Chapter – 1

*Conceptual and Methodological Framework*
Concept of Education

The term education has its origin from the Latin ‘educere’ and ‘educare’ which respectively mean ‘to bring up’ and ‘to bring forth’. A Latin author Varro used the word “Educit obstetrix, educat, nutrix, instiuit, peadagogus, docet, magister” which means, ‘the mid-wife brings forth, the nurse brings up, the tutor trains and the master teaches’. Thus, the word education has a very wide canvas and it is very difficult to give it a precise definition. It is like a diamond which appears to be of different colour when seen from different angles. Therefore, a biologist, a priest, a psychologist, a philosopher, a statesman, a teacher, a merchant, a shopkeeper, an artisan seem to have his own concept of education which is influenced by his own outlook about life and his past experiences.

With all its complexities and wide meanings, education, however, has been defined and the concept has been made precise by different scholars and philosophers, which has been cited in “Teacher and Education in a Developing Society”, by Aggarwal J.C. (2004) as follows:

Plato has explained that “Education develops in the body and in the soul (of the pupil) all the beauty and all the perfection which he is capable off.”

Aristotle speaks of education as “the creation of a sound mind in a sound body”. Education, according to him, should develop the body, i.e. the physical capacities of the child and the mind which means his intellectual, emotional, moral and spiritual capacities.

Pestalozzi defines education “as the natural, harmonious and progressive development of man’s innate powers”.

In the view of **Nunn**, “Education is the complete development of the individuality so that he can make an original contribution to human life to his best capacity.”

According to **Brown**, “Education means the culture which every generation purposely gives to its successors in order to qualify, to keep and to improve the level attained.”

In the words of **Welton, J.** “Education is an attempt on the part of the adult members of the human society to shape the development of the coming generation in accordance with its own ideals of life.”

**Aurobindo** defines education as “helping the growing soul to draw out in itself.”

**Gandhi** says, “By education, I mean an allround drawing out of the best in the child and man—body, mind and spirit.”

**Tagore** thinks, “Education means enabling the mind to find out that ultimate truth which emancipates us from the bondage of the dust and gives us the wealth, not of things but of inner light, not of power but of love, making the truth its own and giving expression to it.”

According to **Vivekanand**, “Education is the manifestation of divine perfection already existing in man. Education means the exposition of man’s complete individuality.”

**Nehru, J. L.**, has defined education as “Enabling the individual to be a producer as well as a good citizen.”

**Husain, Z.**, viewed education as “Helping the mind of the learner to realize absolute moral and intellectual value.”
Radhakrishnan, S., opined that, “By education, I mean training of the intellect, refinement of the heart and discipline of the spirit.”

Many thinkers have defined education with their stress on social and environmental aspects. Few examples are cited here:

According to Dewey, “Education is the development of all those capacities in the individual which will enable him to control his environment and fulfill his responsibilities.”

Thomson says, “By education I mean the influence of the environment upon the individual to produce a permanent change in his habits, behaviour, thoughts and attitude. Environment has various aspects – physical, social and cultural. Education should facilitate the task of adaptation of the child to his environment.”

In the words of Redden, “Education is the deliberate and systematic influence extended by the mature person upon the immature through instruction, discipline and harmonious development of the physical, intellectual aesthetic, social and spiritual powers of the human being according to their essential hierarchy by and for the individual and social uses.”

Mill, J.S., says, “Not only does education include whatever we do for ourselves and whatever is done for us by others for the purpose of bringing us somewhat nearer to the perfection of our nature, it does more in its largest acceptance. It comprehends even the indirect effects produced on character, and on human faculties, by things of which the direct purposes are quite different, by laws, by forms of government, by the industrial arts, by the modes of social life, may even by physical facts not dependent on human will,
by climate, soil and local position. Every environment, every surrounding, every activity helps to shape the human being. A human soul is in constant interaction with his environment. The interaction results in the modification of human behavior or education.”

According to Banerji, P.C. (1931), “Education is the development of the power of adaptation to an ever changing social environment.”

