

**A CRITICAL ANALYSIS OF GSHSEB
STATISTICS TEXTBOOK
OF STANDARD XI**

A dissertation Submitted in Partial Fulfillment

Of Requirement for the Degree of

Masters in Education

Guide:

Dr. Archana Tomar

Investigator:

Ms. Elizabeth Chacko



SCHOOL OF SCIENCE AND EDUCATION

NAVRACHANA UNIVERSITY

BHAYLI ROAD

VADODARA

APRIL 2015

ACKNOWLEDGEMENT

Words are not enough to express my sincere thanks to all those who are associated with my work. God's presence makes all work extra ordinary by ordinary people. I experience the presence of Lord Almighty throughout my M.Ed. programme. First of all I like to give my sincere and hearty thanks to my Lord Almighty for helping me to complete my project

This work could not have been achieved without the continuous and selfless guidance of my Guide, **Dr. Archana Tomar**. She always motivated and inspired me throughout this work whenever I met obstacles on my path. I extend my sincere thanks to my Guide for making this work a wonderful learning experience for me.

I am very happy to express my thanks to the head of the institution, **Dr. P.V Xavier**, who imparted a wide range of knowledge to me from his treasure of knowledge as a Teacher Educator and gave all timely guidance.

Without my teachers this work could have been not possible. I am greatly indebted to all of them for helping me to achieve my goal. I also like to thank **Dr. Vandana Talegaonkar** who was the in charge of M Ed programme and tried her level best to complete all the work in time and with considerable perfection.

My friends were really my strength and happiness in the college and in all my activities. Really I enjoyed their company in various group assignments. They always helped me to find solution for any kind of problems during our study in the college especially during my absence in the college due the sudden demise of my beloved mother. I take this opportunity to express my gratitude to all my friends from the bottom of my heart.

I also like to thank the staff members of the library who supported and helped us throughout our study in the university and all the non teaching staff of the university who were constantly helping us directly and indirectly.

My sincere and heartfelt thanks to my family members especially my husband, **Mr. P.V Mathew** and my two children, **Sherin P. Mathew** and **Shephin P. Mathew** for their care and constant support throughout my study.

Last but not the least I extend my thanks to the University for providing such a great opportunity to us

I expect that my work will be beneficial to the textbook bureau to improve the level of the textbook.

Elizabeth Chacko

2014-15

DECLARATION

I, the undersigned, **Ms. Elizabeth Chacko**, here by declared that this dissertation entitled “A Critical Analysis of GSHSEB Statistics Text Book of Standard XI” is my own work, and all the sources that I have used or quoted have been indicated or acknowledged by means of complete references.

Date: April, 2015

Place: Vadodara

Elizabeth Chacko

CONTENTS

Certificate	I
Acknowledgement	II
List of Contents	III
List of Tables	IV
List of Charts	V

CHAPTER I

Page No

CONCEPTUAL FRAMEWORK

1.0	Introduction	1
1.1.0	Defining curriculum	1
	1.1.1 Curriculum development in ancient India	2
	1.1.2 Scope of curriculum	2
	1.1.3 Significance of curriculum	3
	1.1.4 Basic paradigms in curriculum construction	3
	1.1.5 Suggested principles for higher secondary curriculum	3
	1.1.6 Suggested sequence of the curriculum	4
	1.1.7 Balance in the curriculum	4
1.2.0	Selection of various streams after standard XI	5
	1.2.1 Commerce stream and its main subjects	6
1.3.0	Objectives of commerce curriculum	7
1.4.0	Statistics in the commerce in commerce curriculum	8
	1.4.1 Origin and development of statistics	9
	1.4.2 Defining statistics	10
	1.4.3 Characteristics of statistics	10
	1.4.4 Statistics education	11
	1.4.5 Importance of statistics in the field of education	11
	1.4.6 Goals of statistics education	11
1.5.0	Statistics and mathematics	12
	1.5.1 Statistics , Economics and Mathematics	12
1.6.0	Importance of statistics	12
	1.6.1 Use of statistics in various fields	13

1.7.0	The senior secondary statistics curriculum and teachings of statistics – views of national curriculum frame work (NCF) 2005	14
	1.7.1 Comments from NCF to statistics curriculum	15
	1.7.2 National standard for textbook	16
1.8.0	Why do we teach statistics?	16
1.9.0	Reasons for unchanged methods of statistics education – constraints	18
1.10.0	Origin and development of textbook	19
	1.10.1 Textbook	19
	1.10.2 Use of textbook in education	19
1.11.0	Emergence of various agencies in the preparation of textbook	20
1.12.0	Place of textbook in education	20
	1.12.1 Characteristics of a good textbook	21
	1.12.2 Functions of a textbook	21
1.13.0	Contents in standard XI statistics textbook	22
1.14.0	Analysis of curriculum and textbook	23
1.15.0	Research Questions	23
1.16.0	Objectives of the study	23
1.17.0	Statement of the study	24
1.18.0	Significance of the study	24
1.19.0	Conclusion	24

CHAPTER II

Page No

REVIEW OF RELATED LITERATURE

2.0	Introduction	26
	2.1 Studies related to curriculum	26
	2.2 Studies related to textbook	31
	2.3 Overview of related studies	36
	2.4 Rationale	36
	2.5 Implication for the study	39
	2.6 Conclusion	40

