heads of the household are engaged in agriculture sector, 6.7% heads are in business sector, 7.6% heads are in service sector.

Chapter 4

Public Expenditure on Higher Education in West Bengal

4.1 Public Expenditure on Higher Education in West Bengal

In this chapter, we have discussed public expenditure pattern on higher education in West Bengal and across states in India. The level of expenditure by government reveals the relative importance accorded to the higher education in West Bengal. A time series analysis of higher education expenditure and state domestic product has been done to understand the causal relationship between them.

4.1.1 Intra-Sectoral Resource Allocation to Education in West Bengal

State expenditure on education comprises of expenditure on elementary education, secondary education, higher education, adult education and language development as shown in the Table 4.1 of these elementary had got the highest priority though its share has declined over the years. As is evident from the table proportion of budget expenditure on higher education in West Bengal has declined in the post reform period. The relative importance of secondary education has increased compared to primary and higher education. Sector-wise expenditure on education in West Bengal during 2004-05- to 2014-15 is shown in Table 4.1.

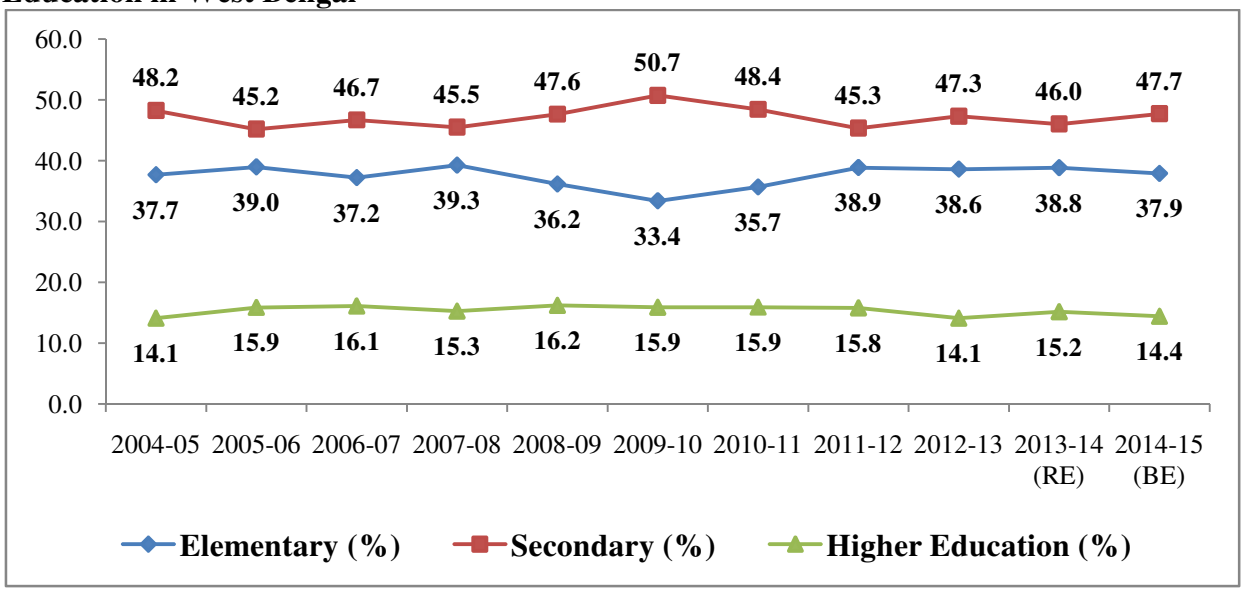
Table 4.1: Sector-wise Expenditure (in Rs. Crore) on Education in West Bengal during 2004-05 to 2014-15

Year	Elementary Education	Secondary Education	Adult Education	University and Higher	Technical Education	Physical Education	General Education	Language Development
2004-05	1836.3	2350.2	2.5	577.0	41.5	2.8	52.7	11.0
2005-06	2105.5	2440.1	3.6	634.9	139.0	3.7	62.7	12.9
2006-07	2191.5	2749.4	5.2	675.0	187.4	4.0	65.5	11.2
2007-08	2592.8	3004.0	5.0	781.3	147.0	4.7	47.1	22.0
2008-09	2674.2	3521.9	5.7	859.4	199.6	5.9	104.2	23.6
2009-10	3801.9	5775.3	9.6	1357.1	280.3	0.0	131.4	30.9
2010-11	4843.8	6574.1	6.7	1669.8	276.6	0.0	169.4	37.2
2011-12	5834.9	6808.1	9.2	1837.9	294.6	0.0	192.4	36.9
2012-13	6605.5	7770.4	29.2	2161.6	437.5	0.0	180.7	50.0
2013-14	7232.6	8566.1	21.4	2088.4	459.0	0.0	197.9	54.3
2014-15	7956.2	10028.2	22.4	2220.6	424.5	0.0	285.4	67.1

Source: Analysis of Budgeted Expenditure on Education, various years

Year-wise percentage shares in primary, secondary and higher education level in West Bengal are shown in Fig. 4.1. In 2014-15, out of total public expenditure on education 37.9% goes to elementary education, 47.7% goes to secondary education and only 14.4% goes to higher education.

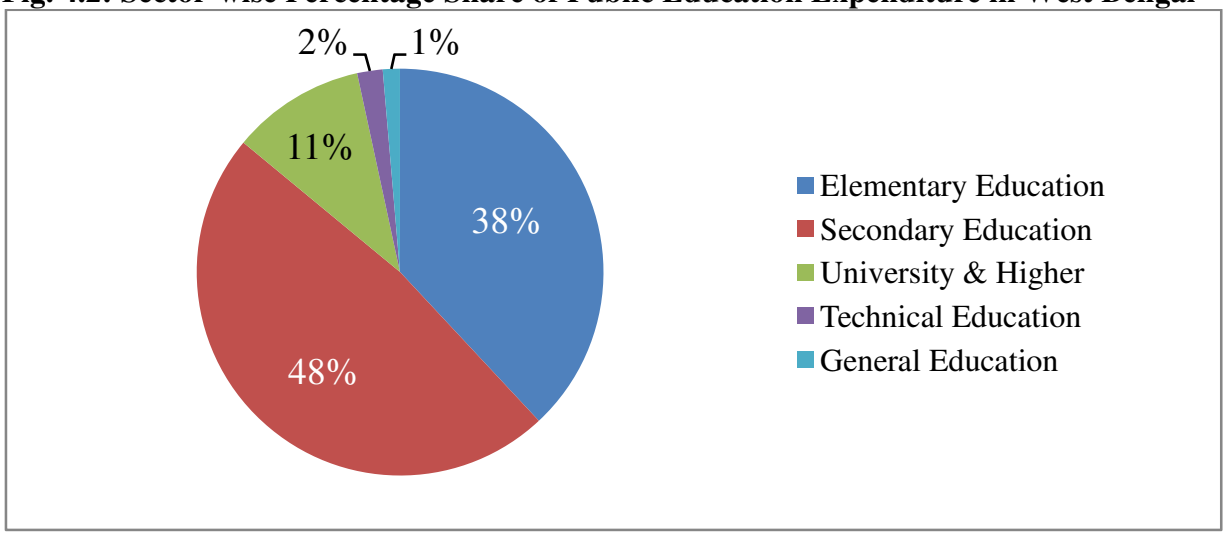
Fig. 4.1:Year-wise Percentage Share of Expenditure in Primary, Secondary and Higher Education in West Bengal



Source: Analysis of Budgeted Expenditure on Education, MHRD

Fig. 4.2 presents percentage share of major sector of education to total education expenditure in 2014-15 in West Bengal.

Fig. 4.2: Sector-wise Percentage Share of Public Education Expenditure in West Bengal



Source: Analysis of Budgeted Expenditure on Education, MHRD, 2014-15

It is true that public expenditures on education in India have increased remarkably in the post independence era. However the growth has not been impressive from the point of view of expenditure in real prices or in per capita terms (Tilak 2004). Total budget expenditure on higher education in West Bengal in nominal terms has increased from Rs. 41.91 crores in 1980-81 to Rs. 2220.6 crores in 2007-08 i.e. expenditure on higher education in West Bengal has increased by 53 times in 27 years. The share of educational expenditure in SDP may be taken as an indicator of state's priority to education.

4.1.2 Growth of Higher Education Expenditure in West Bengal

Growth of expenditure on higher education in West Bengal over the period 1980-81 to 2014-15 is sown in Table 4.2. The changes of percentage shares of expenditure on higher education to State Domestic Product (SDP) for the period 1980-81 to 2014-15 has been presented in the Table.

Table 4.2: Budgetary Position of Higher Education in West Bengal

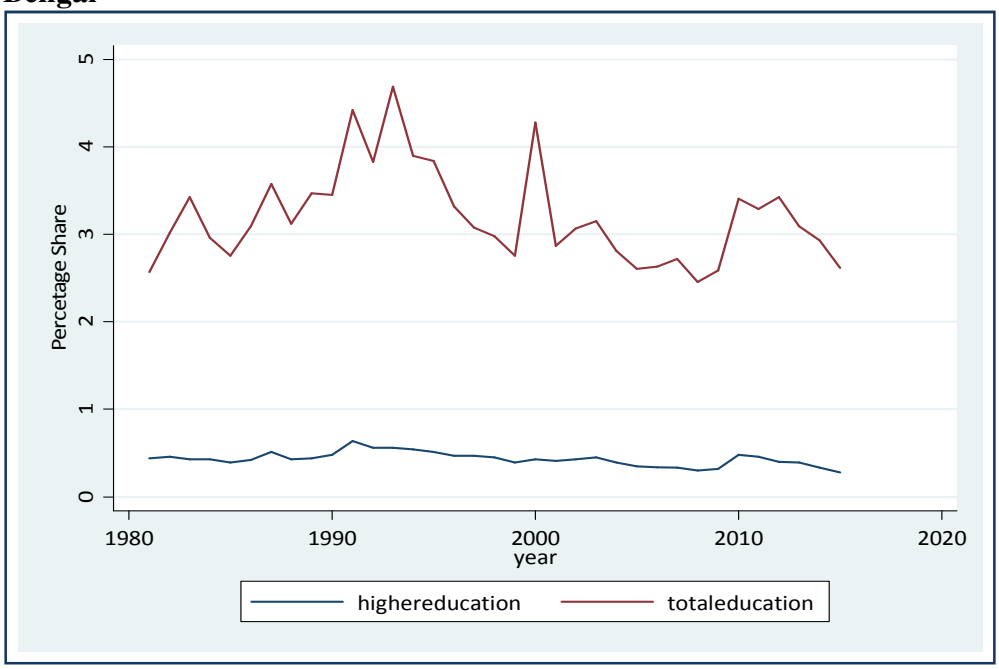
Year	Total Budget Expenditure on Higher Education (Rs. Crore)	% of Budget Exp. on Higher Education with respect to B.E. on Education	% of Higher Education Expenditure in SDP	% of Education expenditure in SDP
1980-81	41.91	17.03	0.44	2.57
1981-82	49.32	15.32	0.46	3.02
1982-83	51.39	12.49	0.43	3.43
1983-84	60.04	14.37	0.43	2.96
1984-85	63.40	14.08	0.39	2.76
1985-86	73.14	13.61	0.42	3.09
1986-87	96.25	14.20	0.51	3.58
1987-88	99.05	13.82	0.43	3.12
1988-89	109.62	12.80	0.44	3.47
1989-90	134.69	14.04	0.48	3.45
1990-91	201.02	14.44	0.64	4.42
1991-92	203.73	14.60	0.56	3.83
1992-93	218.04	11.99	0.56	4.69
1993-94	261.59	13.85	0.54	3.90
1994-95	274.41	13.28	0.51	3.84
1995-96	316.28	14.21	0.47	3.32
1996-97	351.62	15.34	0.47	3.08
1997-98	398.74	15.06	0.45	2.98
1998-99	416.20	14.22	0.39	2.76
1999-00	500.80	10.01	0.43	4.28
2000-01	526.27	14.21	0.41	2.87
2001-02	604.87	13.94	0.43	3.07
2002-03	677.26	14.20	0.45	3.15
2003-04	665.15	13.88	0.39	2.81
2004-05	663.73	13.43	0.35	2.61
2005-06	721.95	12.90	0.34	2.63

2006-07	801.64	11.94	0.33	2.72
2007-08	836.39	12.16	0.30	2.46
2008-09	986.95	12.28	0.32	2.59
2009-10	1733.84	14.01	0.48	3.41
2010-11	1943.76	14.01	0.46	3.29
2011-12	1944.29	11.82	0.40	3.43
2012-13	2161.64	12.54	0.39	3.09
2013-14	2088.45	11.22	0.33	2.93
2014-15	2220.6	10.57	0.28	2.62

Source: Department of Higher Education, Government of West Bengal, Annual Report and Statistical Abstract, Government of West Bengal, various issues

In the Fig. 4.3, we have presented the percentage of higher education budget in SDP in the state of West Bengal. The Chart shows there are no substantial changes in shares of education and higher education in SDP. Percentage of education budget and higher education budget in SDP in West Bengal is shown in Fig. 4.3.

Fig. 4.3: Percentage of Education Budget and Higher Education Budget in SDP in West Bengal



Source: Government of West Bengal, Statistical Abstract various years

It is important to check whether the expenditure on education is related to SDP. According to Wagner's Law, public expenditure is functionally related to economic growth captured by SDP. The Table 4.3 shows the results of the estimated regression model of logarithm of expenditures on higher education (log BHE) on the logarithms of SDP (log SDP). Here we have tried to find the relationship between public expenditure on higher education and state domestic product in West

Bengal using the data of 37 years. The results in Table 4.3 reveal that the elasticity of higher education expenditure with respect to SDP is 1.05. The detailed causal analysis on the relationship between SDP and expenditure on higher education has been done in section 4.1.6.

Table 4.3: OLS Regression Results of SDP and Higher Education Expenditure

Regression Statistics				
Multiple R	0.994			
R Square	0.987			
Adjusted R Square	0.987			
Standard Error	0.157			
Observations	37			
ANOVA				
	df	*SS*	*MS*	*F*
Regression	1	67.85	67.85	2739.17
Residual	35	0.87	0.02	
Total	36	68.71		
Coefficients				
	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	5.16	0.12	44.66	0.00
Ln(exphed)	1.05	0.02	52.34	0.00

Source: Own Estimation

4.1.3 Plan and Non Plan Expenditure on Higher Education in West Bengal

Budgetary expenditure on higher education in the state may be classified into two categories: plan and non-plan expenditures. Non-plan provision is mostly paid to the payment of salary in general degree colleges in the state. Major portion of plan expenditure is utilized for establishing new colleges and also for creating new infrastructure facilities in existing colleges. Declining plan expenditure, therefore, means declining effort for creation or addition of new educational facilities and swelling non-plan expenditure denotes increasing burden of salary payment and maintenance expenditure on the shoulder of the state government.

Percentage of plan and non plan expenditure on higher education in West Bengal and India are shown in Table 4.4. It may be seen that the percentage of plan expenditure in West Bengal than that of India.

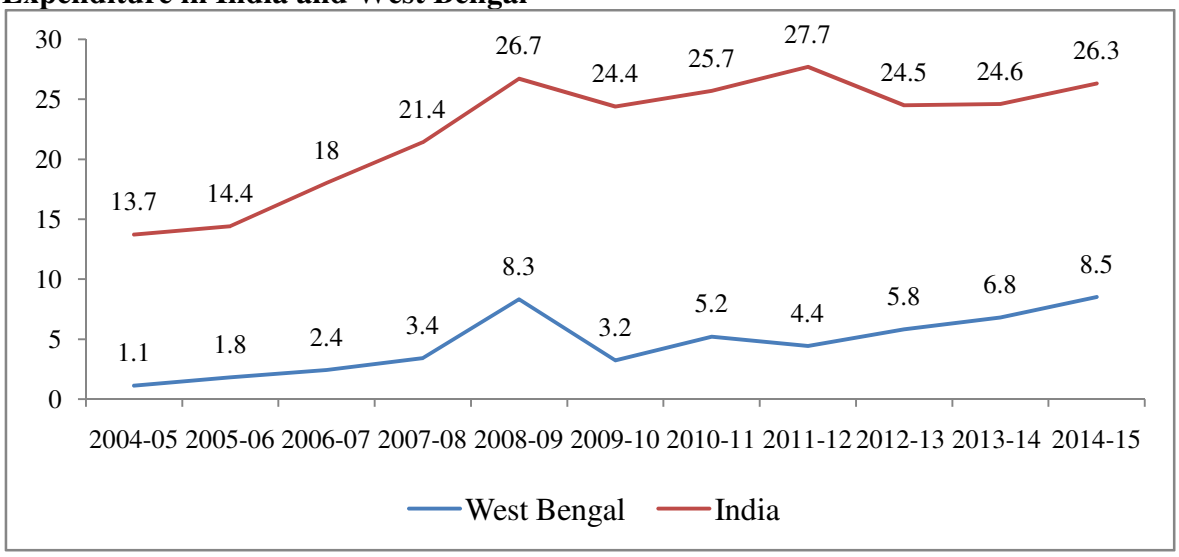
Table 4.4: Percentage of Plan and Non Plan Expenditure on Higher Education in West Bengal and India

Year	Non Plan		Plan	
	West Bengal	India	West Bengal	India
2004-05	98.9	86.3	1.1	13.7
2005-06	98.2	85.6	1.8	14.4
2006-07	97.6	82.0	2.4	18.0
2007-08	96.6	78.6	3.4	21.4
2008-09	91.7	73.3	8.3	26.7
2009-10	96.8	75.6	3.2	24.4
2010-11	94.8	74.3	5.2	25.7
2011-12	95.6	72.3	4.4	27.7
2012-13	94.2	75.5	5.8	24.5
2013-14	93.2	75.4	6.8	24.6
2014-15 (BE)	91.5	73.7	8.5	26.3

Source: MHRD (Analysis of Budgeted Expenditure on Education) Various Year

Percentage of plan and non plan expenditure on higher education in West Bengal and India are shown in Fig. 4.4.

Fig. 4.4: Percentage of Plan Higher Education Expenditure to Total Higher Education Expenditure in India and West Bengal



Source: MHRD (Analysis of Budgeted Expenditure on Education) Various Year

4.1.4 Composition of Expenditure of Higher Education in West Bengal

Table 4.5 shows that composition of expenditure of higher education in West Bengal 2009-10 and 2012-13 in percentages. Most of the non plan expenditure goes to assistance to university and assistance to non government college.

Table 4.5: Composition of Expenditure of Higher Education in West Bengal 2009-10 and 2012-13 in Percentages

	2009-10 (Percentage)			(2012-13) (Percentage)		
Budget Heads	Non-Plan	State Plan	Total	Non-Plan	State Plan	Total
Assistance of Universities	37.35	3.95	41.30	32.67	2.76	35.43
Government Colleges and Institutes	6.85	1.02	7.88	5.56	1.95	7.51
Assistance to Non-Government Colleges	41.16	2.95	44.11	47.42	1.57	48.99
Institutes of higher learning and Other Expenditure	0.43	0.60	1.04	0.38	0.35	0.73
Promotion of Modern Indian Languages	0.03	0.02	0.05	0.04	0.02	0.06
Research, Scholarships, etc.	1.50	0.02	1.52	1.72	0.01	1.73
Technical Education	1.84	1.40	3.24	1.55	2.87	4.42
Physical Education and Youth Welfare (Excluding N.C.C.)	0.14	0.14	0.28	0.23	0.19	0.42
Promotion of Art and Culture	0.36	0.18	0.54	0.49	0.17	0.66
Surveys and Statistics Gazetteers and Statistical Memories	0.04	0.00	0.04	0.05	0.00	0.05
% Total	89.71	10.29	100.00	90.11	9.89	100.00
Total (in Crore)	1743.75	200	1943.75	2186.7	240	2426.7

Source: Department of Higher Education, Government of West Bengal, Annual Report

4.1.5 Per Head Public Higher Education Expenditure

Per head public higher education expenditure (In thousand Rs.) for population of (18-23) Yrs. age group in West Bengal and India is shown in Table 4.6. The table reveals wide disparity in per head higher education expenditure between India and West Bengal.

Table 4.6: Per Head Public Higher Education Expenditure (In Thousand Rs.) for Population 18-23 Age Group in West Bengal and India

	West Bengal	India
2010-11	1.5	2.1
2011-12	1.7	2.3
2012-13 (R.E.)	2.0	2.9
2013-14(B.E.)	1.9	3.4

Source: Own Calculation based on AISHE various years and MHRD (Analysis of Budgeted Expenditure on Education) Various Year

4.1.6 Relation between Higher Education Expenditure and NSDP in West Bengal: A Time Series Analysis

Our primary interest here is to see the relationship between higher education expenditure, and NSDP in West Bengal over time. The methodology employed in this study is time series analysis which

involves first performing unit root test before running the main model of Granger Causality Tests and VAR.

Unit Root Tests

The variables to be used in this study are time series variables which are generally non-stationary. These variables should be tested for stationarity before they are used in the model. If the variables are stationary in levels, that is, without differencing, they are said to be integrated of order Zero. If they become stationary after first differencing they are said to be non stationary in levels and necessitate to be differenced once to become stationary and thus are integrated of order 1, written as I(1). Differencing a variable twice to achieve stationarity means the variable is integrated of order 2, Written as I(2).

VAR Model

The VAR framework used in our analysis is as follows;

$$X_{1t} = \sum_{i=1}^{n} \beta_{1i} X_{1,t-i} + \sum_{i=1}^{n} \beta_{2i} X_{2,t-i} + \mu_{1t} \dots\dots\dots\dots \quad (1)$$

$$X_{2t} = \sum_{i=1}^{n} \beta_{1i} X_{1,t-i} + \sum_{i=1}^{n} \beta_{2i} X_{2,t-i} + \mu_{2t} \dots\dots\dots\dots \quad (2)$$

Where X_t= ($NSDP_t$, Higher Education)

If all the variables of the model are integrated of the same order then we constructed restricted VAR model (i.e. VECM), and all the variables of the model are integrated with different order then we construct an unrestricted VAR model.

Lag Selection within VAR

The Crucial thing in the VAR estimation is the problem of determining the length of optimal lags in the system. In our analysis we determine the optimal lags by using different lag selection criteria such as- the Akaike Information Criteria (AIC), Schwartz Information Criteria (SIC), Hannan-Quin Criteria (HQ), Likelihood Ratio (LR), as well as of the Final Predictor Error (FPE). But we prefer the AIC criteria, as Enders (1995) suggested the optimum lag is selected based on the lowest value of AIC.

Granger Causality Tests

The Granger Causality test as proposed by Granger (1969) is used to test whether one variable is useful in forecasting another variable and vice-versa. In general, a time series X_1 is said to Granger

cause another time series X_2 if it can be shown that the series X_1 values provide statistically significant information about the future values of series X_2, if not, X_1 does not Granger cause X_2. This is confirmed by a probability value that falls within the range of 1% and 10% or an F-statistic that takes an absolute value of at least 2. The larger the value, the more significant it becomes. We use the F-statistic to test the validity of the causality. It depends upon restricted residual sums squares (RRSS) and unrestricted residuals sums square (URSS). F statistic is calculated as follows;

F= ((RRSS – URSS)/m)/(RRSS/(n – k)), and F follows normal distribution, (m, n – k)

Where, m is the number of lags; k is the number of parameters involved in the model; and n is the sample size. The test is to reject the null hypothesis of non-causality between higher education expenditure and economic growth against an alternative hypothesis of causality between the two.

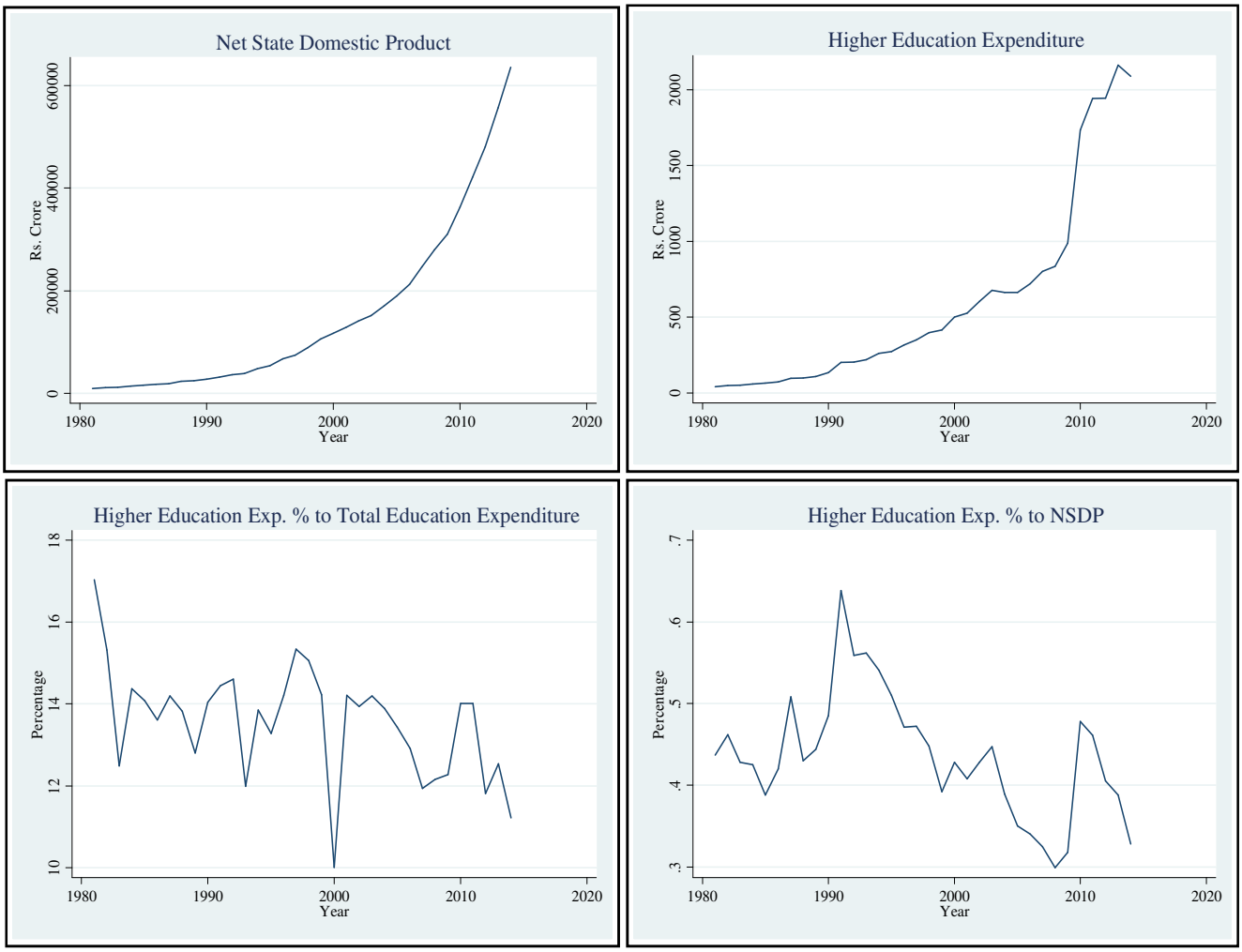
If the above statistic is significant, then we reject the non-causality hypothesis and conclude that education causes economic growth and vice versa. If it is not significant, then the non-causality hypothesis is accepted and concludes that education does not cause economic growth and vice versa. Causality can either be uni-directional or bi-directional. In a two variable model X_1 and X_2, the following two equations are estimated.

Variables of the Model

In this model two variables have been used that are economic growth and higher education expenditure. Economic growth is defined as the increase in a nation's ability to produce goods and services as is shown by increased production levels in the economy. A growth in this study Net State Domestic Product (NSDP) indicates increase in net income of the whole state. And higher education expenditure used as a proxy for higher education but it also fails to reflect the quality of education in the state. Higher education expenditure is expected to positively and significantly relate with economic growth.

Four diagrams in Fig. 4.5 have been present to show the trend in NSDP, higher education expenditure, higher education expenditure percentage to total education expenditure and higher education expenditure percentage to NSDP of West Bengal for the period 1981 to 2014. The figure presents that there is a decreasing trend in percent higher education expenditure to net state domestic product in West Bengal within the study period. Figure presents that relative importance on higher education also decreasing trend as higher education expenditure % to total education expenditure shows decreasing trend throughout the study period.

Fig. 4.5: Growth of NSDP and Higher Education Expenditure in West Bengal



Source: RBI (DBIE). Reports of Department of Higher Education, Government of West Bengal, Annual Report and Statistical Abstract, Government of West Bengal, various issues. Analysis of Budgetary expenditure on Education, MHRD, Various Years

Table 4.7 presents some descriptive statistics of the two variables i.e. Net State Domestic Product (NSDP) and Higher Education Expenditure (HEXP) for West Bengal during the period 1981 to 2014.

Table 4.7: Descriptive Statistics of the Variables

Variables (In Rs. Crore)	Net State Domestic Product (NSDP)	Higher Education Expenditure (HEXP)
Observations	34	34
Mean	150754.9	596.4
Median	81690.9	375.2
Maximum	635784.3	2161.6
Minimum	9594.0	41.9
Std. Dev.	168968.1	639.0
Skewness	1.41	1.40
Kurtosis	4.09	3.76

Source: Own Estimation

Result and Interpretation

Stationarity Tests

Unit root tests are performed on the following variables NSDP and HEXP based on the Augmented Dicky-Fuller approach (ADF) and Phillips – Perron (PP) test. The results show that HEXP become stationary after 1st difference and NSDP become stationary after 2nd difference. So at level the HEXP is integrated in order 1, i.e. I(1) and NSDP is integrated in order 2, i.e. I(2).So the variables in our study cannot be co-integrated (as they have different order of integration) and only an unrestricted VAR (Vector Autoregressive) can be constructed. Therefore, the variables have been used in VAR Estimate and pair-wise Granger causality according to their level of stationarity. HEXP have been differenced one time while NSDP differenced twice. Table 4.8 and Table 4.9 present the unit root tests.

Table 4.8: Augmented Dickey-Fuller Test (with Trend and Intercept) for Unit Root

ADF test statistic	At Level		At 1st Difference		At 2nd Difference		
	t-Statistic	Prob.*	t-Statistic	Prob.*	t-Statistic	Prob.*	Result
NSDP	14.25	1.00	2.30	1.00	-6.04	0.00	I (2)
HEXP	1.78	1.00	-6.37	0.00	-	-	I (1)

*Source: Own Estimation, *MacKinnon (1996) one-sided p-values.*

Table 4.9: Phillips-Perron Test (with Trend and Intercept) for Unit Root

PP test statistic	At Level		At 1st Difference		At 2nd Difference		
	Z(t)	Prob.*	Z(t)	Prob.*	Z(t)	Prob.*	Result
NSDP	13.20	1.00	0.27	1.00	-8.39	0.00	I (2)
HEXP	-0.81	0.95	-4.56	0.01	-	-	I (1)

*Source: Own Estimation, *MacKinnon (1996) one-sided p-values.*

Table 4.10: Pair-wise Granger Causality Test

Pairwise Granger Causality Tests
Date: 03/02/18 Time: 00:35
Sample: 1981 2014
Lags: 8

Null Hypothesis:	Obs	F-Statistic	Prob.
D(HEXP) does not Granger Cause D(NSDP,2)	24	8.28***	0.0057
D(NSDP,2) does not Granger Cause D(HEXP)	24	0.34	0.9223

***significant at 1%

Source: Own Estimation

Pair-wise Granger Causality Test presented in Table 4.10 indicates that there is a unidirectional causality between higher education expenditure and economic growth. This is so because the null hypothesis of higher education expenditure does not Granger cause NSDP was rejected at 1% level

of significance. This is clearly indicated that higher education expenditure caused economic growth. However the reverse causality that economic growth causes higher education expenditure was found to be insignificant. This means that as higher education expenditure increases are contributing to the growth of the economy but higher education expenditure not increased at equal manner as NSDP increased in West Bengal.

Estimation Result for VAR

Before the estimation, the optimum lag in the VAR system selected with the least Akaike Information Criteria (AIC) and this is found 8 (Table 4.11). Here also others lag selection criteria like, Likelihood Ratio (LR), Final Predictor Error (FPE), Schwartz Information Criteria (SIC) and Hannan-Quin Criteria (HQ) suggest that the optimum lag is 8. So we precede further estimation or tests with 8 lags.

Table 4.11: Lag Selection Criteria

VAR Lag Order Selection Criteria, Endogenous Variables: D(NSDP,2) D(HEXP)						
Lag	Log L	LR	FPE	AIC	SIC	HQ
0	-394.2697	NA	7.53E+11	33.02247	33.12064	33.04852
1	-390.7483	6.162411	7.85E+11	33.06236	33.35687	33.14049
2	-390.3016	0.70721	1.07E+12	33.35847	33.84933	33.48869
3	-382.7204	10.74006	8.09E+11	33.06003	33.74723	33.24235
4	-376.6276	7.616053	7.09E+11	32.88563	33.76917	33.12003
5	-367.7429	9.625066	5.06E+11	32.47857	33.55846	32.76507
6	-366.184	1.428959	6.94E+11	32.68200	33.95823	33.02059
7	-357.8622	6.24141	5.76E+11	32.32185	33.79441	32.71252
8	-339.2885	10.83460*	2.24e+11*	31.10738*	32.77629*	31.55014*

* *indicates lag order selected by the criterion, Source: Own Estimation*

All the variables in our analysis have different order of integration. So, no cointegration relation exist between them, that's why we construct unrestricted VAR model. Our target variable is NSDP, we use least square method for estimation. Estimation results are presented in Table 4.12. C(1) to C(8) present the Coefficients of lags of NSDP and C(9) to C(16) present the coefficients of lags of higher education expenditure (HEXP) and C(17) is constant. From the estimated coefficient we see that 1st, 3rd and 8th period lags of higher education expenditure have significant positive impact on NSDP. Value of the coefficients are increasing with increase in the lag order of higher education expenditure, that means present investment in higher education returns more in future.

Table 4.12: Unrestricted Vector Autoregressive Model

Dependent Variable: D(NSDP,2) Method: Least Squares (Gauss-Newton / Marquardt steps)				
D(NSDP,2) = C(1)*D(NSDP(-1),2) + C(2)*D(NSDP(-2),2) + C(3)*D(NSDP(-3),2) + C(4)*D(NSDP(-4),2) + C(5)*D(NSDP(-5),2) + C(6)*D(NSDP(-6),2) + C(7)*D(NSDP(-7),2) + C(8)*D(NSDP(-8),2) + C(9)*D(HEXP(-1)) + C(10)*D(HEXP(-2)) + C(11)*D(HEXP(-3)) + C(12)*D(HEXP(-4)) + C(13)*D(HEXP(-5)) + C(14)*D(HEXP(-6)) + C(15)*D(HEXP(-7)) + C(16)*D(HEXP(-8)) + C(17)				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.661	0.284	-2.329	0.053
C(2)	0.129	0.256	0.506	0.629
C(3)	-0.036	0.238	-0.152	0.884
C(4)	-0.525	0.261	-2.009	0.085
C(5)	-0.851	0.374	-2.274	0.057
C(6)	-0.893	0.484	-1.844	0.108
C(7)	-1.378	0.489	-2.816	0.026
C(8)	-0.325	0.458	-0.710	0.501
C(9)	**36.296*** **	**9.981**	**3.637**	**0.008**
C(10)	9.757	15.917	0.613	0.559
C(11)	**45.398*** **	**11.268**	**4.029**	**0.005**
C(12)	12.623	17.040	0.741	0.483
C(13)	33.448	30.791	1.086	0.313
C(14)	-99.915	37.307	-2.678	0.032
C(15)	35.983	35.234	1.021	0.341
C(16)	**140.362*** **	**35.301**	**3.976**	**0.005**
C(17)	-867.797	1524.402	-0.569	0.587
R-squared = 0.948, Adjusted R-squared = 0.829, F-statistic = 7.969, Prob.(F-statistic) = 0.005, Durbin- Watson stat = 2.02				

*Source: Own Estimation, ***indicate significant at 1% level*

The empirical result from Granger causality test confirmed that there is uni-directional causality running from higher education to economic growth, but the reverse is not true. This shows that investing in higher education is important for economic growth, that is investing more resource in human capital development is vital for productivity and growth of the economy. The study recommends that for enhancing growth process the goverment should concentrate on budgetary allocation and policies that have been improve the higher education system.

4.2 State-wise Public Education Expenditure

4.2.1 State-wise Expenditure on Different Sectors of Education as Percentage to GSDP

Analysis of expenditure on the higher, secondary and elementary education as percent to Gross State Domestic Product (GSDP) across major states reveals the importance being given to different education levels in different states (Table 4.13). A high percentage of GSDP devoted to these sub

sectors of education denotes a higher level of attention on investment in this area. In 2004-05, average expenditure on higher education in India was 0.28 % of GSDP and the expenditure on secondary and elementary education were 0.9% and 1.3% of GSDP respectively. In 2009-10, the share of expenditure on higher education decreased to 0.27% of GSDP and the proportions of secondary and elementary education expenditure increased to 1% and 1.4% of GSDP respectively. In 2014-15, the proportion of expenditure on higher education and elementary education increased to 0.32% and 1.5% of GSDP respectively. The expenditure on higher education as a percentage of GSDP in West Bengal were 0.28%, 0.34% and 0.28% respectively for 2004-05, 2009-10 and 2014-15. In 2014-15, the shares for higher education is found to decline below the National average. In 2014-15, Mizoram, Manipur, Assam, Bihar are found to spend higher proportion of GSDP on higher education compared to other states.

Table 4.13: Expenditure on Higher, Secondary and Elementary Education- As Percent to GSDP

States	Expenditure on higher education as % of GSDP			Expenditure on Secondary education as % to GSDP			Expenditure on elementary education as % to GSDP		
	2004-05	2009-10	2014-15 (BE)	2004-05	2009-10	2014-15 (BE)	2004-05	2009-10	2014-15 (BE)
Andhra Pradesh	0.43	0.45	0.42	0.97	1.11	1.02	1.59	1.19	1.07
Arunachal Pradesh	0.54	0.44	0.46	1.50	1.65	1.23	3.11	5.09	6.43
Assam	0.49	0.51	0.95	1.24	1.11	1.96	2.68	2.38	4.13
Bihar	0.68	0.57	0.92	0.68	0.84	0.88	1.82	2.86	3.82
Chhattisgarh	0.26	0.16	0.15	0.35	0.68	1.37	1.66	2.25	2.22
Goa	0.47	0.36	0.32	1.30	1.19	1.10	0.46	0.51	0.43
Gujarat	0.17	0.14	0.15	0.60	0.53	0.50	1.04	1.06	1.11
Haryana	0.20	0.28	0.26	0.58	0.70	0.50	0.86	1.20	1.33
Himachal Pradesh	0.26	0.28	0.33	1.62	1.20	1.52	2.30	2.34	2.73
Jammu and Kashmir	0.34	0.38	0.59	0.91	1.46	1.92	1.13	1.46	1.90
Jharkhand	0.22	0.35	0.48	0.30	0.36	0.40	1.52	2.00	1.93
Karnataka	0.30	0.22	0.37	0.70	0.79	0.85	1.47	1.33	1.51
Kerala	0.44	0.34	0.47	1.05	1.00	1.08	1.27	1.00	1.08
Madhya Pradesh	0.27	0.20	0.24	0.35	0.59	0.74	1.51	1.67	1.58
Maharashtra	0.22	0.19	0.25	1.01	1.04	0.93	1.04	1.18	1.01
Manipur	1.38	0.86	1.01	1.57	1.73	1.48	2.86	2.03	2.53
Meghalaya	0.36	0.37	0.48	0.97	0.95	1.07	2.19	2.10	2.39
Mizoram	0.77	0.83	1.07	1.69	1.94	1.96	3.75	4.15	3.73
Nagaland	0.34	0.34	0.47	0.78	2.69	2.20	2.30	0.79	2.62
Odisha	0.39	0.56	0.55	0.66	0.87	0.95	1.45	1.70	1.72
Punjab	0.20	0.24	0.19	1.37	1.12	1.26	0.53	0.38	0.69
Rajasthan	0.21	0.20	0.19	1.02	1.15	1.20	1.74	2.00	1.90

Sikkim	0.23	0.21	0.14	3.78	3.00	2.09	4.42	2.82	0.11
Tamil Nadu	0.23	0.22	0.22	0.78	0.90	0.89	0.86	0.96	0.85
Tripura	0.27	0.26	0.30	1.85	2.48	2.14	2.84	2.00	1.74
Uttarakhand	0.31	0.21	0.20	1.79	1.83	1.65	1.94	1.98	1.57
Uttar Pradesh	0.22	0.20	0.21	0.79	0.89	0.66	1.49	1.83	2.37
West Bengal	**0.28**	**0.34**	**0.28**	**1.13**	**1.45**	**1.25**	**0.88**	**0.95**	**0.99**
All States	**0.28**	**0.27**	**0.32**	**0.9**	**1**	**0.9**	**1.3**	**1.4**	**1.5**

Source: Analysis of Budgetary Expenditure on Education, MHRD; DBIE, RBI
BE= Budget Estimate

4.2.2 State-wise Elasticity and Growth of Higher Education Expenditure in India

Table 4.14 presents Growth rate of Higher education Expenditure (2004-05 to 2014-15), GSDP (Exp. Growth) and GSDP elasticity of state goverment expenditure. In West Bengal GSDP elasticity of public expenditure on higher education is 1.10 in that period. The elasticity for West Bengal is found below the National average.

Table 4.14: Income Elasticity of State Government Expenditure on Higher Education and State-wise Growth Rate of Higher Education Expenditure and GSDP at Current Price (2004-05 to 2014-15)

State/Uts	**Growth rate of Higher education Expenditure (2004-05 to 2014-15)**			**GSDP (Exp. Growth)**	**GSDP Elasticity of State Government Expenditure on Higher Education at Current price (2004-05 to 2014-15)**		
	Exp. Growth	**P value**	**R square**		**Elasticity Coefficient**	**t-Value**	**P value**
Andhra Pradesh	5.9	0.000	0.91	6.0	0.98	9.47	0.000
Arunachal Pradesh	5.1	0.000	0.78	7.1	0.73	5.70	0.000
Assam	9.0	0.000	0.97	5.5	1.64	20.30	0.000
Bihar	8.2	0.000	0.92	7.5	1.09	10.40	0.000
Chhattisgarh	6.0	0.001	0.74	6.5	0.90	4.70	0.001
Goa	6.4	0.000	0.84	6.6	0.95	6.09	0.000
Gujarat	6.4	0.000	0.94	6.1	1.07	12.71	0.000
Haryana	7.8	0.000	0.94	6.7	1.15	14.40	0.000
Himachal Pradesh	7.6	0.000	0.98	5.9	1.27	21.61	0.000
Jammu and Kashmir	9.1	0.000	0.93	5.6	1.63	10.82	0.000
Jharkhand	7.6	0.000	0.95	5.5	1.34	9.09	0.000
Karnataka	8.2	0.000	0.94	6.2	1.33	11.38	0.000
Kerala	6.9	0.000	0.96	5.6	1.13	12.52	0.000
Madhya Pradesh	6.3	0.000	0.93	6.6	0.95	12.90	0.000
Maharashtra	7.5	0.000	0.94	6.1	1.23	11.78	0.000
Manipur	3.6	0.013	0.52	4.8	0.80	3.66	0.005
Meghalaya	6.3	0.000	0.92	5.9	1.07	10.48	0.000
Mizoram	7.8	0.000	0.95	6.2	1.30	15.59	0.000

Nagaland	7.5	0.000	0.94	5.4	1.40	13.80	0.000
Orissa	8.4	0.000	0.93	6.2	1.35	10.59	0.000
Punjab	6.0	0.000	0.82	5.7	1.05	6.50	0.000
Rajasthan	7.0	0.000	0.94	7.0	1.01	11.78	0.000
Sikkim	7.7	0.000	0.95	10.0	0.76	21.57	0.000
Tamil Nadu	6.8	0.000	0.96	6.5	1.04	17.30	0.000
Tripura	6.4	0.000	0.91	5.1	1.17	9.14	0.000
Uttarakhand	4.8	0.000	0.86	7.7	0.62	7.17	0.000
Uttar Pradesh	6.1	0.000	0.94	5.9	1.03	11.57	0.000
West Bengal	**6.6**	**0.000**	**0.94**	**6.0**	**1.10**	**12.64**	**0.000**
All States	**7.2**	**0.000**	**0.98**	**6.2**	**1.16**	**18.50**	**0.000**
Delhi	7.6	0.000	0.88	6.6	1.17	8.73	0.000

Source: Own Calculation, MHRD, RBI

4.3 Conclusion

In this chapter we have presented the public expenditure pattern and cost of higher education in West Bengal. The public expenditure pattern in higher education reveals that percentage of higher education expenditure in term of education budget and SDP in West Bengal is more or less same over years in West Bengal. Per capita education expenditure in the relevant age group is found to be much less in West Bengal compared to all India average. Percentage of plan expenditure in total higher education expenditure is found to be much less in India compared to West Bengal.

The time series analysis revealed that there is uni-directional causality running from higher education to economic growth, but the reverse is not true. This shows that investing in higher education is important for economic growth, that is investing more resource in human capital development is vital for productivity and growth of the economy. The study recommends that for enhancing growth process the government should concentrate on budgetary allocation and policies that will improve the higher education system.

Chapter 5

Efficiency of Higher Education Institutions in West Bengal

5.1 Measurement of Efficiency of Higher Education Institutions

The measurement of performance of educational institutions has been the subject of increasing attention in recent years (Johnes 2006). Evaluation of the performance of the units in social sector like education is difficult because profit maximization is not their main objective. The educational institutions use variety of inputs like the different quality of students, the different quality of teachers and the different costs per student. The outputs also vary in terms of the pass percentage of colleges, average grade etc. It is very difficult the capture the performance of an institution by indicator ratios representing efficiency in production (like percentage of successful candidates) or efficiency in costs (like unit cost of education) only. It is important to study the performance of the educational institutions recognizing the divergence of the inputs and outputs. The technique of Data Envelopment Analysis is useful tool where we can replace simple ratios of one output to one input by composite ratio derived from linear programming technique. The major objective of this paper is to assess the efficiency of the colleges under Vidyasagar University in West Bengal, India.

There is wide literature on the measurement of efficiency of educational institutions using DEA. From the time of the original Data Envelopment Analysis (DEA) study by Charnes et al. (1978) for measuring the efficiency of decision-making units, Emrouznejad (2008) presents an extensive listing of DEA research covering theoretical developments as well as "real-world" applications from inception to the year 2007.Athanassopoulos and Shale (1997) examine the comparative performance of higher education institutions in the UK. Johnes (2006) applied DEA to a data set of more than 100 HEIs in England using data for the year 2000/01. Through bootstrapping procedures she finds that differences between the most and least efficient English HEIs are significant. Afonso and Aubyn (2006) address the efficiency of expenditure in education provision by comparing the output (PISA results) from the educational system of 25countries (mostly OECD) with resources employed (teachers per student, time spent at school. Glass et al (2006) investigates whether best-practice efficiency measurement based on data envelopment analysis (DEA) provides empirical support for the higher education policy goals in UK that encourage the publicly funded universities to become more-specialised and larger in size without compromising output quality. Bougnol and Dulá (2006)

compare two classification and ranking schemes involving universities; one from a published report, 'Top American Research Universities' by the University of Florida's *The Center* and the other using DEA. They compare the two methods and discover important equivalences. Colbert et al (2000) uses Data envelopment analysis (DEA) to determine the relative efficiency of 24 top ranked US MBA programs using three output sets of the MBA programs: student satisfaction, recruiter satisfaction. This paper by Nazarko (2014) describes a comparative efficiency study of 19 Polish universities of technology. Detailed analysis of potential input, output and environmental variables describing the HEI efficiency model was carried out. The study used the CCR-CRS output-oriented DEA model. DEA results of Ahn and Seiford (1989) strongly support the hypothesis that public schools are more efficient than private schools when visible and closely monitored output variables are used for evaluation.

Though there is wide literature on the measurement of efficiency higher education institutes, the number of studies for higher education institutes in India is very limited. As a case study, we have taken the colleges under Vidyasagar University to evaluate their comparative performance.

5.2. DEA Methodology

We have used DEA for judging the efficiency of the colleges under Vidyasagar University, West Bengal, India. Data envelopment analysis (DEA) is a non-parametric approach that involves the use of linear programming methods to construct a non-parametric frontier and to evaluate the relative Input-Output efficiency of a Decision Making Unit (DMU). Unlike the econometric approach DEA makes no assumptions regarding the distribution of inefficiencies. The methodology was developed by Charnes, Cooper and Rhodes (1978, 1981) based on M.J. Farrel's contribution to productive efficiency. In his classic paper, M.J. Farrell (1957) argues that the measurement of productive efficiency is of theoretical and practical importance; a satisfactory efficiency measure allows both empirical testing of theoretical arguments and economic planning to improve the productivity of particular industries.

DEA models differ in the emphasis of their orientation (like input or output oriented model) and on the assumption of scale conditions (like CRS and VRS). Technical Efficiency (TE) of a firm can be measured either by (i) output-oriented measure or by (ii) input-oriented measure. In case of output oriented measure the TE of a firm can be computed by comparing its actual output with the maximum producible output from its observed inputs i.e. by how much can output quantities be proportionally expanded without altering the inputs quantities used. In input oriented measure, the TE of a firm can be measured by comparing its actual input in use with the minimum input that would produce the targeted output level i.e. by how much can input quantities be proportionally

reduced without changing the actual output bundle . On the other hand, under variable VRS the envelopment surface presents convexity as a consequence of the constraint ($N1'\lambda = 1$) in the model. The convexity condition essentially ensures that an inefficient DMU is only benchmarked against DMUs of similar size. This means the projected point (for that DMU) on the DEA frontier is a convex combination of observed DMUs (Coelli et al 2005).

So, an inefficient DMU can be made fully efficient by projection onto a point on the envelopment surface and this particular projected point location is dependent upon the DEA model employed in the analysis. DEA models provide various choices for the analyst, and can be employed to meet different demands corresponding to each situation.We have adopted here the input-oriented VRS DEA model. Input orientation is chosen because educational institutions have generally greater control over input quantities relative to output quantities (Coelli et al 2005).

The formal specification of Input-Oriented VRS model is given by the following set of equations.

$$\begin{aligned} &\min_{\theta,\lambda} \theta \\ &\text{s.t.} \\ &Y\lambda \geq Y_i \\ &X\lambda \leq \theta X_i \\ &N1'\lambda = 1 \\ &\lambda \geq 0 \end{aligned} \qquad (1)$$

Where λ is the vector of relative weights ($N \times 1$) given to each Decision Making Unit (DMU) and N is the number of DMUs. Assuming that the DMUs have I inputs and O outputs: X represents the matrix of inputs ($I \times N$) and Y is the matrix of outputs ($O \times N$). The column vectors for the inputs and outputs for each DMU are represented as X_i and Y_i, respectively.

An additional restriction is inserted in the optimization problem if we want to evaluate the DMUs under Varible Returns to Scale (VRS), $N1'\lambda = 1$, where N1 is a ($N \times 1$) vector of ones. This restriction imposes convexity of the frontier, accounting for VRS. Dropping this restriction would mean Constant Returns to Scale (CRS).

Finally, the efficiency score (θ) is a scalar that measures the technical efficiency and takes values between 0 and 1. The efficiency score denotes the distance between the DMU under analysis and the efficiency frontier, defined as a linear combination of the "best practice" units. If $\theta < 1$, the DMU is inside the frontier and it will relatively inefficient; while under $\theta = 1$ the DMU will be on the efficiency frontier and it will be considered technically efficient.

5.3 Measurement of Efficiency of Colleges

5.3.1 Variables for Measurement of Efficiency of Colleges

For the implementation of DEA, we need to define some inputs and outputs. Following the literature on the measurement of efficiency of higher education institutes (HEIs), for our study we have here considered three inputs – (i) Full time teachers and student ratio (FTSR): Ratio of full time teachers and total enrolment of the college (ii) Part time teachers and student ratio (PTSR): Part-time teachers include regular part time teachers and contractual teachers and (iii) Non-teaching staff and student ratio (NTSR): Ratio of non teaching staff and enrolment. These inputs work as the main resources required for the normal performance of colleges. As regards to outputs of colleges, we have considered five outputs: (i) Average marks attained by passed honours students of all courses in the final examination (MARKS): It is calculated by taking the ratio of aggregate marks achieved and the number of honours students passed. So, average marks denotes the marks obtained on an average out of 800 by a student. (ii) Number of first class (above 60% in aggregate) achieved by honours students (1CLASS), (iii) Percentage of honours students passed in the final examination in relation to intake capacity (PERCENTP) and (iv) Number of Departments in the college (DEPT). The outputs reflect the teaching activity of HEIs. All these data refer to the year 2015-2016 and marks have been collected for the Honours students. Data on these variables have been collected from the office of Vidyasagar University and websites of individual colleges. Due to paucity of data, we could not take into research works of faculty members as output variable of a college.

We have presented in Table 5.1 the list of colleges under our study with their location, date of establishment, intake capacity and number of Departments.