It is clear from the above discussion that the central idea of all the scholars and thinkers regarding education is overall human development. It is also clear that the concept of education as formal schooling got replaced by a broader concept which includes a wide variety of activities that influence the growth and development of the individual and the society directly or indirectly. Its main concern is the development of character and personality. The overall impact of education on man can be summarized in the following illustration.
Thus education is a life long process which takes place from womb to the tomb. It has doubtless an important functional or instrumental or utilitarian dimension. It does not mean that it is a commodity to be acquired or possessed and then used, but a process of inestimable importance to individuals and society, although it can and does have enormous use value. Education then is a process of expansion and conversion not in the sense of converting or turning out students into doctors, engineers, etc. but the widening and turning out of the mind, creation, sustenance and development of self critical awareness and independence of thought. It is an inner process of moral intellectual development.

One should not confuse literacy and knowledge with education. Literacy and numeracy are means through which individuals are able to express themselves. It is a vehicle which helps in conveying ideas, thoughts and events over time and space. Literacy equips but may not fully empower individuals and societies. Literacy, therefore, serve a limited role. Similarly the meaning of knowledge in the lexicons is given as “assured belief that is known, information, instruction, equipment learning practical skill and acquaintance.” Thus knowledge is the sum and substance that is acquired by human being through written or unwritten media.

On the other hand, education deals with all-round development of human personality, bringing out the best in man. Education literally means bringing up or training of a child. It is a process through which power of body, mind and culture are strengthened, i.e. bringing of head, heart and hand together. Education is the process of getting informed, acquiring knowledge,
skills and ability. In this process, literacy acts as one of the means or instrument for transmitting knowledge acquired over time and space. In fact, literacy and education are aids to achieve ‘knowledge’ and thus are processes for ultimate universal knowledge.

The purpose of education is to make the human being capable and develop their skills and competence to meet challenges of life and it has to be in full consonance with our entire life such as economic, intellectual, aesthetic, social and spiritual. It should emerge from the core of our basic values and ethics and should live with varied forms of cooperation prevalent therein.

**Importance of Education**

Education has such a wide canvas that no sphere of life is untouched by it. Its importance hardly needs any elaboration. It is continuously playing an important role in the development of a child into a responsible human being. Education is a planned and deliberate process which is devised to give certain information and develop certain skills of mind and certain modes of behavior which are considered desirable. There is no denying the fact that educated human resources invested in economic activity generate increased wealth.

Education and economic development go hand in hand. The role of education in deciding the nature of job availability reflects the direction of development towards which the economy is moving. In economics of production, education has significance in deciding the levels of adoption of new technological inputs upon which the progress of various economic sectors is dependent. A modern industrial unit or any knowledge-based
organization recruits job seekers suitable to their own requirements. Various mechanisms operate in the functioning employment avenues and income generating capacities of the industry, which determines the levels of development of any area. It is the assurance of continued job availability in a particular sector of the economy as a result of its sustained development, which opens up avenues for specialized education and job skills.

The intricate link between attainment of educational levels and increased labour productivity for overall economic development is well established. The level of educational attainment is basically a trait of the society in response to changing outlook towards life. Faster economic development very much depends upon the enlightened masses. Education has an important bearing on the quality of labour, which determines its productivity. While education at primary level provides a country with a literate work force amenable to change and acceptance of new ideas, at the higher level, education acts as a tool of change and development.

Education is the most important single factor in achieving rapid development and in creating a social order based on the values of freedom, social justice and equal opportunities (Patrik, G.D., 1967). Along with the development of education, economic opportunities to masses increases and social barriers are narrowed down. Investment in human resources is more important than any other resources. For the formulation of planning strategies, not only the problems of investment cost of education should be taken into account but the locational planning should also be considered as one of the most important bases, so that wastage in education can be prevented and
maximum benefit may be taken. One of the important necessities for rapid development is a proper channelization of motive among the rural population and this is possible only by educating the masses.

There can be no dispute that planning is relevant and vital for any development, more so when one has to consider rejuvenating social fabrics and structures. The planning process involves perception of problems and alternatives. The analysis of various alternatives and available resources helps us in achieving our goal. The awareness of goal is dependent on clarity of perception and understanding. The level of understanding or conceptualization of problem depends on education. Faster economic development in American and West European nations is the result of efficient planning and better understanding of the problems in which education plays a very important role.

The level of education has an important bearing on the level of living of people inhabiting in the different regions. In the field of economic thought, the Human Investment Revolution was formally brought about by Schultz (1971) in his epoch making presidential address to the American Economic Association in 1960 and by his later writings. Bowman and Anderson (1963) have lent empirical content to this line of reasoning by proving on the basis of an empirical study of as many as eighty-three countries. They concluded that a certain level of education is a basic pre-requisite for economic development. Indeed, international bodies like the United Nations and Organization for Economic Co-operation and Development look upon education as an area of
major social concern and list it as an important constituent of the level of living.