CHAPTER III	Page No
METHODOLOGY	
3.0 Introduction	42
3.1 Statement of the study	42
3.2 Objectives of the study	42
3.3 Explanation of terms	42
3.4 Methodology	43
3.5 Population of the study	43
3.6 Sample and sample technique	43
3.7 Preparation of tools	43
3.8 Validation of tools	44
3.9 Administration of tools	45
3.10 Process of data collection	46
3.11 Process of data analysis	47
3.12 Conclusion	47
CHAPTER IV	Page No
ANALYSIS AND INTERPRETATION OF DATA	
4.0 Introduction	48
4.1 Analysis of data	48
4.2 Objectives of the study	48
4.3 Objective wise analysis of the data	49
4.3.1 Analysis of physical aspects of statistics textbook of standard XI	49
4.3.2 Analysis of academic aspects of statistics textbook of standard XI	51
4.3.3 Chapter wise analysis to find the suitability of each chapter	54
4.3.4 Analysis of checklist for students of standard XI	56
4.3.5 Analysis of physical aspects with the help of charts	58
4.3.6 Analysis of academic aspects with the help of charts	65

4.3.7 Analysis of checklist schedule for students of standard XII	71
4.3.8 Analysis of physical aspects with the help of charts	73
4.3.9 Analysis of academic aspects for checklist of students of standard XII	78
4.3.10 Analysis of academic aspects with the help of charts	80
4.3.11 Content analysis of opinion of students of standard XII	83
4.3.12 Analysis of opinion of teachers	84
4.3.13 Analysis of opinion of experts	87
4.4 Conclusion	91

CHAPTER V	Page No
SUMMARY AND FINDINGS	
5.0 Introduction	92
5.1 Defining curriculum	92
5.1.1 Basic paradigms in curriculum construction	92
5.1.2 Suggested principles for higher secondary curriculum	93
5.1.3 Suggested sequence of the curriculum	93
5.2 Commerce stream and its main subjects	94
5.2.1 Statistics in the commerce curriculum	94
5.2.2 Defining statistics	95
5.2.3 Importance of statistics in the field of education	95
5.3 Origin and development of textbook	95
5.3.1 Textbook	96
5.3.2 National standards for textbook	96
5.4 Analysis of curriculum and textbook	97
5.5 Research questions	97
5.6 Review of related literature	97
5.7 Rationale	98
5.8 Methodology	101
5.8.1 Statement of the study	102
5.8.2 Objectives of the study	102

5.8.3 Population of the study	102
5.8.4 Sample and sample technique	102
5.8.5 Preparation of tools	103
5.8.6 Validation of tools	103
5.8.7 Process of data collection	104
5.8.8 Process of data analysis	104
5.9 Major findings of the study	105
5.10 Discussion	110
5.11 Implications of the study	111
5.12 Suggestions for further study	112

List of Tables	Page No
Table 4.1 Analysis of physical aspects of textbook	49
Table 4.2 Analysis of academic aspects of textbook	51
Table 4.3 Topics of standard XI statistics textbook	53
Table 4.4 Areas where children can face problems in each chapter	54
Table 4.5 Number of Illustrations and Examples in each chapter	55
Table 4.6 Checklist schedule for physical aspects for standard XI	56
Table 4.7 Analysis of physical aspects in percentage	57
Table 4.8 Checklist schedule for academic aspects for standard XI	62
Table 4.9 Analysis of academic aspects in percentage	63
Table 4.10 Checklist schedule for physical aspects for standard XII	71
Table 4.11 Analysis of physical aspects in percentage	72
Table 4.12 Checklist schedule for academic aspects for standard XII	78
Table 4.13 Analysis of academic aspects in percentage	79

List of Charts	Page No
Chart 1 The size and weight of textbook and the attractiveness of cover page	58
Chart 2 Durability of textbook	59
Chart 3 Price of the textbook	59
Chart 4 Font size, printing, margins, page layout	60
Chart 5 Headings, beginning of new chapter, topics layouts	61
Chart 6 Adequate chapters, sequence of chapters	65
Chart 7 Link with previous knowledge and link with other subjects	66
Chart 8 Introduction of new chapters and content suitability	66
Chart 9 Language used	67
Chart 10 Understandability of graphs given	67
Chart 11 Explanation of terms and illustrations given	68
Chart 12 Concept clarity, practice exercises and concern for individual difference	69
Chart 13 Provision of various tables	69
Chart 14 Current issues and real examples	70
Chart 15 Weightage of chapters	70
Chart 16 The size and weight of textbook and the attractiveness of cover page	73
Chart 17 Durability of textbook	74
Chart 18 Price of the textbook	75
Chart 19 Font size, printing, margins and page layout of textbook	75
Chart 20 Headings, new chapters and topics layout	76
Chart 21 Provision of necessary basic knowledge	80
Chart 22 A base for standard 12	80
Chart 23 Understanding of statistical concepts	81
Chart 24 A guide to standard XII	81
Chart 25 Feasibility in studying statistics in standard XI	82

Chart 26 Complexity of contents in standard XII compared with standard XI	82
Chart 27 Weightage of each chapter for evaluation	83

CHAPTER I

CONCEPTUAL FRAMEWORK

1.0 INTRODUCTION

Education is the form of learning in which the knowledge, skills, values, beliefs and habits of a group of people are transferred from one generation to the next through storytelling, discussion, teaching, training or research. In earlier days this was not at all a comprehensive activity and students used to stay at Guru's place and education used to be carried out at the places of Guru. In those days there was a complete dependence of students on the teachers. There was no place for textbook during those days or they were not available. But as time passed and printing has become an easy process textbook has been given an important place in the teaching learning process, it is considered as the mirror of curriculum which is of great help to the teachers as well as to the students. Evaluation of textbook is one of the ways to find out the physical as well as academic aspects of any text with respect to the needs of the users.

