

CHAPTER 3

RESEARCH METHODOLOGY, CONCEPTS AND DEFINITIONS

This chapter discusses the objective of the present study and the methodology which had been exercised to fulfill objective. The data collection methodology and its validity are also discussed. A compilation of concepts and definition relevant to the study is presented in later part of this chapter.

3.1 Research Methodology

As has been enumerated in the previous chapter a better-educated workforce enhances the prospects for economic growth. If that growth is accomplished, the society is able to afford more education and to educate its citizens in more sophisticated ways. A country's system of education is also desired to perform numerous tasks, which have been outlined below:

- Providing an education that arranges people for the labor market of the nation is one of the important ingredients of the economic policy.
- Historically, education systems were key components in the formation of a unified, national culture. Countries that have been through the traumas of civil war, or those that must integrate various ethnic or linguistic groups, find education as a crucial means to create a democratic and tolerant political culture.
- A key function of the education system is to train people so that the nation's economy can become or remain competitive. This poses significant challenges. Currently, economies are transforming rapidly and demanding ever-changing sets of skills.

- Education can be a means of social mobility and achievement. By ensuring access to quality education for all, the “playing field” is leveled and people are given equal chances to achieve something.
- Education facilitates people realize their human potential over and above the economic benefits it ensures. Besides, it is linked to many other positive outcomes: better health and nutrition, greater social participation, and civic involvement.

Considering the importance of higher and technical education for personal and national well being, it is imperative to look into the scenario of higher education sector of Bihar, one of the backward states of the country. In this backdrop, some of the objectives of the present study are presented below.

3.1.1 Research Objectives

The main objectives of the present study are as follows:

- To examine the prevailing scenario of higher education in different states of India and the position of Bihar State.
- To study the public expenditure pattern on higher and technical education in India with special reference to Bihar
- To examine the major factors responsible for outflow of students from the state of Bihar.
- To identify the major issues related to higher education in Bihar.
- To provide the summary conclusions of the study with some useful suggestions for policy implications.

3.1.2 Hypothesis of the study

It is true that students from diverse background are going out of the state in the search for better education. Number of factors viz. income background,

occupation and literacy of parents, lesser availability of choice and expectation of better job opportunities could be responsible for taking this decision. The hypothesis of this research is that irrespective of other factors, lesser availability of choices and poor quality of higher educational services is mainly responsible for this outflow.

3.1.3 Data Collection

Keeping in view of the hypothesis and objective of the study, both primary and secondary data has been collected to examine the prevailing scenario of higher education in the different states and within Bihar, public expenditure on education, government policies and some other aspects.

Secondary Data: The secondary data were gathered from various published and unpublished sources. Data has been collected from official records available at Department of Higher Education, Government of India and Bihar, University Grants Commission, Ministry of Statistics and Programme Implementation, Reserve Bank of India, websites of related national and international organizations, many research studies, reports and policy documents. Besides, relevant information was collected from various published sources to supplement the requirement of the study. Major published sources of data were various issues of Selected Education Statistics, Statistical Abstract of India, Statistical Abstract of Bihar, Economic Survey of India, Economic Survey of Bihar, Analysis of Budget Expenditure of India, Budgetary Documents of Higher Education in India, population Census Reports and other relevant reports. Apart from these, information was also collected from some other institutions related to higher education viz. NUEPA, NCERT. Some Secondary data, in unpublished

form, was collected from the official files of the Department of Higher Education, Government of Bihar and from the office of Registrar of various universities in Bihar. Information was also collected from school and colleges records.

Primary Data: Primary data has been collected from four different set of people through personal interviews, focus group discussion and observation method. Different methodology adopted for the purpose is presented below:-

(i) In order to examine the factors that motivate the students to out – migrate to other states, the first sample was drawn from population having all the students who are currently studying in senior secondary and graduation level in the state. Data has been collected through Multi-Stage Sampling method.

In the first stage, two separate districts namely, Patna and Lakhisarai were selected. These two districts have contrasting education outcomes based on two criteria: (i) College population index, and (ii) Per capita expenditure on higher education. On the basis of these parameters, Patna is classified as the one of the most developed and Lakhisarai as one of the most backward districts in the State.