Education is an important variable for assessing social development. It is the basis of creation and dissemination system that triggers technological progress, which is the main component of economic growth. Improvement in education level indicates improvement in the quality of human resource. For the planning of a region, education should be considered as a fairly reliable index of socio-cultural and economic advancement. Education is essential for eradicating poverty and mental isolation, for cultivating peaceful and friendly international relations and for permitting the free play of democratic processes.

Chandana, R.C. and Sindhu, M.S. (1990). On the other hand, lack of education can certainly be an impediment in the development process. Hence, certain level of education is a basic requirement for people to get out of ignorance and backwardness. Thus, a dynamic and virtuous spiral can then be established between education and socio-economic development.

The role of education and skilled man power in promoting socio-economic development has long been recognized and documented. It is, however, during the last decades of the 20th century, the full force of the impact is being fully appreciated. Moreover, the role of education as an essential input in the re-organization and modernization of societies in the developed countries of today has been even more far reaching. Education played a crucial role in the acquisition of the knowledge base of their people and in the setting up of their exceedingly efficient communication network. Education and socio-economic development are interlinked through bi-
directional causation i.e. they fed, support, sustain and strengthen each other. It acts as a catalyst for social upliftment enhancing the returns on investment made in almost every aspect of development effort, be it population control, health, hygiene, environmental degradation control, empowerment of women and weaker sections of the society.

A minimum level and equitable distribution of socio-economic development is necessary to eradicate hunger, chronic poverty, undernourishment, malnourishment, permanent indebtedness, etc. To achieve this stage, however, education itself has to play a far more active, participatory and dynamic role, to provide the motive, the rationale, the skills, the values and the vision of what is meant by a better society. A better society leads to better education which leads to better social development.

For Mahatma Gandhi, education covered the entire field of life. It became for him co-extensive with life itself, with cleanliness and health, with work and worship, play and recreation. He emphasized that education equip the child with principles of life, sanitation, hygiene, nutrition and doing social work and helping their parents at home. Education creates a just social order (Tripathi, R.C.1994).

The significance of education as a social indicator is brought out by the very fact that like health it is important in itself as an aid to enjoyment of fruits of development. Educational achievement not only is the stepping stone to job opportunities and hence earning, but in the words of Horace Mann “Education is beyond all other devices of human origin, a great equalizer of the conditions of men, the balance wheel of social machinery.” The social
significance of education is brought out by the very fact that those who gain education, benefitted in two ways, i.e. consumption and investment. Consumption benefits are those which individuals receive while they are actually being educated, i.e. the pleasures of learning, the extra curricular opportunities for sports or cultural activities and so on. The investment benefits are those which individuals receive after the completion of education. These include an increase in income over and above that they would otherwise have received; they may also include richer and more meaningful life which may believe education makes possible.

Education yields direct and indirect positive returns to the educated person. Direct returns which are in the form of increased earnings are easily quantifiable. Indirect returns, though important, are not amenable to measurement. They may be in the form of an enlightened electorate, greater tolerance among people; hence, less friction and therefore an amicable and conducive environment in which development can take place. It helps to wean the developing society away from the old and towards the new, it inspires belief in progress, efficiency, achievement and rationality.

There is an inseparable link between education and the exercise of democratic rights, access to information, freedom of expression, consciousness of secular identity, scientific temper, commitment to social justice and pride in one's region, nation, culture and tradition. Democracy is impossible without a certain standard of education as one can easily see from the failure of socialist societies and the success of the Hindu right wing in India, which has churned out untruths day after day with impunity and
away with it. It is the education which makes the women (deprived half of society) conscious of their rights, enabling them to organize themselves to fight against various social evils like the sale of arracks, dowry demands and death and the violence against women. In a country like India where feudal forms of oppression such as bonded labour, child servitude and dowry death are still prevalent, education has positive worth. To be unable to sign, draft an application, read signboards, correctly assess one's dues and earnings, have access to a bank and a post office are handicaps which only those who are privileged to take these for granted can ignore. Hence the positive worth of educational achievement lies in its ability to make people better equipped to fight for their interest. Education plays a very important role to socialize the younger generation by developing in them desirable skills, knowledge, attitudes, values, behavior, etc. that are needed for the society. Because of their educational status, the ideas and actions of academic elites inspire the people in general and youngsters in particular. In the intellectual tradition, academic elite is placed on a very high position and is considered as the embodiment of high values and traditions. It was those belonging to this group who discovered the truth, preserved it and acted according to it. Being erudite intellectuals, they were considered as crusaders for the truth. As a matter of fact, they commanded respect in the society. It is only because of their education and intellectual traditions that the educated people influence the populace and establish themselves as a vital segment of the society.