The researcher's study mainly contains three aspects. (1) The curriculum (2) Statistics and (3) The text book

1.1.0 DEFINING CURRICULUM

According to Manusmrit "A curriculum should deal with all the phases of the individual's life. It should train his intellect, teach him to control his actions and purify his spiritual aspirations and help him in his ascent towards the spirit"

Crow and Crow defines curriculum as "The curriculum includes all the learner's experience, in and outside school that are included in a program which has been devised to help him developmentally, emotionally, socially, spiritually and morally."

Belly defines curriculum with four factors as objective, content, method and evaluation

The secondary education commission report describes curriculum as “Curriculum does not mean only the academic subject traditionally taught in the school but it includes the totality of experience that the pupil receives through the manifold activities that go in the school, in the class rooms, library, laboratory, workshop, playground and in the numerous informal contacts between teachers and pupils. In this sense the whole life of the school becomes the curriculum which can touch the life of the student at all point and help in the evaluation of a balanced personality”

1.1.1 CURRICULUM DEVELOPMENT IN ANCIENT INDIA

Education, in ancient India, emphasized the development of spiritual values at the cost of material ones. It was essentially in religious character and it aimed at preparing the pupils for life in the other world. It may be remembered that this sort of education was meant primarily for the Brahmins whose profession consisted in studying, teaching and performing rituals. The Brahmins were maintained by the society to preserve its religious and philosophical heredity, to carry on research in the field, to pass on the cultural heritage to the younger generation and to help people in gaining religious merit. It is obvious from this that, though the curriculum was liberal in nature, it only provided for the vocation of the Brahmins. The Kshatriyas were the next who took advantage of the educational system. Shastra vidya or the “science of weapons” was included in the curriculum meant for them with the sole aim of meeting their vocational needs and requirements. So there was a continuous process of development in the field of curriculum from ancient periods.

1.1.2 SCOPE OF CURRICULUM

The scope of the curriculum includes the knowledge, skills, values and the student’s experiences needed to achieve the goals. It consists of the experiences of subject matter or content to which the learners are exposed. The content of every field of knowledge is so vast and it is expanding at such a rate it is impossible to cover any field in its entirety, although many teachers appear to strive to do so. Mainly curriculum focuses on the needs of the society based on circumstances.

1.1.3 SIGNIFICANCE OF CURRICULUM

The present formal and non formal education system needs a particular curriculum prescribed by the respective education boards in the country. These boards in India can be State Boards, Central Board of Secondary Education, Indian Certificate of Secondary Education Board etc... The curriculum is a course of study given in a school, home school or college. According to western concept curriculum is concerned with the planning, evaluation, implementation, management and administration of the educational programme. This particular curriculum is introduced in schools and universities through Text Books. **Therefore, a textbook is the mirror of curriculum and one cannot imagine school, college or university without text book.** A meaningful school curriculum has to be responsive to the society, reflecting needs aspirations of the learner.

1.1.4 BASIC PARADIGMS IN CURRICULUM CONSTRUCTION

Curriculum must satisfy the basic aims of education. So it must have the following considerations on its developments

- (1) The individual: A curriculum must consider the children, their age group, level of mental growth, family and social back ground as well as the knowledge possessed aspirations of a child
- (2) The society: A curriculum should be in harmony with the social order, national economic policies, political system, cultural heritage etc
- (3) The human knowledge: The existing level of human knowledge must be a consideration for curriculum development.

1.1.5 SUGGESTED PRINCIPLES FOR HIGHER SECONDARY CURRICULUM

Curriculum of this stage needs to satisfy the psycho- physical requirements of he boys and girls of the age group of 14 to 17 years. Higher secondary curriculum is of vital significance from both individual and social considerations. Socio economic development of a country as a whole primarily depends upon its secondary curriculum. So it is

necessary to consider the following principles. Diversification of courses into different channels should be encouraged on the basis of need, interest and aptitude of the children

- (1) Should have subjects which can train the students for social efficiency and self sufficiency in the students
- (2) Vocationalisation of curriculum to increase economic efficiency and attain self sufficiency in the students
- (3) It should develop a sense of patriotism, loyalty and national discipline
- (4) It should help the students in making effective adjustments with modern science and technology and develop scientific outlook towards modernization

1.1.6 SUGGESTED SEQUENCE OF THE CURRICULUM

Design of curriculum needs certain sequence to ensure the interest of the learners and to help the teachers to motivate them towards their goals. Following points suggest a fair sequence for curriculum.

- Simple content should precede complex content
- The content should match the maturation level of learners
- The content must satisfy the immediate needs of the learners
- The content should provide direction to sequence
- Sequence should follow a Chronological Order

1.1.7 BALANCE IN THE CURRICULUM

Based on the aim of education and to satisfy needs of an ideal society there must be a balance in the curriculum so that one can draw the attention of the learners or they move their own to taste the elements.