In the second stage, two regions, one urban and one rural area was selected for the purpose of carrying out the research. In next stage, list of schools and colleges were taken from Department of Human Resource Development, Government of Bihar. Then, one senior secondary school and one college each from urban and rural area were selected through lottery method. Thus, from two districts, four schools and four colleges was

covered in the proposed study. List of these eight institutions is given in **Annexure-I**.

In the final stage, 384 students were selected for the purpose of the study. Since population size is very large, large Sample size is calculated through the following equation:

$$N_0 = Z^2 p q / e^2$$

Where:

N_0 = Sample Size

Z^2 = the value of the standard variate at a given confidence level
= 1.96 for 95 % confidence level

e = the desired level of precision = $\pm 5\%$

p = sample proportion
= 0.5

q = 1 - p

Since the population size is very large, so we can assume maximum variability i.e. $p = 0.5$ with 95% confidence level and $\pm 5\%$ precision.

Putting the values in the above formula we get

$$N_0 = \{[(1.96)^2 * 0.5 * (1-0.5)] / (0.05)^2\}$$
$$= 384.16 \cong 384$$

The information was collected through personal interview on the basis of structured questionnaire. (**Annexure II**). Self-prepared questionnaire of twenty questions from the following areas: socio-economic background, status of higher education in state and related factors, curriculum, infrastructural facilities and learning resources, student support facilities etc. was used for the purpose of data collection.

(ii) The second sample was drawn from the population who are studying outside the State i.e. from destination universities. The objective was to find out the total cost on education (including boarding, lodging etc.) outside the State and sources of financing at individual level. It also helped us to do a comparative analysis of quality of educational services within and outside Bihar. List of students and their contact number were taken from the official records of the sample schools and colleges selected earlier. Contact information of 150 students was received from competent authority. Since, it was not possible to contact whole population a sample of 108 students was taken through random sampling method. Following method was used for calculating the required Sample size.

$$n = n_0 / 1 + \{(n_0 - 1) / N\}$$

Where:

n = sample size

n₀ = Sample size calculated when population size is very large i.e. 384

N = Population Size i.e. 150

Calculated sample size = 108.

The information was collected through personal interview on the basis of structured questionnaire. (**Annexure III**). The interviews were conducted at different phases of time during the last three years mainly during vacations time like Deepawali or summer vacations when the respondents were present.

(iii) In order to better understand the comparative socio-economic and educational situation, an attempt was made to seek response from four different categories of the people. First category includes students who are currently studying in the state. Second type includes students which were willing to study outside but could not go due to some reason. Third category of students is those who are studying outside the state and finally fourth category of students are those who completed their study outside Bihar and currently employed in different parts of the country. Views of around twelve people have been taken into account through the method of informal meetings and interviews. Personal meetings, telephonic and email conversation was used to accomplish the task of collecting information. The purpose of these 12 case studies is to present the experience of students who have faced different situation and their comparative position. These case studies have further strengthened the argument in the research. It also helped in finding the issues and challenges with respect to higher education in Bihar.

(iv) Discussion was also held with educationists, principals, policy makers and other stakeholders. More than 30 such persons were contacted to find out the problems and the likely solution in the higher education. The objective was to find out issues relating to the backwardness of higher education and the likely measures to correct the situation as provided by above mentioned stakeholders.

3.1.4 Content Validation

After deciding the samples and preparing the questionnaires, it is important to test whether the data collected using the questionnaire supports the model

or whether the questionnaire needs any kind of revision or not. Therefore, it is essential to check the validity of the questionnaire. Validity is the most critical criterion and indicates the degree to which an instrument measures what it is supposed to measure. Content Validity method has been used here to check the validity of the questionnaire. It is a prime indicator of whether the questionnaires are useful for determining the knowledge required for the study or not. Content Validity Ratio developed by C.H.Lawsche's has been used for the purpose. Both the questionnaires were distributed among ten experts and nine of them have rated the questions of the questionnaire as essential. The Content Validity Ratio (or validity of the questionnaire), thus calculated, comes out to 0.8.

$$\text{CVR} = [(E - (N/2)) / (N/2)]$$

Where CVR = Content Validity Ratio

N = Number of experts

= 10 (in this case)

E = Number of experts who rated the questions as essential

= 9 (in this case)

Putting the values in above formula we get,

$$\text{CVR} = [(9 - (10/2)) / (10/2)]$$

$$= 0.8$$

After validation, data has been collected with the help of the prepared questionnaire.