Table 5.1: Colleges Affiliated to Vidyasagar University under Study

Sl.No.	College Name	Block	Date of Establishment	Intake capacity	Number of Departments
1	Bajkul Milani Mahavidyalaya	Bhagawanpur - I	1964	1112	18
2	Belda College	Narayangarh	1963	1446	20
3	Bhattar College	Dantan	1963	1028	14
4	Chaipat S.P.B. Mahavidyalaya	Daspur II	2007	259	4
5	Chandrakona Vidyasagar Mahavidyalaya	Chandrakona(M)	1985	621	9
6	Debra Thana S.K.S. Mahavidyalaya	Debra	2006	750	13
7	Deshapran Mahavidyalaya	Contai-III	2010	278	5
8	Egra Sarada Sashi Bhusan College	Egra	1968	896	13
9	Garhbeta College	Garhbeta 1	1948	1139	13
10	Gourav Guin Memorial College	Garhbeta II	2008	333	5
11	Haldia Government College	Haldia	1988	877	15
12	Hijli College	Kharagpur-I	1995	417	8

13	Jhargram Raj College	Jhaargram (M)	1949	903	14
14	K D College of Commerce	Midnapore (M)	1961	428	4
15	Kharagpur College	Kharagpur (M)	1949	1414	15
16	Khejuri College	Khejuri	1999	509	8
17	Maharaja Nandakumar Mahavidyalaya	Nandakumar	2007	387	6
18	Mahisadal Raj College	Mahisadal	1946	1503	19
19	Mahishadal Girls' College	Mahisadal	1969	1103	15
20	Midnapore College	Midnapore (M)	1873	1332	22
21	Moyna College	Mayna	1972	471	7
22	Mugberia Gangadhar Mahavidyalaya	Bhagawanpur - II	1964	935	14
23	Narajole Raj College	Daspur 1	1966	785	12
24	Panskura Banamali College	Panskura	1960	1960	21
25	Pingla Thana Mahavidyalaya	Pingla	1965	983	13
26	Prabhat Kumar College	Contai-I	1926	1710	18
27	Rabindra Bharati Mahavidyalaya	Kolaghat	2010	249	6
28	Rabindra Satabarshiki Mahavidyalaya	Ghatal (M)	1961	1222	16
29	Raja N.L.Khan Women College	Midnapore (M)	1957	1269	19
30	Ramnagar College	Ramnagar-II	1972	1181	16
31	Sabang Sajani Kanta Mahavidyalaya	Sabang	1970	1184	15
32	Sankrail A.B. Smriti Mahavidyalaya	Sankrail	2007	394	6
33	Santal Bidroha Satabarshiki Mahavidyalaya	Garhbeta III	2005	718	12
34	Seva Bharati Mahavidyalaya	Jamboni	1964	697	11
35	Silda Chandra Sekhar College	Binpur –II	1971	461	9
36	Sitananda College	Nandigram	1960	893	12
37	Subarnarekha Mahavidyalaya	Gopiballavpur-I	1988	476	8
38	Sukumar Sengupta Mahavidyalaya	Keshpur	2004	630	9
39	Tamralipta Mahavidyalaya	Tamluk	1948	1223	17
40	Vivekananda Mission Mahavidyalaya	Sutahata	1968	978	15
41	Vivekananda Satabarshiki Mahavidyalaya	Jhaargram	1964	735	13
42	Yogada Satsang Palpara Mahavidyalaya	Patashpur	1964	833	12

Source: Office, Vidyasagar University and Websites of Colleges

5.3.2 DEA Efficiency Results for Colleges under Vidyasagar University

Following the DEA methodology for input oriented VRS model we have derived the efficiency score of each college. We have taken 42 colleges under Vidyasgar University as the sample for our study. We have prepared a statistical summary of input and output variables of the colleges under our study and is presented in Table 5. 2. The summary based on the collected is presented in the Table 5.2. For example, summary measures for average marks obtained by Honours students (MARKS in column 6) are as follows: maximum – 454.2, minimum – 356.4, average – 397.2 and

standard deviation is 17.2. We have shown statistical summary measures of other parameters in other columns of Table 5.2.

Table 5.2: Summary Table of the Performance of the Colleges

	FTSR	PTSR	NTSR	PASS	MARKS	1CLASS	PERCENTP	DEPT
Max	0.0770	0.1126	0.0647	860.0	454.2	268.0	60.0	22.0
Min	0.0034	0.0089	0.0028	66.0	356.4	1.0	17.0	4.0
Average	0.0181	0.0444	0.0159	298.7	397.2	36.7	34.6	12.4
SD	0.0151	0.0239	0.0109	176.6	17.2	48.4	9.2	4.8

Source: Own Estimation

The correlation matrix of all the inputs and outputs is presented in Table 5.3. The correlation coefficients among the inputs are found not so high.

Table 5.3: Correlation Matrix Tables of Inputs and Outputs

	FTSR	PTSR	NTSR	PASS	MARKS	1CLASS	PERCENTP	DEPT
FTSR	1.000	0.137	0.514	0.327	0.513	0.462	0.017	0.487
PTSR	0.137	1.000	0.632	0.004	0.005	0.248	-0.218	0.124
NTSR	0.514	0.632	1.000	0.195	0.326	0.538	0.140	0.181
PASS	0.327	0.004	0.195	1.000	0.736	0.865	0.474	0.829
MARKS	0.513	0.005	0.326	0.736	1.000	0.807	0.515	0.634
1CLASS	0.462	0.248	0.538	0.865	0.807	1.000	0.532	0.670
PERCENTP	0.017	-0.218	0.140	0.474	0.515	0.532	1.000	0.026
DEPT	0.487	0.124	0.181	0.829	0.634	0.670	0.026	1.000

Source: Own Estimation

Given the DEA model (equation 1) and the data on inputs outputs, we have calculated efficiencies for our selected colleges. The efficiency scores and ranks have been reported in column 3 and column 4 of Table 5.4. Out of 42 colleges 11 colleges are of efficiency scores with value 1 and they are ranked same i.e. 1. The average efficiency score of the colleges under study has been calculated as 0.682 with the minimum efficiency score being 0.299 and standard deviation of scores being 0.262. Eleven colleges having achieved 100% efficiency are: Belda College, Debra Thana S.K.S. Mahavidyalaya, Deshapran Mahavidyalaya, Haldia Government College, K D College of Commerce, Midnapore College, Mahishadal Girls' College, Panskura Banamali College, Rabindra Satabarshiki Mahavidyalaya, Sabang Sajani Kanta Mahavidyalaya, Sankrail A.B. Smriti Mahavidyalaya and Sukumar Sengupta Mahavidyalaya.

Table 5.4: Efficiency Scores and Ranks of Colleges

Sl. No.	Decision Making Unit (College)	Score	Rank
1	Bajkul Milani Mahavidyalaya	0.94	14
2	Belda College	1.00	1
3	Bhattar College	0.53	26
4	Chaipat S.P.B. Mahavidyalaya	0.83	17
5	Chandrakona Vidyasagar Mahavidyalaya	0.54	25
6	Debra Thana S.K.S. Mahavidyalaya	1.00	1
7	Deshapran Mahavidyalaya	1.00	1
8	Egra Sarada Sashi Bhusan College	0.79	18
9	Garhbeta College	0.58	24
10	Gourav Guin Memorial College	0.86	15
11	Haldia Government College	1.00	1
12	Hijli College	0.31	41
13	Jhargram Raj College	0.42	32
14	K D College of Commerce	1.00	1
15	Kharagpur College	0.50	27
16	Khejuri College	0.46	29
17	Maharaja Nandakumar Mahavidyalaya	0.48	28
18	Mahisadal Raj College	0.74	19
19	Mahishadal Girls' College	0.36	39
20	Midnapore College	1.00	1
21	Moyna College	0.42	30
22	Mugberia Gangadhar Mahavidyalaya	0.32	40
23	Narajole Raj College	0.42	31
24	Panskura Banamali College	1.00	1
25	Pingla Thana Mahavidyalaya	0.39	34
26	Prabhat Kumar College	0.98	12
27	Rabindra Bharati Mahavidyalaya	0.69	21
28	Rabindra Satabarshiki Mahavidyalaya	1.00	1
29	Raja N.L.Khan Women College	0.97	13
30	Ramnagar College	0.67	22
31	Sabang Sajani Kanta Mahavidyalaya	1.00	1
32	Sankrail A.B. Smriti Mahavidyalaya	1.00	1
33	Santal Bidroha Satabarshiki Mahavidyalaya	0.86	16
34	Seva Bharati Mahavidyalaya	0.39	35
35	Silda Chandra Sekhar College	0.61	23
36	Sitananda College	0.30	42
37	Subarnarekha Mahavidyalaya	0.72	20
38	Sukumar Sengupta Mahavidyalaya	1.00	1
39	Tamralipta Mahavidyalaya	0.39	36
40	Vivekananda Mission Mahavidyalaya	0.41	33
41	Vivekananda Satabarshiki Mahavidyalaya	0.38	38
42	Yogada Satsang Palpara Mahavidyalaya	0.38	37

Source: Own Estimation

We have regressed efficiencies of colleges on different variables to find the significant factors affecting the efficiency using the following regression model (equation 2) with usual meaning.

Efficiency score = intercept + a× Variable + u (2)

We have found that only significant factor is enrolment size of the college. The regression result is reported in the Table 5.5. The co-efficient of enrolment is found to be 0.00015 and the t statistic is 2.39. The value of F for the regression equation is 5.74 with level of significance being 2.1% and the value of adjusted R^2 is 10.3%.

Table 5.5: Regression Result of Efficiency on Size of the College

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.515039	0.079744	6.458688	1.07E-07
En	0.00015	6.26E-05	2.396008	0.021342

Source: Own Estimation

5.4 Measurement of Efficiency of Universities in West Bengal

5.4.1 Brief History of Eleven Universities Selected for the Analysis

University of Calcutta: University of Calcutta is the first modern university in India and South Asia, established in 1857. The University adopted in the first instance, the pattern of the University of London and gradually introduced modifications in its constitution. The University is now governed by the Calcutta University Act, 1979 as amended on 31 May, 2006.

Visva Bharati: Visva Bharati University was founded by the first non-European Nobel Laureate Rabindranath Tagore in 1921, Visva-Bharati was declared to be a central university and an institution of national importance by an Act of Parliament in 1951. The university is divided into institutes, centres, departments and schools. The respective departments are included in the institutes.

Jadavpur University: History of Jadavpur University is linked with India's freedom movement, particularly with Swadeshi Movement during 1905 -1906. In 1910 the Society for the Promotion of Technical Education in Bengal which looked after Bengal Technical Institute was amalgamated to NCE. After Independence, the Government of West Bengal, with the concurrence of the Govt. of

India, enacted the necessary legislation to establish Jadavpur University on the 24th of December 1955 (JU Website: http://www.jaduniv.edu.in/#) .

University of Burdwan: The University of Burdwan began its journey on the 15th June of 1960 with 6 Post Graduate Departments and 30 affiliated Colleges in the building of the Burdwan Raj of the district Burdwan, called the rice bowl of Bengal. The University has its colleges over in parts of the districts of Hooghly, Burdwan, Bankura and Birbhum districts.

University of Kalyani: In the early 1950s, the township of Kalyani was developed as the brainchild of Dr. Bidhan Chandra Roy, the then Chief Minister of West Bengal. University of Kalyani was established in November 1960, as a unitary university with the faculties of Arts, Science, Education, and Agriculture. The University was divided in the year 1975 and its Faculty of Agriculture in the Mohanpur campus became full-fledged agricultural university, named as Bidhan Chandra Krishi Viswavidyalaya. In 1998 Kalyani University became an affiliating university with its territorial jurisdiction extended to the districts of Nadia and Murshidabad, with affiliations of 37 colleges, earlier under Calcutta University.

University of North Bengal: The University of North Bengal was established in 1962 with the mission "to promote advancement and dissemination of knowledge and learning and to extend higher education to meet the growing needs of society." The University of North Bengal campus covers an area of nearly 331 acres of land at the foothills of high Himalaya in close proximity of vast plains around it with a fascinating glimpse of the Kanchenjunga peak, tea gardens and forest cover.

Rabindra Bharati University: The Rabindra Bharati University was established in 1962 to mark the birth centenary of the Rabindranath Tagore. It is a State University named after Tagore dedicated to the mission of disseminating his thoughts and ideas through humanities, social sciences, art and culture. The Rabindra Bharati University caters mostly to the students of the peripheries of West Bengal Girls and boys from far-flung areas of the state and from backward strata of the society constitute more than seventy percent of the total strength of students. Yet the University takes pride in its share of international students ranging from Europe to Asia, who come, either through the Indian Council of Cultural Relations (ICCR), or on their own, to learn mainly Indian art and culture and to acquire a degree in academics underpinned by Tagore.

Vidyasagar University: Vidyasagar University was established by an Act of the West Bengal legislature which was notified in the *Calcutta Gazette* on 24 June 1981.It is an affiliating university in Paschim Medinipur district of southern West Bengal, India. It offers courses at the undergraduate

and post-graduate levels. Vidyasagar University is named after Pandit Iswar Chandra Vidyasagar, regarded as one of the most illustrious son of Bengal. Academic activities of the University stared in 1985 with 30 colleges in the undivided district of Midnapore..

West Bengal University of Technology: The University came into operation formally with the assumption of the office of the first Vice Chancellor on January 15, 2001 as a sequel to the promulgation of The West Bengal University of Technology Act, 2001. The University is steadfast in its twin objectives: a) To serve as a Centre of Excellence in teaching and research in technology and management area. b) To provide framework of industrialization based on knowledge economy. To realize its mission of emerging as a Centre of Excellence the University has created three Schools of Studies viz. School of Engineering & Technology (SET), School of Biotechnology & Biological Sciences (SBTBS) and School of Management and Sciences (SOMS) comprising presently of five departments.

University of Gour Banga (UGB): The University of Gour Banga (UGB) was established in 2007 at English Bazar Town of Malda District in West Bengal. It is one of the new state universities established by the Government of West Bengal to address the concerns of ‘equity and access’ and to increase the access to quality higher education for people in less educationally developed districts of Malda, Uttar Dinajpur and Daskshin Dinajpur which have a Graduate Enrolment Ratio of less than the state average and National average as well.

Presidency University: The 'Hindoo College’, the earliest institution of higher learning in Asia, established in 1817, was transformed into the ‘Presidency College of Bengal' in 1855. Teaching of both liberal arts and empirical sciences acquired true excellence in the nineteenth century and the tradition continued even after independence. In recognition of its rich heritage of academic excellence the Legislature of West Bengal conferred the status of a University on Presidency College on 7th July of 2010. This was enacted with a view to enabling Presidency University to function more efficiently as a centre of teaching and research in various branches of learning, especially in Humanities, Social and Basic Sciences, and promoting advancement and dissemination of knowledge and learning in the service of the society and the nation.

5.4.2 Variables for the Universities under Consideration

In Table 5.6 we have presented the following for the universities under consideration: Year of visit, Year of establishment, Area and Total Programmes.

Table 5.6: Year of Visit, Year of Establishment, Area and Total Programmes

Sl.No.	Name of the University	Year of NAAC visit	Year of Establishment	Area (Acre)	Total Programmes
1	Calcutta University	Dec, 19-21,2016	1857	1557.27	278
2	Visva Bharati	April, 27-30, 2015	1951	1127.75	241
3	Jadavpur University	July, 22-25,2014	1955	96.5	140
4	Burdwan University	Oct, 20-22, 2016	1960	316.31	118
5	Kalyani University	December 5-7, 2016	1960	346.47	142
6	North Bengal University	November, 21-23, 2016	1961	362.53	64
7	Rabindra Bharati University	January, 11-14, 2016	1962	22.19	94
8	Vidyasagar University	November, 11-14, 2014	1981	138.78	64
9	West Bengal University of Technology	November 13-15,2017	2001	38.7	12
10	Gour Banga University	March, 21-24, 2016	2008	30.51	42
11	Presidency University	Dec, 5-7, 2016	2010	28.8	35

Source: NAAC

In Table 5.7 we have presented the unit cost of education for the selected universities.

Table 5.7: Unit Cost of Education

Sl. No.	Name of the University	With salary (Rs.)	Without salary (Rs.)	Demand ratio
1	Calcutta University	181407	34293	2.22
2	Visva Bharati	193000	72000	3.30
3	Jadavpur University	291000	92000	8.09
4	Burdwan University	87875	11049	5.00
5	Kalyani University	131000	32000	5.59
6	North Bengal University	284007	60985	3.37
7	Rabindra Bharati University	52930	45249	4.12
8	Vidyasagar University	79849	19991	5.72
9	West Bengal University of Technology	197600	124090	NA
10	Gour Banga University	44426	14320	4.97
11	Presidency University	92898	51011	16.00

Source: NAAC Reports

In Table 5.8, we have presented ratios: Teacher Students Ratio (Per 100 students) and Support Staff Students Ratio (Per 100 students).

Table 5.8: Student Teacher Ratio and Support Staff- Teacher Ratio

Sl. No.	Name of the University	Students (Nos.)	Teachers (Nos.)	Support Staff (Nos.)	Teacher-Students Ratio (Per 100 students)	Support Staff -Students Ratio (Per 100 students)
1	Calcutta University	20527	525	1483	2.558	7.22
2	Visva Bharati	6894	544	997	7.891	14.46
3	Jadavpur University	9691	611	1313	6.305	13.55
4	Burdwan University	3555	229	773	6.442	21.74
5	Kalyani University	3495	194	349	5.551	9.99
6	North Bengal University	2403	152	351	6.325	14.61
7	Rabindra Bharati University	5313	134	355	2.522	6.68
8	Vidyasagar University	3409	136	164	3.989	4.81
9	West Bengal University of Technology	683	23	53	3.367	7.76
10	Gour Banga University	2480	82	18	3.306	0.73
11	Presidency University	2719	157	13	5.774	0.48

Source: NAAC Reports

In Table 5.9, we have presented values for different NAAC assessment criteria, CGPA and grades received by different universities.

Table 5.9: NAAC Assessment for Different Criteria

Name of the college	Criteria							CGPA	Grade
	I	II	III	IV	V	VI	VII		
Calcutta University	3.2	3.3	3.48	3.2	3	2.3	3.4	3.2	A
Visva Bharati	2.87	2.75	2.92	2.4	2.6	2.8	3.3	2.82	B
Jadavpur University	3.67	3.9	3.76	3.8	3.6	3.3	3.4	3.68	A
Burdwan University	3.33	3.05	2.84	3.5	2.8	2.9	3.7	3.11	A
Kalyani University	3	3.35	3.04	3	3.4	3	3	3.12	A
North Bengal University	2.8	3.15	3.28	3.2	3.4	2.6	2.6	3.05	A
Rabindra Bharati	3	3.65	2.84	3	3	3.1	3	3.1	A
Vidyasagar University	2.87	3.05	2.84	3	3	2.8	2.3	2.86	B
WBUT	2.67	2.75	2.76	2.7	3	3.6	3	2.87	B++
Gour Banga University	2	2.4	1.84	3	3	2.2	2.4	2.3	B
Presidency University	2.87	3.35	2.8	3.3	3	2.7	3.4	3.04	A

Source: NAAC

5.4.3 DEA Efficiency Results of Selected Universities

For the implementation of DEA, we need to define some inputs and outputs. Following the literature on the measurement of efficiency of higher education institutes (HEIs) and depending upon the availability of data, for our efficiency study of Universities in West Bengal, we have here considered three inputs – (i) Unit cost of education with salary (*UCS*), (ii) Permanent Full time teachers and student ratio (*TSR*): Ratio of full time teachers and total enrolment of the university, (iii) Support

staff and student ratio (*SSSR*): Ratio of non teaching staff and enrolment. These inputs work as the main resources required for the normal performance of universities. As regards to outputs of universities, we have considered three outputs: (i) NAAC Assessment Score (*NAAC*). (ii) The total number of students enrolled (*Students*).(iii) Total number of current programmes going on in the university (*Programme*). The outputs reflect the teaching activity of HEIs. All these data have been collected from the NAAC reports.

Following the DEA methodology for input oriented VRS model we have derived the efficiency score of each university. We have taken 11 Universities as the sample for our study. We have prepared a statistical summary of input and output variables of the universities under our study and is presented in Table 5.10. The summary based on the collected data is presented in the Table 5.10. The correlation matrix of all the inputs and outputs is presented in Table 5.11. The correlation coefficients among the inputs are found not so high.

Table 5.10: Statistics for Input- Output Data

	UCS	TSR	SSSR	NAACRQ	Students	Programme
Max	291.00	7.89	21.74	3.76	20527.00	278.00
Min	44.43	2.52	0.48	1.84	683.00	12.00
Average	148.73	4.91	9.28	2.95	5560.82	111.82
SD	83.06	1.74	6.13	0.47	5284.09	80.72

Source: Own Estimation

Table 5.11: Correlation Matrix

	UCS	TSR	SSSR	NAACRQ	Students	Programme
UCS	1.00	0.42	0.46	0.74	0.27	0.26
TSR	0.42	1.00	0.61	0.28	-0.21	0.18
SSSR	0.46	0.61	1.00	0.46	0.05	0.36
NAAC	0.74	0.28	0.46	1.00	0.56	0.50
Students	0.27	-0.21	0.05	0.56	1.00	0.83
Programme	0.26	0.18	0.36	0.50	0.83	1.00

Source: Own Estimation

Given the DEA model (equation 1) and the data on inputs outputs, we have calculated efficiencies for our selected Universities. The efficiency scores and ranks have been reported in column 3 and column 4 of Table 5.12. Out of 11 selected universities, 4 Universities are of efficiency scores with value 1 and they are ranked same i.e. 1. The average efficiency score of the universities under study has been calculated as 0.864 with the minimum efficiency score being 0.497 and standard deviation of scores being 0.164. Five universities having achieved 100% efficiency are Jadavpur University, Calcutta University, Rabindra Bharati University, Gour Banga University and Presidency

University. To make a comparison between efficiency and quality, we have presented the Efficiency score ranks and ranks based on overall NAAC score in the last two columns of Table 7. Spearman's rank correlation coefficient between these two ranks is found to be 0.06 with level of significance being 86%.

Table 5.12: Efficiency Score of Sample Universities

Sl. No.	**Name of the University**	DEA Efficiency Score	DEA Efficiency Rank	NAAC Overall Score Rank
1	Calcutta University	1.000	1	2
2	Visva Bharati	0.806	7	10
3	Jadavpur University	1.000	1	1
4	Burdwan University	0.793	8	4
5	Kalyani University	0.711	10	3
6	North Bengal University	0.497	11	6
7	Rabindra Bharati University	1.000	1	5
8	Vidyasagar University	0.921	6	9
9	West Bengal University of Technology	0.776	9	8
10	Gour Banga University	1.000	1	11
11	Presidency University	1.000	1	7

Source: Authors' Estimation

5.5 Conclusion

Using the secondary data, the present chapter finds efficiency scores of colleges under Vidyasagar University in West Bengal for the year 2015-16 and selected universities in West Bengal. The efficiency scores were calculated using the non-parametric technique of Data Envelopment Analysis (DEA). The study shows that there is wide variation in efficiency scores across colleges and universities under our study in West Bengal. The results show that oOut of 11 universities, 5 universities are found to be with highest efficiency score. The best and the least efficient educational institutes individually are identified. The literature on efficiency measurement of educational institutions through DEA suggests that efficiency outcomes differ according to the choice of technique, the specification and measurement of inputs and outputs, the level of data used and the assumptions of the model (Johnes 2006). It should be mentioned that the present study does not include some important efficiency parameters such as research outputs like number of publication, satisfaction index of students and other stakeholders etc. which may change the efficiency scores of the colleges. So, these may be incorporated in future studies.

Chapter 6

Equity Issues in Higher Education in West Bengal

6.1 Introduction

While the expansion of higher education is primarily driven by economic agenda, the equity concerns are driven by social agendas like social justice. State policies play a important role in promoting equity in access to higher education. Equity is an inclusive notion, and inclusion implies provision of a basic minimum standard of education for all (Santiago et al. 2008). Equal inputs need not always lead to equal outcomes in education (Varghese et al, 2018).

Various social, economic, political, geographical and other developments in a society lead to both positive and negative discrimination. The notion of equality has been debated in philosophical circles where an egalitarian society appreciates equality in opportunities. It is the responsibility of the society to assure equal opportunity to various groups in the socio-economic as well as political standing. Higher education provision, access and attainment can enhance the likelihood of the disadvantaged groups in the society to uplift themselves. Moreover, it can equip the disadvantaged group for an ascent in their status. We will discuss equity in higher education in terms of institutional distribution, gender-wise and caste-wise enrolment , enrolment in different courses, level-wise outturn, disparity in GER, Gender parity index, rural urban disparity, inter-district disparity, enrolment in technical and vocational education, gender disparity regarding teacher, people-teacher ratio.

6. 2 Institutional Distribution in West Bengal

We have discussed institutional distribution in terms of type-wise and specialisation-wise distribution.

6.2.1 Type-wise Distribution

Type -wise number of Universities in West Bengal and India in 2016-17 is shown in Table 6.1. In West Bengal, there are 41 universities and percentage share 4.7 % in India. 24 universities are state public universities, 8 universities are state private universities and one central university but there are no government deemed universities.

Table 6.1: Type-wise Number of Universities in West Bengal and India in 2016-17

Institutions	West Bengal	India	Percentage of West Bengal
Central University	1	44	2.3
Central Open University	0	1	0.0
Institute of National Importance	6	100	6.0
State Public University	24	345	7.0
Institute under State Legislature Act	0	5	0.0
State Open University	1	13	7.7
State Private University	8	233	3.4
State Private Open University	0	1	0.0
Deemed University-Government	0	33	0.0
Deemed University-Government Aided	0	10	0.0
Deemed University-Private	1	79	1.3
Grand Total	41	864	4.7

Source: AISHE, 2016-17

Number of Private and Government Colleges and enrolment in West Bengal and India in 2016-17 is presented in Table 6.2. West Bengal has share of 3.3 % colleges and 6.1% enrolment in respect to India. West Bengal has share of 2.6% private colleges and 3.2% private college enrolment of India in 2016-17.

Table 6.2: Number and Enrolment of Private and Government College in 2016-17

		West Bengal	India	% of WB
Number of Private and Government Colleges (based on actual response)	Private Un-Aided	511	23647	2.2
	Private Aided	222	5028	4.4
	Total Private	733	28675	2.6
	Government	473	8177	5.8
	Total	1206	36852	3.3
Enrolment in Private and Government Colleges (based on actual response)	Private Un-Aided	182267	12179736	1.5
	Private Aided	394103	5580887	7.1
	Total Private	576370	17760623	3.2
	Government	1021831	8628070	11.8
	Total	1598201	26388693	6.1

Source: AISHE, 2016-17

6.2.2 Institutional Distribution: Specialisation

Specialization - wise number of Universities (2016-17) in West Bengal and India are shown in Table 6.3. The state of West Bengal had 29 general universities i.e. 5.9 % of India in 2016-17.

Table 6.3: State-wise and Specialization-wise Number of Universities (2016-17) in West Bengal and India (Based on actual Survey)

Items	West Bengal	All India	% of West Bengal
General	29	488	5.9
Agriculture	3	51	5.9
Cultural Studies		4	
Education	1	4	25.0
Fine Arts		10	
Fisheries		3	
Gandhian/Religious Studies		1	
Journalism and Mass Communication		3	
Language		9	
Law	1	19	5.3
Medical	2	52	3.8
Oriental Learning	1	3	33.3
Rural Development		4	
Sanskrit		13	
Science		4	
Sports/Yoga/Physical Education		3	
Technical	3	114	2.6
Veterinary		13	0.0
Others	1	37	2.7
Grand Total	41	835	4.9

Source: AISHE, 2016-17

Specialization-wise number of colleges (2016-17) in West Bengal and India is shown in Table 6.4. West Bengal had 2.9 % general degree colleges in India. It may be seen from the table that there are no colleges in the categories of Agriculture, Architecture, Fisheries, and Veterinary etc.

Table 6.4: Specialization-wise Number of Colleges (2016-17) in West Bengal and India

State/UTs	West Bengal	All India	% of West Bengal
General	727	24906	2.9
Agriculture	0	248	0.0
Architecture	0	145	0.0
Arts	10	817	1.2
Commerce	1	249	0.4
Computer Application	12	246	4.9
Education/Teacher Education	231	2600	8.9
Engineering and Technology	72	2213	3.3
Fine Arts	7	107	6.5
Fisheries	0	14	0.0
Home Science	0	16	0.0
Hotel and Tourism Management	6	71	8.5
Journalism and Mass Communication	0	9	0.0
Law	22	552	4.0

Management	27	679	4.0
Medical-Allopathy	23	261	8.8
Medical-Ayurveda	4	188	2.1
Medical-Dental	3	202	1.5
Medical-Homeopathy	11	102	10.8
Medical-Others	6	145	4.1
Nursing	16	1103	1.5
Oriental Learning	0	73	0.0
Para Medical	3	113	2.7
Pharmacy	8	605	1.3
Physiotherapy	3	128	2.3
Sanskrit	1	275	0.4
Science	2	226	0.9
Social Work	0	26	0.0
Sports/Yoga/Physical Education	2	95	2.1
Veterinary	0	44	0.0
Others	9	394	2.3
Grand Total	1206	36852	3.3

Source: AISHE, 2016-17

The general degree colleges in West Bengal are of two broad types – government colleges and non-government colleges. Government colleges are under direct administration of the State Government and the entire expenditure of these colleges is borne by the Higher Education Department. The employees of non-government colleges receive salary under the "Pay Packet Scheme" introduced in 1978. Number and caste-wise percentage of teachers and female share in West Bengal are shown in Table 6.5 According to Government of West Bengal, in 2015-16, there were 57,668 teachers in West Bengal of which share of the different caste categories are as follows: General: 89%, SC:6.63%, ST:0.84%, OBC: 3.5%. The shares of SC, ST and OBC teachers have improved slightly. On the other hand, the share of female teachers was 33.1% which was more or less same over last five years.

Table 6.5: Number and Caste-wise Percentage of Teachers and Female Share in West Bengal

Year	Total Number of Teachers	Gen	SC	ST	OBC	Female share
2011-12	43040	91.75	5.32	0.75	2.18	33.5
2012-13	45262	91.85	5.27	0.70	2.18	33.2
2013-14	48199	91.23	5.47	0.75	2.56	33.1
2014-15	53091	90.43	5.73	0.86	2.98	33.1
2015-16	57668	89.01	6.63	0.84	3.51	33.1

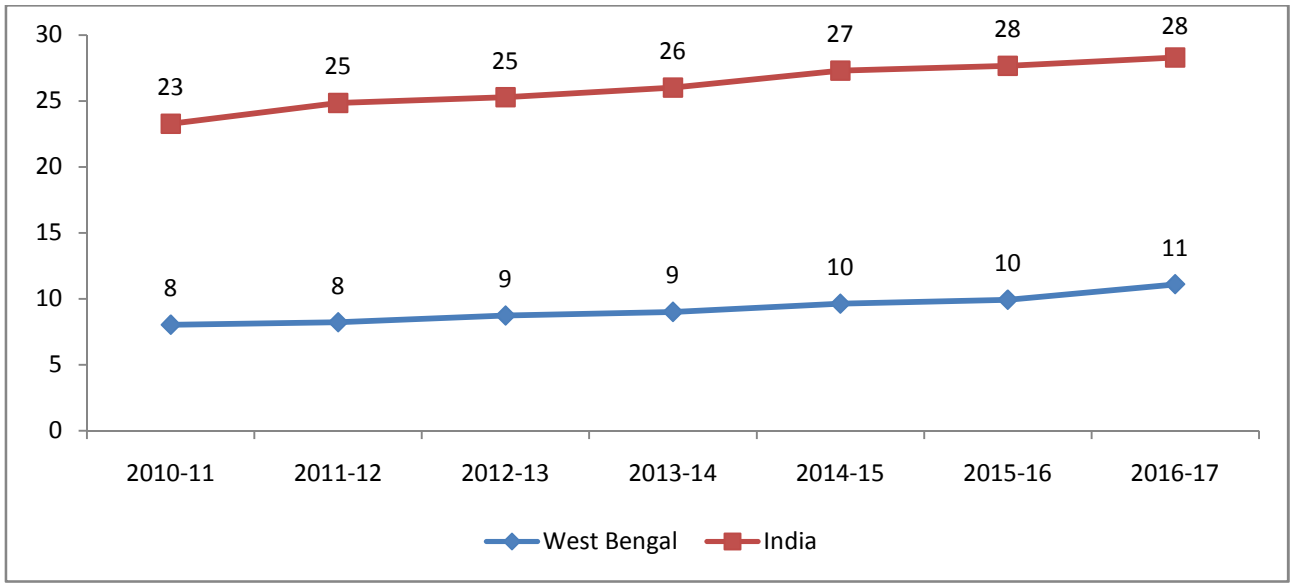
Source: Economic Review- various years, Govt. of West Bengal

6.2.3 Institutional Distribution Per lakh Population

Disparities associated with access to higher education can be partially attributed to differences in institutional infrastructure availability. Distance between residence and institutions providing higher education supplements to the private cost of access to institutions. Lack of institutional capacity with regard to population density also lessens the access opportunities for students. Such circumstances make the disadvantaged groups more vulnerable resulting in dropouts and discontinuation of higher education. It is in this context that the institutional distribution per lakh population should ensure greater opportunities for access. Disparities can also be observed between districts in terms of the availability of colleges per lakh population.

Number of colleges per lakh population in West Bengal and India during 2010-11 to 2016-17 is presented in Fig 6.1. The Figure shows that the number colleges per lakh population in West Bengal which weremuch below the all India average consistently over the period. State-wise Number of Colleges per Lakh Population (18-23 years) in 2016-17 is given in Appendix A6.5.

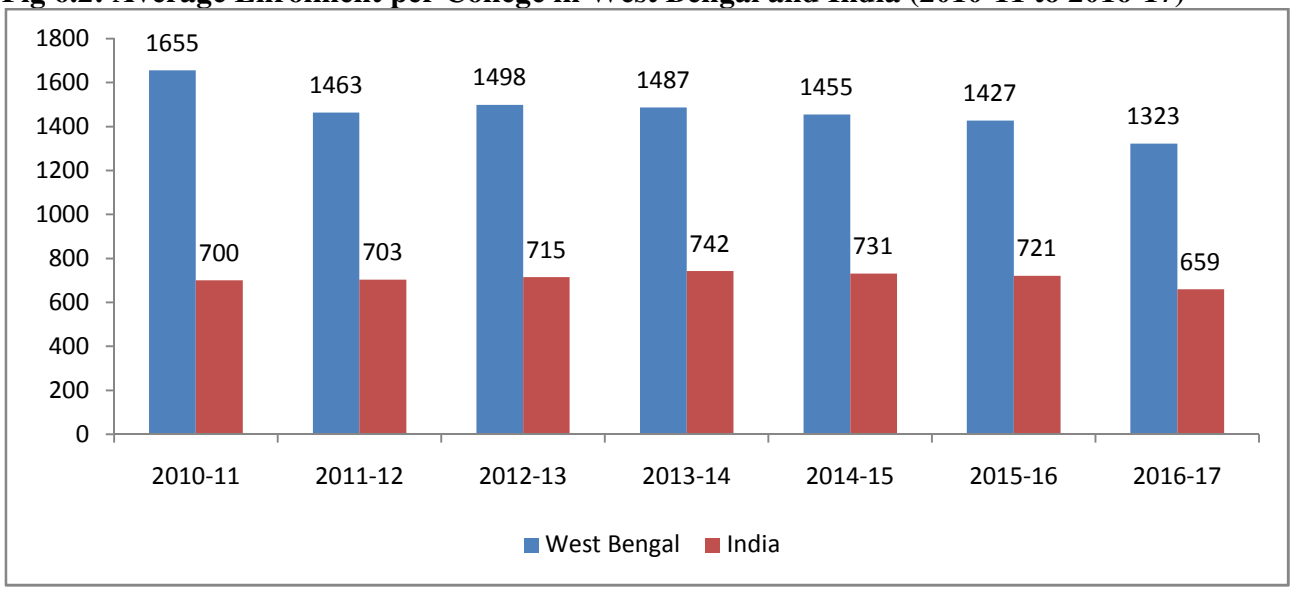
Fig 6.1: Number of Colleges Per lakh Population in West Bengal and India (2010-11 to 2016-17)



Source: AISHE, various years

Average enrolment per college in West Bengal and India during the period 2010-11 to 2016-17 is presented in Fig 6.2. The Figure shows that the enrolment per college is much higher than the national average for all the years over the period considered.

Fig 6.2: Average Enrolment per College in West Bengal and India (2010-11 to 2016-17)

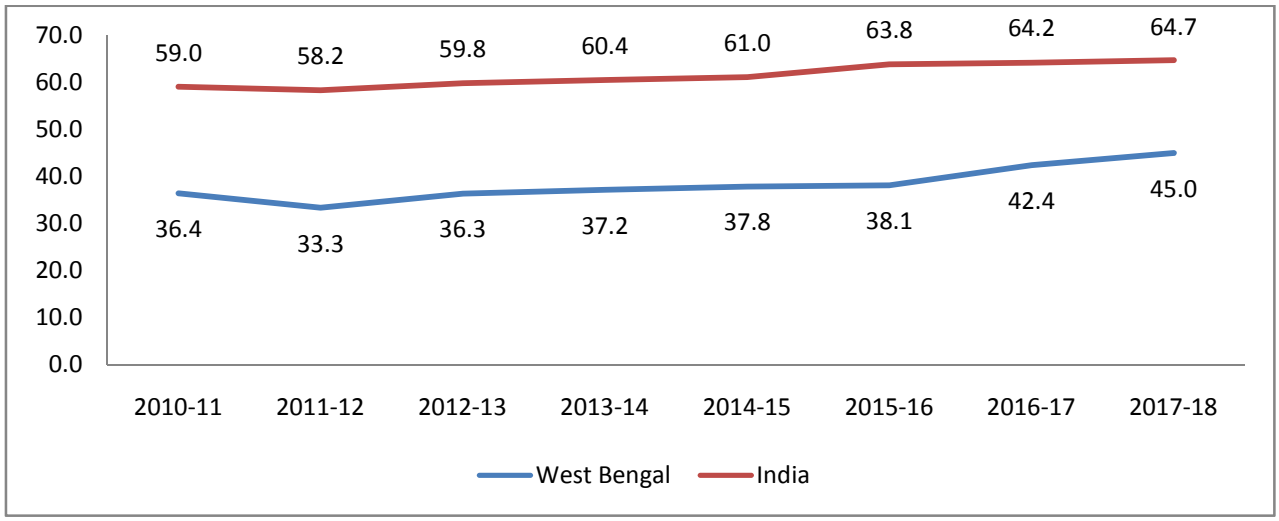


Source: AISHE, various years

6.2.4 Private Institutes in Higher Education in West Bengal

As per the AISHE data, the number of private unaided institutes in West Bengal and India was respectively was 603 and 24,620 respectively in 2017 -18. In India the percentage of private unaided institutes has increased from 59% to 64.7%. During the period 2010-11 to 2017-18, in West Bengal the percentage of private unaided institutes has increased from 36.4% to 45%. The gap between West Bengal and India has decreased from 22.6% to 19.7% for the above period (Fig. 6.3). Number of private institutes and enrolment in private institutes in India and West Bengal are given in Appendix A6.1 and A6.2.

Fig. 6.3 Percentage of Private Unaided Institutes in West Bengal and India during 2010-11 to 2017-18



Source: AISHE, Various years

6.3 Enrolment and Out-turn Pattern in Higher Education in West Bengal

6.3.1 UG and PG Enrolment in West Bengal

Total enrolment Undergraduate (U.G.) and Post Graduate (P.G.) in general degree education in West Bengal including universities and colleges stood at 13.34 lakhs in 20012-13 of which U. G. enrolment was 12.29 lakhs and P. G. enrolment was 1.04 lakhs. UG and PG Enrolment West Bengal (2012-13) are shown in Table 6.6.

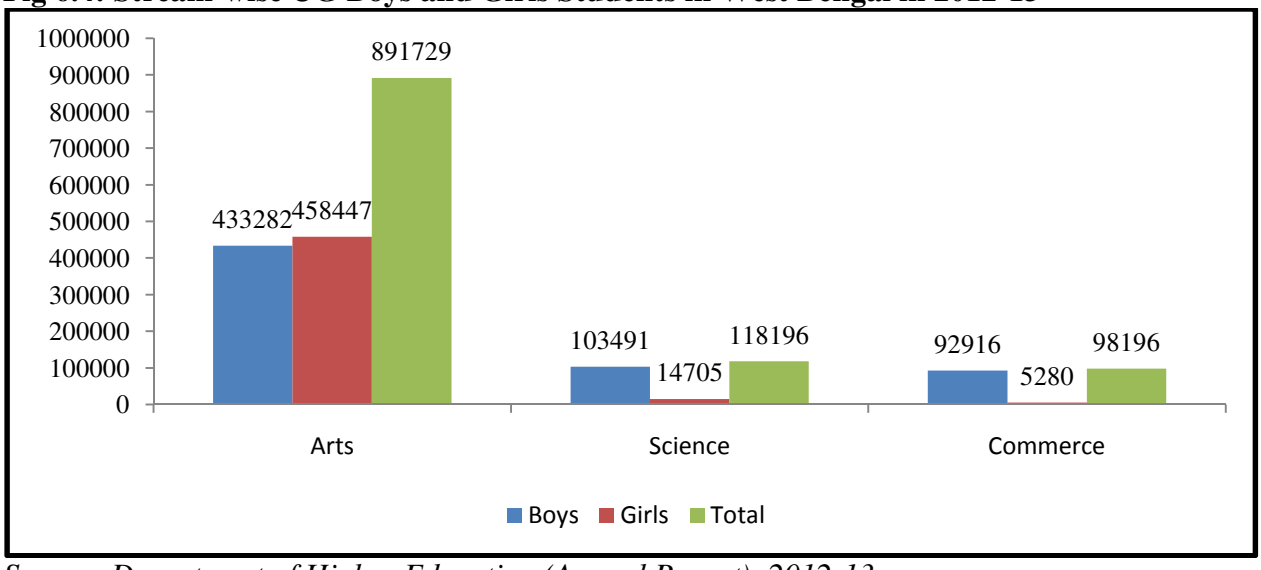
Table 6.6: UG and PG Enrolment in West Bengal (2012-13)

	UG			PG			UG and PG
Area of Study	**Boys**	**Girls**	**Total**	**Boys**	**Girls**	**Total**	**Total**
Arts	433282	458447	891729	26526	27890	54416	946145
Science	103491	14705	118196	14307	8874	23181	141377
Commerce	92916	5280	98196	3659	1963	5622	103818
Education	5922	1493	7415	1660	1570	3230	10645
Law	4429	621	5050	281	301	582	5632
Engineering	75317	22170	97487	3570	716	4286	101773
Management	6020	1648	7668	2575	1022	3597	11265
Others	2696	423	3119	4507	5460	9967	13086
TOTAL	724073	504787	1228860	57085	47796	104881	1333741

Source: Department of Higher Education (Annual Report), 2012-13

Stream-wise UG Boys and Girls students in West Bengal in 2012-13 is shown in Fig. 6.4.The figure reveals that UG female enrolment in Arts is higher than male. However, UG female enrolment in Science is less than male.

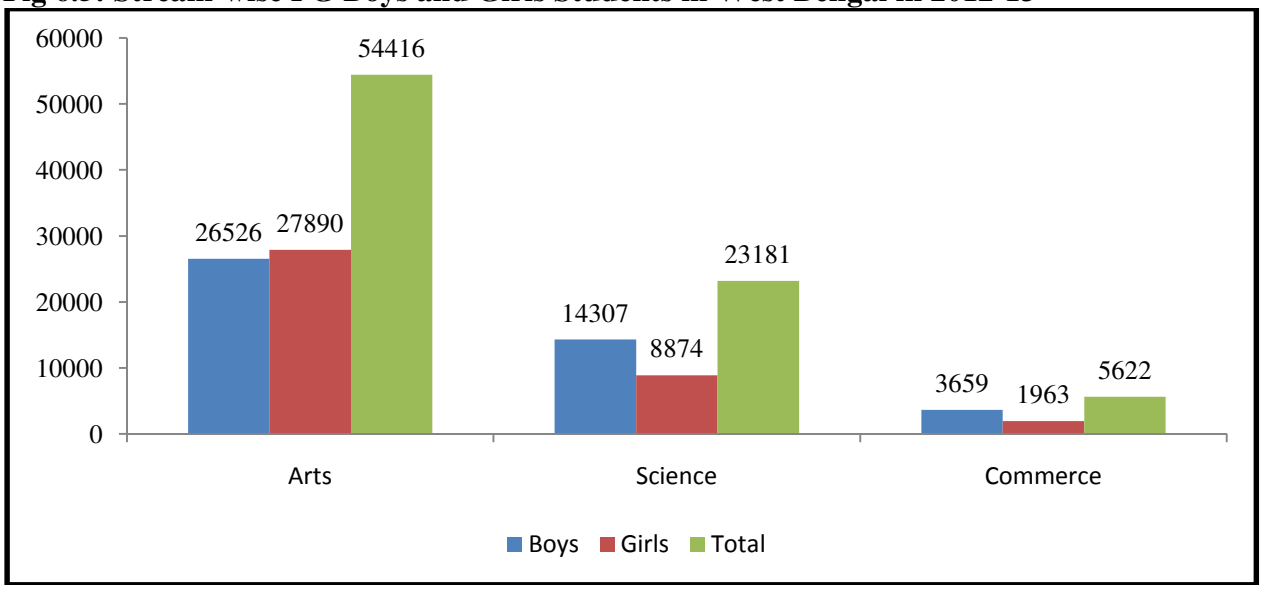
Fig 6.4: Stream-wise UG Boys and Girls Students in West Bengal in 2012-13



Source: Department of Higher Education (Annual Report), 2012-13

Stream-wise PG boys and girls students in West Bengal in 2012-13 are shown in Fig. 6.5.

Fig 6.5: Stream-wise PG Boys and Girls Students in West Bengal in 2012-13



Source: Department of Higher Education (Annual Report), 2012-13

The highest percentage of students in U.G. is occupied by Arts followed by Science, Commerce and Engineering. It is seen from the Table 6.7 that among the prominent disciplines 72.57 % of students are enrolled in Arts, 9.62 % in Science, 7.99% in Commerce, 7.9% in engineering/technology. The representation of SC categories is 16.9 % and that of ST categories is 2.1 % in the higher education in the state. Percentage of enrolment of students in different areas of study in UG (2012-13) by caste-wise and gender-wise in West Bengal is shown in Table 6.7.

Table 6.7: Percentage of Enrolment of Students in Different Areas of Study in UG (2012-13) in West Bengal

	BOYS				GIRLS				GRAND TOTAL
Area of Study	GEN	SC	ST	TOTAL	GEN	SC	ST	TOTAL	
Arts	25.85	7.84	1.56	35.26	30.97	5.33	1.01	37.31	72.57
Science	6.82	1.37	0.23	8.42	0.52	0.56	0.11	1.20	9.62
Commerce	6.85	0.61	0.10	7.56	0.30	0.10	0.03	0.43	7.99
Education	0.37	0.08	0.02	0.48	0.04	0.06	0.02	0.12	0.60
Law	0.31	0.04	0.00	0.36	0.03	0.02	0.00	0.05	0.41
Engineering	5.59	0.50	0.04	6.13	1.67	0.12	0.01	1.80	7.93
Management	0.46	0.02	0.00	0.49	0.13	0.01	0.00	0.13	0.62
Others	0.19	0.02	0.01	0.22	0.02	0.01	0.00	0.03	0.25
TOTAL	46.45	10.50	1.97	58.92	33.67	6.21	1.19	41.08	100.00

Source: Department of Higher Education (Annual Report), 2012-13

The highest percentage of students in P.G. is occupied by Arts followed by Science, Commerce and Engineering. It is seen from the Table 6.8 that among the prominent disciplinesn in P.G., 51.88% of

students obtain P.G. degrees in Arts, 22.10 % in Science, 5.36 % in Commerce, 4.09 % in engineering/technology. The representation in P.G. of SC categories is 17.4 % and that of ST categories is 3.3 % in the higher education in the state. Percentage of enrolment in different areas of study in P.G. (2012-13) by caste and gender is shown in Table 6.8.

Table 6.8: Percentage of Enrolment in Different Areas of Study in P.G. (2012-13)

	BOYS				GIRLS				
Area of Study	**GEN**	**SC**	**ST**	**TOTAL**	**GEN**	**SC**	**ST**	**TOTAL**	**GRAND TOTAL**
Arts	18.38	6.03	0.88	25.29	21.31	4.76	0.52	26.59	51.88
Science	11.52	1.96	0.16	13.64	6.58	1.81	0.08	8.46	22.10
Commerce	3.01	0.45	0.03	3.49	1.60	0.25	0.02	1.87	5.36
Education	1.11	0.42	0.06	1.58	1.05	0.43	0.02	1.50	3.08
Law	0.18	0.06	0.02	0.27	0.22	0.04	0.03	0.29	0.55
Engineering	3.01	0.35	0.05	3.40	0.58	0.09	0.01	0.68	4.09
Management	2.32	0.12	0.01	2.46	0.94	0.04	0.00	0.97	3.43
Others	3.69	0.55	0.06	4.30	4.86	0.30	0.05	5.21	9.50
TOTAL	43.22	9.92	1.28	54.43	37.12	7.73	0.72	45.57	100.00

Source: Department of Higher Education (Annual Report), 2012-13

The highest percentage of students in combined U.G. and P.G. is occupied by Arts followed by Science, Commerce and Engineering. It is seen from the Table 6.9 that among the prominent disciplines, 70.94 % of students are enrolled in Arts, 10.60 % in Science, 7.78 % in Commerce and 7.63 % in engineering/technology. The representation of SC categories is 17 % and that of ST categories is 3.22 % in the higher education in the state of West Bengal.

Table 6.9: Percentage of Enrolment (U.G. and P.G.) of Students in Different Areas of Study in Universities and Colleges (2012-13) in West Bengal

	BOYS				GIRLS				
Area of Study	**GEN**	**SC**	**ST**	**TOTAL**	**GEN**	**SC**	**ST**	**TOTAL**	**GRAND TOTAL**
Arts	25.26	7.70	0.11	34.48	30.21	5.29	0.97	36.46	70.94
Science	7.19	1.42	0.02	8.83	1.00	0.66	0.11	1.77	10.60
Commerce	6.55	0.60	0.00	7.24	0.40	0.11	0.03	0.54	7.78
Education	0.43	0.11	0.01	0.57	0.12	0.09	0.02	0.23	0.80
Law	0.30	0.04	0.00	0.35	0.04	0.02	0.00	0.07	0.42
Engineering	5.39	0.48	0.00	5.91	1.59	0.12	0.01	1.72	7.63
Management	0.61	0.03	0.00	0.64	0.19	0.01	0.00	0.20	0.84
Others	0.47	0.06	0.01	0.54	0.40	0.04	0.01	0.44	0.98
TOTAL	46.20	10.45	0.16	58.57	33.94	6.33	1.16	41.43	100.00

Source: Department of Higher Education, Government of West Bengal, Annual Report, 2012-13

6.3.2 Comparison of Enrolment in Higher Education between West Bengal and India

Enrolment and percentage of total enrolment at different levels by gender in West Bengal and India is shown in Table 6.10. West Bengal has 84 percent of the total students enrolled as under graduate students as compared to the national average of 79.39 percent of the total students in 2016-17. The percentage of PG enrolment is found to be less than UG enrolment.

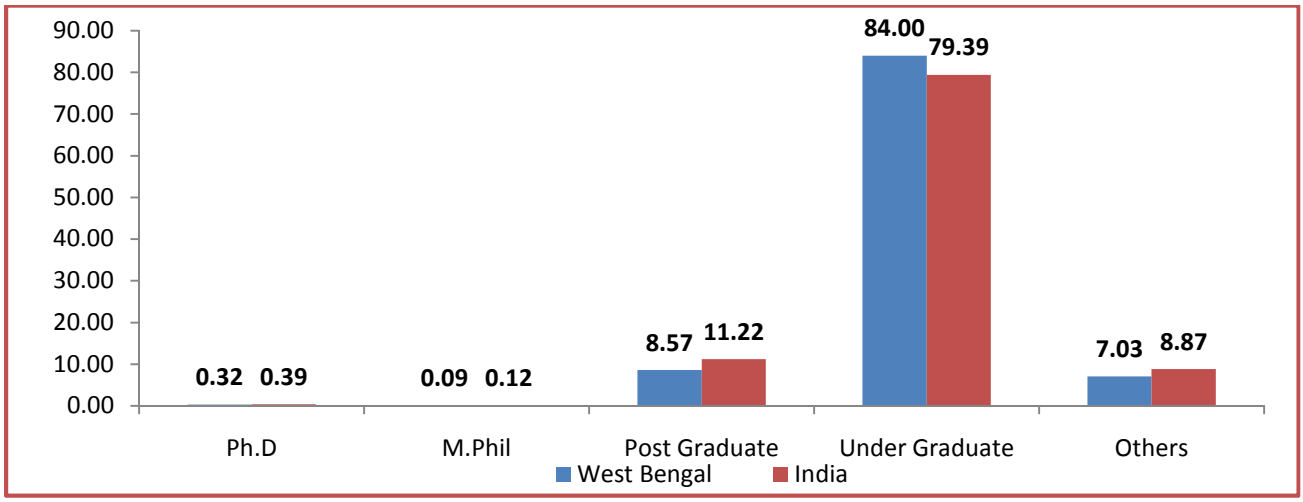
Table 6.10: Enrolment and Percentage of Total Enrolment (2016-17) in West Bengal and India

		West Bengal		India	
		Number	**% of total Enrolment**	**Number**	**% of Total Enrolment**
Ph.D.	Male	4338	0.22	81795	0.23
	Female	2024	0.10	59242	0.17
	Total	6362	0.32	141037	0.39
M.Phil.	Male	1049	0.05	16464	0.05
	Female	753	0.04	26803	0.08
	Total	1802	0.09	43267	0.12
Post Graduate	Male	74481	3.69	1820564	5.10
	Female	98192	4.87	2187006	6.13
	Total	172673	8.57	4007570	11.22
Under Graduate	Male	880701	43.69	14933909	41.82
	Female	812747	40.31	13414288	37.57
	Total	1693448	**84.00**	28348197	**79.39**
PG Diploma	Male	3851	0.19	120792	0.34
	Female	2012	0.10	92259	0.26
	Total	5863	0.29	213051	0.60
Diploma	Male	88551	4.39	1820977	5.10
	Female	32100	1.59	791232	2.22
	Total	120651	5.98	2612209	7.32
Certificate	Male	3425	0.17	83640	0.23
	Female	2298	0.11	82977	0.23
	Total	5723	0.28	166617	0.47
Integrated	Male	6792	0.34	102454	0.29
	Female	2682	0.13	71503	0.20
	Total	9474	0.47	173957	0.49
Grand Total	Male	1063188	52.74	18980595	53.16
	Female	952808	47.26	16725310	46.84
	Total	2015996	100.00	35705905	100.00

Source: AISHE, 2016-17

Percentage of enrolment to total enrolment in West Bengal and India at different levels in 2016-17 is shown in Fig 6.6. West Bengal has 0.32 percent of the total students enrolled as Ph.D. students as compared to the national average of 0.39 percent of the total students in 2016-17.

Fig 6.6: Education Level-wise Percentage of Enrolment to Total Enrolment (2016-17) in West Bengal and India



Source: AISHE, 2016-17

6.3.3 Level-wise Out-Turn/Pass-Out of West Bengal and India

Level-wise out-turn/pass-out of West Bengal and India in Higher education, 2017-18 is shown in Table 6.11. The total pass out in 2017-18 in West Bengal was 3.85 lakhs of which 1.93 lakh students were male and 1.91 lakh students were female. The share of West Bengal in India in passed out male and female students were respectively 4.48% and 4.13%. It may be pointed out that in 2016, 9.27 lakh students passed in Madhyamik Examination. In 2018, 8.04 lakh students appeared for H.S. examination and out of which 6.63 lakh student students passed the examinations.