- There must be a balance between the general education and specialized education

- There must be a balance between the academic and the vocational aspects of the curriculum
- There must be a balance between content aimed at the immediate and the long range needs of learners

1.2.0 SELECTION OF VARIOUS STREAMS AFTER XITH STANDARD

Most of the students are confused with selection of a particular stream after standard X from science, commerce, and arts or any vocational. Some may select a stream at their interest, some from the parent's initiative or some to keep their friendship. Often students are scared of science stream just because of the unwanted fear of difficulty in this stream but still few opt to maintain prestige which ultimately makes them inefficient engineers or costly doctors. In order to save themselves from these troubles many children turn to politics, journalism, literature, film industry..... Vocational study helps few to achieve immediate goal of any student, a decent job.

Leaving all these behind, now there is a reasonable trend for commerce stream as it is the back bone of a country's existence and development, though it comes from their personal interest for their survival. Commerce has become the country's back bone without which no development activity is complete. A developing country like ours needs trade and industry to support the growth and development. Our country makes foreign exchange which is an inevitable aspect for globalization, is possible due to foreign trade. It is the right time to reconsider on the belief to opt a non-science subject just to reduce the burden of studies. Commerce, an eight letter word, it covers more than eighteen aspects of development of a country, banking, statistics, investment, insurance, index number, population, pollution, foreign trade, migration, urbanization, investment, consumer protection, ethics of business, finance, communication, foreign investment, time series analysis, conservation of natural resources, budgeting etc ...How a country can remain stable without proper statistical data. It offers a look into the things happened and an insight for the future. Planning becomes easy when there is clear data about the past. This is possible with the help of statistical analysis of data.

1.2.1 COMMERCE STREAM AND ITS MAIN SUBJECTS

Commerce, one of the streams offered by the state government to the students who passed standard X, has many interesting subjects including language. The main subjects apart from English and mother tongue are Accountancy, Statistics, Economics and Organization of commerce.

Accountancy covers the various procedures of accounting of economic transactions and there by arrive at the profit and loss of the business, which is the main motive, and to know the financial status of the business. It helps to compare the present status with the past as well as with other firms or organizations. Business decisions are taken place based on the analysis of accounting statements. It ensures the efficiency of the management by controlling and reporting and provides permanent record for further examination.

Statistics is the use of mathematical methods in collection, classification, analysis and interpretation of data. By statistics we mean aggregate of facts affected to a marked extend by multiplicity of causes numerically expressed, enumerated or estimated according to reasonable standards of accuracy, collected in a systematic manner for a predetermined purpose and plays in relation to each other.

Commerce: Commerce is the whole system of an economy that constitutes an environment for business. The system includes legal, economic, political, social, cultural and technological systems that are in operation in any country. Thus, commerce is a system or an environment that affects the business prospects of an economy. It can also be defined as a component of business which includes all activities, functions and institutions involved in transferring goods from producers to consumers.

Economics: Economics is the social science that studies economic activities Adam Smith, considered to be the founding father of modern Economics, defined Economics a study of the nature and causes of nations' wealth or simply as the study of wealth. Thus, Professor Samuelson writes, "Economics is the study of how people and society end up choosing, with or without the use of money, to employ scarce productive resources that could have alternative uses to produce various commodities over time and distributing

them for consumption, now or in the future, among various persons or groups in society. It analyses costs and benefits of improving patterns of resource allocation". A large number of modern economists subscribe to this broad definition of Economics.

1.3.0 OBJECTIVES OF COMMERCE CURRICULUM

The various subjects included in the commerce stream provide particular function. The objective of the particular stream lies in its functions. The aim of education is an overall development of a student along with making him a useful element for the society and finally for the country. As such a curriculum should help the student from different angles. The following are the major functions provided by the various subjects of commerce.

- * It helps the students to understand the various activities of a business and the difference between economic and non economic activities
- * It helps the students to learn the accounting procedures without which no economic activity is relevant in the business
- * Management is an activity in which work is getting done by others. Efficient management is the success of any activity. Commerce curriculum helps the students to go deep into the techniques of management.
- * It helps the students to understand the meaning of data, its collection, classification, tabulation, analysis and interpretation thereof which is very important in taking various decisions.
- * Development of economy is the existence of any nation which is well defined in the curriculum
- * Infrastructure is the back bone of any kind of development in individual as well as nations which is clearly conveyed through the curriculum e.g. banking
- * Pollution of various kinds causes major problems in the society. Reasons for this and the remedial measures are neatly discussed in the curriculum of commerce.

* Reaching the consumer is the ultimate aim of any business activity. But the methods of protection of consumers and various acts are familiar to the students through the curriculum.

* Commerce aims the study of globalization, privatization as well as liberalization which are extremely needed in an economy.

* Knowledge about various forms of energies has got a special position in the textbook.

* Acquisition of capital for development as well as various investment procedures increases the importance of commerce as a matter of study.

* Various remuneration rules are provided to use in the organization so that the employees as well as the employers are benefitted.

* Development is not possible without proper communication system within the place of work as well as outside the place. All these information are made available with the help of commerce education.

* E-commerce has acquired a better place in the society which is imparted to the children through commerce curriculum.