3.1.5 Compilation and Analysis of Data

Data compilation and analysis were done after the process of data collection was completed. The collected data was analyzed using simple percentage method to make inferences. Besides, other statistical tools were also applied to draw the meaningful inferences.

3.1.6 Problems during data collection

Ministry of Human Resource Development is responsible for maintaining the database related to higher education in India. They have the clear mandate to publish data and keep records. However, the existing government data base on higher education is highly inadequate and inaccessible. Collection and dissemination of data on higher education therefore suffers from incomplete coverage, inordinate time lag etc. ‘Selected Education Statistics’ and ‘Analysis of Budgeted Expenditure on Education’ are two basic reports published by Ministry of Human Resource Development for data dissemination. However, during the course of this study, it was found that the time series data was not available even with the Ministry. The similar kind of problem was faced at various stages of data collection. One can imagine the worst scenario at state level in terms of capturing and maintaining of the data related to higher education.

3.1.7 Justification of the Study

Bihar has to make drastic changes in its education system at all levels in order to revive its past glory of 'Centre of Excellence' in the field of knowledge. Large scale migration of students from Bihar to other states need to be checked by improving the quality of existing institutions and also by setting up of new institutions – both through public investment and also by

attracting private investment. But before embarking upon some policy for such drastic change, study is essential to identify the factors responsible for the large-scale migration of students to other states, the loopholes in the systems, the cost-benefit analysis etc. The present study has its relevance in presenting picture to the planners, policy makers and educationists for finding a new direction. The problem of out-migration of students at higher education levels is due to poor higher education system is a persistent for long. However, enough steps were not taken to understand the problem and inherent issues. This study is first in its kind which has brought out these issues and has immense significance for the development of knowledge hubs of high standards in Bihar. The study in general and Bihar state in particular has its importance due for policy formulation at the regional level.

3.2 Concepts and Definition

The role of research and documentation is to fill the vacuum in the current understanding and provide the basis for further development. Educational research and analysis is important in identifying the problems and accordingly developing an educational plan. A rigorous research and variety of information is required for the purpose. Information in its raw form cannot be used for interpretations and to draw conclusions. Conceptual clarity of the subject and practical knowledge of terms & definitions is therefore, important to convert the information in a meaningful and purposeful manner. An attempt has been made in this section to compile some of the concepts and definitions related to higher education sector in India.

(i) Tertiary Education: Tertiary Education is that education which follows the completion of secondary education or its equivalent. Thus, tertiary education includes higher education and the more-advanced parts of further education though the term is more often used in the UK in a sense excluding higher education.

(ii) Technical Education: Technical Education designed at upper secondary and lower tertiary levels to prepare middle level persons (technicians, middle management etc.) and at University level to prepare engineers and technologists for higher management positions. Technical education includes general education, theoretical, scientific and technical studies and related skill training. The component of technical education may vary considerably depending on the types of personnel to be prepared and the education level.

(iii) The UGC Act, 1956: It is an Act through which UGC has been established. It is enacted by Parliament of India on 3rd March, 1956. The purpose is to make provision for the co-ordination and determination of standards in Universities.

(iv) University: “University” means a University established or incorporated by or under a Central Act, a Provincial Act or a State Act, and includes any such institution as may, in consultation with the University concerned, be recognised by the Commission in accordance with the regulations made in this behalf under the UGC Act, 1956.

(v) **Constituent Institution:** Constituent Institution means an institution operating under the administrative, academic and financial control of the sponsoring body and declared under the notification.

(vi) **Deemed to be University:** Deemed to be university, is a status of autonomy granted to high performing institutes and departments of various universities in India. This status of Deemed-to-be-University is granted by Department of Higher Education, Ministry of Human Resource Development, on the advice of the University Grants Commission (UGC) of India, under Section 3 of the University Grants Commission (UGC) Act, 1956.

(vii) **Recognized Institution:** Institutions which are established under section 2(f) and 12(b) and section 3 of the UGC Act, which have completed 5 years since establishment or with a record of at least two batches of students having completed their degree program.

(viii) **Autonomous Institution:** An Institution, to which autonomy is granted and is designated to be so by the Statutes of affiliating University.