The double edged nature of education as the operation of social purposes gives to the educational trajectory its specific twists and turns. Depending on the nature of the social organization and propensity of the
ruling elite, education has been used through the mediation of suitable
technologies for war and for peace, for murder and for self defence, for
subjugation of people and for releasing them from bondage. Education
transmits the accumulated heritage of humankind and thereby helps
perpetuate the system of which it is the outcome. However, even as the old
society reproduces itself through education, a dissenting consciousness is also
generated dialectically by contradictory forces objectively existing in the
society. It is these forces of dissent which become the source of progressive
change. Evidence of the contributions made by education to the development
of human societies and to the making of civilizations is available in
abundance. It is a necessary input in this revolution which has enabled man to
interact with non-human nature at a qualitatively higher level and to hope for
the ecstasies of fulfillment. It is, at the same time, the receptacle of a
moribund value system.

Education not only bestows social status and social stability to its
owner but also political power as well. It makes available to the individuals a
wider range of alternatives for the manner in which they would arrange their
lives. It forms an important input in the overall development of individual,
enabling them to comprehend their social, political and cultural environment
better and respond to it appropriately. Therefore expenditure on education is
considered as investment in human resource development.

Thus, it can be said that education is one of the most important and
powerful social force which change the outlook and approach of the members
of the society. Only education can give the desired form of the constantly
changing society. Education is essential for the eradication of backwardness in the society, for promotion of economic development, social upliftment and political maturity. Hence no sphere of life is untouched with the influence of education and we can not make a limit as far as the role of education in our life is concerned.

CONCEPT OF REGION

The process of regionalization and the techniques of regional analysis and their interpretation constitute the very fundamentals of modern geography. However, region, the key-word to these fundamentals, is a term of highly involved connotation. The idea of region is not only a means of the theoretical arguments of geographers and a tool for novelists and poets but also has great practical values for the man of affairs. More or less some idea has been expressed more vividly and explicitly by a regional scientist, who conceives of region as a dynamic social organism possessing an intricate network of interconnection and interrelated via diverse flow to each of hierarchical array of regional and sub-regional entities. A truly scientific concept of regionalism in geography is a product of the 20th century. The concept of region is generally traceable amongst the works of the geographers of all stages and ages of evolution. However, the professional geographers of all the ages and the countries agreed that geography, being basically a science of surface phenomena, is inseparably wedded to region and regional analysis. Hence in modern geographical study region enjoys pivotal position.

The word “region” is defined by different geographers of different ages. Some of which are cited here:
Lavisee (1903): A region is a reservoir of energy whose origin lies in nature but whose development depends upon man. It is a man, who, by moulding the land to his own purposes, brings out its individuality. He establishes a connection between its separate features. He substitutes for the incoherent effects of local circumstances a systematic concourse of forces. It is that a region defines and differentiates itself and becomes as it were a medal struck off in the effigy of a people.

German, French and British geographers of nineteenth and twentieth century have developed and elaborated a vigorous regional concept in geography. According to Hall, R.B. (1935), the development of regional concept has proceeded through a number of distinct stages, each more ambitious than the preceding one and commensurate with the expansion of knowledge about the lands of the world.

In the words of Whittlessey, D. (1954), it is an area throughout which accordant areal relationships between phenomena exist. Notwithstanding all the minor differences of these definitions, a region is basically an area identified or identifiable with reference to one selected element or a combination of selected elements.

Gilbert, E.W. (1960): “Region is a convenient device to keep knowledge within manageable dimensions, and for the social scientists, whose great problem is to get something isolated, the region is a means by which source control may be exercised”.

Hartshorne, R. (1960): “A region is an area of specific location which is in some way distinctive from other areas and which extends as far as that distinction extends.”
Renner, G.T. (1967): “Regions are genuine entities, each of which expresses both natural and cultural differentiation from its neighbours”.