1.4.0 STATISTICS IN THE COMMERCE CURRICULUM

The science of statistics has assumed a great importance in recent years. It was once known as the 'Science of Kings' and its scope was extremely limited. But today the science of statistics has become an all important science without which no other science can progress. Statistics is a very commonly used word but surprisingly enough it is understood by different people in different sense. To someone it is just a set of figures and to someone just representation of facts with charts, figures, diagrams etc However, if we analyze the way the word statistics is looked at, we find that broadly speaking there are two categories-one, in which the word refers to a set of figures and the other in which refers to a set of techniques and methods.

1.4.1 ORIGIN AND DEVELOPMENT OF STATISTICS

The origin of statistics is suggested by the derivation of this word. It seems to have been derived from the Latin word 'statis' which means a political state. In fact the origin of statistics was due to administrative requirements of the state. Statistics in the past was a by-product of administrative activity. Administration of the states required the collection and analysis of data relating to the population and material wealth of the country for purposes of war and finance. The earliest form of statistical data, therefore, relates to census of population and property; collection of data for other purposes, however, was not entirely ruled out. Perhaps one of the earliest censuses of population and wealth was held in Egypt as early as 3050 B.C for the erection of pyramids. Rameses II conducted a census of all lands of Egypt. During the middle age such censuses were held in England, Germany and other western countries as well. In India about 2,000 years ago we had an effective system of collecting administrative statistics. During the Hindu period, particularly during the Mauryan regime, our country had an efficient system of collecting vital statistics and of the registration of the births and deaths. Ain-i-Akbari gives us a detailed account of the administrative and statistical survey conducted during the reign of Emperor Akbar.

The histories of the other countries of the world also clearly indicate that in ancient times statistics was regarded as a matter connected with the activities of the state and that is why it was known as a science of statecraft. The systematic collection of official statistics originated in Germany towards the end of eighteenth century. There has been a vast improvement in the technique of processing the data which has resulted in great economy not only save time but money also. In its earliest forms it was an attempt to assess for political purposes. In England statistics is a legacy of the Napoleon wars. In order to raise new taxes that the cost of war demanded it was found necessary to collect such facts and figures which could enable government to have an idea about the probable revenue and expenditure. In later sixteenth and seventeenth centuries the use of statistical figures proved convenient in the western countries. In the early 18th century statistical methods were used by the name Political Arithmetic since it was mainly used for political purposes. Statistical theory has developed in modern times in such a way that the cost of

compilation of statistical data has gone down considerably. The theory of sampling and various designs of experiments and statistical quality control have all contributed towards lowering the cost of collection and analysis of statistical data.

1.4.2 DEFINING STATISTICS

According to Horace Secrist “By statistics we mean aggregate of facts affected to a marked extent by multiplicity of causes numerically expressed, enumerated or estimated according to reasonable standards of accuracy, collected in a systematic manner for a predetermined purpose and plays in relation to each other”

Statistics is a science in which data collected by either conducting experiments or inquiries of different phenomena and events are classified tabulated and analyzed by mathematical methods.

Statistics is the science which deals with the method of collecting, classifying, presenting, comparing and interpreting numerical data collected to throw some light on any sphere of inquiry.

According to King the science of statistics is the method of judging collective, natural or social phenomenon from the results obtained from the analysis or enumeration or collection of estimates.

1.4.3 CHARACTERISTICS OF STATISTICS

- * They should be aggregates of facts
- * They should be affected to a marked extent by multiplicity of causes
- * They should be numerically expressed
- * They should be enumerated or estimated according to reasonable standards of accuracy
- * They should be collected in a systematic manner
- * They should be collected for a predetermined purpose
- * They should be placed in relation to each other

1.4.4 STATISTICS EDUCATION

Statistics education is the practice of teaching and learning of statistics along with associated scholarly research. Statistics is both a formal science and a practical theory of scientific inquiry. Education in statistics has similar concerns as does education in other mathematical concerns. Statistics education research is an emerging field that grew out of different disciplines and is currently establishing itself as a unique field that is devoted to the improvement of teaching and learning statistics at all levels of education.

1.4.5 IMPORTANCE OF STATISTICS IN THE FIELD OF EDUCATION

- Statistics provide simple yet instant information on the matter it centers on
- Statistical methods are useful tools in aiding researches and studies in different fields such as economics, social science, medicine etc
- Statistics provides a vivid presentation of collected and organized data through the use of figures, charts, diagrams and graphs
- It also helps critical analysis of the presented data
- Helps in processing certain evaluation and surveys given to help improve the school system.

1.4.6 GOALS OF STATISTICS EDUCATION

The goals of statistics education focus on statistical literacy, statistical reasoning and statistical thinking rather than on skills, computations and procedures alone, there is no agreement about what these terms mean or how to assess these outcomes.

Statistical literacy is being able to read and use basic statistical language and graphical representations to understand statistical information in media and in daily life.

Statistical reasoning is being able to reason about and connect different statistical concepts and ideas such as knowing how and why outliers affect statistical measure.

Statistical thinking is the type of thinking used by the statisticians when they encounter a statistical problem. This involves thinking about the nature and quality of the data and where the data came from, choosing appropriate analysis and models, interpreting the results in the context of the problem.

1.5.0 STATISTICS AND MATHEMATICS

Bailar a statistician has quoted ‘statistics is not a branch of Mathematics. Indeed so: the whole of applied mathematics is merely a branch of statistics in which random is reduced to Zero.’ It is true that Mathematics has proven unreasonably effective in understanding statistics, but it is not as the relationship between physics and mathematics. It is like saying that accountancy is a branch of mathematics because it too rests on multitudinous calculation.