(ix) **Constituent Colleges:** Constituent Colleges are defined as colleges established, maintained and nurtured by universities themselves academically, administratively and financially. The advantages of the constituent college system are autonomy, flexibility and freedom of introduction of innovation in curriculum development, teaching-learning process and in examination/evaluation methodology without significant time lag.

(x) **Government Aided Institution:** Government Aided Institution means institution that meets 50 per cent or more of its recurring expenditure out of the grant received from Government or Government organizations.

(xi) **Government Institution:** Government Institution means technical institution established and/or maintained by the Government.

(xii) **Academic Year:** The education cycle consists of a number of years divided into annual calendar. The students are evaluated at the end of each year and are either promoted to the next grade or detained in the same grade. Normally, In the case of many higher education institutions, the educational cycle is divided into semesters and trimesters.

(xiii) *Curriculum: Curriculum is the course of study duly prescribed by a Board or University for completing a particular level of education. UNESCO has defined curriculum as the subjects that are studied or prescribed for study in an educational program.*

(xiv) *Syllabus: Main heads and topics to be covered by a course of study or instruction.*

(xv) **Adult Literacy Rate:** The percentage of population aged 15 years and over who can both read and write with understanding a short simple statement on his/her everyday life.

Calculation method: Divide the number of literates aged 15 years and over by the corresponding age group population and multiply the result by 100. Alternatively, apply the same method using the number of illiterates to derive the illiteracy rate; or by subtracting literacy rate from 100%.

$$LIT_{15+}^t = (L_{15+}^t / P_{15+}^t) * 100$$

Where:

LIT_{15+}^t =Adult Literacy Rate (15+) in year t,

L_{15+}^t =Adult Literate Population (15+) in year t

P_{15+}^t =Adult Population (15+) in year t

(xvi) Transition rate: The number of pupils (or students) admitted to the first grade of a higher level of education in a given year, expressed as a percentage of the number of pupils (or students) enrolled in the final grade of the lower level of education in the previous year. Purpose is to convey information on the degree of access or transition from one cycle or level of education to a higher one. Viewed from the lower cycle or level of education, it is considered as an output indicator, viewed from the higher educational cycle or level, it constitutes an indicator of access. It can also help in assessing the relative selectivity of an education system, which can be due to pedagogical or financial requirements.

Calculation method: Divide the number of new entrants in the first grade of the specified higher cycle or level of education by the number of pupils who were enrolled in the final grade of the preceding cycle or level of education in the previous school year, and multiply by 100.

$$\mathbf{TR}_{h,h+1}^t = \{ (E_{h+1,1}^{t+1} - R_{h+1,1}^{t+1}) / E_{h,n}^t \} * 100$$

Where:

$TR_{h,h+1}^t$ = Transition rate (from cycle or level of education h to h+1 in school year t)

$E_{h+1,1}^{t+1}$ = Number of pupils enrolled in the first grade at level of education h+1 in school year t+1

$R_{h+1,1}^{t+1}$ = Number of pupils repeating the first grade at level of education h+1 in school year t+1

$E_{h,n}^t$ = Number of pupils enrolled in final grade n at level of education h in school year t

(xvii) Gross Enrolment Ratio (GER): Total enrolment in a specific level of education, regardless of age, expressed as a percentage of the eligible official school-age population corresponding to the same level of education in a given school year.

Calculation method: Divide the number of pupils (or students) enrolled in a given level of education regardless of age by the population of the age group which officially corresponds to the given level of education, and multiply the result by 100.

$$\mathbf{GER}_h^t = (E_h^t / P_{h,a}^t) * 100$$

Where:

GER_h^t = Gross Enrolment Ratio at level of education h in school year t

E_h^t = Enrolment at the level of education h in school year t

$P_{h,a}^t$ = Population in age group a which officially corresponds to the level of education h in school year t

(xviii) Net Enrolment Rate (NER): Enrolment of the official age group for a given level of education expressed as a percentage of the corresponding population.

Calculation method: Divide the number of pupils (or students) enrolled who are of the official age group for a given level of education by the population for the same age group and multiply the result by 100.

$$NER_h^t = (E_{h,a}^t / P_{h,a}^t) * 100$$

Where:

NER_h^t = Net Enrolment Rate at level of education h in school year t

$E_{h,a}^t$ = Enrolment of the population of age group a at level of education h in school year t

$P_{h,a}^t$ = Population in age group a which officially corresponds to the level of education h in school year t

(xix) Capital Expenditure: Capital expenditure is the expenditure for assets that last longer than one year, and includes expenditure incurred on the purchase of land, construction of the building of an educational institution, fittings, fixtures, development of playground, hedging, protection walls of the institution and on development of institutional infrastructure that last for more than a year.