Table 6.11: Level-wise Out-Turn/Pass-Out of West Bengal and India in Higher Education, 2017-18

Course	Gender	West Bengal	India	% share of West Bengal to India
Ph.D	Male	1035	20179	5.13
	Female	487	14221	3.42
	Total	1522	34400	4.42
M.Phil	Male	340	8655	3.93
	Female	205	19404	1.06
	Total	545	28059	1.94
Post Graduate	Male	27056	656776	4.12
	Female	37865	847627	4.47
	Total	64921	1504403	4.32
UG	Male	138308	3067201	4.51
	Female	143537	3352438	4.28
	Total	281845	6419639	4.39

PG-Diploma	Male	779	71625	1.09
	Female	601	71551	0.84
	Total	1380	143176	0.96
Diploma	Male	24019	451831	5.32
	Female	7953	285246	2.79
	Total	31972	737077	4.34
Certificate	Male	1172	32406	3.62
	Female	576	42977	1.34
	Total	1748	75383	2.32
Integrated	Male	1104	14598	7.56
	Female	470	11811	3.98
	Total	1574	26409	5.96
Grand Total	Male	193813	4323271	4.48
	Female	191694	4645275	4.13
	Total	385507	8968546	4.30

Source: AISHE, 2017-18

6.3.4 Social Disparity in Out-turn

Community-wise population (Census, 2011) in West Bengal and India is shown in Table 6.12. The table shows that though the share of Hindu in total population was 70.5%, the share of graduate of Hindu was 90.1%. The Table indicates that other communities particularly Muslim community were lagging behind the Hindus in higher education.

Table 6.12: Communities-wise Population (Census, 2011) in West Bengal and India

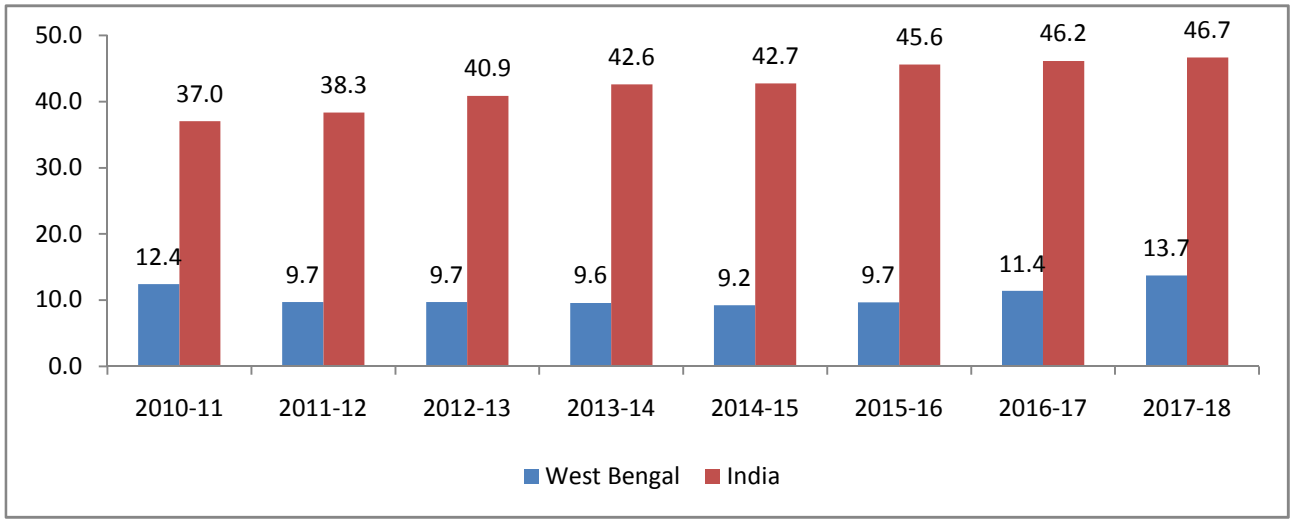
	Total Population		**Graduate and above**	
	West Bengal (%)	**India (%)**	**West Bengal (%)**	**India (%)**
Hindu	70.5	79.8	90.1	84.6
Muslim	27.0	14.2	7.7	7.0
Christian	0.7	2.3	0.7	3.6
Sikh	0.1	1.7	0.2	2.0
Buddhist	0.3	0.7	0.4	0.8
Jain	0.1	0.4	0.4	1.7
Other religions and persuasions	1.0	0.7	0.3	0.3
All religious communities	100.0	100.0	100.0	100.0

Source: Census, 2011

6.3.5 Enrolment in Private Unaided Institutes in West Bengal and India

As per the AISHE data, the enrolment private unaided institutes in West Bengal and India was respectively was 2.15 lakhs and 1.23 crores respectively in 2017 -18. In India the percentage of enrolment in private unaided institutes has increased from 37% to 46.7% during the period of 2010-11 to 2017-18. During the same period in West Bengal the percentage of enrolment in private unaided institutes has increased from 12.4% to 13.7%. The gap between West Bengal and India has increased from 24.6% to 33.0% (Fig. 6.7).

Fig. 6.7: Percentage of Private Unaided Institutes in West Bengal and India during 2010-11 to 2017-18



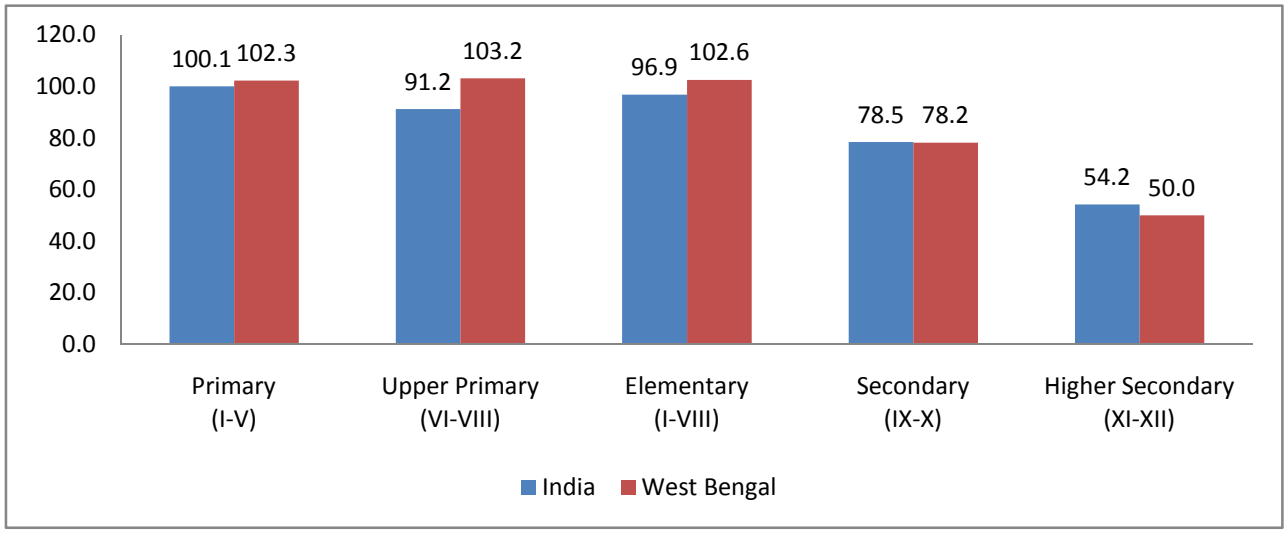
Source: AISHE, various years

6.4 Gross Enrolment Ratio (GER) at Different Levels in Higher Education in West Bengal

6.4.1 GER at Different Levels of Education

Gross Enrolment Ratio (GER) at different levels of school education in West Bengal and India in 2014-15 is shown in Fig. 6.8. It shows that though GER at lower levels is higher for West Bengal and it comes below the National average at higher levels i.e. class XII

Fig 6.8: Gross Enrolment Ratio (GER) in School Education in West Bengal and India in 2014-15



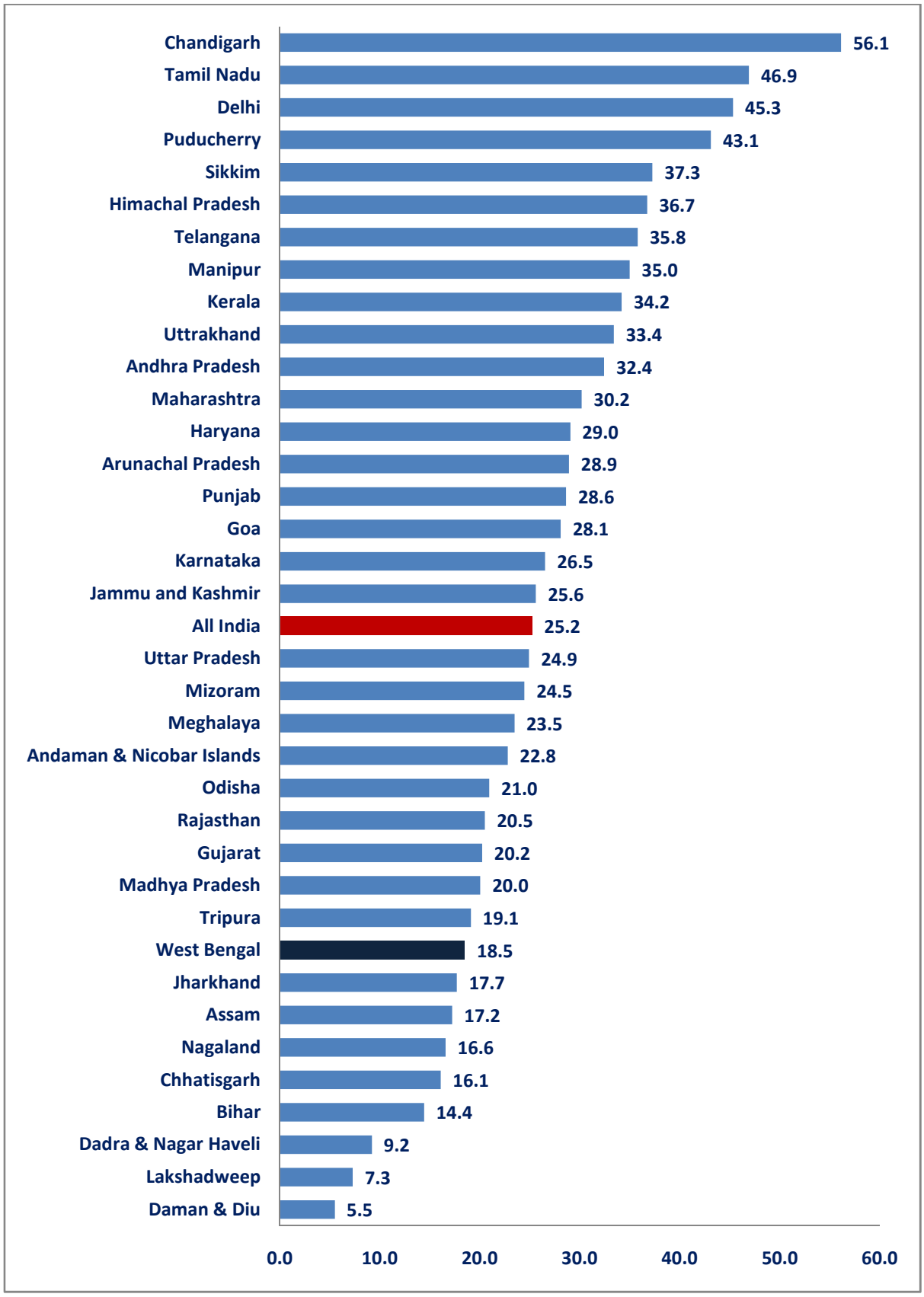
Source: DISE, 2014-15, AISHE, 2014-15

6.4.2 Inter-state Inequality in GER

On the basis of geographical location, the disparities in GER across states are also apparent. Differences in GER among states highlight the regional disparities in access to higher education. Out of 36 states and union territories, 18 states and union territories had a GER less than the national

average of 25.2 percent in 2016-17 as shown in Fig 6.9. Some of these states have huge populating base like Uttar Pradesh, Madhya Pradesh, Gujarat, Rajasthan and West Bengal. The state of West Bengal has GER 18.5 which was much below the national average GER of 25.2 percent. Chandigarh (56.1), Tamilnadu (46.9) and Delhi (45.3) are top GER in ranking and Dadra Nagar Havali (5.5%), Lakshadweep (7.3%), Daman and Due (9.2%) are the lowest GER.

Fig 6.9: State-wise GER for Higher Education in 2016-17



Source: AISHE, 2016-17

6.4.3 Gender-based and Social Differences in GER

Year-wise Growth of GERs for various communities during the period 2006-07 to 2016-17 in India is shown in Table 6.13. It is seen that GER for all the communities has increased substantially during the above period. It is to be noted that GER for SC female has increased three-fold during the period.

Table 6.13: Year-wise Growth of GERs for Various Communities in India

	All categories			SC			ST		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
2006-07	14.53	10.02	12.39	11.52	6.96	9.35	9.45	5.51	7.46
2007-08	15.2	10.7	13.1	13.2	8.6	11	12.4	6.7	9.5
2010-11	20.79	17.88	19.41	14.64	12.32	13.53	12.95	9.52	11.21
2011-12	22.05	19.42	20.80	15.76	13.89	14.87	12.37	9.71	11.03
2012-13	22.67	20.12	21.45	16.88	15.04	16.00	12.44	9.77	11.09
2013-14	23.88	21.97	22.97	17.75	16.41	17.10	12.52	10.17	11.32
2014-15	24.46	22.65	23.59	19.34	17.63	18.52	14.58	12.01	13.28
2015-16	25.4	23.5	24.5	20.8	19.0	19.9	15.6	12.9	14.2
2016-17	26.0	24.5	25.2	21.8	20.2	21.1	16.7	14.2	15.4

Source: AISHE, various years

In India, about 48 per cent of population belonging to the eligible age cohort comprises females. Gender-based inequalities have been historically observed in India. In 2016-17, 8 universities were exclusively for women and about 10.2 per cent colleges were exclusively for girls. The trend in the GER for females shows a consistent improvement. Year-wise Growth of GERs for various communities in West Bengal is shown in Table 6.14.

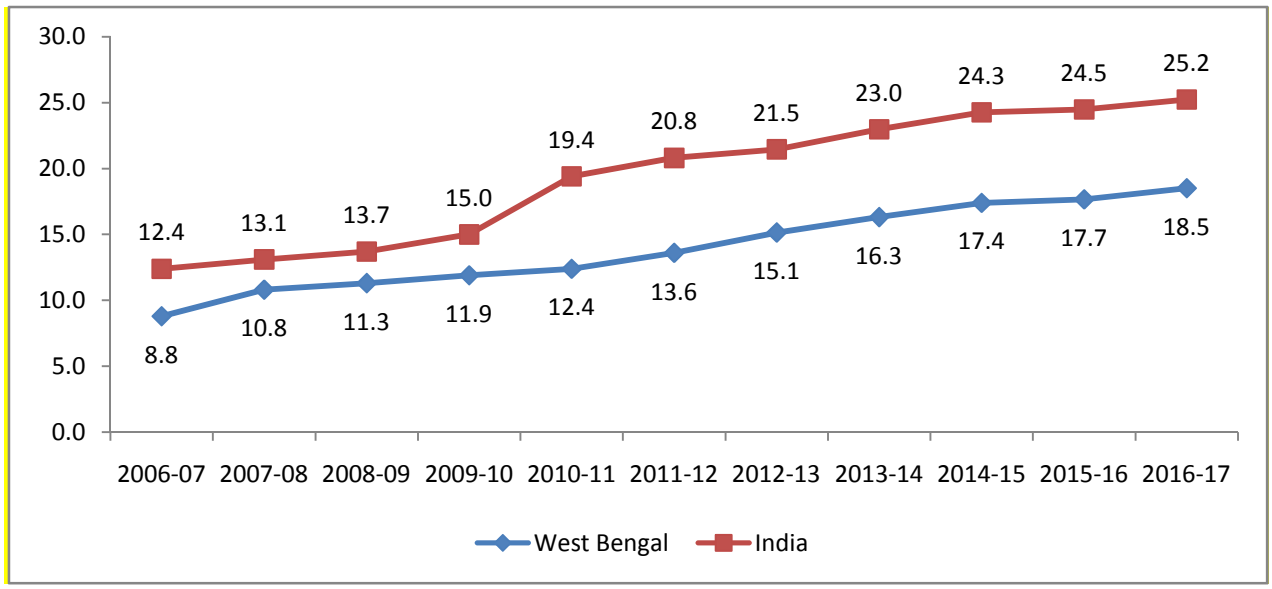
Table 6.14: Year-wise GERs for Various Communities in West Bengal

	All categories			SC			ST		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
2006-07	10.6	6.9	8.79	6.52	2.88	4.73	4.82	2.18	3.43
2007-08	13.1	8.4	10.8	7.4	3.5	5.5	10.6	4	7.2
2010-11	13.77	10.91	12.39	7.84	5.83	6.86	7.32	4.83	6.03
2011-12	15.45	11.80	13.60	10.25	7.65	8.97	7.67	5.28	6.45
2012-13	17.07	13.20	15.14	11.84	8.72	10.30	8.72	6.00	7.32
2013-14	18.23	14.41	16.32	13.44	10.23	11.85	10.23	7.31	8.73
2014-15	18.76	15.52	17.13	14.35	11.37	12.87	11.34	8.23	9.73
2015-16	19.1	16.2	17.7	14.2	11.5	12.8	10.6	8.4	9.5
2016-17	19.8	17.2	18.5	14.8	12.2	13.5	11.5	8.9	10.1

Source: AISHE, various years

The GER of West Bengal was 18.51 percent as compared to the national average of 25.23 percent in 2016-17. There are around 1.06 crore people in the age group of 18 to 23 of which around 18.69 lakhs are enrolled in a higher education institute. Looking at Table 6.14, we see that in West Bengal, GER for all categories has improved from 8.8% in 2006-07 to 18.5% in 2016-17. For SC categories it has increased from 4.7% to 13.5% and for ST categories, it has increased from 3.4% to 10.1%.For all the categories in West Bengal Female GER is found to be less that male GER. On the other hand if we compare West Bengal and India, for all the categories West Bengal lags behind India. The comparative position of West Bengal and India in Gross Enrolment Ratio (GER) for the period 2006-07 to 2016-17 is shown in by Gender in Fig. 6.10.

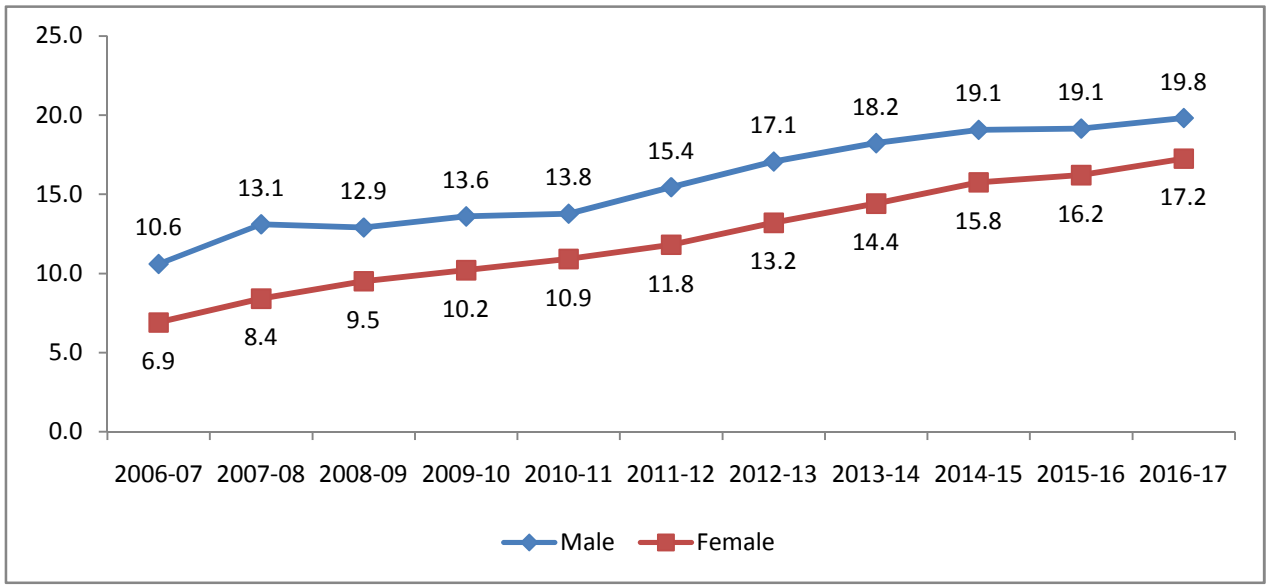
Fig 6.10: GER in West Bengal and India (2006-07 to 2016-17)



Source: AISHE, Various years

Gender bias can also be observed in the GER of females. Gender-wise GER in higher education for the period 2006-07 to 2016-17 can be observed in Fig 6.11. The male GER of West Bengal is 19.8 percent and female GER is 17.2 percent in 2016-17, while the national average for males is 26 Therefore, more efforts to raise the GER for females would not only reduce the gap between male female GER but would also improve the overall GER.

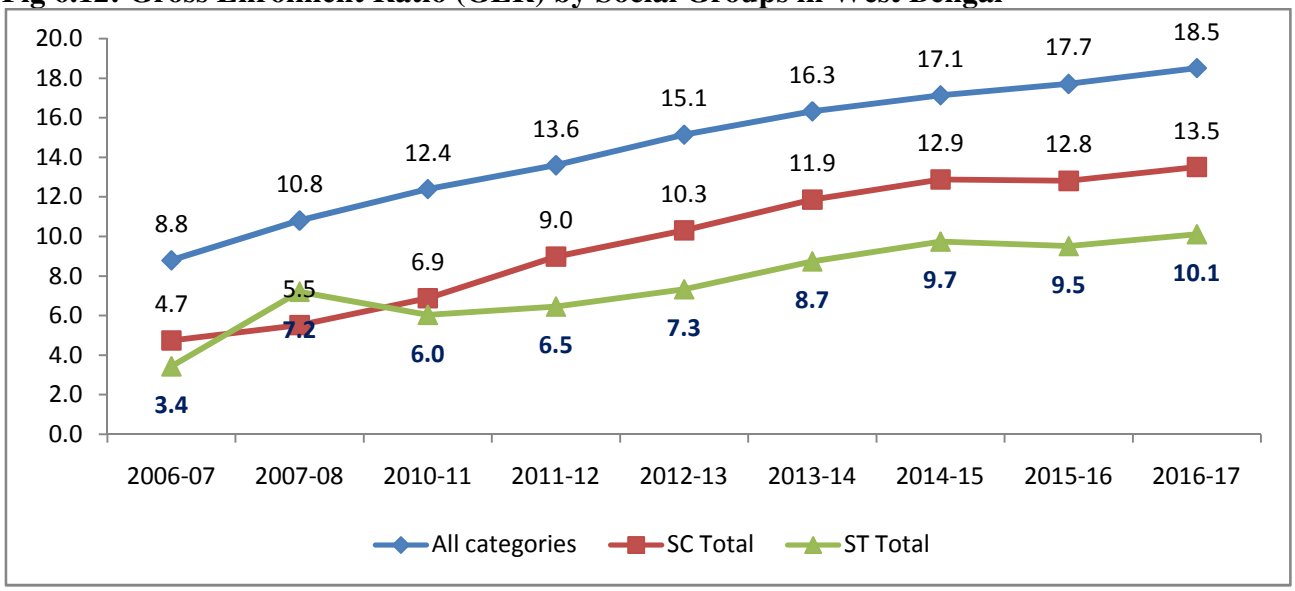
Fig 6.11: Gender -wise Gross Enrolment Ratio in West Bengal (2006-07 to 2016-17)



Source: AISHE, Various years

Historically the social stratification had resulted into marginalization of certain impoverished groups in India. Three such strata of population are recognized as Scheduled Castes (SC), Scheduled Tribe (ST). The gender disparity in access to higher education among Scheduled Tribes requires urgent apposite intervention. Even though the data reflect indistinct engagements of access and participation for Scheduled Tribes when considered in absolute figures, the comparative data for the last decade demonstrate a steep rise. Since 2006-07, the SC and ST population had consistently lower GER than the GER for all categories; But the GER has shown improvement over a period of the decade since 2001 even for SC and ST as observed in Fig 6.12 within these two groups, the GER of SC is observed to be better than ST.

Fig 6.12: Gross Enrolment Ratio (GER) by Social Groups in West Bengal



Source: AISHE, various years

6.5 Gender Parity Index (GPI)

Gender Parity Index (GPI) is the ratio of the female to male values of GER. As can be observed in the Table 6.15, during 2010-11 to 2016-17, the GPI for India had increased from 0.86 to 0.94. During the same period GPI has in West Bengal has improved from 0.79 to 0.87. Disparity in enrolments by gender through GPI is shown in Table 6.15.

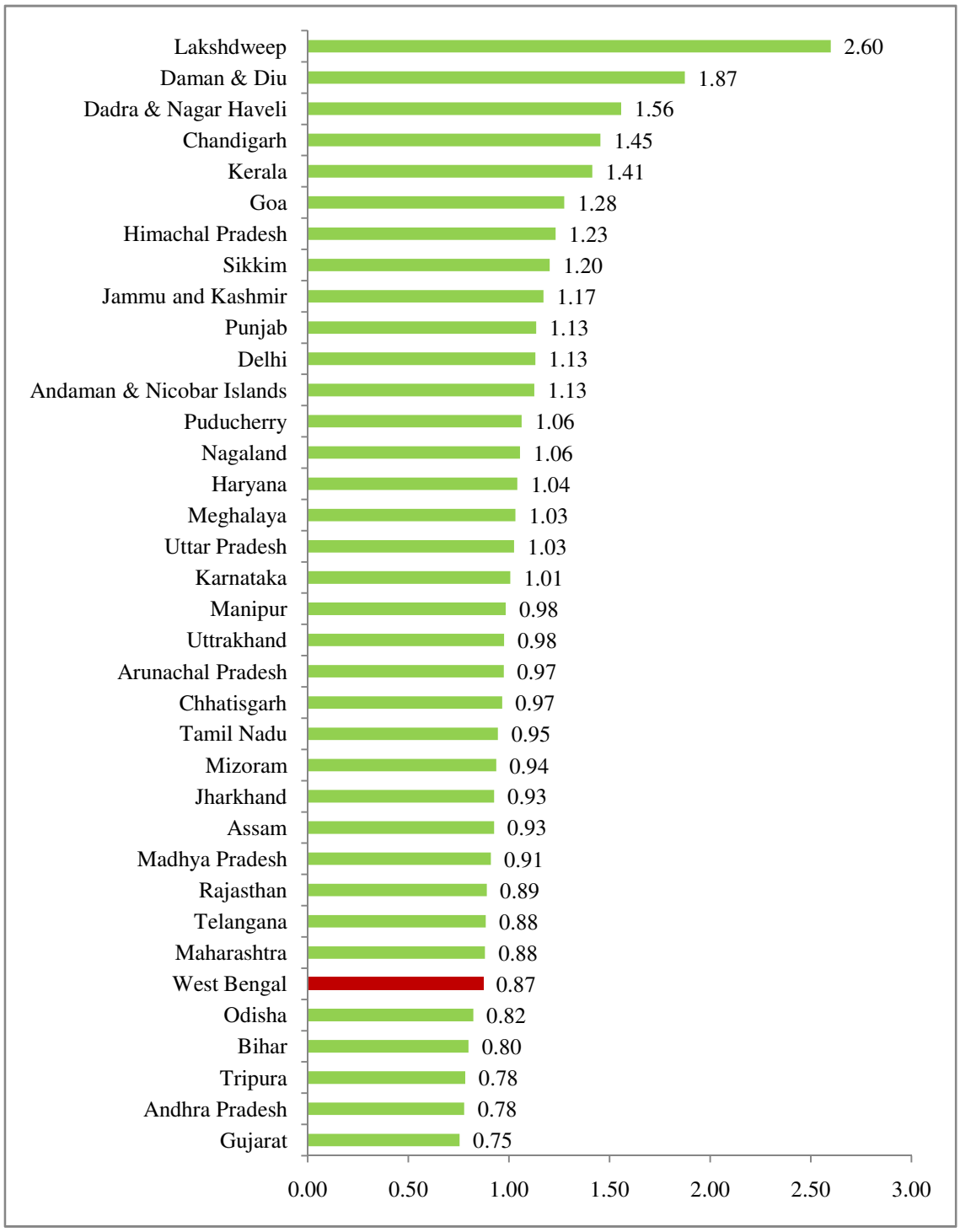
Table 6.15: Gender Parity Index (GPI) for Various Communities in West Bengal and India

	West Bengal			India		
Year	**All Categories**	**SC**	**ST**	**All Categories**	**SC**	**ST**
2010-11	0.79	0.74	0.66	0.86	0.84	0.74
2011-12	0.76	0.75	0.69	0.88	0.88	0.78
2012-13	0.77	0.74	0.69	0.89	0.89	0.79
2013-14	0.79	0.76	0.71	0.92	0.92	0.81
2014-15	0.83	0.79	0.73	0.93	0.91	0.82
2015-16	0.85	0.81	0.79	0.92	0.91	0.79
2016-17	0.87	0.82	0.77	0.94	0.93	0.85

Source: AISHE various years

Inter-state Comparison of Gender Parity Index (GPI) in 2014-15 shown in Fig 6.13. GPI is found to highest in Lakshadweep (GPI =2.60) and lowest in Gujrat (Value =0.75) with West Bengal being in the lower rank (GPI=0.87)

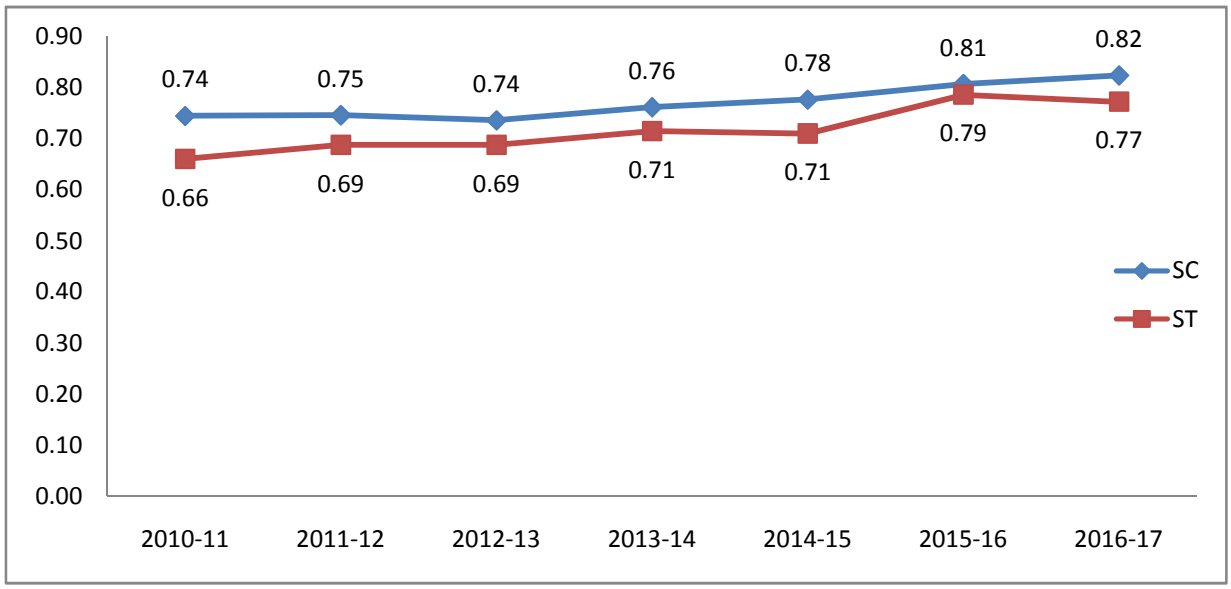
Fig 6.13: Inter-state Comparison of Gender Parity Index (GPI) in 2016-17



Source: AISHE, 2016-17

Gender Parity Index (GPI) for SC and ST population in West Bengal is shown in Fig 6.14. The gender parity index (GPI) in SC categories has increased from 0.74 to 0.82 and Gender Parity Index (GPI) for ST categories has increased from 0.66 to 0.77 during 2010-11 to 2016-17.

Fig 6.14: Gender Parity Index (GPI) in SC and ST Communities in West Bengal



Source: AISHE, various years

6.6 Rural- Urban Disparity

Rural urban disparity in higher education in terms of Gross Attendance Ratio (GAR) and Net Attendance Ratio (NAR) of West Bengal in comparison with India is shown in Table 6.16. GAR is 13 for India and 10 for West Bengal as per NSSO survey, 2014. It is seen that urban attendance rate for both male and female attendance rate is higher in West Bengal as well as India. However, rural attendance rates for both male and female is lower in West Bengal compared to India.

Table 6.16: Gross Attendance Ratio above Higher Secondary: Rural and Urban (2014)

Gross Attendance Ratio (GAR)					
	Rural		Urban		Total
	Male	Female	Male	Female	
West Bengal	8	7	19	16	10
India	12	9	18	18	13
Net Attendance Ratio					
	Rural		Urban		Total
	Male	Female	Male	Female	
West Bengal	8	7	18	16	10
India	12	8	18	17	12
Net Attendance Ratio (18 to 23 Age group)					
	Rural		Urban		Total
	Male	Female	Male	Female	
West Bengal	26	24	41	34	29
India	32	24	40	38	32

Source: NSSO, 71th Round, 2014

6.7 Disparity Regarding Employment of Teachers

Gender-wise percentage of teachers in different posts in West Bengal and in India is shown in Table 6.17. Out of total teachers in India, 69.2% teachers are Assistant Professors and 40.6 % teachers are female teacher. Gender-wise percentage of teachers in West Bengal and India is shown in Table 6.17. The table shows that the gender gap in teachers in West Bengal is 31.2% and it is 18.8% in India i.e. gender gap is higher for West Bengal.

Table 6.17: Gender-wise Percentage of Teachers in different posts in West Bengal and India

		West Bengal	India
Professor and Equivalent	Male	6.7	6.8
	Female	1.5	2.4
	Total	8.2	9.2
Reader and Associate Professor	Male	6.6	6.9
	Female	3.7	3.9
	Total	10.3	10.8
Lecturer/ Assistant Professor	Male	36.9	40.9
	Female	17.5	28.3
	Total	54.4	69.2
Demonstrator/ Tutor	Male	2.1	1.8
	Female	1.8	3.2
	Total	3.8	5.0
Temporary Teacher etc	Male	11.5	2.5
	Female	8.8	2.4
	Total	20.3	4.9
Grand Total	Male	65.6	59.4
	Female	34.4	40.6
	Total	100.0	100.0

Source: AISHE, 2016-17

Pupil Teacher Ratio (PTR) is an important indicator for the quality of education. Pupil Teacher Ratio (PTR) in West Bengal and India is shown in Table 6.18. Pupil Teacher Ratio in West Bengal is above the national PTR. In 2016-17, PTR in India was 26 whereas in West Bengal in 42. This means number of teachers are less in West Bengal compared to India. Pupil Teacher ratio (PTR) in West Bengal and India is shown in Table 6.18.

Table 6.18: Pupil Teacher Ratio (PTR) in West Bengal and India

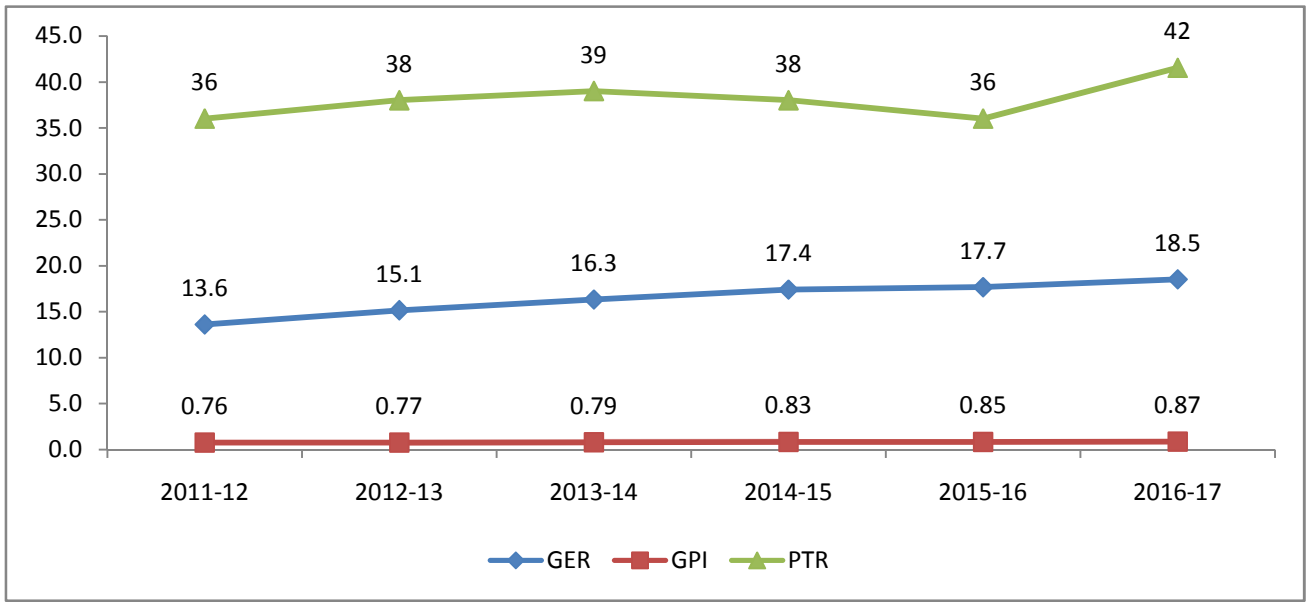
	India		West Bengal	
	Regular and Distance Mode	Regular Mode	Regular and Distance Mode	Regular Mode
2016-17	26	23	42	38
2015-16	23	20	36	32
2014-15	23	21	38	34
2013-14	24	21	39	35
2012-13	23	20	38	35
2011-12	23	21	36	33

Source: AISHE, 2016-17

6.8 GER, GPI and PTR in West Bengal over Years

Three important indicators i.e. GER, GPI and PTR in West Bengal in 2011-12 to 2016-17 is presented in Fig. 6.15. Pupil Teacher Ratio (PTR) line is fluctuated from 36 to 42. Gross Enrolment Ratio (GER) line is upward direction 13.6 to 18.5.

Fig 6.15: GER, GPI and PTR in West Bengal in 2011-12 to 2016-17



Source: AISHE, 2016

Some important indicators like status of GER and gender ratio in higher education in West Bengal is shown in Table 6.19.

Table 6.19: Status of GER and Gender Ratio in Higher Education in West Bengal

Year	Female Enrolment	Total Enrolment	Teacher	Population (18-23 Years)	Student Teacher Ratio(STR)	GER	Gender Ratio
2011-12	641146	1497019	43040	10971915	34.78	13.64	42.83
2012-13	719313	1658987	45262	10957156	36.65	15.14	43.36
2013-14	781155	1765955	48199	10941621	36.64	16.14	44.23
2014-15	864482	1900939	53091	10925358	35.80	17.39	45.48
2015-16	892386	1926500	57668	10908527	33.41	17.66	46.32
2016-17	952808	2015996	NA	10891236	NA	18.51	47.26

Source: Economic Review, Various years, Govt. of West Bengal

6.9 Ranks of West Bengal for Different Parameters of Higher Education

Ranks of West Bengal for different parameters in higher education are given in Table 6.20.In most of the parameters; the rank of West Bengal is at the lower end. For example the ranks of West Bengal for some indicators are as follows: College per lakh population: 32, GER (Total):28, GER (Female):27, Pupil Teacher ratio (PTR): 32, Public Expenditure on higher education per person (18-23) (Out of 28 states):19, Vocational Expenditure per student (out of 28 states): 19. State-wise details of GER, No. of Colleges and Pupil-Teacher Ratio are given Appendix A6.3.

Table 6.20: Different Parameter-wise Number and Rank of West Bengal in India (2016-17)

	Items	Number	Rank (All 36 states)
1	Total University	41	8
2	General University	29	4
3	Total College	1208	12
4	General Degree College	727	12
5	Government College	473	7
6	College per lakh population	11	32
7	Average Enrolment per college	1323	5
8	Enrolment	2015996	4
9	UG Enrolment	1607033	4
10	PG Enrolment	73955	9
11	GER (Total) (%)	18.5	28
12	GER (Male) (%)	19.8	28
13	GER (Female) (%)	17.2	27
14	Gender Parity Indix (GPI)	0.87	31
15	Teacher	48553	12
16	Pupil Teacher ratio (PTR)	42	32
17	Out turn	370457	8
18	Population (Projection 2014-15)	10925358	4
19	Percentage of ST Population (out of 28 States)	6	9
20	GER(XI-XII) (out of 28 states)	42.97	17

21	Public Exp on higher education per person (18-23) (Out of 28 states)	1912	19
22	Higher Education Institutions per lakh pop (out of 28 states)	9.6	26
23	Technical/ professional (Out of 28 states)	58436	18
24	Vocational Expenditure per student (out of 28 states)	21104	19

Source: AISHE, 2016-17

6.10 Comparison of West Bengal with Selected Four States

In this subsection we have attempted a comparative study of four states Delhi, Maharastra, Odisha and West Bengal. In Table 6.21 we have presented number of Universities and number of colleges in these four states.

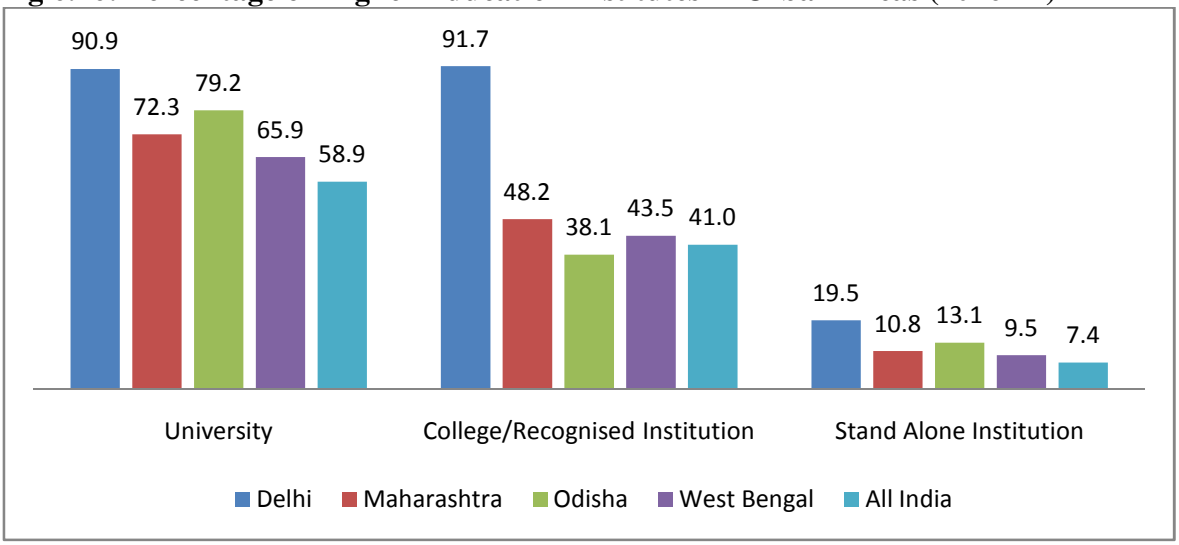
Table 6.21: Some Selected State and Their Higher Education Institute (2016-17)

State	University	College/Recognized Institution	Stand Alone Institution	Total Institutes
Delhi	22	181	272	475
Maharashtra	47	4117	5633	9797
Odisha	24	1060	1440	2524
West Bengal	41	1232	1617	2890
All India	795	35536	43827	80158

Source: AISHE, 2016-17

In Fig 6.16, we have presented percentage of institutes in rural areas (2016-17) in selected four states in India.

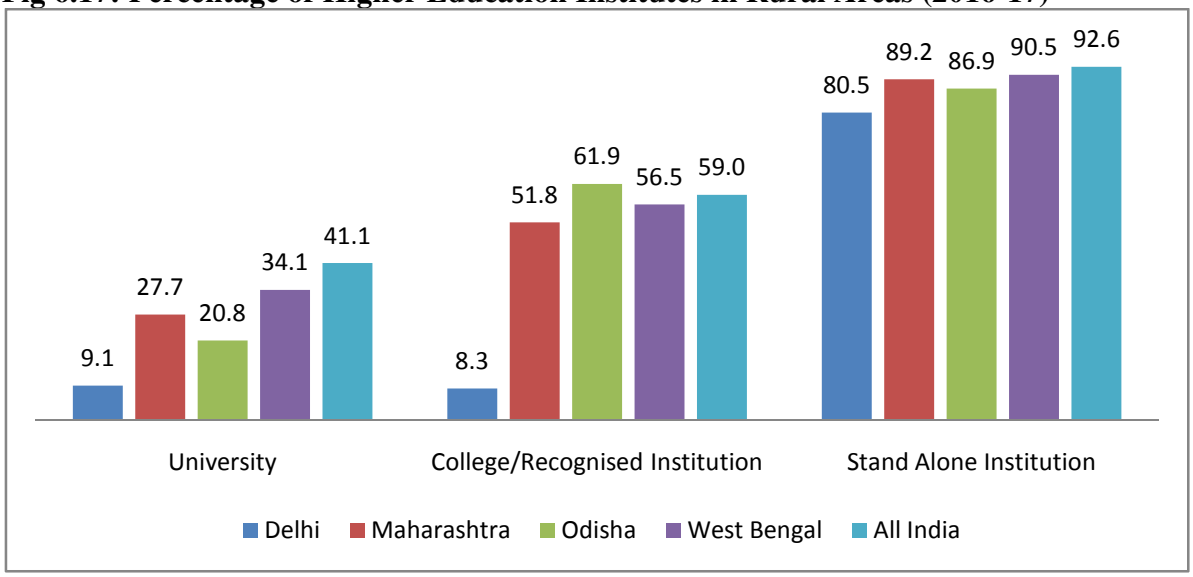
Fig 6.16: Percentage of Higher Education Institutes in Urban Areas (2016-17)



Source: AISHE Report, 2016-17

In Fig 6.17, we have presented percentage of institutes in rural areas (2016-17) in selected four states in India.

Fig 6.17: Percentage of Higher Education Institutes in Rural Areas (2016-17)



Source: AISHE Report, 2016-17

In Table 6.22, we have presented number of universities offering education through distance mode.

Table 6.22: Number of Universities Offering Education through Distance Mode

State	Central Open University	State Open University	State University	Total
Delhi	1		5	6
Maharashtra		1	5	6
Odisha			2	2
West Bengal		1	6	7
All India	1	13	107	121

Source: AISHE Report, 2016-17

In Table 6.23, we have presented specialisation-wise number of colleges for the selected states.

Table 6.23: Specialization-wise Colleges

	Delhi	Maharashtra	Orissa	West Bengal	All India
General	94	2683	747	736	23680
Agriculture		68		3	200
Medical		4			24
Law	1	71	19	22	524
Technical	6	66	25	37	816
Veterinary		6			41
Others	80	1219	269	434	10251
Total	181	4117	1060	1232	35536
Women Out of Total	29	286	97	96	3798

Source: AISHE Report, 2016-17

The ranking of Universities has been done by the National Institutional Rank Framework (NIRF-2017), an autonomous body under the Ministry of Human Resource Development (MHRD). A look

at the first 25 ranks in universities, show that the Tamil Nadu stood first with the state having 5 of the top 25 universities in the country. Delhi followed closely with the state having the 4 of the top 25 universities, Maharashtra and West Bengal having the 3 of the top 25 universities and Orissa having only one university (Table 6.24).

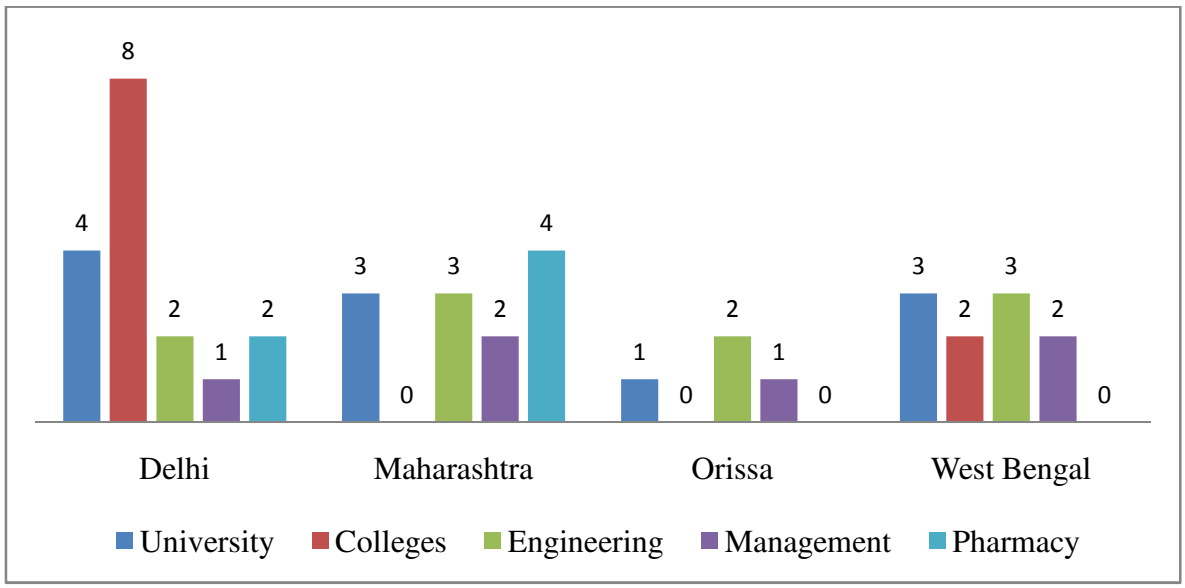
Table 6.24: Top 25 Ranking in NIRF-2017 in Selected State

	Overall	University	Colleges	Engineering	Management	Pharmacy
Tamil Nadu	4	5	10	5	3	4
Delhi	5	4	8	2	1	2
Maharashtra	2	3	0	3	2	4
Orissa	0	3	0	2	1	0
West Bengal	2	1	2	3	2	0

Source: NIRF web site

In Fig 6.18, we have presented number of institutes in top 25 NIRF ranking for the selected four states of India.

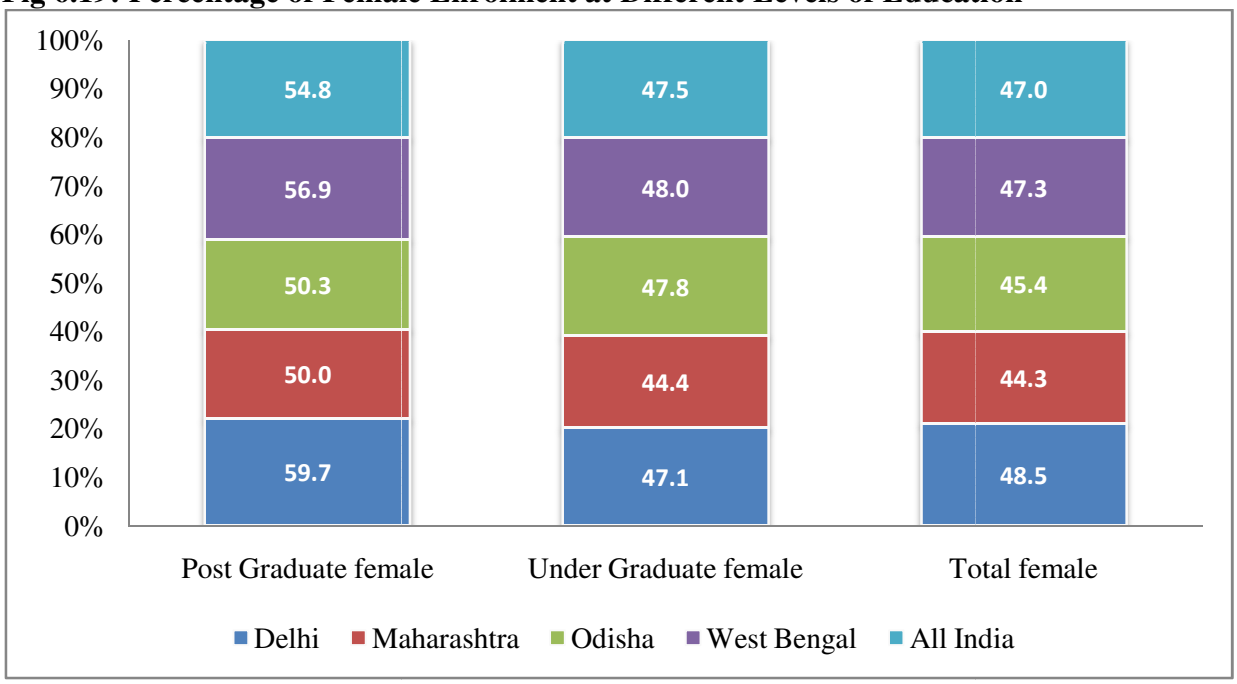
Fig 6.18: State-wise Number of Institutes in Top 25 NIRF Ranking



Source: NIRF web site

In Fig 6.19, we have presented percentage of female enrolment in different levels of education for the selected four states of India.

Fig 6.19: Percentage of Female Enrolment at Different Levels of Education



Source: AISHE, 2016-17

In Table 6.25, we have presented number of colleges per lakh population (18-23 years) and average enrolment per college for selected states.

Table 6.25: Number of Colleges per Lakh Population (18-23 Years), Average Enrolment per College

STATES/UTs	No. of Colleges	No. of Colleges per lakh Population	Average Enrolment per College
Delhi	191	8.5	1526.8
Maharashtra	4569	34.2	628.2
Odisha	1076	23.1	661.0
West Bengal	1082	9.9	1427.3
India	39071	27.7	721.4

Source: AISHE, 2016-17

In Table 6.26, we have presented GER caste-wise and gender-wise for the selected states in India.

Table 6.26: Social Categories-wise Gross Enrolment Ratio (GER) in Selected States

State	All Categories			SC			ST		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Delhi	43.0	48.2	45.4	30.2	28.6	29.5	-	-	-
Maharashtra	31.9	27.6	29.9	31.9	27.0	29.6	18.1	11.4	14.7
Odisha	21.5	17.8	19.6	16.5	12.9	14.7	10.7	8.2	9.4
Tamil Nadu	46.3	42.4	44.3	34.6	34.2	34.4	36.4	27.3	31.8
West Bengal	19.1	16.2	17.7	14.2	11.5	12.8	10.6	8.4	9.5
All India	25.4	23.5	24.5	20.8	19.0	19.9	15.6	12.9	14.2

Source: AISHE, 2016-17

In Table 6.27, we have presented Gender Parity Index (GPI) for the selected states in India.

Table 6.27: Social Categories-wise Gender Parity Index (GPI) in Selected States

State	All Categories	SC Students	ST Students
Delhi	1.12	0.95	-
Maharashtra	0.86	0.85	0.63
Odisha	0.83	0.78	0.77
West Bengal	0.85	0.81	0.79
India	0.92	0.91	0.83

Source: AISHE, 2016-17

In Table 6.28, we have presented percentage of teachers among various social categories for the selected states in India.

Table 6.28: Percentage of Teachers among Various Social Categories in 2016-17

	SC	ST	OBC	PWD	Muslim	Unreserved
Delhi	7.7	2.19	6.16	1.04	2.23	80.72
Maharashtra	9.7	1.41	17.21	0.33	2.36	69.03
Odisha	3.5	1.84	11.50	0.21	0.60	82.36
Tamil Nadu	8.7	0.32	58.53	0.30	1.71	30.43
West Bengal	7.0	0.89	3.67	0.22	3.81	84.45
All India	7.5	2.12	25.39	0.32	3.36	61.36

Source: AISHE, 2016-17

6. 11 Inter-District Inequality in Higher Education in West Bengal

In this section, we have presented inter-district inequality in higher education in West Bengal. General degree universities by districts in West Bengal is shown in Table 6.29.