Traditionally defined concept of a region refers it to be an area so homogeneous in terms of certain specifically selected aspects that it stands distinct from other areas. The Geographical Glossary prepared by the committee of the Royal Geographical Society defines a region as “an area of the earth’s surface differentiated from adjoining area by one or more features or characteristics which give it a measure of unity. According to the criteria employed in differentiation, regions are termed as physiographic, political, economic, etc. (Stamp, L.D., 1968).

The basic concept for which the term region stands in geography is expressed by different terms in different disciplines. Historians call it the ‘sectionalism’, anthropologists give it the name of ‘cultural area’, biologists term it as the ‘biotic area’, and for economists it is the ‘economic domain’ and so on. However, one thing is very sure and definite about region: it is more a conceptual construct than an actuality in the real world. This is understandably reasonable because, as a tool of graphic analysis and explanation, a region is recognized and demarcated by taking into consideration the parameters relevant to the problem of study and ignoring the irrelevant however real they may be.

Since the number of basic elements and realities with which geography is concerned is quite large, geographers have attempted to formulate the meaning of region with reference to the element or elements of their special...
interest. Because of this, many definitions of the region have been given by geographers. A few of them are cited by Minshull, R. (1967) as follows: A region is,

"An area delineated on a basis of general homogeneity of land character and of occupance" (Platt, R.S.).

"A domain where many dissimilar beings, artificially brought together, have subsequently adapted themselves to a common existence" (Vidal de la Blache)

"An area whose physical conditions are homogenous" (Joerge, W.L.G.)

"An area characterized throughout by similar surface features and which is contrasted with neighbouring areas" (Fenneman, N.M.)

Lastly, it may be noted that there is a general agreement on the point that a region is basically a binomial entity with area and a chosen attribute or set of attributes forming the two components of the binomial. It is the attributes, which makes a region with an area. Axiomatically, therefore, a region is necessarily an area but every area is not necessarily a distinct and defined region. In fact, an ‘area’ is any portion of the earth’s surface which has some length and breadth and as such is simply a geometric surface regardless of its being homogeneous or coherent or otherwise. A ‘region’ on the other hand, is an area of specific entity and distinct personality which is identified with reference to the facts of either physical geography such as climate, topography, soil and vegetation etc. or human and cultural geography such as population, economic activities, language and the like. A region is not
a mere homogeneous entity in respect of the selected fact or phenomenon, it is something more. It incorporates accordant relationship between the selected fact and various other phenomena.

**DISPARITY**

The term disparity is not very much clear in its sense as it is very much similar to inequality, imbalance, diversity, etc. However, geographers have attempted to define the terms with some very clear cut demarcations.

The *Oxford Dictionary* meaning of disparity is “the quality or state of being of unequal rank, condition, circumstances, etc. inequality or dissimilarity in respect of age, amount, number or quality, want of parity or equality”.

R.C. Sharma has defined the above mentioned synonymous terms in the following ways.

**Regional Disparity**

Regional disparity means differentiation in the values, qualities or quantities of certain items of different regions. These are determined by the application of quantitative methods, however, identified on the basis of classes, ranges or categories.

**Regional Imbalance**

When disparities disbalance the state of development over different regions is known as regional imbalance.

**Regional Diversity**

It denotes differences in the initial resources endowments, largely of a natural or physiographic character, (not human or sociological) leading to
territorial specialization and division of labour through exploitation of the resource advantages comparative as well as absolute.

In general, regional disparities mean failure of a region to exploit development potential of its initial resource endowments and resource advantages in relation to another region comprising factors other than the natural.

DATA BASE AND METHODOLOGY

In the present study, the state of Uttar Pradesh has been selected for an enquiry into the spatial dimensions of educational disparities. Data related to educational status have been collected at district and village level from primary as well as secondary sources. For the analysis of the data, factor analysis technique is used. Through this technique factor loadings and factor scores have been calculated. Factor Analysis has been used to reduce the large number of indicators, many of them interrelated, to the few independent underlying dimensions called factors which are supposed to be responsible for the spatial variations. Descriptive names have been given to each factor based on the indicators most closely associated with that factor and the concept expressed by the cluster of indicators. Finally, the resulting structural and regional patterns have been analysed with the general notions and hypotheses based on theoretical knowledge and observational ideas.