Statistics rightly belongs to epistemology, the philosophy of how we know what we know.

1.5.1 STATISTICS, ECONOMICS AND MATHEMATICS

There is a happy union between statistics, economic and mathematics. Mathematics has considerably policies and other factors on the level of production. Statistics throw light on the commercial development of a nation. They tell us about the volume of business done in a country and the amount of money in circulation. Statistics discloses the economic conditions of the various classes of society. Mathematics and statistics are the powerful instruments which the modern economist at his disposal and of which business through the development of research agencies and methods is making constantly greater use

1.6.0 IMPORTANCE OF STATISTICS

- Statistics is useful to common man in his day to day life knowingly or unknowingly
- It is used in economics as in all important facts in economics is represented with the help of statistics

- It helps in planning as planning is based on previous data which is an outcome of statistics
- Economic barometers are the gifts on statistical methods and it is extensively used in commerce
- Bankers, brokers, insurance companies etc. use statistical data
- Modern state makes extensive use of statistical data on various problems like population, pollution etc

1.6.1 USE OF STATISTICS IN VARIOUS FIELDS

In scholastic performance:

Numerous statistical studies have demonstrated that a high and positive correlation exists between scholastic performance and extracurricular activities. Findings of these studies have led to a vast expansion of extracurricular activities in educational institutions and ways and means have been devised for encouraging students to participate in them.

In management

One element common to all problems faced by managers is the need to make decision in the face of uncertainty and the essence of modern statistics lies in the development of general principles for dealing wisely with uncertainty. Modern statistical tools of collection, classification, tabulation, analysis and interpretation of data have been found to be an important aid in making wise decisions at various levels of managerial functions. The uses to which statistical methods are put in this area are many and varying. Statistical tools are relied upon heavily in arriving at correct decisions in all these aspects.

In commerce

Statistics are an aid to business and commerce. In fact today the situation is, that a business man succeeds or fails according as his forecasts proved to be accurate otherwise. When a man enters business he enters the profession of forecasting because the success in business is always the result of decision in forecasting. And failure in business is very

often due to wrong expectations, which arise in turn due to faulty reasoning and inaccurate analysis of various causes affecting a particular phenomenon. Modern devices have made business forecasting more definite and precise. A businessman who ignores the effects of booms and depressions can never succeed and he is bound to face frustrations as his calculations are sure to be faulty. A study of all these things is in reality. A study of statistics and hence we say that all types of business men have to make use of statistics in one form or the other if they want any success in their profession.

1.7.0 THE SENIOR SECONDARY STATISTICS CURRICULUM AND TEACHINGS OF STATISTICS – VIEWS OF NATIONAL CURRICULUM FRAMEWORK (NCF) 2005

Till 1976 the Indian constitution allowed state government to take decision on all matters pertaining to school education. But National Council for Educational Research and Training designed the National policy of education and National Curriculum framework in 1968 and 1975 respectively. National Curriculum Framework (2005) is a modified framework of National Curriculum Framework, 2000 with an intention to solve the problems of curriculum load on children. National curriculum framework, 2005 owes its present form to the flurry of ideas generated through a series of intensive deliberations by eminent scholars from different disciplines, principals, teachers, parents, representatives of Non Government Organizations, National Council for Educational Research and Training faculty etc. National Curriculum Framework gets in all the four areas of the school curriculum. Significant changes are recommended with a view to making education more relevant to the present day and future needs and in order to reduce the stress with which children are coping today. National Curriculum Framework recommends softening of subject boundaries so that children can get taste of integrated knowledge and the joy of understanding. National Curriculum Framework NCF draws attention to four other curricular areas works arts and heritage crafts, health and physical education and peace.

The National Curriculum Framework (2005) in its position paper on the ‘Teaching of Statistics’ (National Council for Educational Research and Training (2005) describes the higher secondary stage as the “launching pad from which the student is guided towards career choices.” At this stage the student has to make a choice as to whether she will opt

for the science, commerce or humanities stream. Clearly has an important role to play here in developing his/ her skills so that he/she may pursue his/her chosen course. For curriculum makers the most difficult choice at this stage is between breadth and depth. Whether the curriculum should offer exposure to a variety of topics from various areas or limit the number of topics to develop competence in a few areas is an issue for debate. According to Thurston, “Instead, there should be more courses available.....which exploit some of the breadth of Statistics, to permit starting near the ground level, without a lot of repetition of topics that students have already heard”. The National Curriculum Framework suggests that if breadth is chosen over depth, then the decision as to the extent to which the topics should be developed is a matter of serious consideration. The topics which have importance for Statistics as a discipline should be included and their treatment should be done at least to the extent that the student is able to see the relevance or utility of those topics in Statistics or in some other course of study. The National Curriculum Framework 2005 recommendations have been the driving force for revisiting and revamping the elementary school mathematics curriculum. But the recommendations have had little impact on the senior secondary curriculum. The textbooks as well as the content of the senior secondary curriculum have undergone very few changes over the years. Some topics have been removed while others have been added, but the approaches to the topics have remained the same.