Table 6.29: General Degree Universities in West Bengal in 2015-16

Sl. No.	University Name	District	University Type	Year of Establishment	No. of Colleges
1	Bankura University	Bankura	State Public University	2014	
2	Burdwan University	Barddhaman	State Public University	1960	172
3	Kazi Nazrul University, Asansol	Barddhaman	State Public University	2012	21
4	Seacom Skills University	Birbhum	State Private University	2014	1
5	Visva Bharati, Shantiniketan	Birbhum	Central University	1951	1
6	North Bengal University, Darjeeling	Darjiling	State Public University	1962	58

7	Cooch Behar Panchanan Barma University	Koch Bihar	State Public University	2012	15
8	Aliah University, Kolkata	Kolkata	State Public University	2007	
9	Calcutta University, Kolkata	Kolkata	State Public University	1857	182
10	Netaji Subhash Open University, Kolkata	Kolkata	State Open University	1997	
11	Presidency University	Kolkata	State Public University	2010	1
12	Rabindra Bharati University, Kolkata	Kolkata	State Public University	1962	1
13	University of Gour Banga, Malda	Maldah	State Public University	2008	55
14	Kalyani University	Nadia	State Public University	1960	118
15	Amity University	North Twenty Four Parganas	State Private University	2015	
16	West Bengal State University	North Twenty Four Parganas	State Public University	2008	77
17	Vidyasagar University, Midnapore	Paschim Medinipur	State Public University	1981	85
18	Sidho-Kanho Birsa University	Puruliya	State Public University	2010	30
19	Diamond Harbour Women's University	South Twenty Four Parganas	State Public University	2012	1
20	Jadavpur University, Kolkata	South Twenty Four Parganas	State Public University	1955	1

Source: AISHE, 2016-17

District-wise number of colleges in West Bengal in 2015-16 is shown in Table 6.30.

Table 6.30: District-wise Number of Colleges in West Bengal in 2015-16

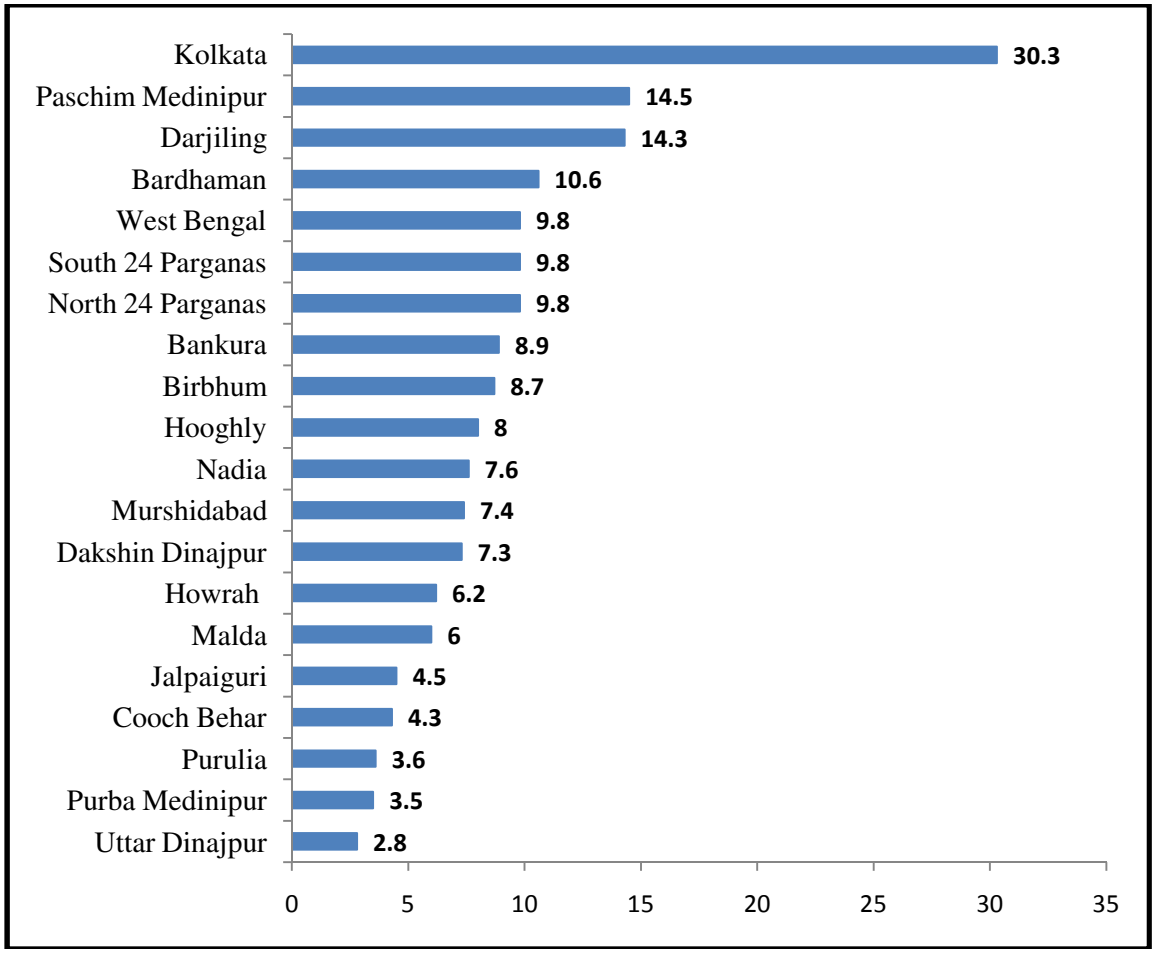
	District	**Rural**	**Urban**	**Total No. of colleges**	**Rural (%)**	**Urban (%)**
1	Bankura	36	7	43	84	16
2	Bardhaman	57	61	118	48	52
3	Birbhum	36	7	43	84	16
4	Dakshin Dinajpur	15	2	17	88	12
5	Darjiling	19	20	39	49	51
6	Howrah	25	18	43	58	42
7	Hooghly	39	21	60	65	35
8	Jalpaiguri	17	10	27	63	37
9	Cooch Bihar	11	7	18	61	39
10	Kolkata	6	171	177	3	97
11	Malda	29	5	34	85	15
12	Murshidabad	63	16	79	80	20

13	Nadia	40	17	57	70	30
14	North 24 Parganas	36	103	139	26	74
15	Paschim Medinipur	44	11	55	80	20
16	Purba Medinipur	28	15	43	65	35
17	Purulia	27	3	30	90	10
18	South 24 Parganas	47	28	75	63	37
19	Uttar Dinajpur	9	2	11	82	18
	West Bengal	584	524	1108	53	47

Source: AISHE, 2015-16

Number of colleges per lakh population belonging to the age group 18-24 by district in West Bengal (Projected population 2014-15) is shown in Fig 6.20. It shows there is wide disparity across districts in West Bengal.

Fig 6.20: Number of Colleges per lakh Population Belonging to the Age Group 18-24 by District in West Bengal (Projected population 2014-15)



Source: AISHE, 2014-15, Census-2011

In the process of achieving United Nation Sustainable Development Goals, the state of West Bengal has started to measure a few development indicators. A few important indicators to show the disparity in higher education by districts in West Bengal during 2017-18 is shown in Table 6.31. The indicators are: Institutional Density (IDEN), College Population Index (number of HEIs per one lakh population) (CPI), Enrolment and Average number of Students per Institution (ASI). The Table 6.31 shows that IDEN is highest in Kolkata and lowest in Uttar Dinajpur. Average number of Students per Institution (ASI) is highest in Nadia and lowest in Bankura. Some facts of development of higher education in West Bengal is given in Appendix A6.4

Table 6.31: A Few Important Indicators in Higher Education by Districts in West Bengal during 2017-18

District	IDEN	CPI	Enrolment	ASI
Bankura	7.12	9.51	51513	1051
Burdwan	17.37	7.37	165508	1356
Birbhum	12.32	7.57	73986	1321
Dakshin Dinajpur	9.01	6.17	32423	1621
Darjeeling	12.38	6.13	63626	1631
Howrah	31.36	7.43	61896	1345
Hooghly	20.64	5.74	113204	1741
Jalpaiguri	4.98	4.31	71992	2322
Coochbeher	5.90	4.1	48821	2441
Kolkata	95.35	4.86	361907	2056
Malda	10.45	6.12	63707	1633
Murshidabad	18.97	8.29	121813	1206
Nadia	16.81	3.62	182131	2759
North 24 Parganas	36.88	7.43	203253	1346
Paschim Medinipur	7.60	6.18	114798	1616
Purba Medinipur	11.4	6.71	80504	1490
Purulia	5.11	6.34	50497	1578
South 24 Parganas	8.23	6.67	122938	1499
Uttar Dinajpur	4.78	4.77	31479	2098

Source: Economic Review

6.12 Technical and Vocational Education in West Bengal

The global competitiveness in Indian industry and also its employment generation potential is clearly dependent on availability of required skills and trained personal. But as several recent studies have revealed the overall state of Indian higher education is dismal and therefore poses a severe constraint on the supply of qualified manpower. Over the years India has become the fastest growing economy of the world. In keeping pace with fast growth of economy the numbers of jobs in India too has risen. Earlier there was some youths who still prefer to go for government jobs in India as it

offers lifelong security, good pay scale and attractive remunerations too (Upadhyaya and Agrawal, 2015).

6.12.1 Technical Education in West Bengal

The West Bengal State Council of Technical Education (WBSCTE) is the statutory body and a state-level council for technical education, under Department of Technical Education and Training (West Bengal), Ministry of Technical Education and training. India is also affiliated to the West Bengal State Council of Technical Education. The Council has also been entrusted with the responsibilities for conduct of Short Term Vocational Training Programme in different centres and affiliate institutes offering Vocational Courses under the supervision of West Bengal State Council of Vocational Education and Training.

Total technical institutes and enrolment in West Bengal is shown in Table 6.32. There were 278 Technical institutes, 90,487 intake capacity and 54 thousand students were enrolled in the state of West Bengal in 2016-17.

Table 6.32: Total Technical Institutes and Enrolment in West Bengal

	Total Institute	Intake Capacity	Enrolment	% of enrolment	Passed	Placement	% of Placement
2012-13	234	71634	48455	67.64	38221	19763	51.70
2013-14	237	77102	49819	64.61	41430	21381	51.60
2014-15	247	87246	51263	58.75	47849	24240	50.65
2015-16	256	88606	52179	58.88	51023	24681	48.37
2016-17	278	90487	54322	60.03		22230	

Source: http://www.aicte-india.org/dashboard/pages/dashboardaicte.php

There were 216 engineering and management institutes and 49 thousand students were enrolled in the state of West Bengal in 2016-17. However percentage of enrolment of the total intake capacity has fallen in recent years. Total number of engineering and management institutes and enrolment in these institutes in West Bengal is shown in Table 6.33.

Table 6.33: Total Engineering and Management Institutes and Enrolment in West Bengal

	Total Institute	Intake Capacity	Enrolment	% of enrolment	Passed	Placement	% of Placement
2012-13	164	59822	42772	71.49878	33450	16994	50.80419
2013-14	168	64646	44396	68.67556	36602	18671	51.01087
2014-15	181	74840	46201	61.73303	43135	21355	49.50736
2015-16	192	76836	46844	60.96621	46506	21951	47.20036
2016-17	216	79870	49002	61.3522		19805	

Source: http://www.aicte-india.org/dashboard/pages/dashboardaicte.php

State-wise number of technical institutes in 2012-13 to 2016-17 has been presented in Table 6.34. In West Bengal, number of technical institute increases 234 to 278 in the period 2012-13 to 2016-17. Maharashtra has the highest number of technical institutes (1515) and Uttarpradesh, Tamilnadu, Andhra Pradesh are the state more technical institutes. Table 6.34 presents state-wise number of technical Institutes in 2012-13 to 2016-17

Table 6.34: State-wise Number of Technical Institutes in 2012-13 and 2016-17

	States	**2012-13**	**2016-17**
1	Andaman and Nicobar	1	4
2	Andhra Pradesh	893	842
3	Arunachal Pradesh	3	8
4	Assam	32	47
5	Bihar	68	119
6	Chandigarh	12	12
7	Chhattisgarh	105	119
8	Dadra and Nagar Haveli	3	3
9	Daman and Diu	1	2
10	Delhi	77	77
11	Goa	16	17
12	Gujarat	424	423
13	Haryana	478	427
14	Himachal Pradesh	74	72
15	Jammu and Kashmir	32	51
16	Jharkhand	45	62
17	Karnataka	755	749
18	Kerala	335	376
19	Madhya Pradesh	531	551
20	Maharastra	1514	1551
21	Manipur	3	4
22	Meghalaya	6	6
23	Mizoram	1	4
24	Nagaland	-	6
25	Odisha	286	302
26	Puducherry	28	31
27	Punjab	377	376
28	Rajasthan	468	417
29	Sikkim	4	5
30	Tamil Nadu	1359	1344
31	Telangana	877	752
32	Tripura	4	12
33	Uttar Pradesh	1061	1131
34	Uttarakhand	164	183
35	West Bengal	234	278
	All India	4862	4831

Source: http://www.aicte-india.org/dashboard/pages/dashboardaicte.php

The sharp rise in the vacancies that the data have thrown up is an indicator of the poor quality of infrastructure and teaching at the state's private engineering colleges, say academics, which prompts the migration of thousands of students to technology colleges in other states. There has been a "mindless" increase of seats at a time when interest in technical courses may be on a decline, feel senior engineering teachers. The number of vacancies has jumped in some other states as well but they are still smaller than Bengal's. In Karnataka, which has been a hub of engineering colleges for more than a decade, the vacancy in 2016-2017 is 24%, marginally above the 2012- 2013 vacancy of 22%. Delhi recorded an 18% vacancy in 2016-2017 and Assam had a vacancy of 35% (The Times of India, March 14, 2018). Vacancy in engineering colleges in West Bengal is shown in Table 6.35.

Table 6.35: Vacancy in Engineering Colleges in West Bengal

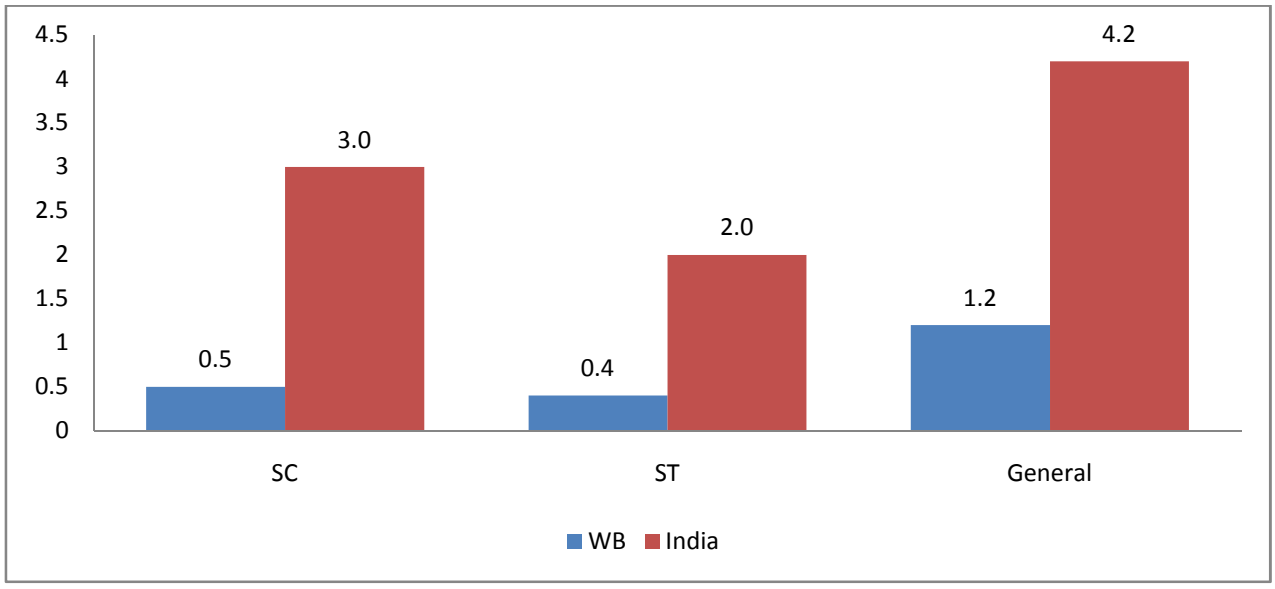
West Bengal Figures	2012-13	2016-17
Total no. of engineering /technical seats	34053	37593
No of vacant seats	9392	15531
% of vacant seats	28%	42%
% of vacant seats in Karnataka	22%	24%
% of vacant seats in Delhi	4%	18%
% of vacant seats in Assam	25%	35%

Source: The Times of India, March 14, 2018

6.12.2 Vocational Education

Vocational Education or Vocational Education and Training (VET), also called Career and Technical Education (CTE), prepares learners for jobs that are based in manual or practical activities, traditionally non-academic and totally related to a specific trade, occupation or vocation, hence the term, in which the learner participates. It is sometimes referred to as technical education, as the learner directly develops expertise in a particular group of techniques or technology. GER in vocational education in West Bengal is much less in West Bengal compared to India. GER in vocational education in West Bengal for different categories are as follows: SC:05, ST:0.4 and General caste: 1.2. GER in vocational education for India for different categories are as follows: SC:3, ST:2 and General caste: 4.2. (Fig. 6.21)

Fig. 6.21: GER in Vocational Education in West Bengal and India (Census, 2011)



Source: Census, 2011

Community Colleges

India is a vast country with a population of more than 1.2 billion. 75% of India's population lives in about six lakh villages. There is a visible difference in rural and urban, rich and poor, highly educated and lesser educated, forward and backward areas. While resourceful people, particularly those living in urban areas, have had access to better education and professional training, but vast majority of those who live in rural areas and slums are lesser educated and hardly undergo any technical, professional and vocational training. In fact, for most of such people, quality education and higher technical and professional education is unaffordable. In an increasingly competitive economic environment of our country, the unorganized sector, which is so important for the country, needs to increase the productivity of its manpower for its survival and growth.

Yet another paradox before the Indian informal sector is that it cannot afford employing highly educated and professionally trained manpower which usually aspires for highly challenging, rewarding and satisfying career. The only option available before the Indian informal sector is to depend upon relatively low paid manpower trained through non formal system of skill development.

There is, therefore, an urgent need to train millions of persons every year through a countrywide network of non-formal skill development. Such non-formal skill training should attract beneficiaries from all cross-sections of Indian society.

There are more than 3200 polytechnics and equivalent technical institutions which exhibit potential to provide skill training to millions of youth through their own facilities and or by establishing extension centres in collaboration with ITIs, or Vocational Skill Knowledge providers, NGOs. These

polytechnics can also render useful services in adoption of appropriate technologies and providing technical and support services to rural people and slum dwellers.

In India 150 community colleges are approved and in West Bengal there are 7 community colleges. List of community colleges in West Bengal in 2017 is given in Table 6.36. There are 7 community colleges in West Bengal and three colleges are in Vidyasagar University.

List of community colleges in West Bengal in 2017 is shown in the Table 6.36.

Table 6.36: List of Community Colleges in West Bengal in 2017

	Name	**Affiliated Courses**	**Under University**
1.	Asutosh College	Advance Diploma in (a) Software Development (b) Mobile Communication	Calcutta University
2.	Bhatter College	Diploma in (a) Food Processing and Enterprise Management (b) Hospitality Management	Vidyasagar University
3.	City College	Diploma in (a) Media and Communication Technology (b) Travel and Tourism	Calcutta University
4.	Derogio Memorial College	Diploma in (a) Photographic Video Production (b) Web Designing and development	
5.	Mahishadal Raj College	Diploma in (a) Automobile Servicing (b) Healthcare	Vidyasagar University
6.	Maynaguri College (Jalpaiguri)	Diploma in (a) Retail Management (b) Travel and Tourism	
7.	Silda Chandra Sekhar College	Diploma in (a) Automobile Servicing (b) Mobile Repairing and Basics of DTH Installation	Vidyasagar University

Source: MHRD Report, 2016

There is enough scope for expansion of vocational education in the fields of manufacturing and production sector; Medical and Hospital Testing and Diagnostic Services; Hospitality and Tourism services; Media and Communication Services; ICT Services; and so on. An in-depth analysis have been done on vocational courses on all aspects covering the entrance to the courses, the curriculum prescription, the methodology of transaction, infrastructural support to offer the programme, procedures of evaluation and certification, employability by the market, possibilities for vertical mobility, etc.

6.13 National Service Scheme (N.S.S.)

The National Service Scheme (NSS) is a noble youth activity of our country started in 1969 on the occasion of the birth centenary of Mahatma Gandhi. The main objective of NSS is 'Education through Community Service'. "Not me but you" is the motto of NSS which means every person should realize that not he alone or she alone is important but the society in which he or she lives is on the whole important. NSS activities are multipurpose as well as multidimensional in their nature. And in practice, these activities take an important part to the service of mankind and in execution of the process of formation of the future generation of the country through various constructive programmes.

The modern dehumanised materialistic civilisation has been neglecting human values. And, it is only the NSS activities which can lead young ones to become more meaningful and fruitful to the society which in an extended sense encompasses the entire humanity. The basic principles and values of NSS include Environment Enrichment and Conservation, Women's Development and Gender Justice, Production orientated programmes. Education and Recreation, Health, Family Welfare and Nutrition of the weaker section of the society, Social Service, Relief and Rehabilitation, Socio-Economic Surveys, Health Awareness and Scientific Awareness Generation etc

West Bengal is one of the first few states where NSS has been introduced since its beginning of Journey in the country in 1969. But over the years, it could not hold the momentum and has now slipped from the top run in the arena of NSS. In the days to come, NSS activities will further be strengthened to take it to the optimum level by sincerity and commitment of all concerned (Department of Higher Education, Government of West Bengal). Table 6.37 reveals that there were 1.01 lakh NSS volunteers in all the universities in West Bengal in 2015-16.

Table 6.37: Allotment of Volunteers in 2015-16 in NSS Unit

	Regular Activities	Special Mapping
Jadavpur University	3000	1500
Burdwan University	16600	8300
Viswa Bharati University	500	250
North Bengal University	10900	5450
Vidyasagar University	13900	6950
W.B.H.S. Council	18200	9100
Kalyani University	5000	2500
Calcutta University	14600	7300
Bidhan Chandra Krishi Vishwavidyalaya	300	150
West Bengal University of Technology	500	250
Indian Institute of Technology Kharagpur	1000	500

Rabindra Bharati University	500	250
National Institute of Technology, Durgapur	200	100
Gour Banga University, Malda	3700	1850
West Bengal State University	5000	2500
Cooch-Behar Panchanan Barma University	100	50
West Bengal University of Animal and Fishery Sciences	100	50
Presidency University	200	100
I.I.E.S.T(BENGAL ENGINEERING and SCIENCE UNIVERSITY)	200	100
Sidho-Kanho-Birsa University	4300	2150
Aliah University	100	50
Uttar Banga Krishi Viswavidyalaya	200	100
Kazi Nazrul University	2100	1050
Total	**101200**	**50600**

Source: Department of Higher Education, Government of West Bengal, http://wbhed.gov.in/page/nss.php

6.14 Determinants of Gross Enrolment Ratio (GER) in Higher Education in Different States of India

We have already observed that there is huge disparity in GER across states in India. We have estimated the following regression equation to find the determinants of Gross enrolment ratio across different states in India.

$GER = a + b_1 HEIL + b_2 EXPTECH + b_3 EXPVOC + u_i$

GER = Gross Enrolment Ratio

HEIL: Number of higher education institutes per lakh population

EXPTECH = Expenditure per household in the state on technical education

EXPVOC = Expenditure per household in the state on vocational education

u_i = Error term

Table 6.38: Regression Estimation Results

A. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.787[a]	.619	.572	5.15181

a. Predictors: (Constant), HEIL, EXPTECH, EXPVOC

B. ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1035.767	3	345.256	13.008	.000[a]
	Residual	636.987	24	26.541		
	Total	1672.754	27			

a. Predictors: (Constant), HEIL, EXPTECH, EXPVOC

b. Dependent Variable: GERHE

C. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.026	4.864		-.211	.835
	HEIL	.388	.081	.636	4.793	.000
	EXPTECH	.000	.000	.366	2.734	.012
	EXPVOC	.000	.000	.190	1.396	.175

a. Dependent Variable: GERHE

The estimated regression results are given in Table 6.38. The estimated regression results shows that Gross Enrolment ratio (GER) depends significantly upon number of higher education institutes per lakh population, expenditure per household in the state on technical education and vocational education

6.15 Conclusion

In this chapter, we have presented equity issues in higher education in West Bengal. We have presented the status of West Bengal in different equity issues like institutional distribution, enrolment pattern, out turn of students, gender based differences, regional disparity, and social disparity, inter district inequality etc. The results reveal that West Bengal lags far behind the other states in most of the parameters of higher education.

Chapter-6: Appendix

Table A6.1: Percentage of Private and Government Colleges in West Bengal and India

	West Bengal					India				
	2010-11	2011-12	2012-13	2013-14	2014-15	2010-11	2011-12	2012-13	2013-14	2014-15
Private Un-Aided	36.4	33.3	36.3	37.2	37.8	59.0	58.2	59.8	60.4	61.0
Private Aided	23.4	23.0	21.6	21.1	20.6	14.2	15.1	14.8	14.9	15.0
Total Private	59.8	56.2	58.0	58.3	58.4	73.2	73.3	74.6	75.3	76.1
Govern-Ment	40.2	43.8	42.0	41.7	41.6	26.8	26.7	25.4	24.7	23.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: AISHE (various years)

Table A6.2: Percentage of Enrolment in Private and Government Colleges in West Bengal and India

	West Bengal					India				
	2010-11	2011-12	2012-13	2013-14	2014-15	2010-11	2011-12	2012-13	2013-14	2014-15
Private Un-Aided	12.4	9.7	9.7	9.6	9.2	37.0	38.3	40.9	42.6	42.7
Private Aided	34.8	32.4	28.5	26.4	26.1	23.8	23.7	22.4	22.4	22.6
Total Private	47.2	42.2	38.2	36.0	35.3	60.8	62.1	63.2	65.0	65.4
Government	52.8	57.8	61.8	64.0	64.7	39.2	37.9	36.8	35.0	34.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: AISHE (Various years)

Table A6.3: Inter-state Disparity for GER, No. of Colleges and Pupil-Teacher Ratio

	GER	Rank	No. of Colleges per lakh population	Rank	PTR (Pupil-Teacher Ratio)	Rank
India	**25.2**					
Andaman and Nicobar Islands	22.8	22	15	26	32	28
Andhra Pradesh	32.4	11	48	5	18	9
Arunachal Pradesh	28.9	14	19	24	41	31
Assam	17.2	30	15	27	30	26
Bihar	14.4	33	7	35	70	36
Chandigarh	56.1	1	14	29	31	27
Chhattisgarh	16.1	32	23	20	27	20
Dadra and Nagar Haveli	9.2	34	13	30	29	25
Daman and Diu	5.5	36	14	28	16	4
Delhi	45.3	3	8	34	57	34
Goa	28.1	16	32	13	18	7
Gujarat	20.2	25	29	15	28	24
Haryana	29.0	13	36	9	26	15
Himachal Pradesh	36.7	6	51	3	27	21
Jammu and Kashmir	25.6	18	24	19	38	30
Jharkhand	17.7	29	8	33	61	35
Karnataka	26.5	17	53	2	15	3
Kerala	34.2	9	44	6	19	11
Lakshadweep	7.3	35	0	36	14	2
Madhya Pradesh	20.0	26	25	18	28	23
Maharashtra	30.2	12	32	12	27	18
Manipur	35.0	8	30	14	23	14
Meghalaya	23.5	21	18	25	27	19
Mizoram	24.5	20	23	21	19	12
Nagaland	16.6	31	26	17	19	10
Odisha	21.0	23	23	22	26	16
Puducherry	43.1	4	49	4	12	1
Punjab	28.6	15	33	10	18	8
Rajasthan	20.5	24	36	8	27	22
Sikkim	37.3	5	22	23	22	13
Tamil Nadu	46.9	2	33	11	18	6
Telangana	35.8	7	59	1	17	5
Tripura	19.1	27	12	31	35	29
Uttar Pradesh	24.9	19	29	16	42	33
Uttrakhand	33.4	10	39	7	26	17
West Bengal	**18.5**	**28**	**11**	32	**42**	32

Source: AISHE, 2016-17

Appendix-A6.4: Some Facts on Development of Higher Education in West Bengal

Year-wise progress of higher education as reported in various issues of Economic Review is given below (Jana, 2012).

1990-91

Colleges were proposed to be modernized by replacing old equipments, adding new books to the libraries and renovating education.

1991-92

The Department was in favour of diversification of modern subjects. It was contemplated that some colleges may be allowed to carry on post graduate teaching on certain subjects.

1992-93

Innovative steps have been taken up in some areas of higher education. The State Government had taken up few supporting steps to build up a cultural complex in the Bhavan under Rabindra Bharati university and it has been taken to convert the B.E. College (Sibpur) into a deemed University.

1993-94

An Education Commissioin was constituted under the chairmanship of Dr. Ashoke Mitra in 1991 to review the content and quality of education in West Bengal since 1977 and make recommendations. The commission submitted its report.

1994-95

Implementation of a number of recommendations of the Education Commission constituted under the Chairmanship of Dr. Ashoke Mitra, was under active consideration of the State Government.

1995-96

The West Bengal State council of Higher Education created by statute of the West Bengal Legislative Assembly had started functioning.Vocational education had been introduced at the undergraduate level in a number of colleges.

1996-97

For proper utilization of higher educated/trained technical personnel is possible, a two fold strategy was followed. While the existing quality of facilities and academic standards are sought to be improved, the expansion of higher education capacity in the state is also being attempted through addition to existing physical facilities, introduction of new courses and establishment of new higher educational institutions.

1997-98

Post graduate studies was in introduced in different colleges of the state like physiology in Hooghly Mohosin College. Ten new colleges had been established during the year.

1998-99

New subjects like computer science, electronics and biotechnology were introduced in different degree colleges.

1999-2000

On the occasion of Golden Jubilee of the Republic day, 50 colleges were declared as the Golden Jubilee colleges. West Bengal National Institute of Juridical Science began its academic session.

2000-01

M.Sc. courses in electronics and micro-biology had been introduced in Vidyasagar University. M.Com. course in Hooghly Mohosin College and M.Sc. in Zoology in Moulana Azad College had been introduced.

2002-03

Attempts were being made by different universities for reviving the syllabi of different courses. Some new courses were introduced like Post Graduate Diploma course in Bio-informatics in Calcutta University, post graduate diploma course in Human Rights and Duties in Kalyani University. Directorate of Distance Education opened in Rabindra Bharati University.

2004-05

A number of different PG courses in different colleges were introduced. Several new subjects were introduced in 133 colleges. 450 new posts were created in different non government colleges were approved. Presidency College of Kolkata had been selected by the UGC under 'Potential of Excellence' scheme.

2005-06

Education map was drawn up by the Department based on GIS data. St. Xavier's College became the first autonomous college in West Bengal. 29 post graduate courses were introduced in 46 general degree colleges. Jadavpur University and BESU were considered for award of the status of "Institutions of National Importance" by UGC. New P.G. Departments viz. Sanskrit, Sociology started in Vidyasagar University.

2007-08

22 new general degree colleges had been established under pay packet schemes in different districts of West Bengal. Eleven post graduate courses had been introduced in 7 government general degree colleges. In 2007-08, there were 2,476 teaching staff in colleges and the number of general degree colleges was 404.

2008-09

The newly established two universities namely Barasat State University and Gour Banga University started functioning. Institute of Development Studies, Kolkata received grant for construction of its own building. .

2015-16

For career-oriented and skill based education, Community College Schemes (CCS) has been introduced in five degree colleges and initiative has also been taken to tie up with local industry partners, so that the students of technical institutions may be considered for absorption upon completion of the course. A major e-governance initiative has been taken to bring in greater transparency and fairness in admission to all UG and PG level courses by making admissions online in all Government and Government aided higher education institution, from the academic session 2015-16 onwards. This system is benefiting more than eight lakh applicants throughout the State.

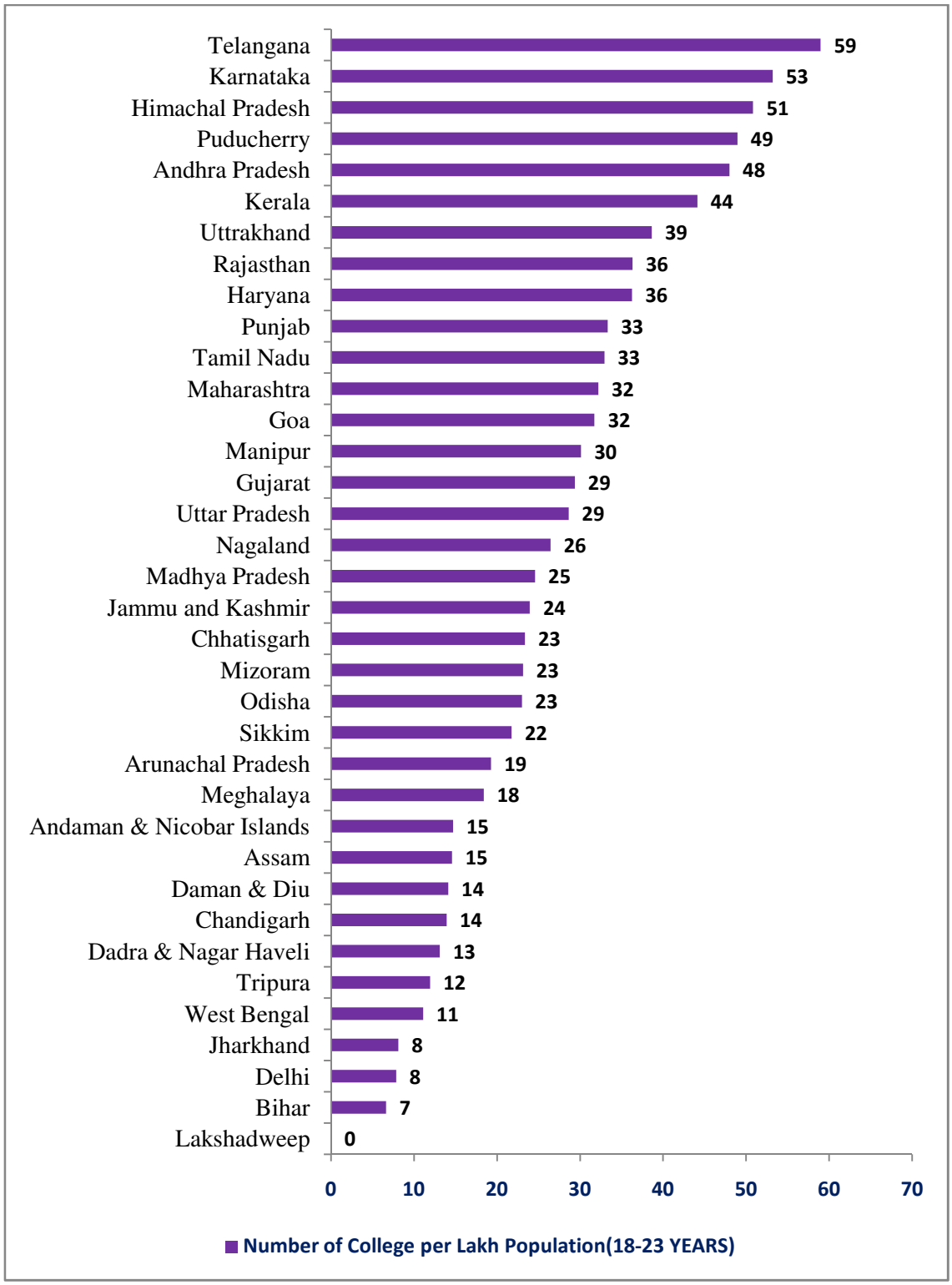
2016-17

The West Bengal State Higher Education Institutions (Reservation in Admission) Act, 2013 was enacted with a mandate to provide a 17 per cent reservation for OBC students, to be achieved over a six year period starting from 2014-15, without reducing the total number of seats available for the General Category students.

For career-oriented and skill based education, Community College Schemes(CCS) has been introduced in five degree colleges and initiative has also been taken to tie up with local industry partners, so that the students of technical institutions may be considered for absorption upon completion of the course.

Source: Economic Review, Government of West Bengal, Various Issues

Figure A6.5: State-wise Number of Colleges per Lakh Population (18-23 years) in 2016-17



Source: AISHE, 2016-17

Chapter 7

Quality of Higher Education in West Bengal

7.1 Introduction

The quality of education provided in a large number of higher education institutions is a matter of great concern. Accreditation agencies were established in India in 1994 as a measure of quality assurance in order to enhance standards of higher education. Assessment and accreditation is not something new. It is prevalent in business and industry. In India in formal way assessment and accreditation is a recent phenomenon in the field of higher education. The major purpose of accreditation of Higher Education Institutions (HEIs) are as follows: (i) To assist all stake-holders (parents, students, teachers, educational institutions, professional societies, potential employers, government agencies, etc.) in identifying those institutions and there specific programmes which meet the current norms and standards as well as other quality indicators which are followed throughout the world. (ii)To provide for continued upgradation of existing programmes and development of new programmes. (iii) To encourage the maintenance of a standard of excellence and to stimulate the process of continual improvement in Technical Education in the Country. (iv) To know the strengths and weaknesses of the programme as seen by the Peer Team/Expert Team.

In order to address the quality issues in India, as on outcome of the ideas contained in the National Policy on Education (NPE) 1986 and Programme of Action (POA) 1992, the National Assessment and Accreditation Council (NAAC) was established on 16 September 1994 as a creative idea to give positive thrust in the direction of quality enhancement of the Indian HEIs. Indian higher education system is well known for its premier institutions across the globe like IITs, IIMs, IIITs, IISc and the like. NPE (1986) laid special emphasis on advocating the quality of higher education in India and strengthening the quality initiatives with the establishment of accreditation agencies in India. Presently, there are mainly four accreditation agencies functioning in India- NAAC being set up by UGC in 1994 to monitor quality of HEIs in general education, National Board of Accreditation (NBA) by all India Council Technical Educations (AICTE) for technical education and Accreditation Board (AB) of Indian Council of Agricultural Research (ICAR) for accrediting agriculture institutions and National institutional Ranking Framework (NIRF). NAAC is considered as a major Quality Assurance (QA) body in India as it covers all kinds of HEIs unlike other bodies engaged in specialised accreditation. The Expert Committee set-up by the UGC developed National Institutional Ranking Framework (NIRF) for Higher Education Institutions under the ambit of

University Grants Commission discussed and deliberated upon reputed globally-recognized rankings of the world-class universities and performance of Indian educational institutions in these rankings. Before going into the discussion of ranking done by NAAC and NIRF, we may look in the infrastructure facilities in higher education institute in West Bengal. Infrastructure facilities in West Bengal and India in 2015-16 are shown in Table 7.1. The table indicates that some infrastructure facilities in higher education in West Bengal is below the all India average - Playground, Auditorium, Library, Health Centre, Computer Centre, Separate Common Room for Girls, etc.

Table 7.1: Infrastructure Facilities in West Bengal and India in 2015-16

Institution	All West Bengal – (Nos. 1427)	ALL INDIA (Nos.-43122)	Per college in West Bengal	Per college in India	Difference between WB and India
Playground	1288	42949	0.90	1.00	-0.1
Auditorium	735	26140	0.52	0.61	-0.09
Theatre	1523	43715	1.07	1.01	0.06
Library	184	9769	0.13	0.23	-0.1
Laboratory	8586	170832	6.02	3.96	2.06
Conference Hall	1181	35905	0.83	0.83	0
Health Centre	615	18950	0.43	0.44	-0.01
Gymnasium/ Fitness Centre	557	15207	0.39	0.35	0.04
Indoor Stadium	137	13010	0.10	0.30	-0.2
Common Room	1811	45528	1.27	1.06	0.21
Computer Centre	1323	41687	0.93	0.97	-0.04
Cafeteria	1012	24818	0.71	0.58	0.13
Guest House	668	18690	0.47	0.43	0.04
Separate Common Room for Girls	1199	37090	0.84	0.86	-0.02
Hostel	1815	37607	1.27	0.87	0.4
Quarter	14671	402167	10.28	9.33	0.95
Solar Power Generation	192	8744	0.13	0.20	-0.07
Connectivity NKN	182	7807	0.13	0.18	-0.05
Connectivity NMEICT	258	8031	0.18	0.19	-0.01

Source: AISHE, 2015-16

Availability of teachers is an important indicator in higher education. Pupil Teacher Ratio (PTR) in West Bengal is much higher than all India average. Year-wise Pupil Teacher Ratio in West Bengal compare to India are presented in Table 7.2 and shown in Fig 7.1.

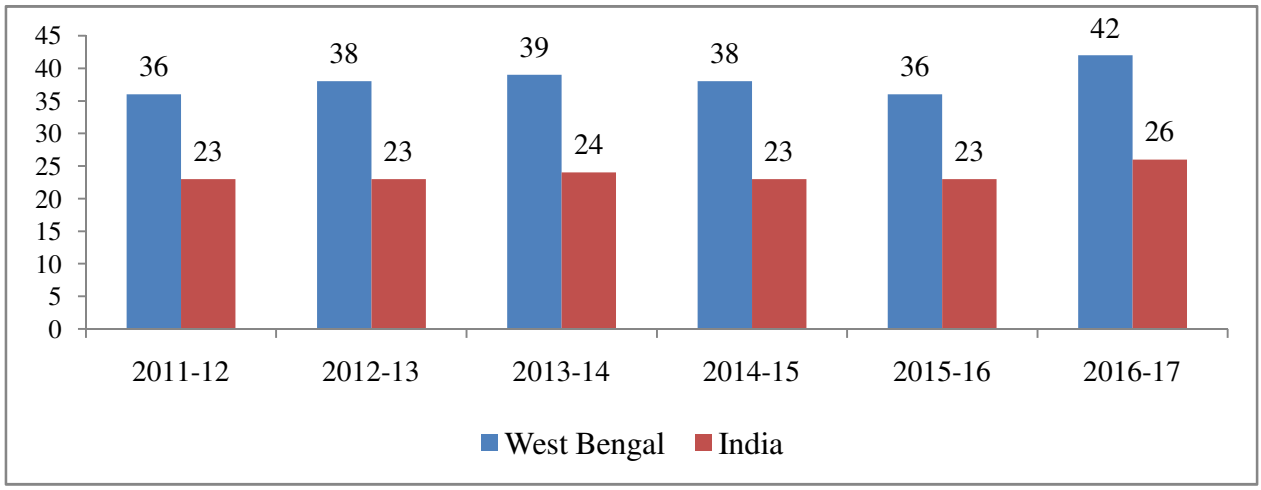
Table 7.2: Year-wise Pupil Teacher Ratio in Higher Education in India and West Bengal, All Institutions

Year	Regular and Distance Mode		Regular Mode	
	West Bengal	India	West Bengal	India
2011-12	36	23	33	21
2012-13	38	23	35	20
2013-14	39	24	35	21
2014-15	38	23	34	21
2015-16	36	23	32	20
2016-17	42	26	38	23

Source: AISHE, 2016-17

Year-wise PTR in higher education in West Bengal and India has been compared in Fig 7.1. The ratio has worsened in recent years.

Figure 7.1: Year-wise Pupil Teacher Ratio (PTR) in Higher Education Institutions in West Bengal and India (Regular and Distance Mode)



Source: AISHE, 2016-17

7.2 NAAC Assessment Results: West Bengal

7.2.1 NAAC Assessment Criteria

NAAC is considered as a major Quality Assurance (QA) body in India as it covers all kinds of HEIs unlike other bodies engaged in specialised accreditation. Form the initial phase of apprehension surrounding the philosophy of external review, the NAAC has gradually been able to build a greater appreciation from the higher education community of the intrinsic benefits of accreditation. For example, the wider participation of academia in NAAC policymaking has been of great benefit in building a greater acceptance of the assessment process. The gradation system of NAAC has changed at different times. In Table 7.3, accreditation method at different years has been presented.

Table 7.3: Assessment and Accreditation Methodology Adopted by NAAC

SL NO.	Scale	Grading system	Years	No of institutions assessed in India
1	Two-point scale	Accredited/not accredited with parameter scores	February, 1999	9 HEIs
2	Five-point scale	Star rating: A*, A**, A***, A****, A*****	1st march 1999 to February 2002	240 HEIs
3	Nine-point scale	Letter grades (each letter grade rated at three levels) C, C+, C++, B, B+, B++, A, A+, A++	March 2002 to March 2007	3495 HEIs (1st cycle: 3374; 2nd cycle: 121)
4	Three-point scale	CGPA with A, B and C letter grades	April 2007 till date	2909 HEIs (1st cycle: 1671; 2nd cycle: 1195; 3rd cycle: 43)

Source: Patil and Pillai (2017)

7.2.2 NAAC Assessment Results in West Bengal

In Table 7.4, we have presented grades achieved by different universities in West Bengal over years.

Table 7.4: NAAC Assessment of Universities in West Bengal

Sl. No.	Universities	Cycle 1		Cycle 2		Cycle 3	
		Grade	Date	Grade	Date	Grade	Date
1	Jadavpur University	5	05-11-2001	A	16-09-2008	A	24-09-2014
2	Presidency University	A	16-12-2016				
3	Rabindra Bharati University	4	05-11-2001	A	19-02-2016		
4	University of Burdwan	4	22-03-2001	B++	31-03-2007	A	05-11-2016
5	University of Calcutta	5	21-05-2001	A	31-12-2009	A	23-01-2017
6	University of Gour Banga	B	25-05-2016				
7	University of Kalyani	3	21-05-2001	B	16-09-2008	A	16-12-2016
8	University of North Bengal	3	20-09-2000	B++	21-05-2006	A	02-12-2016
9	Vidyasagar University	3	12-02-2002	B	29-01-2009	B	10-12-2014
10	Visva-Bharati University	B	11-05-2015				

Source: Self-review document of NAAC

State-wise status of NAAC assessment of universities is shown in Table 7.5. The Table reveals that out of 281 universities assessed in India, 59% has got A grade and percentage for West Bengal, it is 70%. So, West Bengal universalities are comparatively better placed in NAAC assessment.

Table 7.5: Grade-wise and State-wise Universities in India (up to 2016)

Sl.No.	States	Number				Percentage		
		A	B	C	Total	A	B	C
1	Andhra Pradesh	9	2		11	81.8	18.2	0.0
2	Arunachal Pradesh		3		3	0.0	100.0	0.0
3	Assam	1	4		5	20.0	80.0	0.0
4	Bihar	2	4	1	7	28.6	57.1	14.3
5	Chhattisgarh	2	3		5	40.0	60.0	0.0
6	Delhi	13	1		14	92.9	7.1	0.0
7	Goa	1			1	100.0	0.0	0.0
8	Gujrat	11	7		18	61.1	38.9	0.0
9	Haryana	1	3		4	25.0	75.0	0.0
10	Himachal Pradesh	1	3		4	25.0	75.0	0.0
11	Jammu and Kashmir	2	1		3	66.7	33.3	0.0
12	Jharkhand		2	1	3	0.0	66.7	33.3
13	Karnataka	15	10		25	60.0	40.0	0.0
14	Kerala	4	4		8	50.0	50.0	0.0
15	Madhya Pradesh	7	5		12	58.3	41.7	0.0
16	Meghalaya	1			1	100.0	0.0	0.0
17	Maharastra	25	6		31	80.6	19.4	0.0
18	Mizoram	1			1	100.0	0.0	0.0
19	Nagaland		1		1	0.0	100.0	0.0
20	Odisha	9	4		13	69.2	30.8	0.0
21	Panjub	6	1		7	85.7	14.3	0.0
22	Puduchrry	2			2	100.0	0.0	0.0
23	Rajasthan	8	6		14	57.1	42.9	0.0
24	Sikkim		1		1	0.0	100.0	0.0
25	Tamil Nadu	24	18		42	57.1	42.9	0.0
26	Tripura		1		1	0.0	100.0	0.0
27	Uttar Pradesh	10	17	1	28	35.7	60.7	3.6
28	Uttarakhand	4	2		6	66.7	33.3	0.0
29	West Bengal	7	3		10	70.0	30.0	0.0
	Total	166	112	3	281	59.1	39.9	1.1

Source: NAAC website

State-wise NAAC Assessment of Colleges (up to December 2016) in India is shown in Table 7.6. Out of 154 colleges in West Bengal, percentage of A grade is 12.3%, whereas the percentage for India is 24.4. The average grade of the colleges of West Bengal is calculated as 2.52 whereas for India it is 2.59.

Table 7.6: State-wise College Assessment (Percentage) (up to December, 2016)

Sl. No	States	A	B	C	Total	Average Grade
1	Chandigarh	55.6	44.4	0.0	9	3.02
2	Kerala	53.4	45.9	0.7	148	2.92

3	Goa	38.9	61.1	0.0	18	2.90
4	Delhi	52.8	47.2	0.0	36	2.89
5	Punjab	35.7	62.7	1.6	126	2.75
6	Meghalaya	36.4	54.5	9.1	11	2.74
7	Tamil Nadu	33.5	65.0	1.5	540	2.71
8	Sikkim	0.0	100.0	0.0	1	2.70
9	Telangana	32.5	58.5	8.9	123	2.62
10	Jammu and Kashmir	26.1	69.6	4.3	46	2.61
11	Maharastra	25.5	68.5	5.9	674	2.61
12	Andhra Pradesh	33.1	62.3	4.6	175	2.61
13	Karnataka	21.4	72.3	6.3	397	2.56
14	Gujrat	19.5	74.7	5.8	190	2.55
15	Puducherry	29.4	70.6	0.0	17	2.54
16	Madhya Pradesh	18.7	70.5	10.8	139	2.52
17	**West Bengal**	**12.3**	**83.1**	**4.5**	**154**	**2.52**
18	Haryana	16.5	75.3	8.2	158	2.51
19	Uttarakhand	10.3	86.2	3.4	29	2.50
20	Arunachal Pradesh	20.0	60.0	20.0	5	2.49
21	Assam	7.8	87.0	5.2	77	2.49
22	Uttar Pradesh	13.8	74.2	12.1	298	2.46
23	Nagaland	11.1	88.9	0.0	9	2.42
24	Rajasthan	9.2	82.3	8.5	130	2.40
25	Manipur	14.3	78.6	7.1	14	2.39
26	Chhattisgarh	6.3	87.5	6.3	16	2.37
27	Odisha	6.8	81.1	12.2	74	2.34
28	Himachal Pradseh	7.4	77.8	14.8	27	2.32
29	Bihar	10.0	70.0	20.0	10	2.27
30	Mizoram	0.0	57.1	42.9	7	2.23
31	Tripura	0.0	71.4	28.6	7	2.20
32	Jharkhand	0.0	77.8	22.2	9	2.19
	India	24.4	69.6	6.0	3674	2.59

Source: NAAC website

7.2.3 Determinants of Grades of NAAC Assessed Colleges in West Bengal

In this section we have used Ordered Logit model estimation to find the determinants of NAAC assessment of the colleges in West Bengal. For this purpose, we have taken 191 colleges assessed by NAAC during 2016 and 2017. All the data have been collected from reports of NAAC assessment.

In Table 7.7, we have presented average values of different parameters as assessed by NAAC for rural and urban areas. The table shows that in terms of most of the parameters the values are higher for colleges in urban areas

Table 7.7: Average Values of Different Indicators for the NAAC Assessed Colleges by Regions

Item	Rural	Urban
No of Colleges %	52.88	47.12
% of PG	16.83	35.56
No. of Departments	13.57	14.79
Number of Full time teachers	25.21	43.84
Permanent Support Staff	19.55	30.58
Number of UG Students	2976.95	2475.34
Number of PG Students	103.10	116.00
Number of Ph D Teachers	11.30	19.62
Number of M. Phil. Teachers	4.84	7.46
No of research Projects	5.49	7.67
Land Area (Acres)	8.77	5.37
Built up area (Sqr mts)	8310.62	5818.34
Number of Boys Hostel	1.14	0.76
Number of Girls Hostel	1.00	0.97
Number of Books	20366.68	28818.75
Number of Journals	15.90	113.33
Number of Magazines	7.92	8.46
Number of Computers	47.69	104.56

Source: Own Estimation based on NAAC

In Table 7.8, we have presented average values of different indicators for the NAAC Assessed colleges by Grades

Table 7.8: Average Values of Different Indicators for the NAAC Assessed Colleges by Grades

No of Colleges	**1**	**1**	**25**	**33**	**50**	**75**	**6**
Item	**A++**	**A+**	**A**	**B++**	**B+**	**B**	**C**
No of Colleges %	0.5	0.5	13.1	17.3	26.2	39.3	3.1
% of Colleges having PG Depts.	100.0	100.0	56.0	30.3	20.0	17.3	0.0
No. of Departments	23.0	22.0	16.9	17.5	13.6	12.0	12.5
Number of Full time teachers	198.0	75.0	62.9	46.3	28.1	21.6	15.5
Permanent Support Staff	247.0	56.0	43.9	30.7	21.2	15.6	13.3
Number of UG Students	8298.0	5792.0	3226.4	3142.7	2638.1	2359.5	2687.8
Number of PG Students	NA	NA	208.3	84.3	28.3	72.4	NA
Number of Teachers with Ph.D	NA	47.0	28.7	21.9	12.8	9.3	8.2
Number of Teachers with M. Phil.	NA	0.0	9.1	8.1	4.7	5.1	5.0
No of research Projects	NA	0.0	10.3	9.0	5.3	4.8	4.0
Land Area (Acres) of the college	NA	15.2	9.4	8.1	6.9	5.3	8.8
Built up area (Sqr mts)	NA	0.0	9874.3	6253.6	6283.5	4916.4	22190.3
Number of Boys Hostel	1.0	1.0	0.9	1.1	1.1	0.8	1.0
Number of Girls Hostel	1.0	1.0	1.4	0.9	1.0	0.8	1.0
Number of Books	70000	68630	40381	26556	24148	18145	16077
Number of Journals	NA	22.0	382.8	11.6	14.9	15.8	11.0

Number of Magazines	NA	0.0	NA	7.0	12.2	5.5	NA
Number of Computers	246.0	322.0	160.4	115.2	50.0	39.7	56.3

Source: Own Estimation based on NAAC

The main objective of this section is to find the determinants of the different grades of colleges as assessed by NAAC. We have collected the data for grades of our sample 191 colleges in West Bengal assessed during the period 2016 and 2017. Here the dependent variable is ordered into three categories namely high grade (getting A++.A+ and A grad), medium garde (getting B++ and B+ grade) and low grade (B and C grade). We see that out of the 191 colleges in our sample, the percentages of different grade order are as follows: high grade- 20.1%, medium grade- 73.4% and low grade 3 - 6.5%. The dependent variable grade is treated as an ordered variable with 3 representing high grade, 2 representing medium grade and 1 representing low grade. As the dependent variable is unobserved, we can write the model as

$Y_i^* = a + b_1X_1 + b_2X_2 + \ldots\ldots\ldots\ldots\ldots\ldots\ldots + b_nX_n + u_i$

The model assumes that there are cutoff points or thresholds (μ_1 and μ_2 in the following model) which define the relationship between observed and unobserved relationship.

$$Y_i = \begin{cases} 3 & (A++, A+, A) highgrade \ \ if \ \ Y_i^* > \mu_2 \\ 2 & mediumgrade \ (B++, B+) if \ \ \mu_1 < Y_i^* \leq \mu_2 \\ 1 & lowgrade (B, C) Y_i^* \leq \mu_1 \end{cases}$$

The ordered logit model assumes that the error terms follow logistic distribution. The parameters in ordered logit model are estimated by using maximum likelihood. Standards normal tests have been applied to test the significance of the individual coefficients. The grade order of the college depends upon various factors. The factors which can affect the grade order of the college and for which we have collected data college-wise are listed below in the Table 7.9.