Choice of Indicators

The study is basically analytical in treatment of the data. The basic aim is to find out variations in the educational level in an under-developed state like Uttar Pradesh (India). The selection of indicators under each aspect of educational level is made with a view that it is a representative of the
educational disparities in the state. Since the study area have high degree of regional variations in educational level, simple and direct measures of educational development were attempted. The selected indicators are all representative of the status of education for the study area.

The Unit of Analysis

The selection of an unit to analyse the character of an area always poses a problem. Robinson (1950) in the context of 'ecological fallacy' has pointed out that the extent and sometimes even the direction of relationships among indicators may change with varying size of unit of analysis. McCarty, H.H., Hook, J.C., and Knox, D.S. (1964) similarly observed that every change in scale will bring about the statement of a new problem and there is no basis for presuming that associations existing at one scale will also exist at another. Although it is generally said that smaller the unit of analysis lesser the distortion, however, scale is subject to restrictions in both upward and downward directions. Observation of characteristics and relationships over large areas runs into the risk of over-simplifications and fallacious averaging of reality, whereas small units of analysis pose the problem of fragmentation as processes and relationships may cross their boundaries.

In the present study, the political division of the state in the form of districts have been taken as the unit of analysis in general and village in particular. The study larger than district level (i.e., commissionary) will be simplistic and have no geographical value. On the other extreme, village is the smallest unit which presents the better representation of the concerned issues. The limitation of the study does not permit to take into account the entire villages of the state of Uttar Pradesh, therefore, an extensive village level
study of representative villages regarding educational and socio-economic status have been made on the basis of relevant indicators.

The Factor Analysis Technique:

The technique of Factor Analysis, initially developed by psychologists early in the present century as a means of analyzing the results from intelligence tests (Royce, J.R. 1958) and later used by other disciplines. It is a method of studying simultaneously the complex inter-relationship between many variables as measured from different observations and summarizing salient features of relationships in the form of a few basic patterns called factors. Although studies of geographic nature were undertaken at an early date by sociologists (Hagood, M.V. et al., 1941) and the technique has been used recently by geographers, the factor analysis technique has been applied by various geographer in their studies of economic regionalization (Berry, B.J.L., 1960), climatic regionalization (Steiner, D., 1965), classification of cities (Ahmad, Q., 1965), the regionalization of urban areas (Carey, G.W., 1966) and the analysis of commodity flow patterns (Berry, B.J.L., 1966).

One of the most difficult tasks in factor analysis is the identification or giving some meaning to the newly produced factors in the light of the original data, because variables may load about equally with a number of factors rather than correlate with as few factors as possible. The factors are extracted in descending order according to their importance, i.e. in order of their contribution to total variance of the data matrix and the factor scores extracted from the analysis permit mapping the basic dimensions of the indicators used for the identification of spatial variations of the level of education.
Nature of the Analysis

The factor analysis conducted for this study is based on 17 indicators pertaining to regional disparities in the levels of education in 70 districts of Uttar Pradesh (India).

Computation for this analysis was carried on AMU, ALPHA, SDK 100 computing system. The model for the factor analysis used in the study involves the following steps:

1. Initial computation is based on transformation of the original data matrix $D$ for $'n'$ observations on $'m'$ variables into a standard score matrix $z$ of $(n \times m)$ order.

2. From the standard score matrix $Z$ an $(m \times m)$ order correlation matrix $r$ was calculated, which contained product moment correlation coefficient between each indicator and every other indicator.

3. This correlation matrix was resolved into a factor loading matrix $A$ of $(m \times r)$ order. The programme employed is such that it can extract as many factors as the number of indicators, but only three factors are calculated in the present study for ease of analysis.

4. From the standard score matrix of $(m \times m)$ order and factor loading matrix of $(m \times r)$ order a factor score matrix of $(n \times r)$ order was obtained. These factors scores (normalized to zero mean and unit variance) provide a measure of position for each observation (District) on the new factors.

The Z-score method is also used to calculate the standardized scores. It is a linear transformation of the original data in such a way that its mean
becomes zero and its standard deviation becomes unity. For observation ‘I’ of any variable, the Standard Score (Z_i) is given by:

\[ Z_i = \frac{X_i - \bar{X}}{S} \]

where

- \( X_i \) is the original value for observation (i)
- \( \bar{X} \) is the mean for the variable and
- \( S \) is the Standard Deviation.