1.7.1 COMMENTS FROM NCF TO STATISTICS CURRICULUM

The National Curriculum Framework 2005 document lists four core areas of concern: (1) a sense of fear and failure regarding statistics among a majority of children, (2) a curriculum that disappoints both a talented minority and a non-participating majority, (3) crude methods of assessment that encourage a perception of statistics as mechanical computation, (4) lack of teacher preparation and support in the teaching of statistics. It amplifies on the third point: “While what happens in class may alienate, it never evokes panic, as does the examination.” Most of the problems cited ... relate to the tyranny of procedure and memorization of formulas ..., and the central reason for the ascendancy of procedure is the nature of assessment.

Concept learning is replaced by procedural memory. Such antiquated and crude methods of assessment have to be thoroughly overhauled It recommends the following: (1) Shift the focus of statistics education from achieving narrow goals to higher goals; (2) Engage every student with a sense of success, and at the same time offer challenges to the emerging statistician; (3) Change modes of assessment to examine statistical abilities rather than procedural knowledge; (4) Enrich teachers with a variety of statistical resources.

1.7.2 NATIONAL STANDARD FOR TEXTBOOK

Following are few suggestions of the education commission 1952 towards the standards for textbooks.

(1) It should not be with an overloaded syllabus in narrow bookish and theoretical manner. It had suggested that the curriculum should not be divided into a number of watertight subjects but all the subjects should be interrelated.

(2) The curriculum should not be divided in different ways but all subjects should be interrelated and should include relevant significant topics so that it could touch the lives of students.

(3) No single text books should be prescribed for any subject but a reasonable number.

(4) It also recommended that a high powered committee be set up in every state for selecting textbooks.

1.8.0 WHY DO WE TEACH STATISTICS?

The teaching of statistics is not only the learning of formulas and graphics. It is the teaching of a way of thinking, a way to deal with data and to learn how to take decisions. Gras (2000) says that probabilities and statistics have three essential functions:

1. A socio cultural function which gives a greater place to the citizen,
2. An epistemological function emphasizing the difference between a deterministic way of reasoning and a non deterministic one, between deductive and inductive reasoning,
3. A didactical function: a non-dogmatic teaching of probabilities and statistics will provide to the students rich interdisciplinary situations.

We must remember that we have two different objectives, the first one is the general; education of citizens (for everybody, and this the minimum), meanwhile the second one is mainly concerned with scientific education. Whatever the objectives are and whatever the students are, we must keep in mind that a sensible curriculum must have these three previous functions. To reach the objectives, we have to define the content, the pedagogy and the use of technology as defined by Moore (2001) for undergraduate students. It is amazing to see that we are introducing at the secondary school level the proposals that were made ten years ago for the students at the university. But, things are not exactly the same: more powerful technology, different students and contents to be adapted. First, introductory courses must place greater emphasis on data collection, understanding and modeling variation, graphical display of data etc., and less emphasis on mathematical and probabilistic concepts (Snee, 1990). Moore (1992) suggested that only the necessary probabilistic concepts required for further statistical thinking should be thought. In her article, Ballman (1997) provides some suggestions to develop a sound intuition for the characteristics of random variation. At this level, the curriculum must include data collection, management of data, organization and summarization of data and perception of variability and the learning must be active. The goal is to provide quantitative skills to people. Even if at the secondary school level, it could be hard to settle, we could use small group co-operative-learning as defined by Garlfield (1993).

On the other hand, the available material to help teachers is very rich; they can use any magazine with statistics. And some courses such as Chance (<http://www.dartmouth.edu/~chance/>) or publications such as Pénombre (<http://www.unil.ch/penombre/>) give them the elements to discuss articles, and teach their students. Neither Chance, nor Pénombre can replace a statistics or a probability course but both will make students and teachers more rational and informed readers of the press. At this step, any practical work with the computer can help the understanding whether to process real-world data sets or to work on simulation datasets. And don't forget that written and oral reports of the results are very important and helpful to develop statistical reasoning (Smith, 1998). The contents and the steps of scientific education are more or less the same as the previous ones except that in that case, students need more time to conduct a scientific approach to solve a problem and construct their own knowledge.

1.9.0 REASONS FOR UNCHANGED METHODS OF STATISTICS EDUCATION -CONSTRAINTS

Even if most of the educational actors agree on the need of change, things don't change so fast (McAveley, 2001). Why?

1. Lack of Implication of Academic and Professional Statisticians

Statistics is taught by mathematics teachers meanwhile at the university, there are academics that are also statisticians. The absence of statisticians (academics or not) in the secondary schools and their absence also in the thought groups about the evolution of statistical education at this level is a major problem. In most of the countries, a huge portion of beginning statistics introduction is in the hands of mathematicians. We need statisticians to communicate with other people and to promote their domain.

2. Teachers' Education

Besides, we cannot wait for a new generation of teachers to boost statistical education.

We also have to provide teachers with appropriate teaching resources. The need of curricular resources is particularly acute. But to understand statistical thinking, teachers have to practice statistics by themselves, to understand the methodology and manage the data. This implies a good background in applied mathematics, computing, probability and statistics. Unfortunately, the need of more statisticians in the services and in the industry and the appeal of these new jobs don't allow us to increase the number of well-trained teachers.

3. The Problem of Assessment

Third, a last but important problem at the end of the secondary is the assessment in statistics and probability. In the absence of evaluation, teachers will not be motivated to teach probability and statistics.