Table 7.9: Variable Names with Codes

	Variable Code	**Variable name**
1	grade	Grade of the college
2	cyc	Cycle of the NAAC assessment
3	reg	Regional dummy
4	age	Age of the college
5	type	Type of the college
6	PG	Whether the college has PG
7	Fac	Number of faculty members
8	Dep	Number of departments
9	TEACH	Number of teachers in the college

10	SUPP	Number of support staff in the collge
11	STUD	Number of students in the college
12	PHD	Percentage of teachers having Ph.D
13	STR	Student Teacher Ratio

Source: Own Estimation

The ordered logit estimation of the model gives the results as in Table 7.10. The regression results reveal that the significant factors affecting the grade are number of cycle of the assessment and support staff. The results indicate that the probability of getting high grade increases with the experience in NAAC assessment and presence of support staff.

Table 7.10: Ordered Logit Regression Results

LR chi2(11) = 74.73
Prob > chi2 = 0.0000
Log likelihood = -153.25733 Pseudo R2 = 0.1960

grade	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
cyc	1.264306	.3723783	3.40	0.001	.534458	1.994154
reg	-.4850442	.3433648	-1.41	0.158	-1.158027	.1879384
age	.0067067	.0078026	0.86	0.390	-.008586	.0219994
type	-.1461535	.8291928	-0.18	0.860	-1.771342	1.479035
pg	-.1097721	.4079596	-0.27	0.788	-.9093583	.689814
fac	-.2279982	.2594546	-0.88	0.380	-.7365198	.2805235
dep	.0386141	.0461403	0.84	0.403	-.0518192	.1290474
stud	.000226	.0001418	1.59	0.111	-.000052	.000504
phd	-.0007294	.0083715	-0.09	0.931	-.0171373	.0156785
supp	.0299493	.0100098	2.99	0.003	.0103303	.0495682
str	-.0036906	.002204	-1.67	0.094	-.0080105	.0006292
phd	0	(omitted)				
/cut1	1.118074	.7240042			-.3009484	2.537096
/cut2	3.965055	.7854474			2.425607	5.504504

7.3 National Institutional Ranking Framework (NIRF)

The National Institutional Ranking Framework (NIRF) was approved by the MHRD and launched by Honourable Minister of Human Resource Development on 29th September 2015. This framework outlines a methodology to rank institutions across the country. The methodology draws

from the overall recommendations broad understanding arrived at by a Core Committee set up by MHRD, to identify the broad parameters for ranking various universities and institutions.

7.3.1 Parameters for Ranking Universities under NIRF

The parameters broadly cover "Teaching, Learning and Resources," "Research and Professional Practices," "Graduation Outcomes," "Outreach and Inclusivity," and "Perception".

Considering the fact that universities in India are essentially set-up for postgraduate education and research, it was decided to assign higher percentage (40%) weightage to "Research Productivity, Impact and IPR", 30 % weightage to **"**Teaching, Learning and Resources", 5% weightage to "Graduation Outcomes", 5% weightage to "Outreach and Inclusivity" and lastly 10% weightage to "Perception". But for college, it was decided to assign higher percentage weightage to TLR (40%) and GO (25%). Parameter-wise weightage for university and college are shown in Table 7.11.

Table 7.11: Parameters for Ranking Universities and Colleges

		College		University	
	Parameters	**Marks**	**Weight**	**Marks**	**Weight**
1	Teaching, Learning and Resources (TLR)	100	0.40	100	0.3
2	Research Productivity, Impact and IPR (RPII)	100	0.15	100	0.4
3	Graduation Outcome (GO)	100	0.25	100	0.05
4	Outreach and Inclusivity(OI)	100	0.10	100	0.15
5	Perception(PR)	100	0.10	100	0.1
Total			1		1

Source: NIRF, MHRD

Teaching, Learning and Resources (TLR) : Faculty – Student Ratio with emphasis on Permanent Faculty, Combined Metric for Faculty with PhD and Experience(FQE), Metric for Library and Laboratory Facilities, Metric for Sports Facilities and Extra-Curricular Activities(SEC).

Research Productivity, Impact and IPR (RPII): It is Combined Metric for Publications, Combined Metric for Citations (CI), Intellectual Property Right (IPR).

Graduation outcome: It consists of Combined Performance in University Examinations (UE), Combined Performance in Public Examinations (PE).

Citation: Three citation databases have been used as sources for retrieving the number of publications, citations and collaborative publications for institutions who registered themselves for ranking in one or more disciplines. These citation databases are: i) Science Citation Index (SCI), Social Science Citation Index (SSCI) and the Arts and Humanities Citation Index (AandHCI) hosted on the Web of Science platform; ii) Scopus; and iii) Indian Citation Index.

Perception: For the parameter of perception, feedbacks were taken from the stakeholders from both: carefully identified peer groups as well as from general public including students, parents and employers who wished to provide such a feedback. . Perception data has been compiled from inputs from general public and peers.

7.3.2 State-wise Status of Quality of Institutions: NIRF

Rankings are based on the information and data provided by the institutions. NIRF has done limited validation of the data. Data are available on the NIRF portal. According to NIRF,2018 ranking status, Indian Institute of Science (IISc), Bengaluru is ranked as the first amongst universities with a weighted score of 82.16. Ranks 2 to 7 are occupied by the traditional, multi-disciplinary universities led by Jawharlal Neheru University, New Delhi (67.57, Rank 2) followed by Banaras Hindu University, Varanasi (63.52, Rank 3), Anna University (62.82, Rank 4), University of Hyderabad (60.54, rank 5), Jadavpur University (59.68, rank 6), University of Delhi (58.69, rank 7).

In West Bengal 6 institutes are ranked in first 100 in University category in 2018 NIRF in India. Namely, Jadavpur University (rank 6), Calcutta University (rank 14), Visva Bharati (Rank 31), Bidhan Chandra Krishi Vishwavidyalaya (rank 75), Kalyani University (rank 86) and The University of Burdwan (rank 96).

According to NIRF, 2018 ranking status, Mirand House, Delhi is ranked as the first amongst Colleges with a weighted score of 71. Ranks 2 to 5 are led by St. Stephen's College, Delhi (70.77, Rank 2) followed by Bishpo Heber College, Tiruchirappalli (67.63, Rank 3), Hindu College, Delhi (67.46, Rank 4) and Presidency College (66.21, rank 5).

In West Bengal 5 institutes are ranked in first 100 in college category in 2018 NIRF in India , namely, Ramakrishna Mission Vidyamandir, Howrah (rank 9), St. Xavier's College, Calcutta (rank 17), Rama Krishna Mission Vivekananda Centenary College, Rahara (Rank 29), Loreto College, Calcutta (rank 31) and Ramakrishna Mission Residential College (rank 40) . In Table 7.12, we have presented state-wise number of college and university in top 100, in India.

Table 7.12: State-wise Number of Colleges and Universities in Top 100 Institutes in India: NIRF

States	College		University		
	2017	2018	2016	2017	2018
Andhra Pradesh	10	2	3	7	6
Arunachal Pradesh	0	0	0	1	0
Assam	1	0	4	4	4
Bihar	0	0	1	0	0
Chandigarh	3	2	1	0	1
Chhattisgarh	0	0	1	1	0
Delhi	11	27	12	6	6
Goa	1	0	1	1	1
Gujarat	3	2	4	2	2
Haryana	0	0	5	1	3
Himachal Pradesh	0	0	2	2	1
Jammu And Kashmir	6	0	2	0	2
Jharkhand	0	0	2	2	1
Karnataka	14	3	5	8	9
Kerala	10	17	2	5	4
Madhya Pradesh	0	0	2	0	0
Maharashtra	0	4	7	8	9
Manipur	0	0	0	0	0
Meghalaya	0	0	1	1	1
Mizoram	0	0	1	1	1
Nagaland	0	0	0	0	1
Odisha	0	0	2	2	3
Puducherry	0	0	2	2	2
Punjab	0	0	3	4	3
Rajasthan	0	0	7	4	2
Sikkim	0	0	1	0	0
Tamil Nadu	37	38	15	24	20
Telangana	0	0	3	2	4
Uttar Pradesh	0	0	7	7	7
Uttarakhand	0	0	0	0	1
West Bengal	4	5	4	5	6
Total	100	100	100	100	100

Source: NIRF, 2016, 2017, 2018

In Table 7.13, we have presented state-wise number of institutions in top 100 for each category, in India in the year 2018. Form this table we see that Tamil Nadu have 20 universities and 38 colleges in top 100 university and college. In this regard Tamil Nadu has 1st rank compare to all of the states in India. West Bengal has 6 universities and 5 colleges in top 100 universities and college respectively in India.

Table 7.13: First 100 NIRF Ranking Institutes, 2018

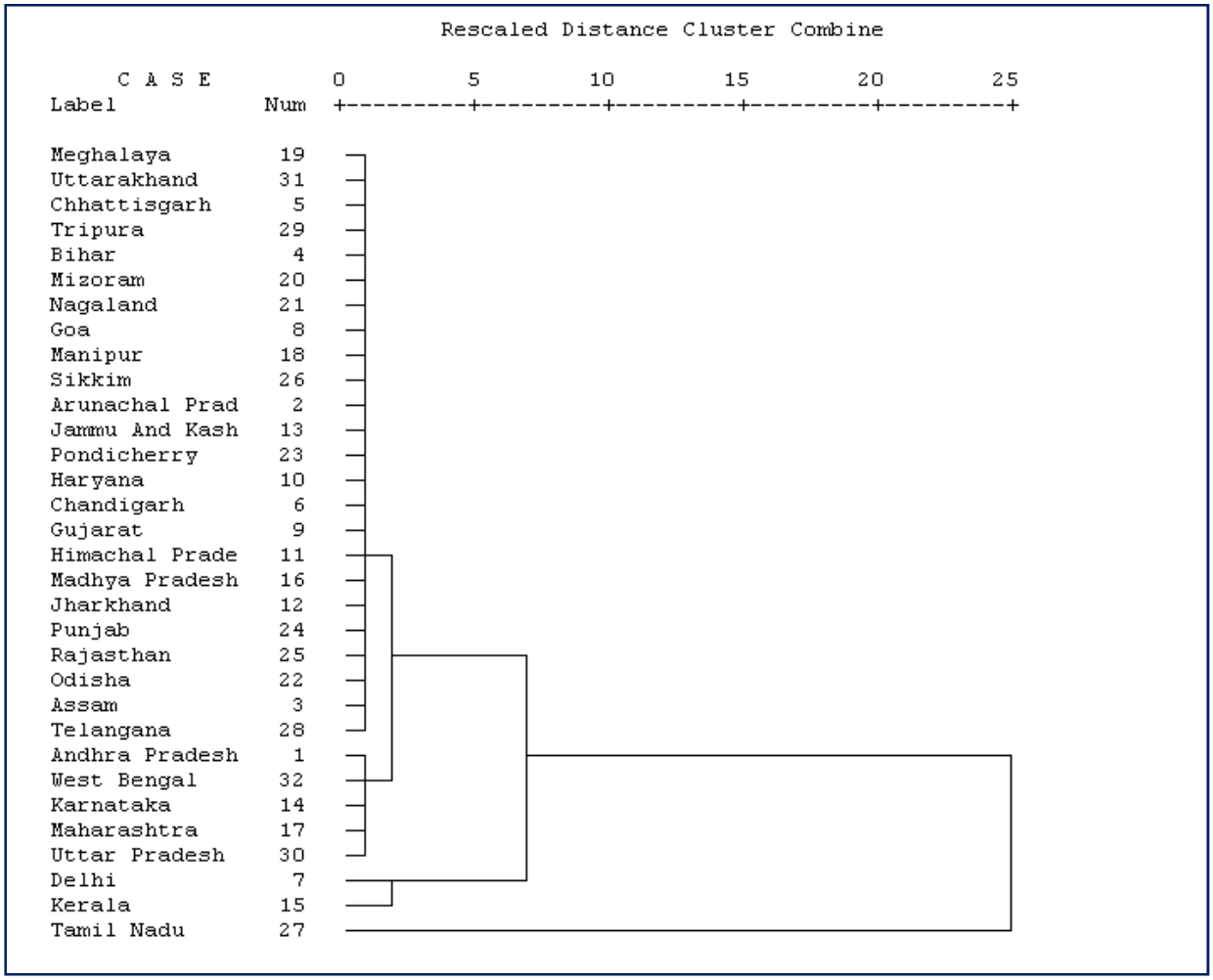
States	University	Engineering college	General College	Total Institutes	% of Total	Rank of the State
Andhra Pradesh	6	5	2	13	4.3	8
Arunachal Pradesh	0	0	0	0	0.0	30
Assam	4	2	0	6	2.0	11
Bihar	0	1	0	1	0.3	24
Chhattisgarh	0	1	0	1	0.3	24
Chandigarh	1	2	2	5	1.7	14
Delhi	6	5	27	38	12.7	2
Goa	1	0	0	1	0.3	24
Gujarat	2	2	2	6	2.0	11
Haryana	3	1	0	4	1.3	16
Himachal Pradesh	1	3	0	4	1.3	16
Jharkhand	1	2	0	3	1.0	18
Jammu And Kashmir	2	1	0	3	1.0	18
Karnataka	9	10	3	22	7.3	4
Kerala	4	3	17	24	8.0	3
Madhya Pradesh	0	3	0	3	1.0	18
Maharashtra	9	9	4	22	7.3	4
Manipur	0	0	0	0	0.0	30
Meghalaya	1	1	0	2	0.7	22
Mizoram	1	0	0	1	0.3	24
Nagaland	1	0	0	1	0.3	24
Odisha	3	4	0	7	2.3	10
Puducherry	2	1	0	3	1.0	18
Punjab	3	3	0	6	2.0	11
Rajasthan	2	3	0	5	1.7	14
Sikkim	0	0	0	0	0.0	30
Tamil Nadu	20	19	38	77	25.7	1
Telangana	4	5	0	9	3.0	9
Tripura	0	1	0	1	0.3	24
Uttar Pradesh	7	8	0	15	5.0	6
Uttarakhand	1	1	0	2	0.7	22
West Bengal	6	4	5	15	5.0	6
Total	100	100	100	300	100	

Source: Own Calculation

By using NIRF 2018 data, we calculate number of colleges and universities in top 100 for respective states in India. Using cluster analysis on the above state wise data (Table 7.13) we prepared a dendogram (Fig 7.2) by using SPSS statistical package (SPSS-16). It is being observed that 'Tamil Nadu' in one group dominates all other states. It can also be stated that 'Delhi' and 'Kerala' shows

higher levels of education quality in one cluster as compared all other states in other cluster. Here also we shows that 'Andhra Pradesh', 'West Bengal', 'Karnatak', 'Mharashtra', and 'Uttarpradesh', creates another cluster.

Fig. 7.2: Dendogram of Top 100 Higher Education Institutes as Ranked in NIRF, 2018



Source: Own Estimation, NIRF 2018

Table 7.14 presents names of the different institutes (which are in top 100 in India) and their year-wise corresponding ranks in West Bengal.

Table 7.14: Rank of Different Institute of West Bengal in India

Rank of Management Institute of West Bengal in India		2018	2017	2016
1	Indian Institute of Management Calcutta	3	3	3
2	Indian Institute of Technology Kharagpur	7	7	
3	International Management Institute Kolkata	51-75	49	12
Rank college of West Bengal in India				
1	Ramakrishna Mission Vidyamandira	9		
2	St. Xavier`s College	17	6	
3	Rama Krishna Mission Vivekananda Centenary College	29	78	
4	Loreto College	31	18	

5	Ramakrishna Mission Residential College	40		
6	Raja Narendralal Khan Women's College		98	
Architecture				
1	Indian Institute of Technology Kharagpur	1		
Law		2018		
2	The West Bengal National University of Juridicial Sciences	7		
Engineering				
1	Jadavpur University	12	9	
2	Indian Institute of Engineering Science and Technology, Shibpur	30	17	79
3	National Institute of Technology Durgapur	47	55	30
4	Indian Institute of Technology Kharagpur		3	
5	Bengal Institute Of Technology			91
Rank University of West Bengal in India				
1	Visva Bharati	31	19	11
2	Bidhan Chandra Krishi Viswavidayalaya	75		31
3	Presidency University			41
4	Kalyani University	86	66	45
5	Jadavpur University	6	5	
6	Calcutta University	14	16	
7	Vidyasagar University		87	
8	Burdwan University	96		

Source: NIRF, 2016, 2017, 2018

Table 7.15 presents state-wise percentage of participating colleges in NIRF 2018. Higher participation in NIRF assessment is observed in the States of Chandigarh, Delhi, Goa, Andhra Pradesh, Tamil Nadu.

Table 7.15: Sate-wise Percentage of Participating College in NIRF 2018

States	Number of college	Number of Participating college (NIRF 2018)	Percentage of college participate in NIRF 2018
A and N Islands*	7	0	0.0
Andhra Pradesh	2663	302	11.3
Arunachal Pradesh	31	2	6.5
Assam	541	40	7.4
Bihar	756	0	0.0
Chandigarh	25	7	28.0
Chhattisgarh	725	13	1.8
Dadra and Nagar Haveli*	8	0	0.0
Daman and Diu*	8	0	0.0
Delhi	178	37	20.8
Goa	55	13	23.6
Gujarat	2116	40	1.9
Haryana	1155	8	0.7
Himachal Pradesh	374	2	0.5

Jammu and Kashmir	316	20	6.3
Jharkhand	307	7	2.3
Karnataka	3753	51	1.4
Kerala	1334	53	4.0
Madhya Pradesh	2173	8	0.4
Maharashtra	4286	184	4.3
Manipur	87	0	0.0
Meghalaya	63	0	0.0
Mizoram	30	1	3.3
Nagaland	65	4	6.2
Odisha	1067	3	0.3
Puducherry	76	2	2.6
Punjab	1068	10	0.9
Rajasthan	3203	4	0.1
Sikkim	17	1	5.9
Tamil Nadu	2368	202	8.5
Telangana	2370	24	1.0
Tripura	52	2	3.8
Uttar Pradesh	7073	20	0.3
Uttrakhand	468	1	0.2
West Bengal	1208	26	2.2
India	40026	1087	2.7

*Source: AISHE 2016-17, NIRF 2018, *Population less than 1 lakh*

7.4 Research Publications in West Bengal

Research and publication of paper is treated as an indicator of the excellence of Higher Education Institutes. Usual parameters of evaluating the research output of institutions are papers published in reputed journals and citations. International indices do not always take into consideration citations in Indian journals. The CII report (CII 2016) is based on 'Indian Citation Index (ICI)' database which currently indexes 950+ journals published from India covering all subject disciplines. ICI does not index journals published from foreign countries even if they publish articles of authors of Indian origin. The data depth of ICI database is 2004 onwards. In Table 7.16, we have presented first 20 states by ranks. In terms of total number of publications and citations in ICI indexed journals, the rank of West Bengal is 6. Though it is not so good for citations per paper.

Table 7.16: State-wise Number of Publications and Citations in Journals Indexed by ICI

Sl.No.	States	No. of Article	Rank Articles	Citations	Rank Citations	Citations /Paper	Rank Citations /Paper
1	Tamil Nadu	51195	1	27611	2	0.539	22
2	Maharashtra	49223	2	27777	1	0.564	20
3	Uttar Pradesh	40593	3	23796	4	0.586	17

4	Karnataka	40140	4	23998	3	0.598	14
5	Delhi	33220	5	23005	5	0.693	5
6	West Bengal	22558	6	10641	6	0.472	31
7	Telangana	18942	7	9984	8	0.527	24
8	Gujarat	16543	8	10271	7	0.621	9
9	Andhra	16034	9	7612	11	0.475	30
10	Rajasthan	15954	10	9301	9	0.583	19
11	Haryana	14457	11	7426	12	0.514	26
12	Punjab	14399	12	7349	13	0.51	27
13	Madhya Pradesh	13808	13	8324	10	0.603	11
14	Kerala	12531	14	6118	15	0.488	28
15	Uttarakhand	11941	15	7126	14	0.597	15
16	Orissa	7604	16	4559	16	0.6	12
17	Jammu	6937	17	3252	20	0.469	32
18	Himachal	6232	18	3759	18	0.603	10
19	Assam	6103	19	3615	19	0.592	16
20	Chandigarh	5804	20	3802	17	0.655	8

Source: CII (2016)

In Table 7.17, we have presented top 30 institutes by the number of articles published in the Journals indexed in ICI. The top performer is Bidhan Chandra Krishi Viswavidyalaya (BCKV) followed by Jadavpur University (JU), University of Calcutta and Indian Institute of Technology Kharagpur.

Table 7.17: Number of Articles Published in the Journals Indexed in ICI by Various Institutions in West Bengal

Sl. No	Institutions	No. of article
1	Bidhan Chandra Krishi Viswavidyalaya (BCKV)	2498
2	Jadavpur University (JU)	2002
3	University of Calcutta (UC)	1878
4	Indian Institute of Technology Kharagpur (IIT Kharagpur)	1547
5	Institute of Post Graduate Medical Education and Research (IPGMER)	1207
6	West Bengal University of Animal and Fishery Sciences (WBUAFS)	1123
7	University of Burdwan (UB)	970
8	Nilratan Sarkar Medical College and Hospital (NSMCH)	861
9	University of Kalyani (UK)	824
10	Medical College (MC)	749
11	Calcutta National Medical College and Hospital (CNMCH)	734
12	Uttar Banga Krishi Viswavidyalaya (UBKV)	697
13	R G Kar Medical College and Hospital (RGKMCH)	620
14	Visva Bharati University (VBU)	594
15	University of North Bengal (UNB)	517
16	Vidyasagar University (VU)	451
17	Indian Statistical Institute (ISI)	436
18	North Bengal Medical College (NBMC)	405
19	Zoological Survey of India (ZSI)	379

20	Burdwan Medical College and Hospital (BMCH)	376
21	Presidency University (PU)	346
22	Seth Sukhlal Karnani Memorial Hospital (SSKMH)	323
23	Bankura Sammilani Medical College (BSMC)	311
24	Botanical Survey of India (BSI)	305
25	Midnapore Medical College and Hospital (MMCH)	302
26	Geological Survey of India (GSI)	295
27	National Institute of Technology Durgapur (NIT Durgapur)	278
28	Indian Association for the Cultivation of Science (IACS)	274
29	Central Research Institute for Jute and Allied Fibres (CRIJAF)	248
30	Bengal Engineering and Science University (BESU)	242

Source: Indian citation index, 2017

7.5 Higher Education and Employment in West Bengal

National Sample Survey (NSS) data classify the workforce by the three types of employment: self-employed, casual labour or regular salaried work. It is not surprising that hardly any illiterate has regular salaried jobs. Most illiterate are either casual workers or in self-employment usually engaged in low productivity work. It has long been known that the rate of open unemployment of university graduates is greater than that of those with lower levels of education. This in itself is not surprising since those with lower levels of education cannot afford to be openly unemployed. The major reasons for the quality problems that led to issue of employability (Mehrotra 2017) are: (i) Teacher and instructor shortage: one of the most serious problems that arose with rapid expansion of the higher education system – in fact its 'massification' – is the shortage of the teacher. (ii) Private sector growth with little regulation affected quality: the private higher education enrolment increased accounting for 59 percent of the total. Typically of this situation is the growth of engineering colleges across country, but especially in south India.(iii) Accreditation system has a very narrow coverage: institutional accreditation through the National Assessment and Accreditation Council (NAAC) has been growing very slowly partly because accreditation is voluntary for higher education institutions. (iv) Skewed funding of public institution: first, household spending and private investment have grown more rapidly than government spending on higher education in recent years. Second, 'government spending, and particular state government spending , has fallen far short of the funding requirement in the face of the dramatic expansion of the system and rising expectation of the people in terms of quality, access and equity'. Table 7.18 reveals that 98 graduates are unemployed per 1000 graduates where it is 100 for India. However the unemployment at PG level for West Bengal is 139 where it is 139 for India. The major reason for unemployment has been found as non-availability of jobs matching with education/skill/experience.

Table 7.18: Per 1000 Distribution of Unemployed Person Having Graduate Level Qualification Aged 15 Years and above by Reasons of Unemployment (Rural + Urban)

Name	Per 1000 distribution of unemployed person having graduate level qualification	Per 1000 distribution of unemployed persons having graduate level qualification by reasons of unemployment			
		non-availability of jobs matching with education/skill/experience	non-availability of adequate remuneration	family/personal problems	Others
Graduate					
West Bengal	98	590	76	20	314
India	100	583	228	53	135
Post Graduate					
West Bengal	139	492	76	1	431
India	98	624	215	38	124

Source: Govt. Of India, Ministry of labour and employment, 2016

It should be pointed out that unless there is sustained high growth of SDP, the problem of educated unemployment cannot be solved. The problem of unemployment cannot be solved only by improving education system. It can only endeavour that the supply of different types of skill are in line with the demand for them (Government of West Bengal, 1984). In Table 7.19, we have presented unemployment rates in 2011-12 under different criteria in West Bengal and India.

Table 7.19: Unemployment Rate among the Youth (15-29 years) according to Different Status in 2011-12

Status	Region	West Bengal	India
Usual Principal Status (UPS)	Rural	103	65
	Urban	162	102
Current Weekly Status (CWS)	Rural	102	73
	Urban	146	107
Current Daily Status (CDS)	Rural	141	101
	Urban	170	120

Source: Government of West Bengal (2015)

7.6 Quality of Education in Colleges: Primary Survey Results

7.6.1 Quality of Students Admitted in Colleges

Here we present the quality of students admitted in college by marks obtained at 10+2 level. Gender-wise and region-wise distribution of student about their obtained marks of higher secondary education of surveyed students is shown in Table 7.20. Overall, the percentage of students who secured marks in higher secondary level between 60% to 79.9% is 58%.

Table 7.20: Gender-wise Distribution Marks of Higher Secondary Education

		Range of marks				
		Below 45%	45% to 59.9%	60% to 79.9%	Above 80%	Grand Total
Gender	Percentage of female	2.5	18.5	61.4	17.7	100.0
	Percentage of male	4.5	33.6	52.2	9.8	100.0
Region	Percentage of Rural students	6.3	35.4	54.7	3.6	100.0
	Percentage of urban students	0.5	13.5	61.4	24.6	100.0
	Percentage of students	3.1	23.4	58.4	15.1	100.0

Source: Primary Survey

Course-wise distribution marks of higher secondary education shown in Table 7.21. Better quality students are found to study in Science.

Table 7.21: Course-wise Distribution Marks of Higher Secondary Education

	Range of marks				
Course	Below 45%	45% to 59.9%	60% to 79.9%	Above 80%	Grand Total
B.A	4.6	29.7	55.9	9.9	100.0
B.com	0.0	10.0	70.0	20.0	100.0
B.Sc.	0.3	9.7	63.8	26.2	100.0
BCA	3.1	50.0	46.9	0.0	100.0
Grand Total	3.1	23.4	58.4	15.1	100.0

Source: Primary Survey

Subject-wise average higher secondary marks and graduation marks and correlation between those is shown in Table 7.22. The table reveals that there is moderate correlation between these two variables. Average HS marks reveals that the best students are taking admission in the subjects like Physics, Chemistry and Mathematics.

Table 7.22: Subject-wise Average Higher Secondary and Graduation Marks of Surveyed Student

Subjects	Correlation between HS and Graduation Marks	Average HS Marks	Average Graduation Marks
Arts Subject			
History	0.6098	54.5	47.1
Sanskrit	0.5709	58.1	48.0
Nutrition	0.5630	69.6	62.8
Bengali	0.5066	64.2	52.8
Sociology	0.4802	55.5	51.4
Philosophy	0.4743	59.3	56.0
Aquaculture	0.4523	59.5	59.4
Geography	0.4318	70.1	45.3
Education	0.4031	56.9	49.4
English	0.3463	72.5	49.7

Santali	0.1513	49.3	52.2
Science Subject			
Anthropology	0.9327	51.3	54.6
Computer Application	0.3710	60.0	62.4
Botany	0.2230	65.6	49.1
Physiology	0.2170	64.6	50.7
Chemistry	0.1956	78.0	61.9
Mathematics	0.1508	74.5	54.2
Physics	0.1267	75.3	59.4
All	0.2901	65.5	53.0

Source: Primary Survey

7.6.2 Attendance of the Students Surveyed in Classes

We had taken responses from the students about there attendance in colleges. Distribution of attendance rate of students surveyed in colleges is shown in Table 7.23. The table reveals that female attendance rate is higher than male attendance rate. However, most of the students have responded their attendance rate above 75%.

Table 7.23: Distribution of Attendance Rate of Students in Graduation

Students	Range of attendance rate			
	Less than 60%	60% to less 75%	75% and above	Grand Total
Gender				
% Female students	7.3	15.1	77.5	100.0
% Male students	11.3	27.6	61.1	100.0
Course				
% of B.A students	10.0	20.5	69.5	100.0
% of B.Com students	20.0	0.0	80.0	100.0
% of B.Sc. students	5.4	16.7	77.9	100.0
% of BCA students	12.5	21.9	65.6	100.0
Percentage of students	**8.6**	**19.2**	**72.2**	**100.0**

Source: Primary Survey

Average of class hours attended by students is shown in Table 7.24. The table reveals that the average class hours of rural students 3.64 and that for urban students is 4.74.

Table 7.24: Average of Class Hours Attended by Students

Students	Rural	Urban	Grand Total
Sex			
Female	3.68	4.92	4.48
Male	3.60	4.08	3.77
Course			
B.A	3.57	4.12	3.80

B.com	3.05		3.05
B.Sc	4.17	5.39	5.15
BCA	3.62	4.56	4.32
Total average	**3.64**	**4.74**	**4.25**

Source: Primary Survey

Average number of days attended by a student in college for different disciplines is given in Table 7.25.

Table 7.25: Average Attendance in College

	Average attendance days in a week in college
Female	**5.01**
B.A	4.92
B.Sc.	5.20
BCA	4.50
Male	**4.68**
B.A	4.62
B.com	4.70
B.Sc.	4.81
BCA	4.62
Grand Total	**4.90**

Source: Primary Survey

7.6.3 Library Visit of Students

Average number of days going to library, average number of books taken from library by the students is shown in Table 7.26. The table reveals that per month number of visit by students is 5.36 days and average of no of books taken from library per month is 3.27.

Table 7.26: Number of Days Going to Library, Book Taken from Library by the Students

	Average of Number of days going to library per month	**Average of No of books taken from library per month**
Female	**4.95**	**3.12**
B.A	5.34	3.44
B.Sc.	4.22	2.49
BCA	3.00	3.00
Male	**6.20**	**3.58**
B.A	6.50	3.60
B.com	5.20	3.40
B.Sc.	5.89	3.71
BCA	4.42	2.46
Grand Total	**5.36**	**3.27**

Source: Primary Survey

7.6.4 Perception of Students about College Education

7.6.4.1 Indicators of Perception

We have taken perception about college education by students on 1-5 scale (1=very bad, 2= bad, 3= Moderate, 4= Good, 5= Very good). Grade-wise percentage of surveyed students for different perception indicators is shown in table 7.27. The table reveals that about 63% students have responded good and about 15% students have responded bad overall. However, the perception differs for various indicators. The overall percentage for different grades for all the indicators are as follows: Very good: 26.7, Good: 36.6, Moderate: 20.5, Bad:8.1 Very Bad: 7.7.

Table 7.27: Grade-wise Percentage of Surveyed Students for Different Perception Indicators

		Very Good	Good	Moderate	Bad	Very Bad	NA	Total
1	Completion syllabus in academic year	25.5	52.3	18.5	2.8	0.9	0.0	100
2	Teaching technique	32.1	54.3	11.7	1.5	0.4	0.0	100
3	The Quality of lectures provided	30.9	50.0	16.8	1.9	0.5	0.0	100
4	The extra coaching, revision of department	7.90	24.9	30.1	22.1	15.0	0.0	100
5	Regularity and Evaluation of internal assessment	40.9	35.4	13.8	6.0	3.8	0.0	100
6	Practical classes in the laboratory	24.0	17.2	39.5	6.9	6.5	5.9	100
7	Distribution of syllabus load in different years	9.10	33.4	29.6	20.8	7.1	0.0	100
8	The Communication skills of teachers	33.3	51.7	11.7	2.4	0.9	0.0	100
9	Teachers attitude in the class room	45.4	46.5	7.1	0.8	0.2	0.0	100
10	The Knowledge of the teacher	57.8	34.6	6.5	0.9	0.1	0.0	100
11	Teachers come in class with preparation	41.7	44.0	11.9	2.0	0.4	0.0	100
12	Regularity and punctuality of the teacher	37.9	39.8	17.0	4.1	1.1	0.0	100
13	Accessibility of teacher outside in the class	37.7	42.7	14.8	3.7	0.9	0.0	100
14	Examples used by the teacher are	45.1	41.2	10.8	2.2	0.6	0.0	100
15	The opportunity of asking questions to teachers	49.0	39.0	9.4	2.0	0.7	0.0	100
16	The focus of a teacher on the topic	39.5	47.6	10.5	1.6	0.7	0.0	100
17	Student teacher relation	53.1	37.5	7.7	1.0	0.6	0.0	100
18	Student principal relation	35.0	39.8	17.9	4.4	2.8	0.0	100
19	Availability of Books and Journals in library	16.9	36.8	26.4	13.0	6.9	0.0	100
20	Quality of book and Journals	17.7	43.6	28.0	8.1	2.5	0.0	100
21	The availability of Laboratory equipment	13.7	25.2	40.6	8.5	5.9	6.0	100
22	Availability of sports equipments	14.1	33.8	26.6	13.1	12.5	0.0	100
23	Hostel availability of long distance student	19.8	26.7	22.5	11.3	19.7	0.0	100
24	Role of Student union in academic development	10.7	25.6	38.1	10.9	12.8	1.9	100
25	The discipline in College	37.6	39.7	14.1	5.3	3.3	0.0	100
26	Overall academic environment of the college	32.9	40.0	19.1	5.3	2.6	0.0	100
27	Distribution of free studentship	8.50	24.0	28.0	16.5	23.0	0.0	100
28	Toilet facility	8.70	23.1	23.3	17.0	27.9	0.0	100
29	Canteen facility	6.80	22.7	28.9	16.5	25.0	0.0	100

30	Common room facility	6.60	23.0	23.6	17.9	28.9	0.0	100
31	Sufficiency of permanent teachers	12.8	29.4	21.2	15.2	21.3	0.0	100
32	Sports activities in college	15.2	38.6	26.1	9.5	10.6	0.0	100
33	Quality of office services	12.1	43.1	29.5	10.6	4.7	0.0	100
34	Drinking water facility	27.5	36.4	15.6	10.7	9.8	0.0	100
35	Grand Total	26.7	36.6	20.5	8.1	7.7	0.4	100

Source: Primary Survey

7.6.4.2 Perception of Students on Quality: Six Sigma Analysis

The major objective of this section is to assess the quality of higher education in the state of West Bengal in India. The specific objectives are as follows: (i) Assessing quality of higher education through 34 indicators of teaching and learning using student feedback. (ii) It has also been attempted whether there is any difference in the quality across regions i.e. rural and urban, and across courses (like, BA, B.Sc. and different professional courses) taken by student. (iii) An attempt has also been made to identify the major problem areas to facilitate policy formulation.

Methods of Six Sigma

This study was conducted at different colleges in the four districts namely Paschim Medinipur, Purba Medinipur, Purulia and Kolkata in the state of West Bengal in India. The students from different colleges and different courses are participated in the survey and gave their objective responses. A total of 2008 students of different colleges gave their perceptions through responses in the designed questionnaires. Survey details by region and course of the students are presented in Table 7.28.

Table-7.28: Percentage of Respondents Selected for Survey from Different Region and Courses

	Female			Male			Grand Total
	general Course	Professional Course	Total	general Course	Professional Course	Total	
Rural	22.5%	0.0%	22.5%	19.9%	0.0%	19.9%	42.4%
Urban	41.4%	2.6%	44.1%	11.3%	2.2%	13.5%	57.6%
Grand Total	63.9%	2.6%	66.6%	31.2%	2.2%	33.4%	100%

Source: Primary survey, own calculation

Table 7.29: Region-wise Number of Student Surveyed

	Rural					Urban					Grand Total
	GEN	OBC	SC	ST	Total	GEN	OBC	SC	ST	Total	
Female	201	130	81	40	452	564	145	127	49	885	1337
Male	145	124	87	44	400	157	71	34	9	271	671
Total	346	254	168	84	852	721	216	161	58	1156	2008

Source: Primary survey

Table 7.30: Course-wise Number of Student Surveyed

Course		Female	Male	Grand Total
	B.A	826	382	1208
	B.com	-	10	10
	B.Sc.	452	209	661
	BCA	6	26	32
General	Total	1284	627	1911
Professional		53	44	97
Grand Total		1337	671	2008

Source: Primary survey

To facilitate this study, questionnaire was prepared by covering three important elements of the academic status with specific focus on education at the bachelor degree level. The three elements consist of (i) Teaching and Evaluation Method adopted in the college (ii) Effectiveness of the Teaching Faculty, which indicates the intellectual capital of the college (iii) Availability of Resources.

The questionnaires consist 34 items with five response options (1-5 scale) with a statement in ascending order: 1= Very Bad; 2= Bad; 3= Moderate; 4= Good; 5=Very Good. The Questionnaire contains three sections comprising 1.Teaching and Evaluation Method, 2.Effectiveness of the Teaching Faculty and 3.Availability of Resources as given in Table 7.31.

Table 7.31: Different Indicators of Teaching and Learning Facilities in the College

Category	Variable	Variable name
1. Teaching and Evaluation Method	X_1	Completion of syllabus in academic year
	X_2	The extra coaching and revision
	X_3	Regularity and evaluation of internal assessment
	X_4	Practical classes in the laboratory
	X_5	Distribution of syllabus load in different years
2. Effectiveness of the Teaching Faculty	X_6	Teaching technique
	X_7	The quality of lectures provided
	X_8	The communication skills of teachers
	X_9	Teachers' attitude in the class room
	X_{10}	The knowledge of the teachers
	X_{11}	Teachers come in class with preparation
	X_{12}	Regularity and punctuality of the teachers
	X_{13}	Accessibility of teachers outside in the class
	X_{14}	Examples used by the teachers are appropriate
	X_{15}	The opportunity of asking questions to teachers
	X_{16}	The focus of a teachers on the topic
	X_{17}	Student-teacher relation
3. Availability of Resources	X_{18}	Student-principal relation
	X_{19}	Availability of books and Journals in library
	X_{20}	Quality of books and Journals in library
	X_{21}	The availability of laboratory equipments

	X_{22}	Availability of sports equipment
	X_{23}	Hostel availability of long distance student
	X_{24}	Role of Student Union in academic development
	X_{25}	The discipline in College
	X_{26}	Overall academic environment of the colleges
	X_{27}	Distribution of free studentship
	X_{28}	Toilet facility
	X_{29}	Canteen facility
	X_{30}	Common room facility
	X_{31}	Sufficiency of permanent teachers
	X_{32}	Sports activities in college
	X_{33}	Quality of office services
	X_{34}	Drinking water facility

Source: Own Estimation

The analysis was carried out to study the perception of the students about all the items included in the Questionnaire. From the response of the students, using Six Sigma methodology, the opportunities and defects were calculated for each item in the questionnaire. A "defect" is defined as anything that could lead to dissatisfaction among the students about their academic programme. Six Sigma is most effective methodology available for quality judgement and improving the performance of any organization minimizing the defects in its products or services. Every error committed, has a cost associated to it in form of losing efficiency.

Understanding the Six Sigma Scale

The six sigma scale is universal measure of the performance of any business or organisation. Higher sigma score indicates batter performance or more precise result. In other words, if the output is defective sixty-nine percent of the time, it implies that performance is one sigma compliant. On the other hand if it is defective thirty-one percent of the time, it means that the performance is demonstrating two sigma compliance.

Table 7.32: Six Sigma Scale

Sigma level	Percent Defective	Defects per Million opportunity
1	69%	691462
2	31%	308538
3	6.70%	66807
4	0.62%	6210
5	0.02%	233
6	0.00%	3.4

Source: Own Estimation

As mentioned in the Table 7.32, Six Sigma implies almost perfect output resulting in only 3.4 defects per million opportunities (DPMO). The term 'DPMO' can be explained as the non-conformities present in the output that falls beyond the satisfactory customer (here students) limits. The number of defects present per million opportunities is used to determine as to which Sigma scale a particular process corresponds to. DPMO is represented by the following expression.

DPMO = (Total number of defects found in sample/sample size number of opportunities per unit in the sample) ×1000000

Results of Six Sigma Analysis

The non-conformance level captured through the responses of the students about the various important elements of the teaching and learning process including the academic facilities prevailing in the college was analysed through Six Sigma analytical tool. The choices of the questions will range from score 1 to 5 for every item in questionnaire. Score 4 and 5 were considered as conformance and score 1, 2 and 3 were considered as non-conformance. The description of quality rating adopted to classify the student's feedback about the teaching methodology adopted and the facilities prevailing in the selected college in rural and urban areas and different courses is depicted in Table 7.33. The quality of each teaching element studied was rated on six point scale ranging from 1 to 6. The higher score indicates better quality. The six point rating scale was prepared based on the Six Sigma Model.

Table 7.33: Quality Rating for the Student Feedback about the Status of Education in the College

Quality Rating Scale	Quality Rating Range	Description of the quality rating
6	Above 5 and up to 6	"Healthy and Excellent world class teaching and learning facilities" provided to the students
5	Above 4 and up to 5	"Benchmarked and stimulating teaching and learning facilities" offered to the students
4	Above 3 and up to 4	Teaching and learning facilities provided to the students are "adequate" with medium necessary provisions needs to be carried out to accomplish the objective of the programme in an efficient way and also gain complete satisfaction from the students.
3	Above 2 and up to 3	Teaching and learning facilities provided in the programme are

		"adaptable" and are just sufficient to accomplish the objective of the programme without hindering performance.
2	Above 1 and up to 2	"Highly compromised teaching and learning facilities" that have the possibility to hinder the academic performance of the students.
1	Less than or equal to 1	Totally inappropriate for the students to learn and gain knowledge through the existing Academic Atmosphere.

Source: Adapted from Kuwaiti and Subbarayaul, 2015

Table 7.34 depicts the quality rating expressed in sigma level for the student feedback on the different indicator by different regions (Rural and urban).

In rural region, sigma level shows that the variables $X_2, X_3, X_8, X_{10}, X_{11}, X_{13}, X_{14}, X_{15}, X_{16}, X_{17}$ and X_{18} are above 2 but less than equal to 3, i.e. were rated by the students as "adaptable" and are just sufficient to accomplish the objective of the programme without hindering performance of the students. The sigma level of indicators $X_1, X_5, X_7, X_{12}, X_{19}, X_{20}, X_{25}, X_{26}, X_{31}, X_{32}, X_{33}$ and X_{34} are above 1 but less than equal to 2, i.e. were rated by the student as "Highly compromised" and it have the possibility to hinder the academic performance of the students. The sigma level of indicators $X_4, X_6, X_{19}, X_{21}, X_{22}, X_{23}, X_{24}, X_{27}, X_{28}, X_{29}$, and X_{30} are less than equal to 1, i.e. were rated by the student as "totally inappropriate for the students to learn and gain knowledge". Only variable X_9 has the sigma level above 3 but less than equal to 4, i.e. were rated by the students as "adequate" with medium necessary provisions needs to be carried out to accomplish the objective of the programme in an efficient way and also gain complete satisfaction from the students.

In urban region, sigma level shows that the variables $X_1, X_2, X_3, X_5, X_8, X_9, X_{10}, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}, X_{16}, X_{17}, X_{25}, X_{26}$, and X_{34} are above 2 but less than equal to 3, i.e. were rated by the students as "adaptable" and are just sufficient to accomplish the objective of the programme without hindering performance of the students. The sigma level of indicators $X_4, X_6, X_7, X_{18}, X_{19}, X_{20}, X_{21}, X_{22}, X_{23}, X_{24}, X_{27}, X_{28}, X_{29}, X_{30}, X_{31}, X_{32}$, and X_{33} are above 1 but less than equal to 2, i.e. were rated by the student as "Highly compromised" and it have the possibility to hinder the academic performance of the students.

Table 7.34: Item and Region-wise Sigma Level (1.5σ shift)

Variables Name	Variables	Region		All
		Rural	Urban	
Completion of syllabus in academic year	X_1	2.00	2.51	2.27
The extra coaching and revision	X_2	2.53	2.65	2.60
Regularity and evaluation of internal assessment	X_3	2.17	2.55	2.37
Practical classes in the laboratory	X_4	0.75	1.25	1.05
Distribution of syllabus load in different years	X_5	1.84	2.58	2.22
Teaching technique	X_6	0.76	1.62	1.28
The quality of lectures provided	X_7	1.46	1.20	1.31
The communication skills of teachers	X_8	2.49	2.57	2.54
Teachers' attitude in the class room	X_9	3.02	2.81	2.89
The knowledge of the teachers	X_{10}	2.89	2.97	2.93
Teachers come in class with preparation	X_{11}	2.44	2.67	2.57
Regularity and punctuality of the teachers	X_{12}	1.99	2.51	2.26
Accessibility of teachers outside in the class	X_{13}	2.20	2.49	2.36
Examples used by the teachers are appropriate	X_{14}	2.49	2.68	2.59
The opportunity of asking questions to teachers	X_{15}	2.56	2.76	2.67
The focus of a teachers on the topic	X_{16}	2.45	2.79	2.63
Student-teacher relation	X_{17}	2.83	2.81	2.82
Student-principal relation	X_{18}	2.43	2.00	2.17
Availability of books and Journals in library	X_{19}	1.19	1.90	1.59
Quality of books and Journals in library	X_{20}	1.59	1.94	1.79
The availability of laboratory equipments	X_{21}	0.75	1.53	1.22
Availability of sports equipment	X_{22}	0.92	1.82	1.45
Hostel availability of long distance student	X_{23}	0.87	1.79	1.41
Role of Student Union in academic development	X_{24}	0.93	1.30	1.15
The discipline in College	x_{25}	1.91	2.57	2.25
Overall academic environment of the colleges	X_{26}	1.69	2.51	2.11
Distribution of free studentship	X_{27}	0.63	1.30	1.05
Toilet facility	X_{28}	0.79	1.18	1.03
Canteen facility	X_{29}	0.61	1.18	0.96
Common room facility	X_{30}	0.76	1.10	0.96
Sufficiency of permanent teachers	X_{31}	1.08	1.46	1.30
Sports activities in college	X_{32}	1.28	1.83	1.60
Quality of office services	X_{33}	1.76	1.53	1.63
Drinking water facility	X_{34}	1.54	2.11	1.86

Source: Own Estimation

Table 7.35 depicts the quality rating expressed in sigma level for the student feedback on the different courses in West Bengal.

For BA course, the sigma level shows that $X_{9,}$ X_{10} andX_{17} are above 3 but less than equal to 4, i.e. were rated by the students as "adequate" with medium necessary provisions needs to be carried out to accomplish the objective of the programme in an efficient way and also gain complete satisfaction

from the students. The sigma level shows that X_1, X_2, X_3, X_5, X_8, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}, X_{16}, X_{18}, X_{25}, and X_{26} are above 2 but less than equal to 3, i.e. were rated by the students as "adaptable" and are just sufficient to accomplish the objective of the programme without hindering performance of the students. The sigma level of indicators X_7, X_{19}, X_{20}, X_{22}, X_{23}, X_{24}, X_{27}, X_{31}, X_{32}, X_{33} and X_{34} are above 1 but less than equal to 2, i.e. were rated by the student as "Highly compromised" and it have the possibility to hinder the academic performance of the students. The sigma level of indicators X_4, X_6, X_{21}, X_{28}, X_{29} and X_{30} are less than equal to 1, i.e. were rated by the student as "totally inappropriate for the students to learn and gain knowledge".

For B.Sc. course, the sigma level shows that X_1, X_2, X_3, X_5, X_6, X_8, X_9, X_{10}, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}, X_{16}, X_{17}, X_{21}, X_{25}, X_{26}, and X_{34} are above 2 but less than equal to 3, i.e. were rated by the students as "adaptable" and are just sufficient to accomplish the objective of the programme without hindering performance of the students. The sigma level of indicators X_4, X_7, X_{18}, X_{19}, X_{20}, X_{22}, X_{23}, X_{24}, X_{27}, X_{31}, X_{32} and X_{33} are above 1 but less than equal to 2, i.e. were rated by the student as "Highly compromised" and it have the possibility to hinder the academic performance of the students. The sigma level of indicators X_{28}, X_{29} and X_{30} are less than equal to 1, i.e. were rated by the student as "totally inappropriate for the students to learn and gain knowledge".

For professional course, the sigma level shows that X_1, X_2, X_3, X_5, X_9, X_{10}, X_{11}, X_{12}, X_{14}, X_{15}, X_{16}, X_{17}, X_{18}, X_{25}, and X_{34} are above 2 but less than equal to 3, i.e. were rated by the students as "adaptable" and are just sufficient to accomplish the objective of the programme without hindering performance of the students. The sigma level of indicators X_4, X_7, X_8, X_{13}, X_{19}, X_{20}, X_{22}, X_{26}, X_{28}, X_{29}, X_{31}, X_{32}, and X_{33} are above 1 but less than equal to 2, i.e. were rated by the student as "Highly compromised" and it have the possibility to hinder the academic performance of the students. The sigma level of indicators X_6, X_{21}, X_{23}, X_{24}, X_{27} and X_{30} are less than equal to 1, i.e. were rated by the student as "totally inappropriate for the students to learn and gain knowledge".

Table 7.35: Item and Course-wise Sigma Level (1.5σ shift)

Variables Name	Variables	Courses			All
		B.A.	B.Sc.	Professional	
Completion of syllabus in academic year	X_1	2.28	2.26	2.28	2.27
The extra coaching and revision	X_2	2.81	2.35	2.28	2.60
Regularity and evaluation of internal assessment	X_3	2.47	2.29	2.09	2.37
Practical classes in the laboratory	X_4	1.00	1.08	1.20	1.05
Distribution of syllabus load in different years	X_5	2.12	2.41	2.43	2.22
Teaching technique	X_6	0.47	2.72	0.91	1.28
The quality of lectures provided	X_7	1.38	1.16	1.12	1.31
The communication skills of teachers	X_8	2.72	2.35	2.00	2.54

Teachers' attitude in the class room	X_9	3.18	2.67	2.15	2.89
The knowledge of the teachers	X_{10}	3.21	2.73	2.36	2.93
Teachers come in class with preparation	X_{11}	2.61	2.58	2.18	2.57
Regularity and punctuality of the teachers	X_{12}	2.25	2.28	2.43	2.26
Accessibility of teachers outside in the class	X_{13}	2.45	2.29	2.00	2.36
Examples used by the teachers are appropriate	X_{14}	2.79	2.38	2.47	2.59
The opportunity of asking questions to teachers	X_{15}	2.83	2.53	2.25	2.67
The focus of a teachers on the topic	X_{16}	2.64	2.69	2.28	2.63
Student-teacher relation	X_{17}	3.03	2.63	2.25	2.82
Student-principal relation	X_{18}	2.37	1.83	2.25	2.17
Availability of books and Journals in library	X_{19}	1.51	1.77	1.54	1.59
Quality of books and Journals in library	X_{20}	1.73	1.92	1.83	1.79
The availability of laboratory equipments	X_{21}	0.65	2.17	0.82	1.22
Availability of sports equipment	X_{22}	1.41	1.57	1.09	1.45
Hostel availability of long distance student	X_{23}	1.31	1.69	0.97	1.41
Role of Student Union in academic development	X_{24}	1.22	1.08	0.48	1.15
The discipline in College	x_{25}	2.26	2.26	2.22	2.25
Overall academic environment of the colleges	X_{26}	2.11	2.17	1.94	2.11
Distribution of free studentship	X_{27}	1.03	1.13	0.61	1.05
Toilet facility	X_{28}	1.00	1.00	1.38	1.03
Canteen facility	X_{29}	0.89	1.02	1.25	0.96
Common room facility	X_{30}	0.96	1.00	0.48	0.96
Sufficiency of permanent teachers	X_{31}	1.41	1.07	1.56	1.30
Sports activities in college	X_{32}	1.59	1.64	1.49	1.60
Quality of office services	X_{33}	1.69	1.48	2.00	1.63
Drinking water facility	X_{34}	1.67	2.18	2.06	1.86

Source: Own Estimation

Discussion on Six Sigma Results

The analysis of the feedback of students by the six sigma tool indicates that the overall score of the different colleges in the rural areas score was 1.65 i.e. were rated by students as "Highly compromised teaching and learning facilities" that have the possibility to hinder the academic performance of the students. Overall status of the different colleges in urban areas as indicated by the sigma score of 2 in Table 7.36 "Highly compromised teaching and learning facilities" that have the possibility to hinder the academic performance of the students, but marginally better than rural region.

Course-wise analysis of the feedback of students by the six sigma tool indicates that the overall score of the B.A., B.Sc. and professional course are 1.82, 1.90 and 1.71 respectively i.e. were rated by students as "Highly compromised teaching and learning facilities" that have the possibility to

hinder the academic performance of the students. The overall status of the different courses as indicated by the sigma score in Table 7.37.

The study is quality rating of facilities adopted at the higher education institutions in West Bengal, India. Through this rating scale, the academicians can monitor quality improvements in the educational process and also observe what teaching and learning element need to be improved to attain six sigma level of quality (i.e. 3.4 DPMO).

For improving the quality of rural and urban colleges institutional authority more concentrate on some items as presented in Table 7.38.