(xx) **Current Expenditures:** Current expenditures are expenditures for goods and services consumed within the current year, and which should be renewed if there is need for prolongation to the following year.

(xxi) **Revenue Expenditure:** Revenue Expenditure includes all expenditure excluding capital expenditure.

(xxii) **Plan Expenditure:** Plan expenditure is that expenditure which is incurred out of the funds provided under different Five Year Plans/Annual Plans of the country.

(xxiii) **Non-Plan Expenditure:** Non-plan expenditure is committed expenditure for the maintenance of the existing school plant. While non-plan expenditure is maintenance expenditure, the plan expenditure is developmental expenditure.

(xxiv) **Recurring Expenditure:** Recurring expenditure on education is the expenditure, which is required to be incurred frequently or which recurs repeatedly. Under this head, we may include salaries and allowances of staff, consumable stores, whitewashing, maintenance etc. of school plant, including repairs and maintenance.

(xxv) **Non-Recurring Expenditure:** Non-recurring expenditure on education is that expenditure which is comparable to capital expenditure on education. It includes expenditure on construction, purchase of major equipment, land, hostel, vehicles, development of laboratories, library etc.

(xxvi) Public Expenditure on Education as per cent of Gross Domestic Product: Total public expenditure on education (current and capital) expressed as a percentage of the Gross Domestic Product (GDP) in a given financial year.

Calculation method: Divide total public expenditure on education in a given financial year by the GDP of the country for the corresponding year and multiply by 100.

$$\% \text{PXGDP}_t = (\text{PXE}_t / \text{GDP}_t) * 100$$

Where:

$\% \text{PXGDP}_t$ = Percentage public expenditure on education in financial year t

PXE_t = Total Public expenditure on Education in financial year t

GDP_t = Gross Domestic Product in financial year t

(xxvii) Public Expenditure on Education as per cent of Total Government Expenditure: Total public expenditure on education (current and capital) expressed as a percentage of total government expenditure in a given financial year.

Calculation method: Divide total public expenditure on education incurred by all government agencies/departments in a given financial year by the total government expenditure for the same financial year and multiply by 100.

$$\% \text{PXE}_t = (\text{PXE}_t / \text{TPX}_t) * 100$$

Where:

% PXE_t = Public expenditure on education as a percentage of total government expenditure in financial year t

PXE_t = Total public expenditure on education in financial year t

TPX_t = Total government expenditure in financial year t

(xxviii) Pupil-Teacher Ratio (PTR): Average number of pupils (students) per teacher at a specific level of education in a given school year. Calculation method: Divide the total number of pupils enrolled at the specified level of education by the number of teachers at the same level.

$$PTR_h^t = E_h^t / T_h^t$$

Where:

PTR_h^t = Pupil-teacher ratio at level of education h in school year t

E_h^t = Total number of pupils or (students) at level of education h in school year t

T_h^t = Total number of teachers at level of education h in school year t

(xxix) Gender Parity Index (GPI): Ratio of female to male values of a given indicator. The GPI measures progress towards gender parity in education participation and/or learning opportunities available for women in relation to those available to men. It also reflects the level of women's empowerment in society.

Calculation Method: Divide the female value of a given indicator by that of the male.

$$\mathbf{GPI}_i^t = \mathbf{F}_i^t / \mathbf{M}_i^t$$

Where:

\mathbf{GPI}_i^t = Gender parity index of a given indicator i in year t

\mathbf{F}_i^t = Female value of a given indicator i in year t

\mathbf{M}_i^t = Male value of the same indicator i in year t

3.3 Concluding Observations

The present Chapter made an attempt to highlight the underlying research methodology in detail. The research objective, hypothesis, data sources and methods adopted for data collection and validation has been presented in this section. Various technical terms have been used in this study. In order to have a clear grasp over the different aspects of the study, it was imperative to make the meanings of these terms clear. Meaning and computational details of some of the relevant technical terms are discussed in the last section of the chapter. Status of higher education in Bihar in comparison with other states of the country will be presented in the next Chapter.