Table 7.36: Quality Rating for the Students' Feedback about the Bachelor Programme Offered by the Colleges in Different Region in West Bengal (Different Categories)

Variables	Groups	Region		All
		Rural	Urban	
(X_1-X_5)	Teaching and Evaluation Method	1.83	2.23	2.05
(X_6-X_{17})	Effectiveness of teaching Faculty	2.21	2.39	2.31
(X_{18}-X_{34})	Availability of Resources	1.24	1.69	1.50
Over All Sigma Level (X_1-X_{34})		1.65	2.00	1.84

Source: Own Estimation

Table 7.37: Quality Rating for the Students' Feedback about the Bachelor Programme Offered by the Colleges in Different Courses in West Bengal (Different Categories)

Variables	Groups	Courses			All
		B.A.	B.Sc.	Professional	
(X_1-X_5)	Teaching and Evaluation Method	2.06	2.04	2.02	2.05
(X_6-X_{17})	Effectiveness of teaching Faculty	2.31	2.36	2.00	2.31
(X_{18}-X_{34})	Availability of Resources	1.46	1.58	1.43	1.50
Grand Total (X_1-X_{34})		1.82	1.90	1.71	1.84

Source: Own Estimation

Table 7.38: For Attaining Higher Sigma Level (Increase in Quality) the Variables Needing more Concentration

		Teaching and Evaluation Method	Effectiveness of the Teaching Faculty	Availability of Resources
Region	Rural college	X_4	X_6, X_7	X_{21}, X_{22}, X_{23}, X_{24}, X_{27}, X_{28}, X_{29}, X_{30}
	Urban College	X_4	X_7	X_{24}, X_{27}, X_{28}, X_{29}, X_{30}
Course	B.A.	X_4	X_6, X_7	X_{21}, X_{27}, X_{28}, X_{29}, X_{30}
	B.Sc.	X_4	X_7	X_{24}, X_{27}, X_{28}, X_{29}, X_{30}, X_{31}
	Professional	X_4	X_6, X_7	X_{21}, X_{22}, X_{23}, X_{24}, X_{27}, X_{29}, X_{30}

Source: primary survey, own estimation

The six sigma tool is a stringent criterion for quality assessment. The present study is a student-driven quality rating system for the teaching and learning facilities adopted in the higher education institutions in West Bengal, India. From the sigma value, it has been possible to identify the problems of the selected higher education institutions in West Bengal. In this study the basic problems of higher education institutions as perceived by the students are lack of availability of resources (like toilet facility), sufficiency of permanent teachers, canteen and common room facilities and lack of teaching and evaluation methods like practical classes in the laboratory, quality of lectures and the extra coaching, revision of department. This study will help the policy planners or academicians of the higher education sector to understand the students' views in improving the quality of higher education.

7.6.4.3 Perception of Students on Quality: Principal Component Analysis

In the earlier section, we have described the 34 variables on which we have collected about the perception of the students. We have employed Principal Component Analysis (PCA) to extract the major components out of those 34 variables. These factors indicate the major groupings of the variables. PCA has extracted 6 components having eigen value greater than one from the group of the 34 variables. The components have been presented in Table 7.39A.

Table 7.39A Principal Components and Eigen Values

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.57	25.22	25.22	8.57	25.22	25.22
2			2.91	2.91	8.57	33.79
3	1.50	4.41	38.20	1.50	4.41	38.20
4	1.36	4.00	42.20	1.36	4.00	42.20
5			1.20	1.20	3.53	45.72
6	1.07	3.15	48.87	1.07	3.15	48.87

Source: Own Estimation

Interpretation of the results of PCA in Table 7.39B indicates that the most important component of students' perception about the quality of higher education is related to the *teaching quality*, explaining 25.2% of the variance. The first factor has 14 dominating indicators of quality which mostly relates to the teaching quality. The second component has 10 dominating indicators which mostly relate to the infrastructure facilities in the institutes. The third factor relates to the academic environment of the college.The fourth factor relates to academic discipline in the college. The fifth

factor relates to syllabus load. The sixth factor relates to laboratory facilities and classes in the institutes.

Table: 7.39B: Principal Component Analysis

Varible	Varible No.	PC1	PC2	PC3	PC4	PC5	PC6
Examples used by the teacher are	X14	0.677	0.112	0.059	0.085	-0.067	0.003
The Knowledge of the teacher	X10	0.641	0.131	0.099	0.212	-0.059	0.026
Teachers attitude in the class room	X9	0.635	0.025	0.047	0.084	0.271	-0.001
The opportunity of asking questions to teachers	X15	0.631	0.147	-0.005	0.014	-0.006	-0.053
accessibility of teacher outside in the class	X13	0.616	0.127	0.105	-0.041	0.038	0.006
Teachers come in class with preparation	X11	0.606	0.171	0.036	0.118	0.004	0.186
Student teacher relation	X17	0.595	-0.029	0.119	-0.070	0.230	-0.037
Teaching technique	X2	0.584	0.048	0.062	0.415	0.045	0.013
The focus of a teacher on the topic	X16	0.582	0.204	0.022	0.012	0.013	0.112
The Communication skills of teachers	X8	0.552	0.029	0.134	0.271	0.197	0.066
The Quality of lectures provided	X3	0.547	0.050	0.065	0.472	-0.058	-0.042
Regularity and pancuality of the teacher	X12	0.483	0.223	0.258	0.150	-0.104	0.114
availability of Books and Journals in library	X19	0.220	0.680	0.066	0.047	-0.048	0.204
Canteen facility	X29	0.045	0.657	0.196	0.259	0.303	0.056
sports activities in college	X32	0.178	0.623	0.214	0.037	0.006	-0.083
sufficiency of permanent teachers	X31	0.226	0.618	-0.137	0.299	0.172	-0.101
Common room facility	X30	0.046	0.611	0.264	0.211	0.301	0.108
Quality of book and Journals	X20	0.239	0.602	-0.090	-0.035	-0.033	0.171
Toilet facility	X28	0.043	0.588	0.212	0.180	0.418	0.054
Drinking water facility	X34	0.041	0.520	0.184	-0.059	0.062	-0.006
Availability of sports equipments	X22	0.166	0.512	0.458	0.201	-0.149	0.037
Hostel availability of long distance student	X23	0.017	0.486	0.430	0.236	-0.127	-0.070
Role of Student union in academic development	X24	0.097	0.053	0.708	0.124	0.265	0.008
The discipline in College	X25	0.358	0.372	0.509	-0.127	-0.080	0.033
Overall academic environment of the college	X26	0.362	0.366	0.497	-0.068	-0.181	-0.011
Distribution of free studentship	X27	0.079	0.382	0.493	0.162	0.102	0.018
Regularity and Evaluation of internal assessment	X5	0.271	0.310	0.095	0.492	0.006	-0.053
The extra coaching, revision of department	X4	0.268	0.141	0.260	0.489	0.024	0.243
Completion syllabus in academic year	X1	0.365	0.218	0.129	0.475	0.105	-0.038
Student principal relation	X18	0.288	0.020	0.123	-0.383	0.336	-0.130

Distribution of syllabus load in different years	X7	0.021	0.045	-0.012	0.095	0.631	0.271
Quality of office services	X33	0.108	0.200	0.024	-0.110	0.497	-0.163
Practical classes in the laboratory	X6	0.055	-0.046	-0.082	0.045	0.184	0.763
The availability of Laboratory equipment	X21	0.109	0.346	0.160	-0.005	-0.184	0.647

Source: Own Estimation

Some other problems as revealed from primary survey are as follows:

1) Lack of sufficient class rooms
2) Insufficiency of permanent teachers
3) Non existence of College boundaries in some colleges in rural areas
4) Non- availability of clean and purified drinking water facilities in some colleges
5) Lack of playground in college.
6) Insufficiency of library books
7) Insufficiency of Boys' common room
8) Lack of greenery in colleges
9) Lack of Honors subjects in colleges
10) Lack of NSS and NCC units in colleges
11) Non existence of language labs
12) Lack of Free Health checkup
13) Lack of office services
14) Biasness of College union in some cases
15) Lack of Programs on Social consciousness
16) Problems of entry of outsiders
17) Lack of course materials and modules for the students
18) Lack of Sports equipments
19) Lack of responsibility of class teachers in some cases
20) Lack of career counseling and campusing facilities in colleges
21) Lack of awareness programs on different kinds of scholarships and competition at national and state levels.

7.7 Quality of Higher Education: Assessment by Teachers

We have collected data from some teachers in Undergraduate colleges on their perceptions about the quality of higher education. Number of teacher surveyed under study is given Table 7.40.

Table 7.40: Number of Teacher Surveyed Under Study

	Number	Percentage
Male Teacher	23	76.7
Female Teacher	7	23.3

Source: Primary survey

Academic qualification of teacher under survey is given in Table 7.41.

Table 7.41: Academic Qualification of Teacher under Survey

Highest Qualification	Number	Percentage
PG	13	43.3
M.Phil	1	3.3
Ph.D	12	40.0
Both M.Phil and Ph.D	4	13.3
Total	30	100.0

Source: primary survey

Number of teacher form different type of college under survey is given in Table 7.42.

Table 7.42: Number of Teacher form Different Type of College under Survey

	Number of Teacher	%
Govt. College Teacher	5	16.7
Private College Teacher	5	16.7
Govt. Aided	20	66.7
Total	30	100.0

Source: primary survey

Average attendance rate of the student in the class is given in Table 7.43. The table clearly shows that in higher levels students are less interested to come to the colleges. This contradicts somewhat with the perception of the students.

Table 7.43: Average Attendance Rate of the Student in the Class

	Percentage
1st year	73.8
2nd year	65.2
3rd year	63.6

Source: primary survey

Some indicators of the teacher surveyed are given in Table 7.44.

Table 7.44: Some Indicators of the Teachers Surveyed

	Items	Values
1	Teaching Experience (Year)	8.1
2	Number of paper publishing	9.7
3	Family background (Rural) Teacher (%)	66.7

4	Distance between residing place and the college (Km)	45.1
5	Number of classes allotted per week	20
6	Intake capacity of the department (Honers)	87.2
7	There is separate room for teachers of your department (%)	63.3
8	Number of computers in your department	2.5

Source: primary survey

Teachers Perception (1 to 5 Scale) (1= strongly support, 2 = support, 3= Indifferent, 4= disagree, 5= strongly disagree) of different quality indicator about their colleges is given in Table 7.45.The table shows the teachers are interested in the introduction of evaluation of teachers. However many of the teachers have not supported the sufficiency of internet facilities in colleges and admission is done on the basis of merit.

Table 7.45: Teachers Perception (1 to 5 Scale) (1= strongly support, 2 = support, 3= Indifferent, 4= disagree, 5= strongly disagree) of Different Quality Indicator about Their College

Sl. No.	Items	Percentage				
		1	2	3	4	5
1	Introduction of evaluation of the teachers by the students is needed	37	43	7	10	3
2	Teachers are getting opportunity to participate in activities as seminars, projects	37	47	7	3	7
3	The College has excellent infrastructural facilities like space, furniture, and building facilities	63	23	3	10	0
4	The library facilities available and quality of the books and journals is satisfactory	43	20	10	13	13
5	The availability of online and internet services to teachers is satisfactory	27	23	10	40	0
6	Admission is done on the basis of merit	27	17	3	40	13
7	The modern teaching aids like LCD projector,	67	13	20	0	0
8	OHP, CD-ROMs and computer systems in	33	30	10	27	0
9	A considerable number of students of the College use library regularly.	20	33	17	27	3
10	Significant research activity is going on in the college	17	27	20	20	17
11	The college is effectively providing placement and counselling services to students.	17	37	13	27	7
12	Teachers participate in functioning of the college.	30	57	7	7	0
13	The quality of books and journals available in our college library	33	23	20	20	3
14	The availability of laboratory equipment in our college	27	33	13	20	7
15	The provision of sports, games, and other extracurricular facilities	27	53	7	10	3
16	Communication of the college is good	37	13	10	20	20
17	Long distance student has hotel availability	33	27	20	20	0
18	The academic environment of the college is good	33	43	17	7	0
19	Student union play a good role in academic development	23	30	17	20	10

20	The principle of the college takes care	30	40	17	10	3
21	The discipline in college is satisfactory	30	30	23	13	3
22	Student teacher relation is good	40	40	7	7	7
23	There is Fair distribution of free studentship	30	53	10	3	3
24	The regularity of the students in attending the class is satisfactory	20	37	7	30	7
25	The students are more interested in private coaching than coming to classes?	27	40	20	7	7
26	Teachers should stay 5 hours (min) in the college	63	37	0	0	0
27	The principal of the college is efficient in managing the activities of the college	40	30	20	7	3
Average		32	33	12	15	5

Source: Primary survey

7.8 Distance Education: Primary Survey

7.8.1 Distance Learning in West Bengal

Distance learning education also allows students from remote villages of West Bengal to pursue higher studies. Distance education in university wise in West Bengal is shown in Table 7.46.

Table 7.46: University-wise Distance Education in West Bengal

		Number			Percentage		
		Male	**Female**	**Total**	**Male**	**Female**	**Total**
1	Burdwan University, Burdwan	4270	8086	12356	34.6	65.4	100.0
2	Indian Institute of Technology	110	11	121	90.9	9.1	100.0
3	Kalyani University, Kalyani	5147	7901	13048	39.4	60.6	100.0
4	Netaji Subhash Open University, Kolkata	35293	21738	57031	61.9	38.1	100.0
5	North Bengal University, Darjeeling	785	1951	2736	28.7	71.3	100.0
6	Rabindra Bharati University, Kolkata	10880	25546	36426	29.9	70.1	100.0
7	Vidyasagar University, Midnapore	2206	1915	4121	53.5	46.5	100.0
	All	58691	67148	125839	48.4	51.6	100.0

Source: AISHE, 2016-17

Percentage of enrolment in distance mode in West Bengal and India in 2016-17 is shown in Table 7.47. 51.6 percent of the students enrolled in distance education program are females in West Bengal as compared to 45.4 percent at the national level in 2016-17.

Table 7.47: Percentage of Enrolment in Distance Mode in West Bengal and India in 2016-17

		West Bengal	India
Ph.D.	Male	0.0	0.0
	Female	0.0	0.0
	Total	0.0	0.0
M.Phil.	Male	0.0	0.0
	Female	0.0	0.0
	Total	0.0	0.0
Post Graduate	Male	24.1	16.3
	Female	35.8	16.3
	Total	59.9	32.5
Under Graduate	Male	21.4	34.0
	Female	14.7	25.9
	Total	36.1	59.9
PG Diploma	Male	0.5	1.0
	Female	0.4	0.6
	Total	0.8	1.6
Diploma	Male	1.5	2.1
	Female	0.7	1.2
	Total	2.2	3.3
Certificate	Male	0.8	1.3
	Female	0.1	1.4
	Total	1.0	2.7
Integrated	Male	0.0	0.0
	Female	0.0	0.0
	Total	0.0	0.0
Grand Total	Male	48.4	54.6
	Female	51.6	45.4
	Total	100.0	100.0

Source: AISHE, 2016-17

7.8.2 Distance Learning: Primary Survey

We have conducted primary survey on some distance learners in P.G. education under Vidyasagar University. The findings are reported below. Caste, Religion, Poverty and Gender-wise distribution (Percentage) in distance education is shown in Table 7.48. Maximum percentage general caste, Hindu and female are distance education learning.

Table 7.48: Caste, Religion, Poverty and Gender-wise Distribution in Distance Education

Caste		Religion		Poverty		Gender	
	Percentage		**Percentage**		**Percentage**		**Percentage**
General	73	Hindu	92	APL	92	Male	33
SC	8	Muslim	2	BPL	6	Female	67
ST	6	Others	6	Antaydaya	2		100
OBC	13		100		100		
	100						

Source: Primary Survey

Support for educational expenditure and aim of preferable job is shown in Table 7.49. In survey, education support is gate from family (67%). The major students are preferred education job (33%).

Table 7.49: Support for Educational Expenditure and Aim of Preferable Job

		Percentage
Support for Educational Expenditure	Family	67
	Self	23
	Both	6
	Others	4
	Total	100
What is your aim? (Preferable Job)	Teaching	33
	Govt. Job	27
	Non-govt. job	2
	Business	13
	Any job	25
	Total	100

Source: Primary Survey

Some indicators of distance learning students represents in Table 7.50. The findings of the study reveal that average Higher Secondary marks is 59%, average Honors marks is 50% and 46% student's preferred video lecture. 75% students have computer training.

Table 7.50: Some Indicators of Distance Learning Students

	Items	**Average Marks**
1	Average Higher secondary Marks obtained	59%
2	Average Honours marks obtained	50%
3	Applied for regular course	4%
4	Prefer regular course than DDE	69%
5	Average Computer Training	75%
6	Time spend in computer Per day (Hours)	1.4 hours
7	Prefer video Lecture	46%

Source: Primary Survey

7.9 Conclusion

In this chapter, we have presented the quality of higher education in West Bengal mainly in terms of NAAC assessment and NIRF assessment. The NAAC assessment reveals that the position of West Bengal is not so satisfactory. However, NIRF data reveals that West Bengal is ahead of All India average in terms of different parameters of quality of higher education.

Chapter 8

Household Expenditure on Higher Education

8.1 Introduction

In this chapter, we have discussed household expenditure on higher education. We have collected the data on household expenditure on higher education both from primary sources and secondary sources. The secondary data has been collected from NSSO reports. As the secondary data were not sufficient particularly for finding the determinants of education expenditure, we have collected the data from primary sources. First, we have discussed the expenditure on higher education based on primary data in 8.2. The district-wise disparity in higher education expenditure in West Bengal based on NSSO 71st round unit level data is presented in section 8.3. State-wise average Expenditure per Student in Current Academic Session by Type of Education is given in Appendix 8.1.

8.2 Household Expenditure on Higher Education: Primary Survey

Household expenditure on higher education refers to the expenditure made by the students and/or their parents on their higher education. So it is also referred to as household investment on higher education. Both public and household expenditure on higher education are highly significant not only because of their magnitude but also because of their nature and characteristics. While public expenditure can provide educational facilities, only household expenditure will enable its utilisation. The two are so interrelated and inter dependent, in the absence of either of them there is likely to be under allocation of resource for education.

Generally, the share of non-food component in total household expenditure will increase with the increase in household income. As education belongs to the non- food category, the expenditure on education reveals the priority of education as well as the income level of the households in India. The percentage share of education on the total Private Final Consumption Expenditure on Education (PFCE) was 0.60 percent in 1950-51 and increased to 2.55 percent in 2007-08. It is clear that there is a continuous increase in the allocation to education in the total household consumption expenditure in India.

From the collected data of primary survey, we have calculated the household expenditure on higher education in West Bengal.

8.2.1 Higher Education Expenditure across Different Categories

Here we have presented our primary survey findings of expenditure on higher education by region, caste, religion and income class.

8.2.1.1 Expenditure on Higher Education by Region

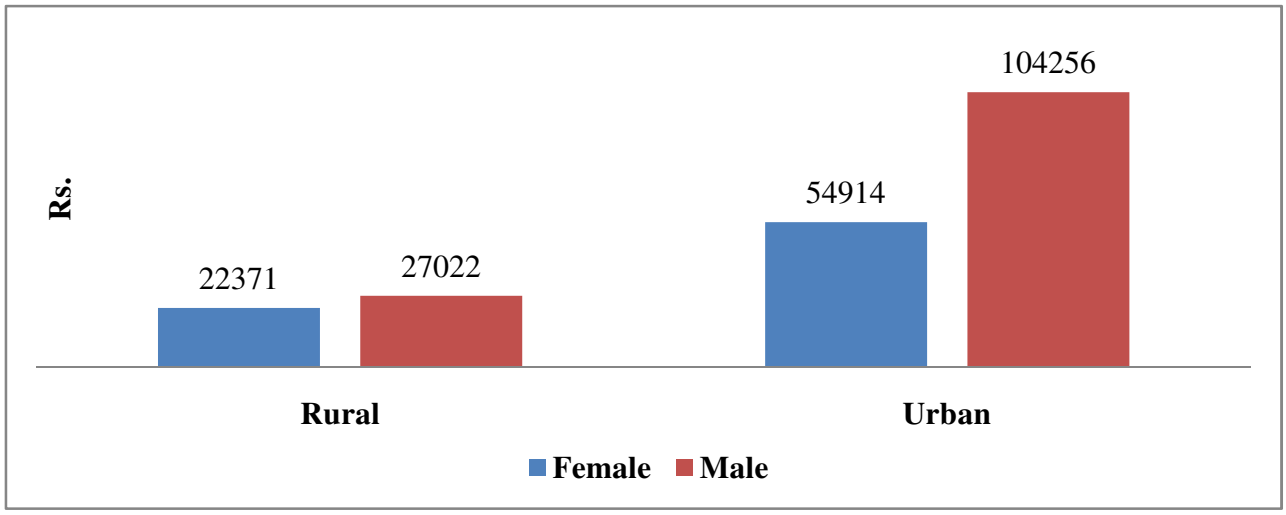
Household spends on an average Rs. 56,348 per student per year on its higher education. The corresponding value increases to Rs. 72,227 if the student is enrolled in urban areas institutions and decrease to Rs. 24,634 if the student enrolled in rural areas institutions which are less than half of urban institutions. Household spends Rs. 72,604 per male student and spend Rs. 45,682 per female student on his/her higher education. The gap between male and female student of expenditure on higher education is more in urban area. Per student higher education expenditure by gender and region wise are present in Table 8.1.Gender disparity in higher education expenditure, present in Fig 8.1.

Table 8.1: Region-wise Average of Total Annual household Expenditure (Rs.) Per Student in Higher Education

Region	Female	Male	Grand Total
Rural	22371	27022	24634
Urban	54914	104256	72227
Grand Total	45682	72604	56348

Source: Primary Survey

Fig. 8.1: Gender-Wise Per Student Household Expenditure (Rs.) on Higher Education



Source: Primary Survey

8.2.1.2 Expenditure on Higher Education by Caste

Household expenditures on higher education per student also differ by caste group. The expenditure on higher education is less in the case of the scheduled population (Scheduled Caste and Scheduled Tribe) than in the case of non-scheduled population (Gen and OBC). Generally the higher education expenditure is less in case of scheduled tribes compared to scheduled caste. Social caste-wise disparity is present remarkably in urban area. It is important that socially and economically weaker sections like the SC and ST households also spend considerable amounts on higher education. Caste and region wise yearly expenditure (Rs.) per student shown in Table 8.2.

Table 8.2: Caste and Region-wise Yearly Expenditure (Rs.) Per Student

Row Labels	Rural	Urban	Grand Total
GEN	26585	80876	67179
OBC	22349	62302	45719
SC	24547	56522	43576
ST	22986	40959	30532
Grand Total	24634	72227	56348

Source: Primary Survey

8.2.1.3 Expenditure on Higher Education by Religion

Household expenditures on higher education per student also differ by religious groups. Muslim household spend greater amount on higher education than *hindu* and other religious household in West Bengal. Gender disparity is present for all community. But, gender disparity is high for *muslim* community. Religion and gender-wise average of total yearly expenditure (Rs.) per student shown in Table 8.3.

Table 8.3: Religion and Gender-wise Average of Total Yearly Expenditure (Rs.) Per Student

Per Student Total Exp (Annual) (Rs.)	Region		Gender		
Religion	Rural	Urban	Female	Male	Grand Total
HINDU	24244	71562	46135	71161	55903
ISLAM	29825	85596	40535	118076	71653
Others	28700	63439	32723	46851	41603
Grand Total	24634	72227	45682	72604	56348

Source: Primary Survey

8.2.1.4 Expenditure on Higher Education by Income Class

Household expenditures on higher education per student also differ by income class of the household. The expenditure on higher education is less in the case of the BPL household than in the case of APL household. Disparity between APL and BPL family is more observable in urban area. Income class-wise average of total yearly expenditure (Rs.) per student on higher education is shown in Table 8.4.

Table 8.4: Income Class-wise Average of Total Yearly Expenditure (Rs.) Per Student

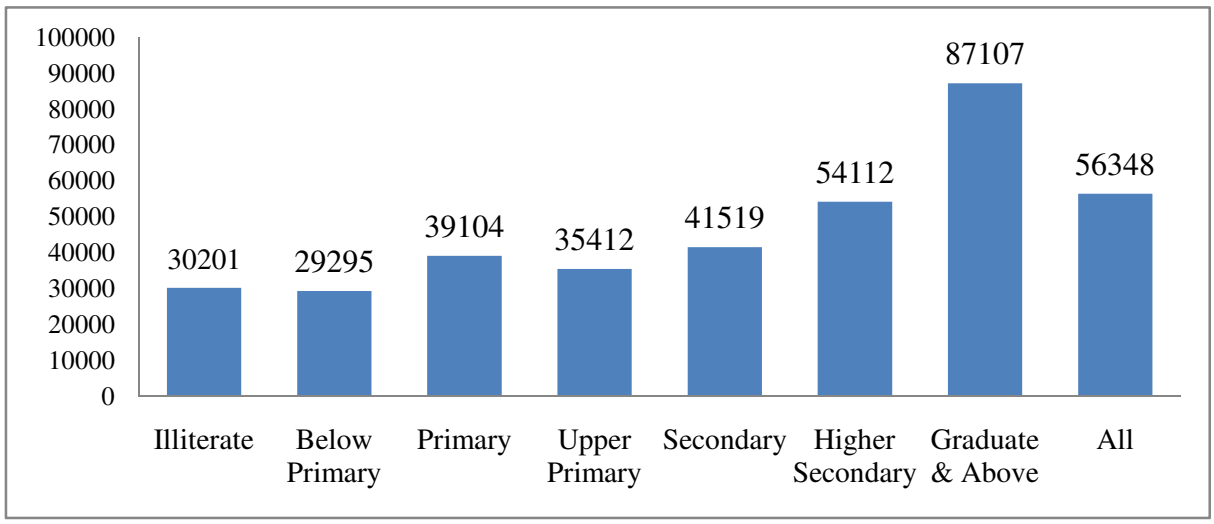
Row Labels	Rural	Urban	Grand Total
APL	27915	78655	66770
BPL	21525	47060	32806
Grand Total	24634	72227	56348

Source: Primary Survey

8.2.1.5 Expenditure on Higher Education by Education Level of Head of the Family

It is expected that better educated families to value education more and accordingly to spend more on higher education. Household higher education expenditure depends on education level of the head of the household. Household higher education expenditure more or less systematically increases by the educational level of the head of the household. The higher the level of education of the head of the household, the higher will be the expenditure on higher education. Fig 8.2 also presents that a positive relation between educations level of head of the family and higher education expenditure.

Fig. 8.2: Household Expenditure on Higher Education by Education Level of Head of the Household of the Student



Source: Primary survey

8.2.1.6 Expenditure on Higher Education by Courses

Household expenditures on higher education per student also differ by course of study of the student. The expenditure on higher education is less in the case of general courses then in the case of professional courses like, law, management. Per student household expenditure on higher education for general course is Rs. 34,844 and for professional course is Rs. 1,94,213. Under general degree, the household expenditure per student for PG course is less then UG course, i.e. Rs.32,604 and Rs.35,207 correspondingly. Under professional degree, household expenditure per student for PG

course is Rs.2,49,125, greater then UG course i.e. Rs.1,01,178. course-wise per student household expenditure on higher education is presented in Table 8.5.

Table 8.5: Course-wise Average of Total Yearly Household Expenditure (Rs.) Per Student

Per Student Total Expenditure (Annual)	Gender		
Courses	**Female**	**Male**	**Grand Total**
1. General	**33408**	**37347**	**34844**
1.1 Post Graduate (PG)	**32376**	**32966**	**32604**
Master of Arts (M.A)	32267	31936	32142
Master of Science (M.Sc.)	32753	36111	34127
1.2 Under Graduate (UG)	**33568**	**38105**	**35207**
Bachelor of Arts (B.A)	24804	22809	24149
Bachelor of Commerce (B.Com)	-	32942	32942
Bachelor of Science (B.Sc.)	49223	56938	52122
Bachelor of Computer Application (BCA)	75919	67343	68951
2. Professional	**170084**	**210427**	**194213**
2.1 Post Graduate (PG)	**240104**	**253217**	**249125**
Management (MBA)	240104	253217	249125
2.2 Under Graduate (UG)	**103283**	**98561**	**101178**
Law (LLB)	106819	104223	105435
Management (BBA, BHM)	101605	93793	98544
Grand Total	**45682**	**72604**	**56348**

Source: Primary Survey

8.2.2 Composition of Household Expenditure on Higher Education

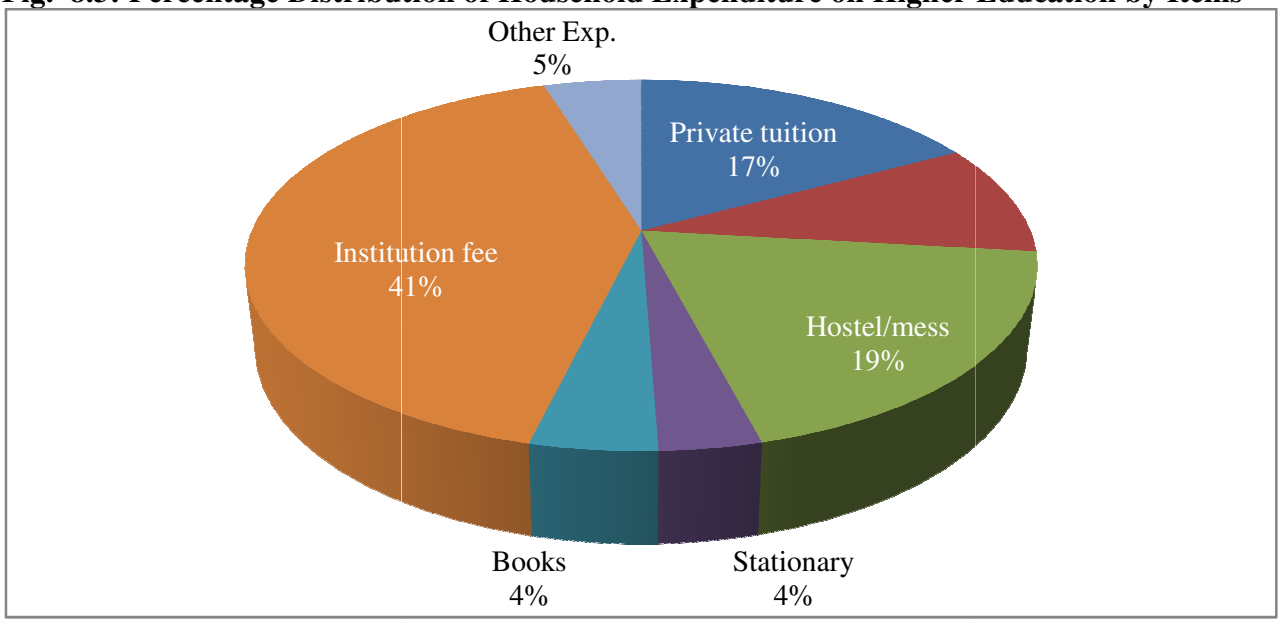
Table 8.6 presents major items of household expenditure on higher education. Out of total household expenditure on higher education hostel/mess fee, institution fee and private tuition expenditure are major important expenditure types on higher education in West Bengal. Fig. 8.3 also presents percentage composition of household expenditure on higher education.

Table 8.6: Composition of Per Student Annual Household Expenditure on Higher Education by Region and Gender

	Region		Gender		
Items (Rs.)	**Rural**	**Urban**	**Female**	**Male**	**Grand Total**
Annual Private tuition Fees	6627	11059	8897	10621	9580
Transport	5303	5450	4948	6091	5401
Hostel/mess	3754	14162	10492	10990	10689
Stationary	1493	2195	1902	2050	1961
Books	2173	2578	2436	2453	2443
Institution fee	3575	32984	14119	36969	23171
Other Expenses	1709	3131	2443	2983	2657
Total Expenditure	24634	72227	45682	72604	56348

Source: Primary Survey

Fig. 8.3: Percentage Distribution of Household Expenditure on Higher Education by Items



Source: Primary Survey

8.2.3 ANOVA of Household Higher Education Expenditure by Different Categories

Here, using one - way ANOVA we examine, there is any statistically significant difference between household average expenditure incurred during study by different factors. For this purpose, expenditure has been measured through basic categories viz.

A) Region: Rural and Urban Students
B) Religion: Hindu, Islam and others
C) Castes: General, SC, ST, OBC
D) Course: UG/PG, General/professional
E) Gender: Female and Male
F) Income Class: APL and BPL

For all courses combined,

All the test results are analyzed on the basis of p-values of two tailed test and we considered maximum 5% level of significance.

Different categories-wise total expenditure on education and level of significance shown in Table 8.7.

Table 8.7: Category-wise Average Expenditure on Higher Education and Level of Significance

Factors			N	Expenditure on Education (Rs.)	F-value	Level of Significance
Region		Rural	1046	24634	370.48	0.000
		Urban	2089	72227		
Religion		Hindu	2913	55903	5.41	0.005
		Muslim	152	71653		
		Others	70	41603		
Caste		Gen	1752	67179	36.46	0.000
		SC	494	43576		
		ST	212	30532		
		OBC	677	45719		
Course	UG/PG	UG	2491	39365	958.42	0.000
		PG	644	122040		
	General/Professional	General	2712	34844	5166.6	0.000
		Professional	423	194213		
Gender		Male	1242	72604	118.38	0.000
		Female	1893	45682		
Income Class		APL	2173	66770	170.18	0.000
		BPL	962	32806		

Source: Primary Survey

From the ANOVA results, we observe that there is significant difference in average household (mean) expenditure incurred on higher education across regions (rural and urban), religions, castes, gender, different courses (Like, PG and UG or General and Professional), and income classes.

8.2.4 Determinants of Household Expenditure on Higher Education

Investment in education is incurred in two domains: individual and institutional. Individual investment refers to the investment made by the students and/or their parents for their education. So it is also referred to as household or family investment in education. Institutional investment is referred to as public or more specifically, government investment in education. Both public and household investment in education is highly important not only because of their magnitudes, but also because of their nature and characteristics. While public investment can provide educational facilities. Only household investment will enable its utilisation. These two are inter-related and inter-dependent than in the absence of either of them, there will be under allocation of resources on education. The willingness of a household to invest in education is affected by a number of factors which vary considerably between member states and even very down to the level of individual households (Sabu and Raju 2015).

8.2.4.1 Variables, Their Notation and Definition

- **Economic condition of the household**

➢ Per capita annual household income

➢ Income class of the household (Whether the household belongs to APL or BPL) (dummy variables)

= 1, if APL

0, if otherwise (BPL)

Occupation – primary occupation of the head of the household (dummy variables)

➢ Agricultural (Farm employment, marginal farmer, agricultural labour)

= 1, if cultivation and allied agricultural activities

0, otherwise

➢ Non agricultural labour

= 1, if household primary source of income is labour in non-farm sector

0, otherwise

➢ Business

= 1, (if household primary activity is business)

0, Otherwise

➢ Permanent Job (Non-Farm employment, Basically salaried govt./non-govt. job)

= 1, permanent job

0, otherwise

- **Social Caste**

➢ General (dummy variables)

= 1, the student belongs to general category

0, otherwise (scheduled cast and tribes, OBC)

➢ Scheduled Caste (SC) (dummy variable)

= 1, the student belongs to Scheduled Caste family

0, otherwise (scheduled tribe, OBC, GEN)

➢ Scheduled Tribe (ST) (dummy variable)

= 1, the student belongs to Scheduled Tribe family

0, otherwise (scheduled cast, OBC, GEN)

- **Religion of The Household of The Student**

➢ Hindu (dummy variables)

= 1, if Hindu

0, otherwise (Muslim and other communities)

- **Household Educational Status**

➢ Education level of the head of the household of the student is measured in years of schooling. The years of schooling and the corresponding educational levels are defined as follows:

Illiterate	0
Below primary	4
Primary	5
Upper Primary	8
Secondary	10
Higher Secondary	12
Graduation	15
Post Graduation	17
Professional	16
Other higher degrees	20

- **Region (whether the studied in rural/urban college)**

➢ Urban (dummy Variable)

=1, if urban

0, otherwise (rural)

- **Gender of The Student**

➢ Sex of the student (Dummy Variables)

= 1, if Female

0, Otherwise (Male)

- **Course/Subject Taken by Student at Bachelor Degree Level**

➢ Under Graduate (UG) (Dummy Variables)

= 1, if studied in UG Courses

0, Otherwise (PG courses)

➢ Professional (Dummy Variables)

= 1, if Professional course (like management, Law)

0, Otherwise (General degree course, BA, BSc,

B.Com, MA, MSc, M.Com etc)

- **Marks Obtained at Previous Level**

➢ We have taken percentage marks obtained by UG student at 10+2 level. And those who are studying at PG level, we have taken percentage of marks obtained at UG level.

➢ **Private Tuition Taken by Student**

Private Tuition (Dummy variables)

=1, if student have at least a private tuition

0, no private tuition

- **Institutions to Home Distance**

➢ Distance between college/university/or other higher education institutions to home of the student in kilometre (Km.)

- **Incentive Received by Student**

➢ Scholarship/Stipend (Dummy variable)

=1, if student get any scholarship or stipend form institution

0, otherwise (No scholarship and stipend)

- **Demographic Condition of the Household of The Student**

➢ Number of Family member of the student

The method of Ordinary Least Square (OLS) model has been used to identify the determinants of the per student household expenditure on higher education for 3135 students from different colleges/universities/higher education institutions.

Table 8.8: Regression Results of Per Student Household Expenditure on Higher Education

	Coefficient	t	Sig.	VIF
(Constant)	8097.2	1.33	0.18	-
Per Capita Household Income (Annual)	0.1	4.08	0.00	1.61
Income Class (APL = 1, BPL = 0)	7252.6	4.42	0.00	1.38
Agriculture	-2856.5	-1.08	0.28	4.24
Non Agricultural Labour	-6809.8	-1.90	0.06	1.68
Business	-1457.7	-0.47	0.64	2.38
Permanent Job	95.5	0.04	0.97	2.92
GEN (GEN =1, Others= 0)	-1354.5	-0.76	0.45	1.88
SC (SC = 1, Others = 0)	-926.6	-0.43	0.67	1.52
ST (ST = 1, Others= 0)	3754.5	1.25	0.21	1.37
Hindu (Hindu = 1, Others = 0)	-5642.8	-2.10	0.04	1.14
Household Head's Education (schooling years)	785.1	3.94	0.00	1.62
Region (Urban = 1, Rural =0)	1682.5	0.98	0.33	1.59
Gender (Female = 1, Male = 0)	-12145.6	-8.42	0.00	1.20
Level of Study (UG=1, PG=0)	-41783.2	-19.06	0.00	1.89
Professional (Professional= 1, General = 0)	151239.3	57.11	0.00	1.97

Marks Obtained at previous level (% Marks)	315.0	4.61	0.00	1.44
Private Tuition (Yes= 1, No=0)	41275.0	19.50	0.00	1.80
Distance between institute to home (kms.)	73.7	12.15	0.00	1.16
Receipt of Scholarship (Yes = 1, No= 0)	-1868.7	-1.22	0.22	1.41
Family Size (Number of family member)	762.9	1.43	0.15	1.08
N (Number of observations)	3135			
R Square	0.729			
Adjusted R Square	0.727			
F	418.8			
Sig.	0.000			

Source: Authors Estimation

8.2.4.2 Discussion on Regression Results

One may expect that multi-collinearity be present between independent variable of regression model. Variance Inflation Factor (VIF) of all the independent variable are estimated, given in the Table 8.8, does not show severe multi-collinearity problem between independent variables as all the VIF values are less than 5.

In regression equations household expenditures on higher education per student considered as the dependent variable.

The results of regression on household expenditure on higher education per student are given in Table 8.8. Most of the regression coefficients are statistically significant at 95 per cent confidence level; and more interestingly, most have expected signs. The coefficients of determination (R^2) are not so small, given the large sample it is not be surprising. The results provide some important insight into the problem of the determinants of household expenditure on higher education.

Table 8.8 presents the OLS regression results of household expenditure on higher education per student on several explanatory variables identified.

As expected, household income has a positive effect on the household higher education expenditure. Household with high income tend to spend more on higher education. Household economic condition is measured by per capita household income. The coefficient is reasonably high and statistically significant at 1% level of significance.

One another economic status of the household prescribed by government poverty line as considered as dummy variable (equal 1 if APL and 0 if BPL and others). The values of the coefficient suggest that APL household spending more on higher education and it is expected. The coefficient is reasonably high and statistically significant at 95 percent confidence level.

Occupation of the head of the household is considered as a dummy (four dummy variables). The result shows that whose household head have a permanent salaried job they have expenses more on higher education. The coefficient is reasonably high but not statistically significant. Also we have show that household primary occupation is non agricultural labour, expense less on higher education. The coefficient is negatively related with dependent variable and also statistically significant at 10% level of significance.

Social caste is measured as a dummy variable (three dummy variables). The values of the coefficients' might suggest that the probability of spending on higher education is higher if one is a scheduled, but this result is not statistically significant for all cases.

One dummy variables are introduced on religion (equal 1 if Hindu and 0 otherwise). The values of the coefficient might suggest that the probability of spending on higher education is lower if one is a Hindu; this result is statistically significant at 5% level.

The education of the head of the household can be expected to have a positive effect on household expenditure on higher education. Education level of head is measured in terms of year of schooling. The coefficient is reasonably high and positively related with dependent variable and statistically significant at 99 percent confidence level.

Demographic burden measured in terms of the size of the household of the student increases, household may not be able to spend more on higher education, as demand for alternative purpose increases. So, generally any one expects that a negative effect of household size on household higher education expenditure. But our result shows that reverse of the expectation. Household size positively affects per head higher education expenditure but the result is not statistically significant.

Gender (dummy taking the value of 1 if female and 0 for male), has a significant effect on household expenditure on higher education. The coefficient suggests that the household expenditure would be higher on male student then on female student. The coefficient is statistically significant at 99 percent confidence level. So there is present of gender disparity in household expenditure on higher education.

The type of course is a significant factor. Type of course taken by student is considered as a dummy (whether it is professional or general courses, 1 if professional 0 otherwise). The coefficients suggested that, who are studied professional course like management, law etc, household expenditure on that type of student is high compare to non professional (general degree course) course. Another finding is that who are studied in under graduate level, household expenditure on that type of student is low compare to who are studied in post graduate level that means household expenditure is increased with increase in education level.

Previous qualification performance is an important factor i.e. performance at 10+2 level for current UG students and performance at UG level for current PG students. Who are perform better at previous level, parents are more concentrate on that student for better higher education that's why they expense more on that type of student. Here we measured the performance of the student by percentage of marks obtained at previous level. The coefficient is positively related with dependent variable and also the significant at 99% level of confidence.

Private tuition expenditure is a major part of total household expenditure on higher education.
Private tuition taken by student considered as a dummy variable (equal 1 if student take at least on private tuition and 0 for no private tuition). Private tuition positively and also significantly affects household higher education expenditure at 99% level of confidence.

Availability of a college/university in the habitation is considered to measure the access to higher education. If a college/university is available within habitation, it would obviously reduce household expenditure considerable. Here it is measured by college/university/institutions to home distance. It is expected to be positively related with household higher education expenditure. If college/university/institutions to home distance is high then transport cost or hostel accommodation fees is necessary to access higher education. Distance is measured in kilometre. The coefficient is positively related with household higher education expenditure at 1% level of significance.

Provision of free studentship, scholarship and stipend (considered as dummy variable, equal 1 if student get at least one and equal to 0 if not have any type of incentives) reduce the need for more household expenditure; hence they push down the household expenditure. It is found that the relationship with household expenditure is negative. But it is not significant.

Whether the college is placed in rural or urban area is a significant factor of household expenditure on higher education. It is measured as a dummy variable (equals 1 if urban and 0 for rural). The values of the coefficient suggest that household spending more on higher education who are studied at urban college. The coefficient is reasonably high but not statistically significant.

8.2.5 Private Tuition Expenditure

A large share of students take private tuition in undergraduate courses. Percentage of students taking private tuition in Undergraduate Course as revealed from our primary survey has been given in Appendix A8.2

8.2.5.1 Private Tuition Expenditure by Region and Gender

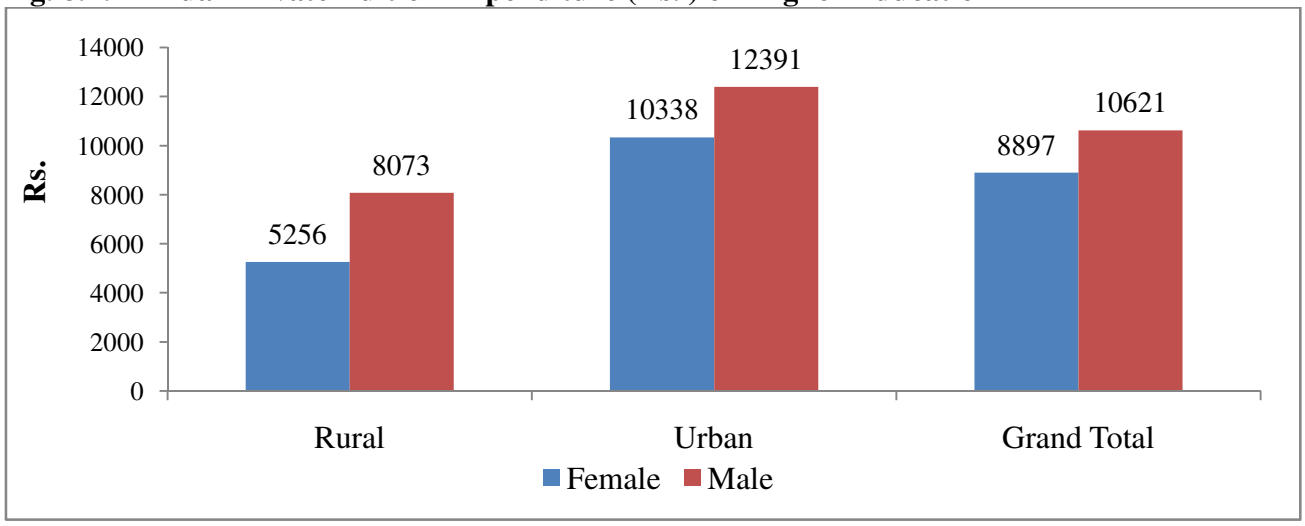
Household spends an average of Rs. 9580 per student per year on private tuition in higher education. The corresponding value is Rs. 11059 for urban students and Rs. 6627 for rural students. Households spend Rs. 10621 per male student and spend Rs. 8897 per female student for their private tuition on his/her higher education. Gender-wise and region-wise per student private tuition expenditure on higher education are presented in Table 8.9. Gender disparity in private tuition expenditure on higher education is presented in Fig. 8.4.

Table 8.9: Gender-wise Average Private Tuition Expenditure (Rs.) in Higher Education

Gender	Rural	Urban	Grand Total
Female	5256	10338	8897
Male	8073	12391	10621
Grand Total	**6627**	**11059**	**9580**

Source: Primary Survey

Fig. 8.4: Annual Private Tuition Expenditure (Rs.) on Higher Education



Source: Primary survey

8.2.5.2 Private Tuition Expenditure by Courses

Course-wise average private tuition expenditure based on gender of the student can be seen from the Table 8.10. It can be observed that, considering B.A courses, per student private tuition expenditure on female student (Rs.6356) is higher than that of the male student (Rs.5041). Per student private tuition expenditure on under graduate level is higher than post graduate level. In under graduate courses private tuition expenditure is higher for general degree courses than professional courses.

Table 8.10: Course-wise Average Private Tuition Expenditure (Rs.) in Higher Education

Row Labels	Female	Male	Grand Total
Post Graduate	**2422**	**2924**	**2679**
M.A	2217	2098	2172
M.Sc.	231	1333	682
Management	4240	3734	3892
Under Graduate	**10189**	**13395**	**11364**
B.A	6356	5041	5924
B.com	-	19700	19700
B.Sc.	17755	25938	20830
BCA	43034	29010	31640
Law	11475	4990	8016
Management	454	316	400
Grand Total	**8897**	**10621**	**9580**

Source: Primary Survey

8.2.5.3 Private Tuition Expenditure by Religion

Private tuition expenditure on higher education based on the religion and gender of the student can be seen from the Table 8.11. Muslim students are spend more on private tuition than Hindu and other religious community for pursing their higher education.

Table 8.11: Religion and Gender-wise Average of Yearly Private Tuition Expenditure (Rs.) in Higher Education

	Gender		
Religion	**Female**	**Male**	**Grand Total**
Hindu	8914	10513	9538
Muslim	8917	16010	11764
Others	7623	5962	6579
Grand Total	**8897**	**10621**	**9580**

Source: Primary Survey

8.2.5.4 ANOVA: Average Private Tuition Expenditure by Different Categories

Here, using one - way ANOVA we examine, there is any statistically significant difference between Household average private tuition expenditure incurred during study by different factors. For this purpose, private tuition expenditure has been measured through basic categories viz.

A) Region: Rural and Urban Students
B) Religion: Hindu, Islam and others
C) Castes: General, SC, ST, OBC
D) Course: UG/PG, General/professional
E) Gender: Female and Male
F) Income Class: APL and BPL

For all courses combined,

All the test results are analyzed on the basis of p-values of two tailed test and we considered maximum 5% level of significance.

Table 8.12: Average Private Tuition Expenditure and Level of Significance in Different Categories-wise

Factors			N	Total Expenditure on Education (Average)	F-value	Level of Significance
Region		Rural	1046	6627	43.74	0.000
		Urban	2089	11059		
Religion		Hindu	2913	9538	2.15	0.117
		Muslim	152	11764		
		Others	70	6579		
Caste		Gen	1752	10023	5.56	0.001
		SC	494	8568		
		ST	212	5326		
		OBC	677	10505		
Course	UG/PG	UG	2491	11364	126.58	0.000
		PG	644	2679		
	General/Professional	General	2712	10501	54.65	0.000
		Professional	423	3676		
Gender		Male	1242	10621	7.05	0.008
		Female	1893	8897		
Income Class		APL	2173	11155	56.34	0.000
		BPL	962	6023		

Source: Primary Survey

From the result of ANOVA in Table 8.12, we observe that there is significant difference in average private tuition (mean) expenditure incurred on higher education across regions (rural and urban), castes, gender, different courses (Like, PG and UG or General and professional), and income classes.

8.2.6 Course Fees

8.2.6.1 Institution Fee Including Course Fee for Different General Degree and Professional Courses

There are three types of fees classified on the basis of the Universities expenditure on students. These are: (i) Academic fees, (ii) Examinations Fees and (iii) Others fees and Development charges. Academic Fees comprises of Tuitions Fees, Application Fees, Library Fees, and other miselenouses receipts from students. Charges for conducting examinations are included in examinations fees. Charges for transfer certificates, eligibility certificates, study related certificates, and other study related charges constitute other fees. Of late, university has introduced development charges along with the tuition fees. Undoubtedly, next to grants received from the State Government, fees from students form an important source of revenue for the university (Upadhyaya and Agrawal, 2015).

The level of expenditure on professional course is high when compared to general course. The annual course fees in general courses at bachelor level is Rs. 3697 and at post graduate level is Rs. 2482 (for govt. and govt. aided institutions). The annual course fees in professional courses at bachelor level is Rs. 52998 and at post graduate level is Rs. 205846 (private institutions). Course-wise and subject-wise annual institution fee are present in Table 8.13.

Table 8.13: Course and Specialization-wise Annual Institutional Fee (Including Course Fee and Admission Fee) Rs.

Courses	Annual Institution Fee (Rs.)
General Courses	**3527**
Post Graduate (PG)	**2482**
Master of Arts (M.A.)	2698
Bengali	1248
English	1248
Sanskrit	4558
Sociology	4558
Master of Science (M.Sc.)	**1773**
Anthropology	1773
Mathematics	1773
Under Graduate (UG)	**3697**
Bachelor of Arts (B.A.) Honours	**2916**
Bengali	2825

Education	4935
English	2897
Geography	4551
History	2540
Philosophy	2509
Political Science	2555
Sanskrit	3514
Santali	2401
Sociology	2932
Bachelor of Commerce (B.Com.) Honours	**2775**
Accountancy	2775
Bachelor of Science (B.Sc.) Honours	**4423**
Anthropology	3275
Aquaculture	6650
Botany	3698
Chemistry	3889
Computer Application	12000
Computer Science	5713
English	5300
Geography	4004
Mathematics	3969
Nutrition	7071
Physics	3617
Physiology	3364
Zoology	3956
Bachelor of Computer Application (BCA)	**12178**
Computer Application	12178
Professional	**149115**
Post Graduate (PG)	**205846**
Management	**205846**
Master of Business Management (MBA)	205846
Under Graduate	**52998**
Law	**60000**
LLB (H)	60000
Management	**48667**
Bachelor of Business Administration (BBA)	48667
Bachelor of Business Management (BBM)	48667
Bachelor of Hospitality Management (BHM)	48667
BMS	48667
Grand Total	**23171**

Source: Primary Survey

8.2.6.2 Composition of Course Fee at Under Graduate General Degree Level

Under- Graduate general degree average yearly course fees shown in Table 8.14. From this table we shows that major portion of course fee goes to tuition fee, development fee and miscellaneous charge.

Table 8.14: Average Annual Course Fees of Under-Graduate General Courses

	Arts		**Science**		**Commerce**	
	Hons. (Rs.)	**Genl (Rs.)**	**Hons. (Rs.)**	**Genl (Rs.)**	**Hons. (Rs.)**	**Genl (Rs.)**
Tuition Fee	900	600	1320	1020	900	600
Development Fee	200	200	200	200	200	200
Library Fees	150	150	150	150	150	150
University Registration fee	50	50	50	50	50	50
University Enrolment fee	55	55	55	55	55	55
University and College Sports fee	100	100	100	100	100	100
Computer charge	120	120	120	120	120	120
Identity card fee	20	20	20	20	20	20
Medical Charges	50	50	50	50	50	50
Misc. charge	905	905	885	885	755	955
Total	**2550**	**2250**	**2950**	**2650**	**2400**	**2300**

Source: Primary Survey

Self financing Subject and Course fees are shown in Table 8.15.

Table 8.15: Self Financing Subject and Course Fees

		Yearly Course Fee (Rs.)
1	Computer Science	7000 to 11000
2	Nutrition	7000 to 11500
3	BCA	10000 to 22000
4	Micro Biology	9000 to 12000

Source: Primary Survey

8.2.6.3 Course Fees of Technical Education

The level of expenditure on technical education is high when compared to general education. The annual course fees in government college (Rs.1,20,800) for B.Tech. is less than that of private college (Rs. 308000) in B.Tech, shown in Table 8.16.

Table 8.16: B.Tech Course Fees in Govt. and Private Colleges (Approximate)

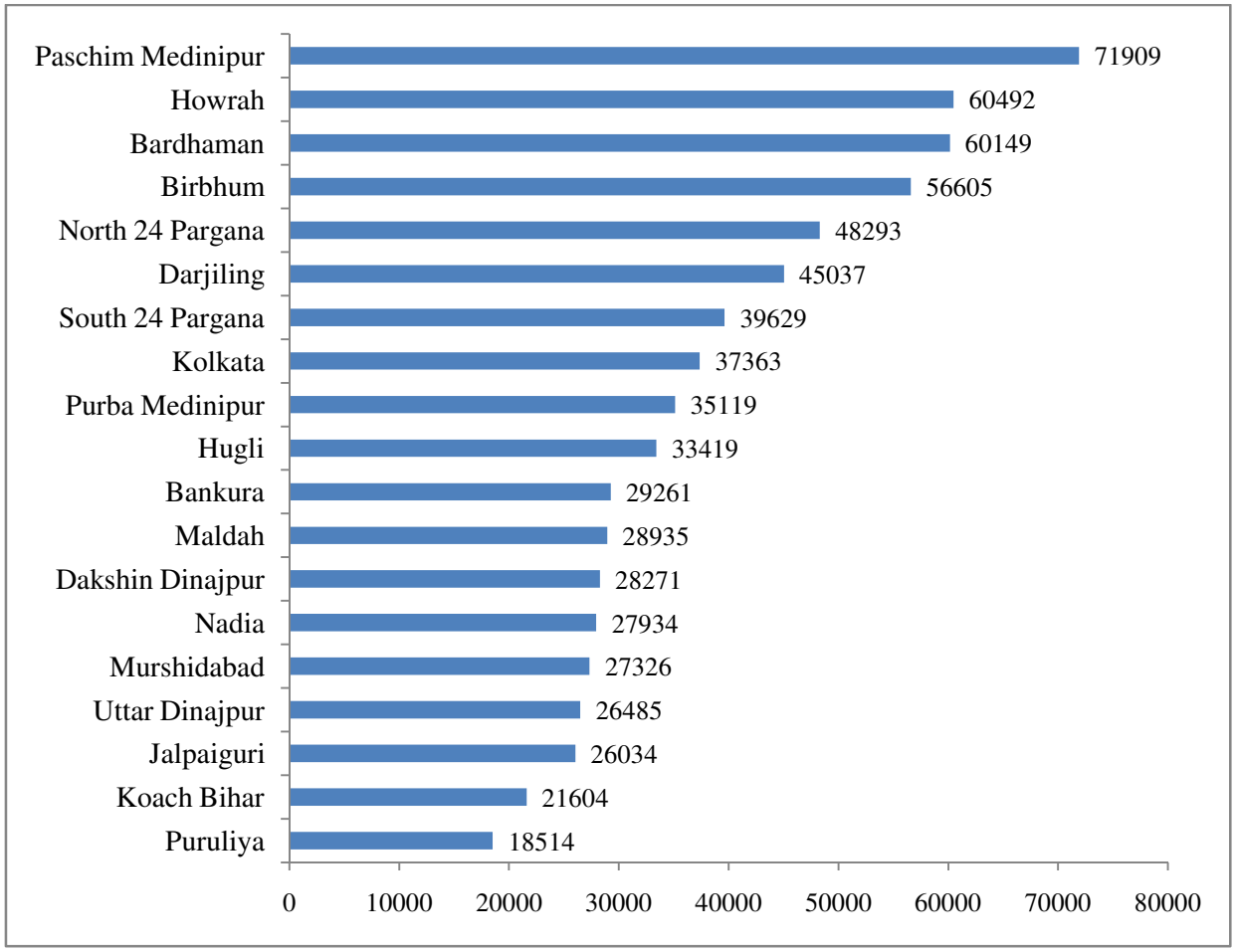
	Government College	**Private College**
Tuition Fees	24000	60000
Others	6200	17000
Total Fees yearly	30200	77000
Total Course fees in four year	120800	308000

Source: Primary Survey

8.3 District-wise Household Expenditure on Higher Education Based on Secondary Data

According to NSSO 71st round unit level data, household has spent Rs. 43,302 per student per year on higher education. Some states like Pschim Medinipur, Howrah, Bardhaman, Birbhum, North 24 Pargana and Darjiling are expense more than state average, others district are expense less than state average. Per student household higher education expenditure is remarkably low for Purulia district. District-wise per student household higher education expenditure are present in Fig. 8.5.

Fig. 8.5: District-wise Per Student Household Expenditure on Higher Education in West Bengal



Source: NSSO 71st Round Unit Level data

8.3.1 District-wise Household Expenditure on Higher Education by Gender

Household has spent Rs. 49361 per male student and spend Rs. 32816 per female student on his/her higher education in West Bengal. This is important that, households in Darjiling and Malda districts are spent more on their female student than male student. In other districts, households spent more on their male student than female student in higher education. District-wise and gender-wise household expenditure on higher education is present in Table 8.17.

Table 8.17: District-wise Per Student Household Higher Education Expenditure in West Bengal by Gender (in Rs.)

Districts	Female (Rs.)	Male (Rs.)	Grand Total (Rs.)
Darjiling	46889	43970	45037
Jalpaiguri	15399	36045	26034
Cooch Behar	20568	22713	21604
Uttar Dinajpur	6048	36703	26485
Dakshin Dinajpur	15549	39721	28271
Malda	48252	21065	28935
Murshidabad	22008	30029	27326
Birbhum	43649	60924	56605
Bardhaman	42393	67461	60149
Nadia	19933	33323	27934
North 24 Pargana	37828	55142	48293
Hooghly	32630	33847	33419
Bankura	11501	36167	29261
Purulia	11620	20812	18514
Paschim Medinipur	43712	93440	71909
Howrah	45263	69799	60492
Kolkata	29360	42019	37363
South 24 Pargana	39038	39904	39629
Purba Medinipur	22203	41578	35119
West Bengal	32816	49361	43302

*Source: NSSO 71st Round Unit Level Data *Diploma, Graduation and Post Graduation*

8.3.2 District-wise Household Expenditure on Higher Education by Region

Household has spent Rs. 43302 per student per year on higher education. The corresponding value increases to Rs. 49802 if the student is from urban area and decrease to Rs. 33173 if the student is from rural area. District-wise and region-wise household expenditure on higher education is present in Table 8.18.

Table 8.18: District-wise Per Student Household Higher Education Expenditure in West Bengal by Regions (in Rs.)

District	Rural	Urban	Grand Total
Darjiling	54827	41068	45037
Jalpaiguri	13740	38328	26034
Cooch Behar	10531	33468	21604
Uttar Dinajpur	16194	39942	26485
Dakshin Dinajpur	20369	41819	28271
Malda	33710	20749	28935
Murshidabad	27597	27043	27326
Birbhum	52906	61610	56605
Bardhaman	58240	61379	60149

Nadia	22218	33650	27934
North 24 Pargana	34246	52000	48293
Hooghly	26044	38472	33419
Bankura	37400	18902	29261
Purulia	19500	16683	18514
Paschim Medinipur	83981	70040	71909
Howrah	-	60492	60492
Kolkata	29192	45348	37363
South 24 Pargana	31616	55655	39629
Purba Medinipur	34852	36309	35119
West Bengal	33173	49802	43302

Source: NSSO 71st Round Unit Level data

8.3.3 District-wise Household Expenditure on Higher Education by Caste

Table 8.19 presents district-wise and caste-wise household annual expenditure on higher education in West Bengal. Non-scheduled household has spent Rs. 47396 per student and scheduled household spend Rs. 27618 per student on higher education in West Bengal. In three districts namely, Uttar Dinajpur, Dakshin Dinajpur and Purulia scheduled household spent more than non scheduled household for pursuing higher education.

Table 8.19: District-wise per Student Household Higher Education Expenditure in West Bengal by Castes (in Rs.)

District	Non-Scheduled	Scheduled	Grand Total
Darjiling	47900	31356	45037
Jalpaiguri	32377	13350	26034
Cooch Behar	26861	14155	21604
Uttar Dinajpur	22040	31565	26485
Dakshin Dinajpur	25478	38745	28271
Malda	30672	25172	28935
Murshidabad	29600	17293	27326
Birbhum	64674	41620	56605
Bardhaman	67879	29231	60149
Nadia	30552	21607	27934
North 24 Pargana	49302	44820	48293
Hooghly	36140	24348	33419
Bankura	31664	16643	29261
Purulia	14287	31196	18514
Paschim Medinipur	76993	15341	71909
Howrah	64700	26570	60492
Kolkata	38220	32482	37363
South 24 Pargana	41579	21102	39629
Purba Medinipur	38097	21853	35119
West Bengal	47396	27618	43302

Source: NSSO 71st Round Unit Level data.

8.3.4 District-wise Household Expenditure on Higher Education by Courses

Table 8.20 presents district-wise and course-wise household annual expenditure on higher education in West Bengal.

Table 8.20: District-wise Per Student Household Higher Education Expenditure in West Bengal by Current Study (in Rs.)

District	Diploma	Graduation	Post Graduation	Grand Total
Darjiling	40264	30877	18540	34204
Jalpaiguri	28667	7370	13833	16992
Cooch Behar	27083	1462	4300	12259
Uttar Dinajpur	38500	3179	18875	15868
Dakshin Dinajpur	26994	16868	11288	19957
Malda	31648	2003	31738	19185
Murshidabad	20354	11910	24845	17690
Birbhum	26451	28825	174833	38886
Bardhaman	54541	25593	36466	44570
Nadia	17203	17925	18552	17753
North 24 Pargana	27276	28806	40971	30265
Hooghly	29803	15234	14187	21695
Bankura	28400	20703	17257	21829
Purulia	26100	3733	14825	10425
Paschim Medinipur	76782	16442	60736	45851
Howrah	42262	32747	72631	41173
Kolkata	13939	25478	21536	23119
South 24 Pargana	17879	31980	64714	29350
Purba Medinipur	24181	16401	42200	23608
West Bengal	34632	21533	39209	28955

Source: NSSO 71st Round Unit Level data.

8.3.5 ANOVA of Household Expenditure on Higher Education by Different Categories

Here, using one - way ANOVA we examine, there is any statistically significant difference between Household average expenditure incurred during study by different factors. For this purpose, expenditure has been measured through basic categories viz.

A) Districts in West Bengal

B) Region: Rural and Urban

C) Castes: Scheduled and Non-Scheduled

D) Gender: Female and Male

For all courses combined (Diploma, Graduation and Post-Graduation)

All the test results are analyzed on the basis of p-values of two tailed test and we considered maximum 5% level of significance.

Table 8.21: ANOVA of Higher Education Expenditure by Different Categories (NSSO Data)

Factors		N	Mean	F	Sig.
Districts	Darjiling	52	45037	4.15	0.000
	Jalpaiguri	66	26034		
	Cooch Behar	29	21604		
	Uttar Dinajpur	30	26485		
	Dakshin Dinajpur	19	28271		
	Malda	38	28935		
	Murshidabad	92	27326		
	Birbhum	40	56605		
	Bardhaman	120	60149		
	Nadia	82	27934		
	North 24 Pargana	182	48293		
	Hooghly	91	33419		
	Bankura	25	29261		
	Purulia	20	18514		
	Paschim Medinipur	97	71909		
	Howrah	145	60492		
	Kolkata	87	37363		
	South 24 Pargana	63	39629		
	Purba Medinipur	60	35119		
Region	Urban	815	49802	21.45	0.000
	Rural	523	33173		
Caste	Non-Scheduled	1061	47396	20.92	0.000
	Scheduled	277	27618		
Gender	Female	490	32816	20.69	0.000
	Male	848	49361		

Source: Own Estimation, NSSO 71st Round Unit Level Data

From the results of ANOVA in Table 8.21, we observe that there is significant difference in average expenditure incurred on higher education across Districts (Districts in West Bengal), Regions, Castes and gender.

8.4 Conclusion

From the pattern of household expenditure on higher education in West Bengal, it appears that-

- All those who are from urban area spend more amounts in higher education compared to rural area.
- Household expenditure on female student is less than on that of male student. In this context gender disparity is present to some extent. Gender disparity is present more in urban area. This is remarkably present in Muslim community than others.

- Household expenditure by scheduled population is less than non-scheduled population.
- Higher educated families spend more on higher education than less educated family.
- Household expenditure is high for professional/technical courses than general courses.
- Household expenditure is higher for private college than Government College.
- Major share of household expenditure on higher education goes to College/Course fee, Private tuition Expenditure, transport and hostel accommodation.

Household expenditure on higher education is a function of many socio-economic, household and educational variables. The major ones are included in the functional form estimated here. The estimates of OLS regression equations lead us to the following conclusions:

- Household characteristics, particularly household economic condition and educational level of the head of the household are important determinants of household expenditure on higher education.

- Gender is a very significant determinant of household expenditure on higher education. But it is not necessarily true in all cases.

- Course/subject related variables (course of study by the student whether BA, BSc, B.Com, law, management etc.) are important determinants of household expenditure on higher education.

- Private tuition taken by student is a very significant determinant of household expenditure on higher education.

- College to home distance of the student is an important also significant determinant of household expenditure on higher education.

- Performance at 10+2/UG level is a significant determinant of household expenditure on higher education of the student. But it is not necessarily true in all cases.

Chapter-8: Appendix

Table A8.1: State-Wise Average Expenditure per Student in Current Academic Session by Type of Education

States	General	Technical/ professional	Vocational
Andhra Pradesh	7358	43400	14927
Arunachal Pradesh	5917	43632	46810
Assam	4152	41632	16736
Bihar	4251	75629	36693
Chhattisgarh	2993	35522	12578
Delhi	19491	67537	33799
Goa	8465	54798	15128
Gujarat	7442	60491	22423
Haryana	13905	74260	33450
Himachal Pradesh	8367	78886	23534
Jammu	7311	60699	29548
Jharkhand	4543	39084	35177
Karnataka	7863	59803	20811
Kerala	9326	82232	19646
Madhya	4894	55192	28504
Maharashtra	9292	69181	31179
Manipur	10012	81152	24195
Meghalaya	7037	49363	13135
Mizoram	10041	59649	32665
Nagaland	11501	60751	20518
Odisha	4584	66159	34740
Punjab	12600	69520	39139
Rajasthan	6804	47822	35852
Sikkim	5853	104922	29691
Tamil	9773	79689	35469
Telangana	9600	47788	14744
Tripura	6174	51610	15861
Uttar	5074	58567	28073
Uttarakhand	5893	96342	30177
West Bengal	6692	58436	21104
Andaman andNikobar Island	8191	39897	11684
Chandigarh	18426	81480	29364
Dadra	7092	75212	15423
Daman	11926	43074	12274
Lakshadweep	2504	35796	3357
Puducherry	11436	59629	9366
all-India	6788	62841	27676

Source: NSSO, 71th round, 2014

Table A8.2: Percentage of Students Taking Private Tuition in Undergraduate Courses

Description	General course	Professional course
Percentage of student have taken tuition (2208 out of 2334 for general course, 67 out of 157 for professional course)	94.6	42.7
1.Percentage of student tuition taken from college permanent teacher (792 out of 2208 for general course, 1 out of 67 for professional course)	35.9	1.5
1.1 Percentage of student tuition taken from own college permanent teacher	62.2	0.0
1.2 Percentage of student tuition taken from others college permanent teacher	37.8	100.0
2. Percentage of student tuition taken from college par-time teacher (702 out of 2208 for general course, 31 out of 67 for professional course)	31.8	0.0
2.1 Percentage of student tuition taken from own college par-time teacher	74.2	0.0
2.2 Percentage of student tuition taken from others college par-time teacher	25.8	0.0
3. Percentage of student tuition taken from college gust teacher (390 out of 2208 for general course, 14 out of 67 for professional course)	17.7	46.3
3.1 Percentage of student tuition taken from own college gust teacher	84.1	54.8
3.2 Percentage of student tuition taken from others college gust teacher	15.9	45.2
4. Percentage of student tuition taken from college permanent teacher (669 out of 2208 for general course, 36 out of 67 for professional course)	30.3	53.7

Source: Primary Data

Chapter 9

Vidyasagar University

9.1 Introduction

In this chapter, we have taken Vidyasagar University as case study. We have discussed various aspects of higher education in the light of the experience of Vidyasagar University. Vidyasagar University, named after one of the most illustrious sons of Bengal as well as one of the doyens of Indian Renaissance, Pandit Iswar Chandra Vidyasagar, has grown out of a long cultural and educational movement in West Bengal in general and in the undivided district of Midnapore in particular. The university came into existence by an Act West Bengal Act XVIII of 1981. Academic activities started six post graduate departments (Anthropology, Applied Mathematics with Oceanology and Computer Programming, Commerce with Farm Management, Economics with Rural Development, Library and Information Science, Political Science with Rural Administration) and 30 colleges of the District of Midnapore were affiliated to the Vidyasagar University with effect from 1st June 1985.

The U.G.C. accorded recognition to the University in terms of Section 12B of the U.G.C. Act, on 1st March 1990.The University presently houses 27 PG departments, 12 in Humanities and 15 in Science with 101 affiliated colleges. Fourteen vocational subjects and six other specialized courses are also offered at the UG level.

9.2 Post Graduate Education in Vidyasagar University

We have discussed here some aspects of higher education at Vidyasagar University. We have selected the period of 2010 to 2016-17 to see the changes for some aspects related to enrolment at different levels, infrastructure facilities, course fee, teaching and non teaching staff etc.

9.2.1 Enrolment in Post Graduate Level

Enrolment in Vidyasagar University has been raising the enrolment in under-graduate course but enrolment in post-graduation course is stagnant during period. Table 9.1 shows the growth of enrolment in under-graduate course during the period 2013-14 to 2016-17, whereas Table 9.1 shows the total enrolment growth in post-graduation course during the period 2011-12 to 2016-17. Of the total enrolment of 7814 in post-graduate course, 3693 students were enrolled in regular courses and the rest of the students enrolled in distance mode. Of the total enrolment of 3693 in post-graduate

course in regular mode in 2016-17, only 2051 were male students and 1642 were female students. Therefore growth rate of regular students in post-graduate course is stagnant over the period.

Table 9.1: Number of Postgraduate Students in Vidyasagar University by Years

Year	Regular Students			Distance Students			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
2011-12	2140	1658	3799	300	33	333	2441	1691	4132
2012-13	2263	1721	3984	7261	0	7261	9524	1721	11245
2013-14	2105	1622	3727	3335	3242	6577	5440	4864	10304
2014-15	2012	1516	3528	7082	6939	14021	9034	8455	17549
2015-16	1927	1734	3661	2980	1742	4722	4907	3476	8383
2016-17	2051	1642	3693	2206	1915	4121	4257	3557	7814

Source: AISHE

9.2.2 Enrolment in Ph.D Level

Vidyasagar University is found to produce moderate number of Ph.Ds over years. It is found that ninety eight students have taken registration in Vidyasagar University in 2016-17 and ninety three students awarded in the same year. Growth rate of Ph.D students taking registration is found to fall in recent years (Table 9.2). Of the total scholars awarded Ph.D degree, 25% of scholars are found female.

Table 9.2: Number of Ph.D Students' Registration and Awarded in Vidyasagar University

	Registration			Awarded		
	Arts and Commerce	Science	Total	Arts and Commerce	Science	Total
2010-11	80	189	269	16	22	38
2011-12	120	175	295	7	24	31
2013-14			106			94
2014-15	107	81	188	20	32	52
2015-16	71	97	168	2	60	80
2016-17	43	55	98	33	60	93

Source: Annual Report of Vidyasagar University

At Ph.D level in Vidyasagar University, the number of students enrolled in Science (55) stream is higher than that in Arts and Commerce (43) in 2016-17. Also number of students awarded in Science (60) stream is higher in Arts and Commerce (33). At Ph.D level in Vidyasagar University, share of male students enrolled and awarded are higher than that of female (Table 9.3).

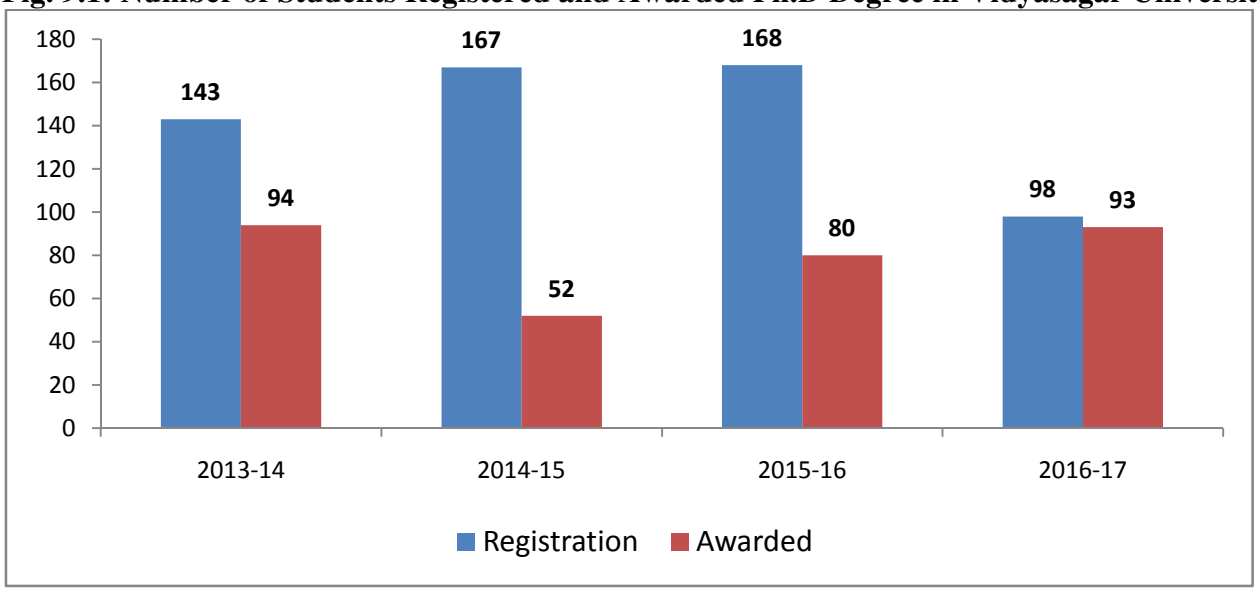
Table 9.3: Gender-wise Ph.D. Students' Registration and Awarded in Vidyasagar University in 2016-17

Stream	Registration			Awarded		
	Male	Female	Total	Male	Female	Total
Arts and Commerce	24	19	43	24	9	33
Science	40	15	55	44	16	60
Total	64	34	98	68	25	93

Source: Annual Report of Vidyasagar University, 2016-2017

Number of students registered and awarded in Ph.D. in Vidyasagar University is shown in Fig. 9.1. In recent years, the gap between those has fallen.

Fig. 9.1: Number of Students Registered and Awarded Ph.D Degree in Vidyasagar University



Source: Annual Report, VIdyasagar University

9.2.3 Number of Teachers in Vidyasagar University

Year-wise number of teachers working in Vidyasagar University is given in Table 9.4. Over years, growth rate of employment of teachers is rising but at very low rate. In 2015-16, number of teachers was 165. Out of total teachers, male teachers were 130 and female teachers were 35 i.e. 78.8 per cent teachers were male in Vidyasagar University in 2015-16.

Table 9.4: Number of Teachers in Vidyasagar University by Years

Year	Male	%	Female	%	Total
2011-12	107	84.3	20	15.7	127
2012-13	125	78.1	35	21.9	160
2013-14	129	78.2	36	21.8	165
2014-15	126	77.3	37	22.7	163
2015-16	130	78.8	35	21.2	165

Source: AISHE

Number of teachers by levels in Vidyasagar University in 2016-17 is shown in Table 9.5. The total number of approved posts of teachers in 2016-17 was 161 and the actual number of teachers were 131 ie.e 18.6 per cent teachers was found vacant. Out of total teachers in position; 13 teachers were in the positions of professor, 21 teachers were associate professors and 97 teachers were assistant professors. The contractual teachers in Vidyasagar University were 16 in 2016-17.

Table 9.5: Number of Teachers in Vidyasagar University in 2016-17

	Professor	Associate Professor	Assistant Professor	Total
Sanctioned post	17	31	113	161
In position	13	21	97	131
Vacant post	4	10	16	30
Contractual teachers			16	16

Source: Annual Report of Vidyasagar University (2016-2017 and 2010-2011)

9.2.4 Number of Officers in Vidyasagar University

Year-wise number of administrative officers in Vidyasagar University is shown in Table 9.6. Over time, number of officers is found rising but at very slow rate. The number of sanctioned posts of officers in Vidyasagar University was 25 and in position the number was 21 in 2016-17 i.e. 16 per cent post are vacant in 2016-17.

Table 9.6: Number of Officers in Vidyasagar University by Years

Year	Sanctioned post	In position	Vacant	Officer contractual
2010-11	13	9	4	0
2011-12	23	18	5	0
2013-14	24	19	5	0
2014-15	24	19	5	0
2015-16	25	19	5	0
2016-17	25	21	4	2

Source: Annual Report of Vidyasagar University

9.2.5 Number of Non- Teaching Staff in Vidyasagar University

Year-wise number of non-teaching staff in Vidyasagar University is shown in Table 9.7. Over time number of non-teaching posts is almost stagnant. In 2016-17, number of sanctioned posts of non-teaching staff in Vidyasagar University is 139 and in position the number was 118 i.e. 15 per cent post are vacant in 2016-17.

Table 9.7: Number of Non-Teaching Staff in Vidyasagar University by Years

Year	Sanctioned post	In position	Vacant	Contractual
2010-11	135	129	6	16
2011-12	135	126	9	16
2013-14	135	126	7	37
2014-15	135	126	9	37
2015-16	139	123	8	37
2016-17	139	118	21	37

Source: Annual Report of Vidyasagar University

9.2.6 Books and Journals in the Library and Internet Facilities

The Central Library of Vidyasagar University started in in the year 1986 with the commencement of six post graduate departments. The library has a collection of more than 1 lakh volumes which includes Text Books; Reference Books and Bound volumes of Journals, Standards etc (Table 9.8). Collection development, its organization and information retrieval are the basic functions of the library. The book collection has been supporting the teaching, research, development and other professional activities of the University. The central library of Vidyasagar University, being a member of UGC-Infonet Digital Library Consortium, provides online access to more than 7 thousand peer-reviewed full text journals and database services. It has also a good collection of electronic books in its Digital Resource Centre.

Table 9.8: Year-wise of Books and Journals of Vidyasagar University Library

Year	Books	Journals	Theses	e-Journals	e-books
2010-11	79851	125	253	5000*	50000*
2011-12	99140	92	326	5000*	50000*
2013-14	99140	92	326	5000*	
2014-15	110618	112	555	5000*	
2015-16	110688	100	555	8000*	
2016-17	113910	96	733	8000*	602

Source: Annual Report of Vidyasagar University
**approx*

With the developments in Information and Communication Technologies, the behavioural characteristics of the users of library have been changing rapidly and the library is trying its best to adapt with the technological advancement. The Central Library has developed computer based information storage and retrieval system in the multi-user environment using SOUL software; an Integrated Library management software package. The identity of all books and the library users are fully bar-coded and all Library house-keeping operations like, acquisition, cataloguing, circulation and periodicals services have been automated with the help of SOUL software package. The book

database is accessible through OPAC (Online Public Access Catalogue) and other information relating to library is given in the Table 9.9.

In 2016-17, total number of desktop computers was 1190, total number of laptop was 135, total number of VLAN was 56, total number of LAN is1200, number of computer access to internet was 1150, total number of Wi Fi access point was 85 and total number of device under Wi Fi system was 1500.

Table 9.9: Total Number of Computers and Other related Information in Vidyasagar University

	Desktop computer	Laptop	Number of VLAN	Number of Computer under LAN	Number of Computer Access to Internet	Number of LAN / Internet users	Wi Fi access point	Number of Devices under Wi Fi system
2010-11	410		22	400*	350*	2000*		
2011-12			22			2000*		
2013-14	519		22	310	310	2100*		
2014-15	966	113	44	800	800	2500*		
2015-16	1250*	125*	56	1200*	1150*	3500*	64	900*
2016-17	1190*	135*	56	1200*	1150*	3500*	85	1500*

Source: Annual Report of Vidyasagar University (2016-2017 and 2010-2011)
**approx*

9.2.7 Quarters and Hostel Facilities in Vidyasagar University

There were 92 Staff Quarters in Vidyasagar University in 2016-17(56 teaching staff quarter, 36 non-teaching staff quarter) (Table 9.10). There were two Boys' Hostels (300 intake capacities and 300 residing) and 2 Girls Hostel (302 intake capacities and 302 residing) in their Vidyasagar University in year 2016-17(Table 9.11).

Table 9.10: Number of Staff Quarters in Vidyasagar University

Year	Total Staff Quarter	Teaching Staff Quarter	Non-teaching Staff Quarter
2011-12	92	56	36
2012-13	92	56	36
2013-14	92	56	36
2014-15	92	56	36
2015-16	92	56	36
2016-17	92	56	36

Source: AISHE, Various Years

Table 9.11: Hostel Facilities at a Glance in Vidyasagar University

	Boys Hostel			Girls Hostel			Total Hostel		
	Number	Intake Capacity	Residing	Number	Intake Capacity	Residing	Number	Intake Capacity	Residing
2011-12	1	172	172	1	165	165	2	337	337
2012-13	1	172	172	2	223	223	3	395	395
2013-14	2	300	300	2	302	302	4	602	602
2014-15	2	300	300	2	302	302	4	602	602
2015-16	2	300	300	2	302	302	4	602	602
2016-17	2	300	300	2	302	302	4	602	602

Source: AISHE Various Years

9.2.8 Courses and Course Fees in Vidyasagar University

9.2.8.1 Post Graduate Courses and Course Fees in Distance Education

Distance education has become one powerful medium of obtaining degrees for large number of students who are staying in far off and remote areas and for whom accessing universities on regular basis is still a dream. Subject-wise fees structure in distance mode in Vidyasagar University is given in Table 9.12.Average annual fees for studying in Science stream is Rs. 20, 350 and Rs. 10,300 for Commerce and Arts stream in Vidyasagar University.

Table 9.12: Post-graduate Fees Structure and Courses of Vidyasagar University in Distance Education in 2016-17

	Courses	Subject	Fees (Rs.)	Duration (Yrs.)
1	Master of Commerce [M.Com]	Commerce	10300	2
2	Master of Science [M.Sc]	Physics	20350	2
		Zoology	20350	2
		Chemistry	20350	2
		Botany	20350	2
		Geography	20350	2
		Applied Mathematics	20350	2
		Environmental Science	20350	2
3	Master of Arts [MA]	Bengali	10300	2
		English	10300	2
		History	10300	2
		Political Science	10300	2
		Sanskrit	10300	2

Source: www.getmyuni.com/college/vidyasagar-university-distance-education-courses-fees

9.2.8.2 Post Graduate Courses and Course Fees in Regular Mode

Course and subject-wise fees structure in regular mode in Vidyasagar University is given in Table 9.13. Some subjects are running on self financing mode. Self finance courses in Vidyasagar University in 2016-17 were MBA, Clinical Nutrition and Dietetics, Bio-Medical Laboratory Science

and Management, Computer Science, Electronics, Fisheries Science, Microbiology, Remote Sensing and GIS and MCA.

Table 9.13: Fees Structure in PG Courses of Vidyasagar University- Regular Mode

	Courses	Subject	Fees	Duration
1	Certificate Course	Basic and Advanced Java	7410	1 Yr.
2	Master of Business Administration [MBA]		63245	2Yr.
3	Master of Commerce [M.Com]		2645	2 Yr.
4	Master of Science [M.Sc]	Clinical Nutrition and Dietetics	43265	2 Yr.
		Anthropology	3795	2 Yr.
		Applied Mathematics with Oceanology and Computer Programming	3545	2 Yr.
		Botany and forestry	3795	2 Yr.
		Bio-Medical Laboratory Science and Management	53265	2 Yr.
		Chemistry and Chemical Technology	3795	2 Yr.
		Computer Science	55265	2 Yr.
		Electronics	63265	2 Yr.
		Fisheries Science	43265	2 Yr.
		Geography and Environment Management	3845	2 Yr.
		Human Physiology with Community Health	3795	2 Yr.
		Microbiology	63265	2 Yr.
		Physics and Techno-Physics	3945	2 Yr.
		Remote Sensing and GIS	43265	2 Yr.
		Zoology	3795	2 Yr.
5	Master of Arts [MA]	Economics with Rural Development	2645	2 Yr.
		Bengali	2495	2 Yr.
		English	2495	2 Yr.
		Hindi	2495	2 Yr.
		History	2495	2 Yr.
		Philosophy	2495	2 Yr.
		Political Science with Rural Administration	2495	2 Yr.
		Sanskrit	9115	2 Yr.
		Santali	2495	2 Yr.
		Sociology	9115	2 Yr.
6	Master of Library and Information Science [M.Lib.I.Sc]		2450	1Yr.
7	Master of Social Work [MSW]		2575	2Yr.
8	Master of Computer Application [MCA]		80380	3Yr.
9	Post Graduate Diploma	Quality Control and Assurance in Microbial Technology	6090	1Yr.
		Applied Computer Science	20410	1Yr.
		Office Automation and Internet Technologies	4500	1Yr.
		Advanced Hardware and Networking Administration	18410	1Yr.

Source: http://vidyasagar.ac.in/Files/Admission/Fees.pdf

9.2.9 Seats for Post Graduate Courses in Vidyasagar University (V.U Campus and Affiliated Colleges)

Intake capacity of Vidyasagar University for the subjects in 2016-17 is given in Table 9.14. Total intake capacity in 41 subjects in Vidyasagar University was 4,693. These seats were located in Vidyasagar University Campus and affiliated colleges under Vidyasagar University. Bengali has the maximum seats (683) in Vidyasagar University in 2016-17 followed by Sanskrit (335) and English (334). In science streams maximum seats are allotted in Chemistry (189) followed by Mathematics (181), Zoology (147) and Physics (131).

Table 9.14: Intake Capacity in PG Courses in 2016-2017

Sl. No	Subject	Institutes	Intake Capacity
1.	Bengali	VU campus	110
		Midnapore College	54
		Jhargram Raj College	34
		Kharagpur College	58
		Tamralipta Mahavidyalaya	54
		Ghatal Rabindra Satabarshiki Mahavidyalaya	49
		Panskura Banamali College	55
		Prabhat Kumar College,Contai	44
		Belda College	54
		Egra S.S.B. Mahavidyalaya	44
		Mahishadal Raj College	44
		Vivekananda Mission Mahavidyalaya	39
		Pingla Thana Mahavidyalaya	44
2.	Commerce	VU campus	100
		Prabhat Kumar College	44
		Vivekananda Mission Mahavidyalaya	34
		Pingla Thana Mahavidyalaya	24
3.	MBA	VU campus	62
		Eastern Institute for Integrated Learning in Management	360
4.	Economics	VU campus	69
5.	English	VU campus	110
		Midnapore College	42
		Ghatal Rabindra Satabarshiki Mahavidyalaya	42
		Prabhat Kumar College,Contai	44
		Belda College	54
		Mahishadal Raj College	42
6.	History	VU campus	110
		Midnapore College	52
		Tamralipta Mahavidyalaya	44
		Panskura Banamali College	44
		Vivekananda Mission Mahavidyalaya	34

7.	Philosophy	VU campus	110
		Vivekananda Mission Mahavidyalaya	34
8.	Political Science	VU campus	95
		Midnapore College	52
9.	MLISc	VU campus	17
10.	BLISc	VU campus	38
11.	Sanskrit	VU campus	100
		Midnapore College	44
		Tamralipta Mahavidyalaya	44
		Ghatal Rabindra Satabarshiki Mahavidyalaya	59
		Prabhat Kumar College,Contai	44
		Bajkul Milani Mahavidyalaya	44
12.	Sociology	VU campus	64
13.	Santali	VU campus	54
14.	Hindi	VU campus	54
15.	Anthropology	VU campus	54
16.	Applied Mathematics	VU campus	84
		Midnapore College	24
		Ghatal Rabindra Satabarshiki Mahavidyalaya	22
		Panskura Banamali College	29
		Mahishadal Raj College	22
17.	Fishery Science	VU campus	34
18.	Botany	VU campus	59
		Midnapore College	22
19.	Bio-Medical	VU campus	34
20.	Chemistry	VU campus	59
		Midnapore College	29
		Jhargram Raj College	24
		Panskura Banamali College	29
		Mahishadal Raj College	24
		Haldia Govt. College	24
21.	Computer Science	VU campus	39
		Panskura Banamali College	24
22.	Electronics	VU campus	29
23.	Geography	VU campus	69
		Panskura Banamali College	24
		Haldia Govt. College	24
24.	Human Physiology	VU campus	44
		Midnapore College	24
25.	MCA	VU campus	50
26.	Microbiology	VU campus	34
27.	Physics	VU campus	59
		Midnapore College	24
		Panskura Banamali College	24
		Prabhat Kumar College, Contai	24
28.	Remote Sensing and GIS	VU campus	49
29.	Zoology	VU campus	49
		Midnapore College	24

		Jhargram Raj College	24
		Tamralipta Mahavidyalaya	24
		R.N.L.Khan Women's College	26
30.	Clinical Nutrition and Dietetics	VU campus	29
		Vidyasagar Institute of Health	44
31.	P.G. Diploma Quality Control And Assurance and Microbial Technology	VU campus	19
32.	Rural Management	Bhatter College, Dantan	34
33.	Education	Sevayatan Sikshan Mahavidyalaya	50
34.	M.P.Ed	Mugberia Gangadhar Mahavidyalay	40
35.	M.Ed.	Yogada Satsanga Palpara Mahavidyalaya	35
36.	MSW	Mahishadal Girls' College	42
37.	Biochemistry	Oriental Institute of Science and Technology	64
38.	Biotechnology	Oriental Institute of Science and Technology	64
39.	Master of Social Work	Vidyasagar School of Social Work	54
		AMIK, Institute of Management Science and Technology Durgapur	54
40.	Psychological Counselling	Vidyasagar School of Social Work	29
41.	L.L.M	Haldia Law College	27

Source: Prospectus (2016-17) of Vidyasagar University

9.2.10 Results in Post Graduates Courses in Vidyasagar University

Total students appeared and passed in post graduate level in Vidyasagar University have been classified in six streams viz – Master of Arts (M.A), Master of Science (M.Sc), Master of Commerce (M.Com), Master of Business Administration (MBA), Master of Computer Science (MCA) and M.Phil (Table 9.15). In Master of Arts (M.A.), 1671 students appeared and 1657 students were passed i.e. 99.16 per cent students passed in this category. In Master of Science (M.Sc), 974 students appeared and 969 students were passed i.e. 99.49% students passed in this category. The total number of students appeared and passed in Vidyasagar University under all categories were 3055 and 2998 respectively. Therefore, 98.13% students appeared in Vidyasagar University under different disciplines were passed.

Table 9.15: Result of Post Graduate Courses of the Vidyasagar University (Stream-wise) (V.U Campus and Affiliated Colleges)

		2016			2010		
Sl. No	**Course**	**Appeared students**	**Passed Students**	**% of Passed Candidates**	**Appeared students**	**Passed Students**	**% of Passed Candidates**
1	Master of Arts (M.A)	1671	1657	99.16	825	816	99.91
2	Master of Science (M.Sc)	974	969	99.49	807	804	99.63
3	Master of Commerce (M.Com)	87	83	95.4	46	41	89.13
4	Master of Business Administration (MBA)	267	233	87.27	16	16	100
5	Master of Computer Science (MCA)	44	44	100			
6	Master of Philosophy (M.Phil) in Political Science with Rural Administration	12	12	100			
	Total	3055	2998	98.13			

Source: Annual Report of Vidyasagar University (2016-2017 and 2010-2011)

9.2.11 Subject-wise Results of Post Graduate Courses

The total number of students appeared at post graduate level in major subjects is given in Table 9.16. The total number of students appeared and passed were 2025 and 1973 respectively in Arts and Commerce courses. There were 18 subjects under this category. Out of this, the highest number of students appeared in Bengali (546 students) followed by Business Administration (267 students), Sanskrit (251 students), History (212 students) and English (183 students). In some subjects, 100% students passed in 2016 - Economics, Education, Hindi, B.Lib.I.Sc. L.L.M, M.Lib. I.Sc, MSW, Santali and Sociology.

Table 9.16: Results of Post Graduate (Subject-wise) Examination - 2016 (Arts and Commerce) (V.U Campus and Affiliated Colleges)

Sl. No	**Subject**	**Appeared**	**Passed**	**% of Passed Candidates**
1	Bengali	546	542	99.3
2	Business Administration	267	233	87.3
3	Commerce with Farm Management	87	83	95.4
4	Economics with Rural Development	14	14	100.0
5	English	183	182	99.5
6	Education	42	42	100.0
7	Hindi	9	9	100.0
8	History	212	211	99.5

9	B.Lib.I.Sc.	30	30	100.0
10	L.L.M	4	4	100.0
11	M.LibI.Sc.	16	16	100.0
12	Master of Social Work (MSW)	57	57	100.0
13	Philosophy and the Life-World	126	125	99.2
14	Political Science with Rural Administration	77	76	98.7
15	Psychological Counselling (Diploma)	10	7	70.0
16	Sanskrit	251	248	98.8
17	Santali	46	46	100.0
18	Sociology	48	48	100.0
	TOTAL	2025	1973	97.4

Source: Annual Report of Vidyasagar University (2016-2017)

In Science stream at post graduate level 1,108 students appeared and 1,013 students passed in Vidyasagar University in 2016. There were 20 subjects under this category as mentioned in Table 9.17. Highest number of students appeared in Chemistry (123 students), followed by Zoology (105 students) Mathematics (104) and Physics. Overall, 99.5% students passed in Science stream in Vidyasagar University. In most of the subjects, 100% students passed in 2016 except Human Physiology with Community Health (97.4%), Physics and Techno physics (98.0%) and Zoology (98.1%).

Table 9.17: Results of Post Graduate (Subject-wise) Examination - 2016 (Science) (V.U Campus and Affiliated Colleges)

Sl. No	Subject	Appeared	Passed	% of Passed Candidates
1	Anthropology	31	31	100.0
2	Applied Mathematics with Oceanology and Computer Programming	104	104	100.0
3	Fisheries Science	21	21	100.0
4	Bio-Medical Laboratory Science and Management	19	19	100.0
5	Bio-Chemistry	24	24	100.0
6	Bio-Technology	37	37	100.0
7	Botany and Forestry	53	53	100.0
8	Chemistry and Chemical Technology	123	123	100.0
9	Computer Science	52	52	100.0
10	Clinical Nutrition and Dietetics	32	32	100.0
11	Electronics	25	25	100.0
12	Geography and Environment Management	83	83	100.0
13	Human Physiology with Community Health	39	38	97.4
14	Master of Computer Application (MCA)	44	44	100.0
15	Microbiology	31	31	100.0
16	Nutrition and Dietetics	40	40	100.0

17	Physics and Technophysics	100	98	98.0
18	Remote Sensing and GIS	44	44	100.0
19	Zoology	105	103	98.1
20	Diploma in Quality Control and Assurance in Microbial Technology	11	11	100.0
	Total	1018	1013	99.5

Source: Annual Report of Vidyasagar University (2016-2017)

Number of applicants in different PG Courses in Vidyasagar University, 2018 is presented in Table 9.18. This table presents demands for the different subjects at P.G. level of Vidyasagar University. The demand ratio is highest for Chemistry followed by Geography and Physics. The demand ratio is found low for the subjects like Hindi, Economics, and Sociology etc.

Table 9.18: Number of Applicants in Different PG Courses in Vidyasagar University, 2018

Subject	**No. Of Applicants**	**No. of seats**	**Ratio (Applicatios/Seats)**
Bengali	1266	130	9.7
Commerce with Farm Management	149	118	1.3
Economics with Rural Development	52	82	0.6
English	1101	130	8.5
Hindi	7	63	0.1
History	515	130	4.0
B.Lib.I.Sc.	271	38	7.1
M.Lib.I.Sc.	35	16	2.2
Philosophy and the Life-World	214	130	1.6
Political Science with Rural Administration	205	112	1.8
Sanskrit	501	118	4.2
Santali	64	63	1.0
Sociology	66	75	0.9
Santhali	64		
Anthropology	109	63	1.7
Applied Mathematics with Oceanology and Computer Programming	794	100	7.9
Fisheries Science	116	37	3.1
Bio-Medical Laboratory Science and Management	77	37	2.1
Botany and Forestry	493	70	7.0
Chemistry and Chemical Technology	931	70	13.3
Computer Science	156	42	3.7
Clinical Nutrition and Dietetics	287	37	7.8
Electronics	54	30	1.8
Geography and Environment Management	1073	81	13.2
Human Physiology with Community Health	164	52	3.2
Microbiology	179	37	4.8
Physics and Technophysics	891	70	12.7

Remote Sensing and GIS	355	58	6.1
Zoology	658	58	11.3

Source: Annual Report of Vidyasagar University

Number of applicants in different M. Phil Courses in Vidyasagar University in 2018 is presented in Table 9.19. The Table depicts demands for the different subjects at M.Phil. level in Vidyasagar University. The Table reveals that the highest demand is for the subject Bengali followed by Sanskrit, History.

Table 9.19: Number of Applicants in Different M. Phil Courses in Vidyasagar University, 2018

M. Phil	No. Of Applicants	No. of Seats	Ratio
Anthropology	28	15	1.9
Bengali	173	15	11.5
Commerce	17	15	1.1
Computer Science	32	15	2.1
Economics	16	15	1.1
English	112	15	7.5
Hindi	26	15	1.7
History	111	15	7.4
Life Science	89	15	5.9
Philosophy	94	15	6.3
Pol. Science	50	15	3.3
Sanskrit	157	15	10.5
Santali	77	15	5.1
Women Studies	109	15	7.3

Source: Annual Report of Vidyasagar University

9.3 Under Graduate Education in Vidyasagar University

9.3.1 Colleges and Centres in Vidyasagar University

There are three main types of tertiary institution in India: 1) universities and university-level institutions, 2) colleges and 3) diploma-awarding institutions. Indian higher education as well as West Bengal higher education System higher education is the affiliated college system. The vast number of students study in colleges which are affiliated to Vidyasagar University. These colleges do not have their own degree awarding powers. They deliver the courses, curricula and examinations specified and regulated by their Vidyasagar University. There were 101 affiliated colleges in Vidyasagar University in 2016-17. There were seven recognized centres, one regional centre and one study centre, four faculties and twenty nine departments in Vidyasagar University (Table 9.20).

Table 9.20: Number of Affiliated Colleges and Centers in Vidyasagar University

Year	Affiliated Colleges	Recognized Centers	Regional Centers	Study Centers	Faculties or Schools	Departments
2011-12	60	11	1	1	3	28
2012-13	64	7	1	1	4	30
2013-14	64	7	1	1	4	31
2014-15	71	7	1	1	4	29
2015-16	78	7	1	1	4	29
2016-17	101	7	1	1	4	29

Source: AISHE

Year-wise number of various types of colleges / institutions under Vidyasagar University is shown in Table 9.21.

Table 9.21: Year-wise Various Types of Colleges/ Institutions under Vidyasagar University

Year	General Colleges	Government Colleges	Girls' Colleges	Professional Colleges (B.Ed)	Law Colleges	Paramedical Colleges	Colleges with affiliated courses
2010-11	41	2	3	17	3	5	12
2011-12	43	2	3	17	3	5	12
2013-14	43	2	3	26	3	5	16
2014-15	47	6	4	28	4	4	16
2015-16	41	12	4	32	4	4	
2016-17	42	12	4	32	4	4	9

Source: Annual Report of Vidyasagar University

9.3.2 Enrolment in Under Graduate Level

The number of undergraduate students in Vidyasagar University is significant. In 2016-17, 52,989 students were enrolled as against 45,064 in previous year in different under-graduate courses in Vidyasagar University (Table 9.22). The enrolment of women undergraduate students at 2016-17 was 29,068, constituting 54.8 per cent of the total enrolment. Of the total enrolment in under-graduate course in 2016-17, 10260 students were of scheduled category and 7514 students were of OBC category.

Table 9.22: Number of UG Students Registered in Vidyasagar University in 2016-17

Year	Male	Female	Total	SC	ST	OBC	PH
2013-14	24523	20541	45064	6626	2907	3941	141
2014-15	25254	22992	48246	6726	2961	5112	94
2015-16	24408	26944	51352	7403	2890	6456	102
2016-17	23921	29068	52989	7212	3048	7541	61

Source: Annual Report of Vidyasagar University

9.3.3 Results in Under Graduate Courses in Vidyasagar University

Total students appeared and passed at under-graduate level in Vidyasagar University have been presented in Table 9.23 under thirteen streams - Bachelor of Arts (Hons), Bachelor of Science (Hons), Bachelor of Commerce (Hons), Bachelor of Arts (Gen), Bachelor of Science (Gen), Bachelor of Commerce (Gen), Bachelor of Arts (Major), Bachelor of Science (Major), B C A (Semester System), L.L.B 3yrs. (Semester System), L.L.B 5yrs. (Semester System), Bachelor of Social Work (Hons), Special B. (Semester System). The total number of students appeared and passed for all those were 22326 and 20818 respectively. Therefore, 93.3% students passed in 2016 in Vidyasagar University in UG Courses. Out of the total appeared of 22,326 students, a majority of 9443 students are appeared at Bachelor of Arts (Hons) stream (42.3%). If we compare the years 2010 and 2016 as given in the Table, we find that there has been substantial increase in the number of students for the courses.

Table 9.23: Results of the Final Examinations of UG Courses of the Vidyasagar University

		2016			2010		
Sl. No	**Name of the Examinations**	**Appeared students**	**Passed Students**	**% of Passed Candidates**	**Appeared students**	**Passed Students**	**% of Passed Candidates**
1	Bachelor of Arts …Honours	9443	9000	95.3	7619	7351	96.5
2	Bachelor of Science …Honours	3342	3070	91.9	1715	1616	94.2
3	Bachelor of Commerce…Honours	545	532	97.6	347	344	99.1
4	Bachelor of Arts …General	7587	6925	91.3	6402	5906	92.3
5	Bachelor of Science …General	721	687	95.3	328	303	92.4
6	Bachelor of Commerce…General	151	133	88.1	136	133	97.8
7	Bachelor of Arts …Major	20	20	100.0	41	41	100.0
8	Bachelor of Science …Major	90	90	100.0	29	29	100.0
9	B C A (Semester System)	177	117	66.1			
10	L.L.B 3yrs. (Semester System)	164	162	98.8			
11	L.L.B 5yrs. (Semester System)	49	45	91.8			
12	Bachelor of Social Work (Hons.) (Semester System)	13	13	100.0			
13	Special B. (Semester System)	24	24	100.0			
	Total	22326	20818	93.3			

Source: Annual Report of Vidyasagar University (2016-2017 and 2010-2011)

9.3.4 Estimation of Drop-Out from College Education

We have tried to estimate the drop-out from colleges in Vidyasagar University. We have presented in Table 9.24 college-wise enrolment in Vidyasagar University for 1st year and 3rd year. From the percentage of enrolment in 3rd year in terms of 1st year enrolment, we can make an assessment of drop-out in higher education. The Table reveals that a large number of students are dropping out from higher education at college level. The average estimated drop out rate in colleges varies from 18.7% to 83.6% with avaerge being 52.9%. Estimated drop out rate has been calculated as 100% - Percentage of Enrolment in 3rd year in terms of 1st Yr.

Table 9.24: College-wise Enrolment in Vidyasagar University

Sl.No.	Colleges	Total Enrolment in First Year	Total Enrolment in 3rd year	Percentage of Enrolment in 3rd year in terms of 1st Yr.	Estimated Drop Out Rate
1	Bajkul Milani Mahavidyala	1586	896	56.5	43.5
2	Belda College	1673	802	47.9	52.1
3	Bhattar College, Dantan	1102	570	51.7	48.3
4	Chandrakona V. Mahavidyala	1242	458	36.9	63.1
5	Debra Thana S K S Mahavidyala	1690	870	51.5	48.5
6	Deshpran Mahavidyala	543	123	22.7	77.3
7	Egra S. S. B. College	1557	972	62.4	37.6
8	Garhbeta College	1925	702	36.5	63.5
9	Gourav Guin Momorial College	650	216	33.2	66.8
10	Hijli College	349	214	61.3	38.7
11	K. D. College of Commerce and General Studies	537	313	58.3	41.7
12	Kharagpur College	1539	852	55.4	44.6
13	Khejuri College	679	299	44	56
14	Maharaja Nandakumar Mahavidyala	419	210	50.1	49.9
15	Mahishadal Girl's College	568	462	81.3	18.7
16	Mahishadal Raj College	1629	797	48.9	51.1
17	Midnapore College	1739	940	54.1	45.9
18	Moyna College	807	400	49.6	50.4
19	Mugberia Gangadhar College	902	441	48.9	51.1
20	Narajole Raj College	626	332	53	47
21	Panskura Banamali College	3412	1718	50.4	49.6

22	Pingla Thana Mahavidyalaya	1005	753	74.9	25.1
23	Prabhat kumar College, Contai	1938	1513	78.1	21.9
24	Rabindra Bharati Mahavidyala	159	26	16.4	83.6
25	Rabindra Satanarsiki Mahavidyalaya	2268	1202	53	47
26	Raja N L Khan Women's College	879	695	79.1	20.9
27	Ramnagar College	1310	640	48.9	51.1
28	Sabang Sajanikanta Mahavidyalaya	1475	628	42.6	57.4
29	Sankrail Anil Biswas Smriti Mahavidyalaya	704	338	48	52
30	Santal Bidroha Sardha Satabarshaki Mahavidyalaya	710	211	29.7	70.3
31	Sava Bharati Mahavidyalaya, kapgari	670	149	22.2	77.8
32	Silda Chandra Sekhar College	751	217	28.9	71.1
33	Sitananda College, Nandigram	757	284	37.5	62.5
34	Subrnarekha Mahavidyalaya	1240	405	32.7	67.3
35	Sukumar Sengupta Mahavidyalaya	1181	744	63	37
36	Tamralipta Mahavidyalaya	1584	485	30.6	69.4
37	V.S. Mahavidyalaya, Manikpara	934	199	21.3	78.7
38	V.M. Mahavidylaya, Chitanyapur	1058	446	42.2	57.8
39	Y.S. Palpara Mahavidyalaya	928	472	50.9	49.1
40	Jharagram Raj College	1032	278	26.9	73.1

Source: Own Calculation Based on Datta of Vidyasagar University

In Table 9.25 we have presented percentage of passed students in colleges with resepect to intake capacity in honours subjects. This Table also helps us to understand the drop out in honours courses in West Bengal.

Table 9.25: College-Wise Percentage of Passed Students to Intake Capacity in Honours Subjects

College Name	Percentage of Passed out of Intake Capacity
Bajkul Milani Mahavidyalaya	33.4
Belda College	29.7
Bhattar College	28.4
Chaipat S.P.B. Mahavidyalaya	44.8
Chandrakona Vidyasagar Mahavidyalaya	36.7
Debra Thana S.K.S. Mahavidyalaya	36.7
Deshapran Mahavidyalaya	33.8
Egra Sarada Sashi Bhusan College	46.0

Garhbeta College	29.8
Gourav Guin Memorial College	33.9
Haldia Government College	28.1
Hijli College	17.0
Jhargram Raj College	29.0
K D College of Commerce	60.0
Kharagpur College	35.5
Khejuri College	36.0
Maharaja Nandakumar Mahavidyalaya	41.6
Mahisadal Raj College	31.7
Mahishadal Girls' College	26.5
Midnapore College	58.3
Moyna College	30.8
Mugberia Gangadhar Mahavidyalaya	31.3
Narajole Raj College	32.5
Panskura Banamali College	44.1
Pingla Thana Mahavidyalaya	27.3
Prabhat Kumar College	38.2
Rabindra Bharati Mahavidyalaya	27.7
Rabindra Satabarshiki Mahavidyalaya	37.6
Raja N.L.Khan Women College	45.8
Ramnagar College	36.9
Sabang Sajani Kanta Mahavidyalaya	27.5
Sankrail A.B. Smriti Mahavidyalaya	31.5
Santal Bidroha Satabarshiki Mahavidyalaya	31.1
Seva Bharati Mahavidyalaya	20.8
Silda Chandra Sekhar College	21.9
Sitananda College	27.5
Subarnarekha Mahavidyalaya	45.8
Sukumar Sengupta Mahavidyalaya	53.3
Tamralipta Mahavidyalaya	36.7
Vivekananda Mission Mahavidyalaya	31.5
Vivekananda Satabarshiki Mahavidyalaya	21.5
Yogada Satsang Palpara Mahavidyalaya	32.8

Source: Office, Vidyasagar University

9.3.5 Block-wise Presence of Colleges

Colleges under Vidyasagar University fall under two districts namely Purba Medinipur and Paschim Medinipur. Block-wise number of Colleges in the two districts of Purba Medinipur and Paschim Medinipur is presented in the Table 9.26. As we see from the Table, there one Block in Paschim Medinipur district that is without any college. There are eight Blocks in Purba Medinipur district that are without any colleges. At these blocks, initiatives may be taken up for setting up new colleges.

Table 9.26: Block-wise Colleges in the District of Paschim Medinipur

Sl. No.	Block	Name of the College
1	Jhargram	Jhargram Raj College
	Jhargram	V.S. Mahavidyalaya
2	Binpur-I	Lalgarh Government College
3	Binpur-II	Shilda C.S. College
4	Jamboni	Seva Bharati Mahavidyalaya
5	Nayagram	Nayagram Pandit Raghunath Murmu Government College
6	Sankrail	Sukumar Sengupta Mahavidyalaya
7	Gopiballavpur-I	Subarnarekaha Mahavidyalaya
8	Gopiballavpur-II	Beliabera Government College
9	Salbani	Government General Degree College at Salboni
10	Keshpur	Sukumar Sengupta Mahavidyalaya
11	Garbeta-I	Garhbeta College
12	Garbeta-II	Santal Bidroha Sardha Satabarshiki Mahavidyalaya
13	Garbeta-III	Gourav Guin Memorial College, Chandrakon Road
14	Midnapore	Midnapore College
	Midnapore	Raja N.L. Khan Women's College
	Midnapore	K.D. College of Commerce
15	Debra	Debra Thana S.K.S. Mahavidyalaya
16	Pingla	Pingala Thana Mahavidyalaya
17	Keshiary	Keshiary Government College
18	Datan-I	Bhatter College
19	Datan-II	Kashmuli Government College
20	Narayangarh	Belda College
21	Mohanpur	Government General Degree College, Mohanpur
22	Sabong	Sabang S.K.Mahavidyalaya
23	Kharagpur-I	Kharagpur College
		Hijili Colege
24	Kharagpur-II	Ambigeria Government College, Madpur
25	Chandrakona-I	
26	Chandrakona-II	Chandrakona V.Mahavidyalaya
27	Ghatal	R.S.Mahavidyalaya, Ghatal
28	Daspur-I	Narajole Raj College
29	Daspur-II	Chaipat Saheed Pradyot Bhattacharya Mahavidyalaya

Source: District Hand Book, Paschim Medinipore, Goverment of West Bengal

Table 9.27: Block-wise Colleges in the District of Purba Medinipur

Sl. No.	Name of the Block	Name of the College
1	Tamluk	Tamralipta Mahavidyalaya
	Tamluk	V.M.Mahavidyalaya
2	Sahid Matangini	Shahid Matangini Hazra Government College for Women
3	Panskura-I	
4	Panskura-II	Panskura Banamali College
		Siddhinath Mahavidyalaya
5	Moyna	Moyna College

6	Nandakumar	Maharaja Nandakumar Mahavidyalaya
7	Nandigram-III	
8	Mahishadal	Mahishadal Girl's College
	Mahishadal	Mahishadal Raj College
9	Nandigram-I	Sitananda College
10	Nandigram-II	
11	Sutahata	Vivekananda Mission Mahavidyalaya
12	Haldia	Haldia Govt. College
13	Potashpur-I	Y.S. Palpara College
14	Potashpur-II	
15	Bhagawanpur-I	Bajkul Milani Mahavydyalaya
16	Egra-I	Egra S.S.B. College
17	Egra-II	
18	Khejuri-I	
19	Khejuri-II	Khejuri College
20	Bhagawanpur-II	Mugberia G.Mahavidyalaya
21	Ramnagar-I	
22	Ramnagar-II	Ramnagar College
23	Contai-I	Prabhat Kumar College
24	Contai-II	
25	Contai-III	Deshapran Mahavidyalaya

Source: District Hand Book, Purba Medinipore, Goverment of West Bengal

9.4 Expenditure Pattern in Vidyasagar University

In this sub-section we have presented in brief the income and expenditure pattern of Vidyasagar University. We have presented income, expense and balance over income for different years in Vidyasagar University. As Table 9.28 reveals, the income of the University has increased form Rs. 15.13 crores to Rs.59.01 crores during 2007 to 2008. During the same period the expenditure of the University has increased from Rs.15,28 crores to Rs. 62.5 crores.The trend shows rising deficits in recent years.

Table 9.28: Expenditure Pattern of Vidyasagar University

Year	Income (Rs. Crore)	Expense (Rs. Crore)	Balance (Rs. Crore)
2007-08	15.1397	15.2877	-0.1480
2008-09	17.1926	17.7875	-0.5949
2009-10	25.9237	26.0772	-0.1535
2010-11	38.1313	38.3210	-0.1897
2011-12	30.9850	31.1165	-0.1315
2012-13	38.1287	39.4657	-1.3370
2013-14	65.1058	67.5616	-2.4558
2014-15	61.3163	64.1135	-2.7972
2015-16	60.8307	63.2497	-2.4191
2016-17	59.0161	62.5073	-3.4912

Source: Annual Report, Vidyasagar University

In Table 9.29, we have presented number of scholarships received by PG students in Vidyasagar University. This reveals that number of scholarships are being awared to the students for continuing higher education.

Table 9.29: Number of Scholarships Received by PG Students in Vidyasagar University

Sl.No.	Name of the Scholarship	Number of Awarded students
1	Swami Vivekananda Merit-cum Means Scholarship, Govt. of West Bengal	684
2	Single Girl Child scholarship by UGC	34
3	Rank Holdar Scholarship by UGC	34
4	Post Metrics Scholarship for Minority Students by West Bengal Minority Development and Finance Corporation Below 50%.....	75
5	Post Metrics Scholarship for SC/ST/OBC students for studies by Government of India	1068
6	West Bengal Handicapped Scholarship by the office of the District Mass Education Extension officer, Paschim Medinipur	15
7	Scholarship by National Handicapped finance and development corporation, Govt. of India	9
9	Sitaram Jindal Foundation scholarship	8
10	Inspire Scholarship by UGC	44
11	Scholarships under Beedi workers welfare Fund-Ministry of Labour and empoyement	23

Source: Office, Vidyasagar University

9.5 Conclusion

In this chapter, we have taken Vidyasagar University as case study. We have discussed various aspects of higher education of Vidyasagar University. We have selected the period of 2010 to 2016-17 to see the changes for some aspects related to enrolment at different levels, infrastructure facilities, course fee, teaching and non teaching staff etc. Of the total enrolment of 7814 in post-graduate course, 3693 students were enrolled in regular courses and the rest of the students enrolled in distance mode. The library has a collection of more than 1 lakh volumes Total intake capacity in 41 subjects in Vidyasagar University was 4,693. The average estimated drop out rate in colleges varies from 18.7% to 83.6% with avaerge being 52.9%. Our findings reveal that there are total nine blocks in Purba Medinipur and Paschim Medinipur that are without any college. We have also presented in brief the income and expenditure pattern of Vidyasagar University.

Chapter 10

Summary and Recommendations

10.1 Introduction

Our analysis of the state of higher education scenario in the state of West Bengal in India brings to light many facets of higher education in the state. The state - which was once the leading one in the country in educational attainment – has now been lagging behind the national average in terms of many performance indicators. The Gross Enrolment Ratio (GER) in higher education in West Bengal is 18.5 compared to all India average 25.2 in 2016-17. Also, the higher education sector in the state is characterized by uneven regional or inter-district development as well as imbalance within the major streams. However, what is most important is that quantitative figures alone do not reflect the true performance of the state. It needs to be emphasized that this sector is plagued by various problems – viz. dearth of eligible and quality teachers, infrastructure and, above all, absence of proper institutional mechanism ensuring quality of education. A number of measures need to be taken for that. In this chapter, we have first presented summary of the findings of the study and then present some suggestions to improve the situation of higher education in West Bengal.

The major objectives of the study are assessing (i) the public expenditure pattern on higher education (ii) different disparities and inequalities in higher education in West Bengal (iii) Estimating cost of delivery of higher education for different types of higher education institutions (iv) cost of higher education defrayed by students, gross return from delivery of higher education. (v) Nature of participation in higher education for different social and economic classes. (v) To assess the efficiency of higher education institutions and identifying the factors affecting efficiency of the institutions and suggesting ways how the efficiency could be improved. (vi) To assess the quality of higher education in West Bengal.

The data source

10.2 Summary of the Findings

10.2.1 Public Expenditure on Higher Education in West Bengal

Public Expenditure on Higher Education in West Bengal has been discussed in Chapter 4. Some of the findings on this issue are given below.

- Out of total public expenditure on education in 2014-15, it is seen that 37.9% goes to elementary education, 47.7% goes to secondary education and only 14.4% goes to higher education.
- Proportion of budget expenditure on higher education in West Bengal has declined in the post reform period. However, there have been no substantial changes in expenditure shares of education and higher education in SDP.
- It is found that the percentage of plan expenditure in West Bengal is much less than that of India.
- Wide disparity has been found in per head higher education expenditure between country average and West Bengal.
- The regression results reveal that the elasticity of higher education expenditure with respect to State Domestic Product (SDP) is 1.05.
- The detailed causal analysis of the relationship between SDP and expenditure on higher education in West Bengal has been done using time series analysis. The empirical result from Granger causality test confirmed that there is uni-directional causality running from higher education to economic growth.

10.2.2 Efficiency of Higher Education Institutes

We have selected 42 colleges and 11 universities for the study of efficiency analysis of higher education insitutions in West Bengal. Some of the findings on efficiency of higher education institutes as given in Chapter 5 are given below.

- We have taken 42 colleges under Vidyasgar University as the sample for our study. Following the DEA methodology for input oriented VRS model we have derived the efficiency score of each college. Out of 42 colleges selected under Vidyasagar University 11 colleges are of efficiency scores with value 1, having achieved 100% efficiency. The average efficiency score of the colleges under study has been calculated as 0.682 with the minimum efficiency score being 0.299 and standard deviation of scores being 0.262.
- Out of 11 selected selected universities, 5 Universities are of efficiency scores with value 1. The average efficiency score of the universities under study has been calculated as 0.864 with the minimum efficiency score being 0.497 and standard deviation of scores being 0.164. Five universities having achieved 100% efficiency are Jadavpur University, Calcutta University, Rabindra Bharati University, Gour Banga University and Presidency University.

10.2.3 Equity Issues in Higher Education in West Bengal

We have studied various issues of equity of higher education in West Bengal in Chapter 6. Some of the findings are given below.

- The number of colleges per lakh population in 2016-17 was 11 in West Bengal which was much below the all India average of 28.
- West Bengal has share of 3.3 % colleges and 6.1% enrolment in respect to India. West Bengal has share of 2.6% private colleges and 3.2% private college enrolment of India in 2016-17.
- Specialisation-wise number of colleges reveals that there are no colleges in the categories of Agriculture, Architecture, Fisheries, Veterinary etc.
- Total enrolment (U.G. and P.G.) in general degree education in West Bengal including universities and colleges stood at 21.14 lakhs in 20012-13 of which U. G. Enrolment was 19.5 lakhs and P. G. Enrolment was 1.6 lakhs.
- In West Bengal in 2012-13, in both UG and PG, female enrolment was higher than male enrolment in Arts. However, for both of these female enrolment was less in Science. Overall in UG and PG enrolment, the share of girls was 41.4% and the share of boys was 58.6% in 2012-13.
- The total outurn in higher education in 2017-18 in West Bengal was 3.85 lakhs students of which 1.93 lakh students were male and 1.91 lakh students were female. The shares of West Bengal of pass out male and female students in India were respectively 4.48% and 4.13%.
- In West Bengal, the percentage of private colleges was 42.4% and it was 64.2% in India in 2017-18. In India the percentage of enrolment in private unaided institutes has increased from 37% to 46.7% in 2017-18. During the same period in West Bengal the percentage of enrolment in private unaided institutes has increased from 12.4% to 13.7%.
- It is seen that though the share of Hindu population in total population was 70.5% in India, the share of Hindu graduate in total number of graduate was 90.1%, which indicates that other communities particularly Muslim community were lagging behind the Hindus in higher education.
- The state of West Bengal has GER 18.5 which was much below the national average GER of 25.2 percent in 2016-17.
- We see that in West Bengal, GER for all categories has improved from 8.8% in 2006-07 to 18.5% in 2016-17. For SC categories it has increased from 4.7% to 13.5% and for ST

categories, it has increased from 3.4% to 10.1%.For all the categories in West Bengal Female GER is found to be less that male GER. On the other hand, if we compare West Bengal and India, for all the categories West Bengal lags behind India.

- During 2010-11 to 2016-17, the Gender Parity Index (GPI) for India had increased from 0.86 to 0.94. During the same period GPI has in West Bengal has improved from 0.79 to 0.87.
- Inter-state Comparison of Gender Parity Index (GPI) in 2014-15 reveals that GPI was highest in Lakshadweep (GPI =2.60) and lowest in Gujrat (Value =0.75) with West Bengal being in the lower rank (GPI=0.87).
- The gender gap in the employment of teachers in the higher education sector in West Bengal was 31.2% and it is 18.8% in India in 2016-17.
- The ranks of West Bengal for some indicators in 2016-17 were as follows: College per lakh population: 32, GER (Total):28, GER (Female):27, Pupil Teacher ratio (PTR): 32, Public Exp on higher education per person (18-23) (Out of 28 states):19, Vocational Expenditure per student (out of 28 states): 19.
- There is wide disparity across districts in higher education indicators like institutional density, number of HEIs per one lakh population, enrolment per institution. The data shows that institutional density is highest in Kolkata and lowest in Uttar Dinajpur in 2017-18. Average number of students per institution was highest in Nadia and lowest in Bankura.
- GER in vocational education in West Bengal for different caste categories were as follows: SC:05, ST:0.4 and General caste: 1.2. GER in vocational education for India for different categories are as follows: SC:3, ST:2 and General caste: 4.2.
- According to AISHE Report in 2015-16, there were 57,668 teachers in West Bengal of which share of the different categories are as follows: General: 89%, SC:6.63%, ST:0.84%, OBC: 3.5%. On the other hand , the share of female teachers is 33.1%.
- In India there are 150 Community Colleges and in West Bengal 7 there are community Colleges.
- There were 1.01 lakh NSS volunteers in all the Universities in West Bengal in 2015-16.
- The estimated regression results show that Gross Enrolment ratio (GER) depends significantly upon number of higher education institutes per lakh population, expenditure per household in the state on technical education and vocational education.

10.2.4 Quality of higher education in West Bengal

We have studied various issues of quality of higher education in West Bengal in Chapter 7. Some of the findings are given below.

- The NAAC assessment data (upto 2016) reveals that out of 281 universities assessed in India, 59% had got A grade and percentage for West Bengal, it is 70%. So, West Bengal Universalities were comparatively better placed in NAAC assessment.
- Out of 154 colleges in West Bengal, percentage of A grade colleges was 12.3%, whereas that for India is 24.4.
- In West Bengal, five institutes were ranked in first 100 in college category in 2018 NIRF in India.
- For NIRF 2018 data, we calculated number of colleges and universities in top 100 for the states in India. Using cluster analysis on the above state wise data, we prepared a dendogram by using SPSS statistical package (SPSS-16). It is revealed that 'Tamil Nadu' makes a single member group and dominates all other states. It can also be stated that 'Delhi' and 'Kerala' shows higher level of education quality in second cluster as compared other states (Except Tamil Nadu) in other cluster. Here also we see that 'Andhra Pradesh', 'West Bengal', 'Karnatak', 'Mharashtra', and 'Uttarpradesh', makes a third cluster that are better compared to other states except first and second cluster.
- In terms of total number of publications and citations in ICI indexed journals, the rank of West Bengal is 6. Though the rank is not so good for citations per paper.
- The ordered logit regression results reveal that the significant factors affecting the grade are number of cycle of the assessment and support staff. The results indicate that the probability of getting high grade increases with the experience in NAAC assessment and presence of support staff.
- To get the perception of the students about higher education in colleges, questionnaire was prepared by covering three important elements of the academic status with specific focus on education at the bachelor degree level. The three elements consist of (i) Teaching and Evaluation Method adopted in the college (ii) Effectiveness of the Teaching Faculty, which indicates the intellectual capital of the college (iii) Availability of Resources.The questionnaires consist 34 items with five response options (1-5 scale) with a statement in ascending order: 1= Very Bad; 2= Bad; 3= Moderate; 4= Good; 5=Very Good. The Questionnaire contains three sections comprising 1.Teaching and Evaluation Method,

2.Effectiveness of the Teaching Faculty and 3.Availability of Resources. The overall percentage for different grades for all the indicators are as follows: Very good: 26.7, Good: 36.6 Moderate:20.5 Bad:8.1 Very Bad: 7.7.

- Applying six sigma analysis, it has been possible to identify the problems of the selected higher education institutions in West Bengal. We find the basic problems of higher education institutions as perceived by the students are lack of availability of resources (like toilet facility), sufficiency of permanent teachers, canteen and common room facilities and lack of teaching and evaluation methods like practical classes in the laboratory, quality of lectures and the extra coaching, revision of course by the department.
- Interpretation of the results of PCA indicates that the most important component of students' perception about the quality of higher education is related to the *teaching quality*, explaining 25.2% of the variance. The first factor has 14 dominating indicators of quality which mostly relates to the teaching quality. The second component has 10 dominating indicators which mostly relate to the infrastructure facilities in the institutes. The third factor relates to the academic environment of the college.The fourth factor relates to academic discipline in the college. The fifth factor relates to syllabus load. The sixth factor relates to laboratory facilities and classes in the institutes.

- NSSO data reveals that 98 graduates are unemployed per 1000 graduates in West Bengal where it is 100 for India. However the unemployment at PG level for West Bengal is 139 where it is 139 for India.

- Primary Survey results reveal some aspects of the quality of higher education in WestBengal: (i) Overall, the percentage of students who secured marks in H.S. between 60% to 79.9% is 58%, (ii) average class hours attended per day of rural students is calculated as 3.64 hrs. and that for urban students is 4.74 hrs. (iii) per month number of visits to library by students is 5.36 days and average of no of books taken from library per month is 3.27

- Primary survey shows that in higher levels students are less interested to come to the colleges. It is seen that the teachers are interested in the introduction of evaluation of teachers. However many of the teachers have not supported the sufficiency of internet facilities in colleges and admission in colleges is done on the basis of merit.

- The findings of the study on distance learners reveal that average higher secondary marks are 59%, average marks obtained in Hons. Course is 50%. It is also found that 46% students preferred video lecture. 75% students have computer training.

10.2.5 Household Expenditure on Higher Education

From the pattern of annual household expenditure on higher education in West Bengal as revealed from the primary survey in Chapter 8, we get the following observations.

- It appears that all those who are from urban area spend more amounts in higher education (Rs. 72,227) compared to rural area (Rs. 24,634).
- Household expenditure on female student (Rs. 45,682) is less than on that of male student (Rs. 72,604). In this context gender disparity is present to some extent. Gender disparity is remarkably present in Muslim community than other communities.
- Household expenditure by scheduled population (SC- Rs. 43,576, ST- Rs. 30,532) is less than non-scheduled population (GEN- Rs. 67,179, OBC- Rs. 45,719).
- Higher educated families (as measured by the level of education of the head of the household) spend more on higher education than less educated family (Below Primary- Rs. 29,295, Primary- Rs. 39,104, Secondary- Rs. 41,519, Higher Secondary- Rs. 54,112 and Graduate & Above- Rs. 87,107).
- Household expenditure is high for professional/technical courses (Rs. 1,94,213) than general courses (Rs. 34,844). Household expenditure is higher for private college than Government College.
- Major share of household expenditure on higher education goes to College/Course fee (41%), Private tuition Expenditure (17%), transport (10%) and hostel accommodation (19%).
- Household expenditure on higher education is a function of many socio-economic, household and educational variables. The estimates of OLS regression equations reveal that the significant determinants of household expenditure on higher education are: household economic condition and educational level of the head of the household, Gender, Course, Private tuition, College to home distance, Performance at 10+2/UG level.

10.3 Recommendations:

Some suggestions based on our study have been given below to improve the situation of higher education in West Bengal.

1. Time series analysis shows that investing in higher education is important for economic growth, that is investing more resource in human capital development is vital for productivity and growth of the economy. Higher share of public expenditure should be allocated to higher education.
2. The plan expenditure in proportion to non-plan expenditure in the state should be increased.
3. For improving access to higher education, there is need for establishment of more number of colleges, particularly in rural areas. More state universities should be established wherever such institutions are not available. There is enough demand for PG Courses for some subjects. PG courses in colleges may be introduced more number of colleges with the recruitment of more teachers. These courses will add dynamism to the academic environment of the colleges. More autonomy should be given to the colleges in conducting these courses.
4. More subjects and Departments should be introduced in colleges and universities. ICTs can also be harnessed for remedial education, training of teachers, adult literacy programmes, skill education, learning tool in higher education and also as a governance and management tool. IT-based applications for monitoring the performance of students for college management are currently being used in several states. There are a number of similar ongoing efforts and new initiatives and experimentation in this field. What is required is a well-coordinated strategy, that can propel wide scale the use of ICT to improve education in India.
5. Massive online open courses (MOOC) is another application of ICT which may help in enhancing the ICT enabled higher education levels, enhancing access to quality education at an affordable cost. MOOC and other online courses may be introduced in different colleges. These courses will not only enhance the quality of higher education, it will be useful where there are not sufficient number of teachers.
6. Own resources of the higher education institutes need to be increased to complement the public expenditure. It is found that large areas in some colleges have remained unutilized. The authorities should try to enhance the earning potential of the college keeping in the academic environment and livings conditions of the local people.
7. Participation in higher education from the other states should be encouraged.

8. As GER of West Bengal is much below the national average, measures need to be taken to improve the GER in the state.
9. Gender parity index in higher education need to be improved for ST Category.
10. Full time teachers and more infrastructural facilities are urgently required. In 2016-17, Student Teacher Ratio (STR) in India was 26 whereas in West Bengal was 42. Teacher Student Ratio should be improved.
11. Inter district inequality in terms of number of colleges per lakh population, average number of students per college need to be reduced in West Bengal with the establishment of new colleges.
12. Constructing boys' and girls' hostel for colleges particularly in rural areas is very important. Construction of separate hostel for ST students may be thought of.
13. Facilities of college buses and other transport services need to be there for colleges in backward regions where there are transport problems.
14. The resources of the universities and colleges may be shared so that teachers and students may enjoy the benefits mutually.
15. Female share in teachers should be improved.
16. Sports and cultural activities are seen as secondary activities in colleges. The attitude towards these should be changed because there are opportunities in these fields also. In relevant areas there may be collaboration with Industry to offer practical training and other supports for these students.
17. Infrastructural facilities like more drinking water facilities and ladies' toilets need to be increased in the colleges.
18. Arrangement for career counseling should be there for every college. Every institute should have placement cell where the students can get information about different job vacancies.
19. The government of West Bengal may take effective steps to remove the district-wise inequality in the gender differential in enrolment.
20. The increase in the number of medical, engineering and nursing colleges may be controlled to reduce the gap between the demand and supply of such education.
21. Private institutions have not been spending enough on fee concessions or scholarships for the students and charging of very high fees and funds from the students may be one of the important factors for the lower proportion of SC and ST students. The need is to special take care and special scholarship that type of students.

22. GER in vocational education in West Bengal is much below the all India average. There are only seven community colleges in West Bengal. Vocational education in colleges should be given more emphasis and the courses should be taught more seriously.
23. More community colleges need to be introduced in different districts of the state.
24. The government may establish more professional colleges to provide education in law, agriculture and veterinary science in the all districts in West Bengal. The professional education in some of the important fields such as the Engineering, Medical, Dental, Management, MCA, Law, Pharmacy, Ayurvedic, Physiotherapy and Nursing has become the exclusive domain of private sector. The public provision of education sector in the state in the professional areas must be created to implement the desired programmers like fee concessions, scholarships, free ships or loans and policies related to the weaker and meritorious students and also generate public-private competition.
25. There are scope of vocational education in the fields of Manufacturing and Production Sector; Medical and Hospital Testing and Diagnostic Services; Hospitality and Tourism services; Media and Communication Services; ICT Services; and so on. Employment oriented subjects like Aquaculture may be offered in the institutions in order to remove unemployment and maintain the balance between demand and supply of higher education.
26. Colleges and Universities should take initiative to develop rapo with industry on timely basis to increase the employability ratio of trained and professional human resource for society.
27. Keeping in view, the high cost recovery from professional education, there is a necessity to establish an independent regulatory commission with statutory powers and public accountability to determine, control and monitor the fees and funds charged from the students.
28. There is huge difference of marks among the students in the final results of colleges. The number of first classes varies widely across colleges and subjects. The performances of students in the final examinations need to be evaluated on regular basis.
29. Care should be taken such that teaching days are not lost. In the days of internal assessment examination, other classes should be held. Minimum number of teaching days should be implemented and the institutions should go by the academic calendar.
30. Poor attendance in colleges have been the major problem in most of the colleges in West Bengal. Measures need to be taken to improve the situation. Minimum attendance of students should be strictly implemented. There should be strict vigilance so that the classes are held regularly and the students get motivation to attend the classes.

31. Internal Assessment of students should be given more emphasis and it should be linked with the attendance rate in the class.
32. There should be more incentive for research work in colleges. The college teachers should be encouraged to guide Research scholars for Ph.D degree in their subjects.
33. The analysis reveals that students are not satisfied with the regularity of the pass subject classes, book availability in the library, communication system of the college, quality of the cultural programme and sports, distribution of free studentship.
34. The Drop-out Rate varies depending upon the subject and location of the college. Steps should be taken to check drop-out.
35. Internal assessment should be carefully done. It has been observed that internal assessment across the colleges are not uniform. It has also been observed that internal assessment marks are not consistent with the marks for written examination.
36. Students' politics in some colleges are reported to vitiate academic environment. Though students attitude towards students union is not so bad as revealed in our survey, students politics in some colleges are damaging the normal course of the college. Local politics are some cause of concern for smooth running of the college.
37. Higher education should be adaptive and responsive to the changing needs of the society and economy and diversify accordingly. Curriculum and content has to be continually reviewed and renewed through Teaching and Learning Support Networks. Syllabi should be updated and for this purpose it should be reviewed in a time span of 3 years.
38. A large proportion of the products of the education system are found to lack employable skills. This has substantially lowered the credibility of the higher education system. The utility of higher education in assuring employment remains questionable. Many graduate and Post-Graduate students do not get jobs in their respective fields. The task of enhancing the employability of the products of the education system ought to be accorded high priority.
39. There should be more linkage between colleges and the universities.
40. Marks may be given for NCC, NSS and sports (at least district level). For this one general subject may be dropped.
41. The admission procedure should be on centralized online procedure so that the better quality students can get chance to get admission in their preferred colleges.
42. Evaluation of courses and teachers by students as well as peer evaluation of teachers by reputed teachers may be introduced in all institutions.

43. While granting scholarship, apart from considering the income and community, sex can also be taken into consideration so that more number of women students from the lower strata may come forward to pursue higher education.
44. Free studentship should be carefully distributed so that actual needy can get the opportunity to pursue higher education.
45. Self financing courses should be explored further with various newer subjects with the facilities and scholarships for the weaker section of the people.
46. Most of the UG students in the state depend on private tuition. Module-based teaching may be introduced in colleges so that students may get study materials. Private tuition by full time teachers need to be controlled.
47. The following problems in colleges should be taken care of as revealed from the primry survey: the extra coaching, revision of department, distribution of syllabus load in different years, student principal relation, availability of Books and Journals in library, availability of sports equipments, hostel availability of long distance student, role of Student union in academic development, distribution of free studentship, toilet facility, canteen facility, common room facility, sufficiency of permanent teachers, sports activities in college.
48. Some other suggestions made by the students for the improvement of academic environment in colleges are: construction of college boundaries in some colleges in rural areas, availability of clean and purified drinking water facilities in colleges , providing more playgrounds in college, more library books and library space, Boys' and Girls'common room facilities, more plantation and gardening , introducing diversified subjects in Honours course, more NSS and NCC units in colleges, introducing language labs in colleges, free health checkup programs in colleges, more student friendly office services, responsible College union , Programs on social consciousness , more responsibility of class teachers in the regularity of classes in some cases, more career counseling and campusing facilities in colleges, programs on awareness programs on different kinds of scholarships and competition at national and state levels etc..

References

1. Abbott M., and Doucouliagos C. (2003). "The Efficiency of Australian Universities: A Data Envelopment Analysis", *Economics of Education review*, *22*(1), 89-97.
2. Abdullah Firdaus (2006). "Measuring Service Quality in Higher Education: Three Instruments Compared", *International Journal of Research & Method in Education*, Vol. 29, No. 1, April 2006, pp. 71–89.
3. Agarwal Pawan (2006). "Higher Education Policy Many Contradictions", *Economic & Political Weekly*, November 11, 2006.
4. Agha S. R., Kuhail I., Abdelnabi N., Salem M., and Ghanim A. (2011). "Assessment of Academic Department's Efficiency Using Data Envelopment Analysis", *Journal of Industrial Engineering and Management, 4*(2), 301-325.
5. Agrawal T. (2014). "Educational Inequality in Rural and Urban India", *International Journal of Educational Development, 34*, 11-19.
6. Agrawal Vineeta (2014). "Higher Education in India: Challenges and Opportunities*",* *International Journal of Scientific Research,* Volume 3, Issue 1, January 2014.
7. Altbach P.G. (2010). "Open Door in Higher Education: Unsustainable and Probably Ill – Advised", *Economic & Political Weekly*, March 27.
8. Anand S. (2014). "Inter State Variations in Public Spending on Higher Education in India", *International Journal of Humanities and Social Science Invention*, *31*(9), 23-31.
9. Awasthi Kshitij and Bhat Kiran K. (2016). "High Returns from Higher Education Effect on Agricultural Income", *Economic & Political Weekly,* Vol LI No 7, February 13, 2016.
10. Bairagya Indrajit (2018). "Why is Unemployment Higher among the Educated?", *Economic & Political Weekly,* Vol LIII No 7, February 17, 2018.
11. Bal Monalisa (2014). "Dismantling of Planning Commission & Higher Education: A Perspective", *International Journal of Education and Information Studies,* Volume 4, Number 2 (2014), pp. 71-79.
12. Balakrishnan Pulapre (2006). "Higher Education Needs a Longer View", *Economic & Political Weekly*, August 12, 2006, pp.3458-3459.
13. Basant Rakesh and Sen Gitanjali (2010). "Who Participates in Higher Education in India? Ethinking the Role of Affirmative Action", *Economic & Political Weekly*, September 25, 2010 Vol. XLV No. 39, pp.62-70.
14. Bhalla S.S. (2018). "Let the Elite Pay", The Indian Express, June 23, *https://indianexpress.com/article/opinion/columns/higher-education-in-india-admission-hrd-let the-elite-pay-5229469/.*
15. Bhattacharya Soumyajit (2011). "The 'Semesterisation' Impasse at Dehli University", *Economic & Political Weekly*, May 7, 2011, VOL. XLVI No.19, pp.22-25.
16. Bhushan Sudhanshu (2013). "Higher Education in 12th Plan Paradigm Shift in Favour of 'For Profit'", *Economic & Political Weekly*, Vol XLVIII No 4, January 26, 2013.
17. Bordoloi Ritimoni (2012). "Accessibility and Equity: A Challenge for Higher Education in India", *Journal of Economics and Sustainable Development,* ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online) Vol.3, No.4, 2012.

18. Borooah Vani K. (2018). *Higher Education in India: Access, Quality and Structure*, Varghese et al Eds. (2018), Sage Publications, New Delhi.

19. Brown P. H. and Park A. (2002). "Education and Poverty in Rural China", *Economics of education review*, *21*(6), 523-541.

20. Calhoun J. and Hall J. (2013). "Data Envelopment Analysis of Relative Efficiencies of Public and Private Institutions of Higher Learning", *Economics Working Papers*, (13-06).

21. Certa A., Enea M., and Hopps F. (2015). "A Multi-Criteria Approach for the Group Assessment of an Academic Course: A Case Study", *https://www.infona.pl/resource/bwmeta1.element.elsevier-abc0dec0-94c9-3df4-b8fa-95018d27e62c*.

22. Chahal Mukesh (2015). "Higher Education in India: Emerging Issues, Challenges and Suggestions", *International Journal of Business Quantitative Economics and Applied Management Research,* Volume 1, Issue 11, April 2015.

23. Chakrobarti Anindita and Rama Joglekar (2006). "Determinants of Expenditure on Education: An empirical Analysis Using State Level Data", *Economic & Political Weekly*, April 15, 2006, pp.1465-1473.

24. Chandrasekhar, S., Rani, P.G., & Sahoo, S. (2016). Household Expenditure on Higher Education in India: What do we know & what do recent data have to say? WP-2016-030. Indira Gandhi Institute of Development Research, Mumbai.

25. Chattopadhyay Saumen (2007). "Exploring Alternative Sources of Financing Higher Education", *Economic & Political Weekly,* October 20, 2007, pp.4251-4259.

26. Chaturvedi S. and Gupta P. V. (2009). "Quality of Higher Education: A New Paradigm", *University News*, 47(40), October 5-11.

27. Collins C. S. and Rhoads R. A. (2010). "The World Bank, Support for Universities, and Asymmetrical Power Relations in International Development", *Higher Education*, *59*(2), 181-205.

28. Cristian Barra and Roberto Zotti (2013). "Measuring Teaching and Research Efficiency in Higher Education Using Data Envelopment Analysis. A Case Study from the University of Salerno"*, Research gate https://www.researchgate.net/publication/258051833.*

29. Cvetkoska V. (2011). "Data Envelopment Analysis Approach and its Application in Information and Communication Technologies", *http://ceur-ws.org/Vol-1152/paper37.pdf*

30. Daghbashyan Z. (2013). "Essays on University Efficiency Analysis And Entrepreneurship Among University Graduates", *www.diva-portal.org/smash/get/diva2:581259/FULLTEXT02.pdf.*

31. Davis Educational Foundation (2012). "An Inquiry into the Rising Cost of Higher Education: Summary of Responses from Seventy College and University Presidents", 30 Forest Falls Drive, Suite 5, Yarmouth ME 04096*, www.davisfoundations.org*.

32. de Mello J. C. C. S., Gomes E. G., Meza L. A., De Mello M. H. C. S. and de Mello A. J. R. S. (2006). "Engineering Post-Graduate Programmers: A Quality and Productivity Analysis", *Studies in Educational Evaluation*, *32*(2), 136-152.

33. Deshpande Ashwini (2018). *Access and Exclusion: Mapping Social Diversity in Education in India*, Varghese et al Eds. (2018), Sage Publications, New Delhi.

34. Deshpande Satish (2016). "Higher Education an Uncertain Policy Process", Economic & Political Weekly, vol lI no 35, august 27, 2016.

35. Dey Doli and Tarini Halder (2014). "Present Status of Women in Higher Education in West Bengal: An Appraisal*", International Journal of Humanities & Social Science Studies,* Volume-I, Issue-III, November 2014, Page No.166-172.
36. Dolan R. C. and Schmidt R. M. (1987). "Assessing the Impact of Expenditure on Achievement: Some Methodological and Policy Considerations", *Economics of Education Review*, *6*(3), 285-299.
37. Finegold D., Kumar B. V., Winkler A. L. and Argod V. (2011). "Will they Return? Indian Students in The United States", *Economic and Political Weekly*, 21-24.
38. Ganegodage K. R. and Rambaldi A. N. (2011). "The Impact of Education Investment on Sri Lankan Economic Growth", *Economics of Education Review*, *30*(6), 1491-1502.
39. Gani Abdul (2010). "Mapping Open Educational Resources for Access and Equity in Higher Education in India", *http://dspace.col.org/handle/11599/2176.*
40. Giambona F., Vassallo E. and Vassiliadis E. (2011). "Educational Systems Efficiency in European Union Countries", *Studies in Educational Evaluation*, *37*(2-3), 108-122.
41. Gosai M.R. (2004), *Internationalization of Quality Culture through NAAC: Some Theoretical Implications in Association of Indian Universities (1999), http://shodhganga.inflibnet.ac.in.*
42. Goswami Marami (2013), "Neo-liberalism and Higher Education in India", *Quest Journals Journal of Research in Humanities and Social Science,* Volume1 Issue 3 (2013) pp: 32-3.
43. Govt. of India (2015). *Key Indicator of Social Consumption in India- Education: NSSO 71st Round.* Ministry of Statistics and Programme Implementation (MoSPI).
44. Govt. of India. All India Survey of Higher Education (AISHE) Report. Ministry of Human Resource Development (MHRD), Various Years.
45. Gronberg T. J., Jansen D. W. and Taylor L. L. (2012). "The Relative Efficiency of Charter Schools: A Cost Frontier Approach", *Economics of Education Review*, *31*(2), 302-317.
46. Gujar Suju (2006). "Higher Education System: Impact on Indian Economy", *Tactful Management Research Journal, http://oldtm.lbp.world/SeminarPdf/358.pdf.*
47. Gupta D. and N. Gupta (2012). "Higher Education in India: Structure, Statistics and Challenges", *Journal of Education and Practice, 3*(2).
48. Gurukkal Rajan (2018). *The state, Markets, Equity and Quality in Higher Education*, in Varghese et al Eds. (2018), Sage Publications, New Delhi.
49. Hajj M. and Panizza U. (2009). "Religion and education gender gap: Are Muslims different?", *Economics of Education Review*, *28*(3), 337-344.
50. Heyneman S. P. (2004). "International Education Quality", *Economics of Education Review*, *23*(4), 441-452.
51. Jana, S.K. (2010), "Quality of Higher Education in West Bengal: NAAC Assessment", *Artha Beekshan.Vol.*19 No.3, pp. 108-123.
52. Jana, S.K. (2017,a), "Efficiency Analysis of Higher Education Institutes: A Study on Colleges under Vidyasagar University in West Bengal, India", Scholars Journal of Economics, Business and Management, Vol.4 No.1, pp.35- 40.
53. Jana, S.K. (2017,b), "Higher Education in West Bengal – An Overview", *Artha Beekshan,* Vol. 26. No. 1-2. pp. 21-55.
54. Jana, S.K.(2012), "Education in West Bengal – Looking Beyond Schools" Shipra Publications, New Delhi, 2012.

55. Jana, S.K., and Karmakar, A.K. (2017), "Infrastructure, Education and Economic Development in India: A State Level Analysis", in *Social, Health, and Environmental Infrastructures for Economic Growth, Edited by* R.C Das, IGI Global.
56. Jana, S.K., Maiti, A. & Manna, S.S. (2018), "An Assessment of Quality of Higher Education Using Six Sigma – A Study in West Bengal, India", Scholars Journal of Arts, Humanities and Social Sciences,Vol. 6 No.1, pp.259-266 .
57. Jahan K. K. and Selvarani D. C. (2015). "Higher Education in India: Issues and Challenges", *International Conference on Humanities, Literature and Management,* Jan. 9-10, Dubai (UAE).
58. Johnes G. and Johnes J. (2009). "Higher Education Institutions' Costs And Efficiency: Taking the Decomposition a Further Step", *Economics of Education Review*, *28*(1), 107-113.
59. Johnes Jill (2006). "Data Envelopment Analysis and its Application to the Measurement of Efficiency in Higher Education", *Economics of Education Review,* 25 (2006) pp. 273–288.
60. Johnstone D. Bruce (2016). "The Costs of Higher Education: Worldwide Issues and Trends for the 1990s*", http://gse.buf falo.edu/fas/Johnston/TRENDS.HTM.*
61. Kapur D. and Mehta P. B. (2017). *Navigating the Labyrinth: Perspectives on India's Higher Education,* Orient Black Swan.
62. Kapur J.N. (1999). "Quality of Higher Education: Measurement and Assurance", Association of Indian Universities (1999).
63. Khare Mana (2018). *Disparities in Graduate Employability Skills*, Varghese et al Eds., Sage Publications, New Delhi.
64. Kontic Ljiljana (2014). "Measuring Service Quality in Higher Education: The Case of Serbia". *http://www.toknowpress.net/ISBN/978-961-6914-09-3/papers/ML14-610.pdf, accessed in 18th January, 2017.*
65. Krishnaveni R and J Meenakumari (2010). "Usage of ICT for Information Administration in Higher education Institutions – A study", *International Journal of Environmental Science and Development,* Vol. 1, No. 3, August 2010, ISSN: 2010-0264.
66. Kumar B. Venkatesh (2010). "Implementation of the Maharashtra Universities Act", *Economic & Political Weekly*, Octobar 23, 2010, Vol. Xlv, No 43, pp. 19-21.
67. Kumar R. Ravi (2013). "Quality improvement in Higher Education in India: A Review", *International Journal of Educational Research and Reviews,* ISSN: 2329-9843 Vol. 1 (2), pp.044-046, July, 2013.
68. Kundu Amitabh (2018). *Economic and Educational Inequalities in India: Access and Outcome indicators for Different Socio-religious Groups,* Varghese et al Eds., Sage Publications, New Delhi.
69. Mangnale V. S. and Rajasekhara Mouly Potluri (2011). "Quality Management in Indian Higher Education System: Role of Internal Quality Assurance Cell (IQAC)", *Asian Journal of Business Management* 3(4): 251-256, 2011, ISSN: 2041-8752.
70. Mikkola Anne and Carrie A. Miles (2007). "Development and Gender Equality Consequences, Causes, Challenges and Cures*",* Discussion Paper No. 159 April 2007 ISSN 1795-0562*, www.hecer.fi.*

71. Mirabent Berbegal and Solé Parellada (2012). "What are we Measuring when Evaluating Universities' Efficiency?" *Regional and Sectorial Economics Studies, Vol. 12-3 (2012).*

72. Mishra Vikrant (2013). "Globalization and Indian Higher Education*", Journal of Educational and Instructional Studies in the World February,* March, April 2013, Volume: 3 Issue: 1 Article: 02.

73. Misra S. N. and Monalisa Bal (2014). "Excellence through Equity: Challenges before Higher Education in India", *International Journal of Educational Planning & Administration.* . Volume 4, Number 1 (2014), pp. 67-77, Research India Publications*,* *http://www.ripublication.com.*

74. Moenjak T. and Worswick C. (2003). "Vocational Education in Thailand: A Study of Choice and Returns", *Economics of Education Review*, *22*(1), 99-107.

75. Nazarko Joanicjusz and Jonas Šaparauskas (2014). "Application of DEA Method in Efficiency Evaluation of Public Higher Education Institutions", *Technological and Economic Development of economy,* Volume 20(1): 25–44.

76. Neuman S and Ziderman A. (2003). "Can Vocational Education Improve the Wages of Minorities and Disadvantaged Groups?: The Case Of Israel", *Economics of education review*, *22*(4), 421-432.

77. Niranjana Tejaswini (2013). "Indian Languages in Indian Higher Education", *Economic & Political Weekly*, Vol XLVIII No 12, March 23, 2013.

78. Nitza Davidovitch, Michael Byalsky and Dan Soenand Zilla Sinuani-Stern (2013), "The Cost of More Accessible Higher Education: What Is the Monetary Value of the Various Academic Degrees? A Case Study", *Contemporary Issues in Education Research,* First Quarter 2013, Volume 6, Number 1.

79. Pathak Binay Kumar (2014). "Critical Look at the Narayana Murthy Recommendations on Higher Education", *Economic & Political Weekly*, Vol XLIX No 3, January 18, 2014.

80. Peet E. D., Fink G. and Fawzi W. (2015). "Returns to education in developing countries: Evidence from the living standards and measurement study surveys", *Economics of Education Review*, *49*, 69-90.

81. Prakash Ved (2007). "Trends in Growth and Financing of Higher Education in India", *Economic and Political Weekly,* August 4, 2007

82. Prasad Madhu (2008). *Autonomy, Privatisation and Commercialisation in Higher Education*, in Prakash Ved and K Biswal.

83. Pujar Uma (2014). "Trends in Growth of Higher Education in India", *IOSR Journal of Economics and Finance (IOSR-JEF),* e-ISSN: 2321-5933, p-ISSN: 2321-5925.Volume 2, Issue 6 (Feb. 2014), PP 01-04, *www.iosrjournals.org*.

84. Rao, P. (2014). Analysis of Household Expenditure on Education. *International Journal of Education and Information Studies*. 4 (1); pp-35-39

85. Robinson Rowena, Raja Wasim, Choudhury Hiten and Saikia Dhruba J (2016), "Sociology of Education and Indian Higher Education Systems A University's 'Institutional Research Model", *Economic & Political Weekly*, Vol LI No 9, February 27, 2016.

86. Saha, A. (2013). "An Assessment of Gender Discrimination in Household expenditure on Education in India". *Oxford Development Studies*. 41(2); pp-220-238.

87. Sarkar, N. (2017). "Determinants of household expenditure on higher education in India". *International Education & Research Journal (IERJ)*. 3(6); pp-12-13

88. Self S. and Grabowski R. (2004). "Does Education at All Levels Cause Growth? India, A Case Study", *Economics of Education Review*, *23*(1), 47-55.

89. Shah A. M. (2005). "Higher Education and Research: Roots of Mediocrity", *Economic & Political Weekly*, May 28- Jun 4, 2005, pp.2234-2242.

90. Shah K H (2008). "Traditional Sources of Financing Higher Education", *Economic & Political Weekly,* February 16, 2008, pp.74-76.

91. Sinha Sachidananda (2018). *Regional Disparities in Availability, Access and Equity in Higher Education in India*, Varghese et al Eds. (2018), Sage Publications, New Delhi.

92. Sunder S. (2010). *Higher Education Reforms in India*. In The Oxford handbook of the Indian economy.

93. Tansel A. and Bircan F. (2006). "Demand for Education in Turkey: A Tobit Analysis of Private Tutoring Expenditures", *Economics of education review*, *25*(3), 303-313.

94. Thakur Narender (2016). "De Facto Privatization in Indian Public Higher Education A Transition from FYUP to CBCS", *Economic & Political Weekly*, Vol LI No 9, February 27, 2016.

95. Tilak J. B. G. (2003). "Higher Education and Development in Asia", *Journal of Educational Planning and Administration,* Vol. XVII, No.2, pp 151-73.

96. Tilak J. B. G. (2004). "Absence of Policy and Perspective in Higher Education", *Economic & Political Weekly*, May 22, pp 2159-2164.

97. Tilak J. B. G. (2008). "Education in 2008-09 Union Budget", *Economic & Political Weekly*, May 17, 2008, pp.49-56.

98. Tilak J. B. G. (2010). "A weak Attempt to Curb Unfair Practices in Higher Education", *Economic & Political Weekly*, September 28, 2010, VOL. XLV No.38, pp.19-21.

99. Tilak J. B. G. (2012). "Higher Education Policy in India in Transition", *Economic & Political Weekly*, Vol XLVII No 31, March 31, 2012.

100. Tilak J. B. G. (2014). "Private Higher Education in India", *Economic & Political Weekly*, Vol XLIX No 40, October 4, 2014.

101. Tilak J. B. G. (F2013). "Higher Education in the BRIC Member-Countries Comparative Patterns and Policies", *Economic & Political Weekly*, Vol XLVIII No 14, April 6, 2013.

102. Tilak, J. B. G. (2015). "How Inclusive is Higher Education in India?" *Social Change*, *45*(2), 185-223.

103. Tilak, J.B.G. (1991). "Family and government investment in education". *International Journal of Educational Development*. 1 (2); pp- 91-106

104. Tilak, J.B.G. (2002). Determinants of Household Expenditure on Education in Rural India, Working Paper Series No. 88, New Delhi: National Council of Applied Economic Research.

105. Tilak, J.B.G. (2009). Household Expenditure on Education and Implications for Redefining the Poverty Line in India. *General Reports, Planning Commission, Govt. of India.* *http://www.planningcommission.gov.in/reports/genrep/tilak.pdf*

106. Toro Ulka (Gulavani) and Millind Joshi (2012). "ICT in Higher Education: Review of Literature from the Period 2004-2011*", International Journal of Innovation, Management and Technology,* Vol. 3, No. 1, February 2012.

107. Upadhyan Sugeeta (2007). "Wastage in Indian Higher Education" *Economic & Political Weekly,* January 13, 2007, pp. 161-167.

108. Varghese N. V., N. S. Sabharwal and C. M. Malish (2018). *India Higher Education Report 2016 – Equity*, Sage Publications. New Delhi.

109. Vijay Arun (2013). "Appraisal of Student Rating as a Measure to Manage the Quality of Higher Education in India: An Institutional Study Using Six Sigma Model Approach", *International Journal for Quality Research,* 7(3) 3–14.

110. Virmani Shipra (2014). "Higher Education in India - Challenges and Outlook", *International Journal of Computing and Business Research (IJCBR) ISSN (Online):* 2229-6166 Volume 5 Issue 5 September 2014.

111. Wankhede Govardhan (2016). "Higher Education and the Scheduled Castes in Maharashtra", *Economic & Political Weekly*, Vol LI No 6, February 6, 2016.

112. Witenstein Matthew A. (2017). "Teachers' Perspectives on Higher Education Policies", *Economic & Political Weekly*, Vol LII No 39, September 30, 2017.

113. World Bank (2018). Lange, Glenn-Marie; Wodon, Quentin; Carey, Kevin. 2018. The Changing Wealth of Nations 2018: Building a Sustainable Future. Washington, DC: World Bank. World Bank. *https://openknowledge.worldbank.org/handle/10986/29001 License: CC BY 3.0 IGO."*

114. Worthington A. C. and Lee B. L. (2008). "Efficiency, Technology and Productivity Change in Australian Universities 1998–2003", *Economics of education review*, 27(3), 285-298.

115. Yadav S. (2018). "Explained: How the Pay-and-publish Business Works", The Indian Express, July 19, 2018 *https://indianexpress.com/article/explained/how-the-pay-and-publish-business-works-5265198/.*

Reports:

1. All India Survey of Higher Education (AISHE), MHRD, GOI, http://aishe.nic.in/aishe/home,
2. Department of Higher Education, Government of West Bengal, http://www.wbhed.gov.in/
3. MOSPI NSSO, CSO, "Education in India" http://mospi.nic.in/sites/default/files/publication_reports/nss_rep_575.pdf
4. Websites of different universities and colleges
5. Economic review, Government of West Bengal, https://www.wbpspm.gov.in/publications/Economic%20Review
6. UGC Annual Report, Various years, https://www.ugc.ac.in/page/Annual-Report.aspx
7. Government of West Bengal, District Statistical Handbook, https://www.wbpspm.gov.in/publications/District%20Statistical%20Handbook
8. NAAC, http://www.naac.gov.in/
9. NIRF, https://www.nirfindia.org/2018/Ranking2018.html

Publication of Papers

1. Jana Sebak Kumar, Adwaita Maiti, Pranjit Paul (2018), "Efficiency of Higher Education Institutes: A Study on Some Universities in West Bengal, India", *International Journal of Research and Analytical Reviews (IJRAR)*, October, Volume 5, Issue 4 (E-ISSN 2348-1269, P- ISSN 2349-5138),pp.548-554, www.ijrar.org
2. Jana Sebak Kumar, Adwaita Maiti, Siddhartha Sankar Manna, Tapas Payra (2018), "Quality of Higher Education in West Bengal, India - Six-Sigma Analysis Using Students' Feedback in a College", International Journal of Research and Analytical Reviews (IJRAR), October, Volume 5, Issue 4 (E-ISSN 2348-1269, P- ISSN 2349-5138),pp.478-486, www.ijrar.org
3. Jana Sebak Kumar and Adwaita Maiti (2018), "Public Higher Education Expenditure in West Bengal – Trends and Its Relation with NSDP", *Zenith International Journal of Multidisciplinary Research*, September, 2018, (ONLINE ISSN: 2231-5780).
4. Jana Sebak Kumar, Adwaita Maiti and Siddhartha Sankar Manna (2018) , "An Assessment of Quality of Higher Education Using Six Sigma – A Study in West Bengal, India", *Scholars Journal of Arts, Humanities and Social Sciences*, Vol. 6(1D), pp. 259-266, ISSN 2347-5374(Online), ISSN 2347-9493(Print), pp. 259-266. http://saspjournals.com/sjahss
5. Jana Sebak Kumar (2017), "Efficiency Analysis of Higher Education Institutes: A Study on Colleges under Vidyasagar University in West Bengal, India" *Scholars Journal of Economics, Business and Management*, 4(1):35-40, pp. 35-40, e-ISSN 2348-5302, p-ISSN 2348-8875. SAS Publishers, http://saspjournals.com/sjebm
6. Jana Sebak Kumar (2017), "Higher Education in West Bengal – An Overview", First Giribala Karmakar Memorial Lecture, 2017, *Artha Beekshan*, Journal of Bengal Economic Association, Vol. 26, No. 1-2, June to September, 2017, ISSN: 0972-1185, pp. 21-55.
7. Jana Sebak K. and Asim K. Karmakar (2017), "Infrastructure, Education and Economic Development in India: A State Level Analysis", in *Social, Health, and Environmental Infrastructures for Economic Growth, Edited by* R.C Das, IGI Global, DOI: 10.4018/978-1-5225-2364-2.ch001, pp. 1-13, ISBN13: 9781522523642|ISBN10: 1522523642|EISBN13: 9781522523659.
8. Karmakar Asim Kumar and Sebak Kumar Jana (2018), "National Policy on Skill Development", Bihar Economic Journal, Economic Association of Bihar, Vol. 6, No. 2, June 2018, ISSN- 2230-8970, pp. 290-296.
9. Jana Sebak Kumar and Adwaita Maiti, "State-Wise Public Higher Education Expenditure in India: An Empirical Analysis", *Arthshastra: Indian Journal of Economics and Research* (Under Review).