4. The Great Variability among World Educational Systems

There is a great variability in the situations among the countries: in the United States, we can see the increased cooperation between the Mathematical Association of America (MAA) and the American standard Association (ASA); in France, the birth of a new curriculum is a little bit more painful. The situation depends highly on the collaboration of statistical societies and their involvement in academic changes. Besides, the research

on statistical education makes available a great variety of innovative techniques such as collaborative learning, active learning, computer integration and use of real data.

1.10.0 ORIGIN AND DEVELOPMENT OF TEXTBOOK

In earlier days the activity called education was done by teachers called Gurus at their homes. Children were sent to guru's house to get them educated. An overall development of a child was censured by gurus. There was no need of textbooks in those times. Whatever things were taught by the Gurus was learnt by the students. Apart from mathematics, science and social studies children were getting lessons of philosophy and religious education from this kind of Gurukula education system. There was a close relationship between the teacher and the student and a close link with nature. The boundaries of knowledge were very limited. As time passed the acquisition and accumulation of knowledge became a normal activity in man's life. To impart this accumulated knowledge textbooks acted as a media and this might have given the need of textbooks in the field of education.

1.10.1TEXTBOOK

A textbook is a book whose purpose is for instructional use. Textbook can include dictionaries, encyclopedias, software manuals etc. School text books pertain to an instructional sequence based on an organized curriculum. Textbooks and teachers' guides occupy a unique place in the teaching learning process. Textbook material is often divided into four categories as narration and discipline, prescription and directives, procedures and theoretical laws. A textbook is a manual of instruction in any branch of study. Textbooks are produced according to the demands of educational institutions. A textbook used in the study of a subject is a literary work or a presentation to the study of a subject. Textbooks are print books or e- books that accompany a specific class or subject at the school or university level, and suggest a curriculum that is a course of learning for that particular class.

1.10.2 USE OF TEXTBOOKS IN EDUCATION

- Used as a teaching tool

- A tool for artistic self expression
- A faithful evaluation of discipline
- Textbook provide understanding
- To give guidance to young learners to link what they already know and what they are trying to learn

1.11.0 EMERGENCE OF VARIOUS AGENCIES IN THE PREPARATION OF TEXTBOOKS – National Council of Educational Research and training (NCERT), State Council of Educational Research and training (SCERT) and textbook bureaus

In the post independence period with a view to institutionalize the production and preparation of textbooks various agencies like NCERT, SCERT, and Textbook bureaus came into existence. NCERT worked at the national level and the SCERT worked at the state level. At present various private agencies are engaged in the preparation and production of textbooks. The motive of all these agencies was to help the institutions in providing necessary curriculum in accordance with the latest needs of the society. They undertake the process of up gradation of various text books with an intention to include the latest changes in the developmental process. NCERT is the first official agency in the country that planned and developed a wide variety of instructional materials.

1.12.0 PLACE OF TEXTBOOKS IN EDUCATION

In the present situation of advanced technology text book's place is not less in the teaching learning process. Textbook often teach the teachers where there is lack of training. In a developing country like ours text cannot be replaced by the latest technology for whatever reason might be. It is like a weapon for the students to overcome many hurdles and tool for instruction for the teachers. Even in the age of audio visual media – lies in the fact that school text books pass on fundamental knowledge to the younger generation: selected methodologically prepared text, key themes, and pictures suggestions. In situation of limited specialized training for teachers textbooks often teach the teachers and play a substantial role in lesson planning. The present day

classroom practices of almost all countries are dominated by textbooks. Francis Bacon (1625) “A textbook designed for classroom use, carefully prepared by experts in the field and equipped with the usual teaching devices” Americana (1964) “Textbook is a book that presents a body of knowledge in an organized and usually simplified manner for the purpose of learning.” Textbooks are specifically written for their use in school or college courses.

1.12.1 CHARACTERISTICS OF A GOOD TEXTBOOK

- A textbook is designed to achieve some instructional objective
- A textbook should provide material for a detailed study
- It must be carefully designed to influence the learners in the specific area
- Functions of a Textbook: Text book helps to keep continuity in treatment of subject
- A textbook provide basic understanding
- Textbook provide situation for applying the knowledge for effective use
- A textbook provide curiosity and need for further study

1.12.2 FUNCTIONS OF A TEXTBOOK

1. Textbook helps in keeping continuity in the treatment of subject in different classes and stages.
2. Provides the basic knowledge for a particular class at one place in some well organized manner
3. Provides situations for applying the knowledge for effective use along with some suggestions to tackle them.
4. Develops curiosity and need for further study.

1.13.0 CONTENTS IN STANDARD XI STATISTICS TEXTBOOK

The present statistics textbook of standard XI was first published in the year 2004 as a replacement of business mathematics along with other subjects in standard XI. Till the year 2004 very school opted statistics as one of the main subjects and business mathematics was followed in most of the schools. It must be to help the students in higher studies this replacement was done. The GSHSEB has prepared the new syllabi in accordance with the new national syllabi prepared by the NCERT. These syllabi are sanctioned by the Government of Gujarat. At first the book was published in Gujarati language and it was translated to English language. Both the manuscripts were reviewed by experts, teachers and even by language teachers. Till the year 2012 there has been eight editions for this textbook.

Following are the various topics included in the statistics textbook of Std XI

1. Collection of Data
2. Classification and tabulation
3. Presentation of data by diagrams and graphs
4. Measures of central tendency I
5. Measures of central tendency II
6. Measures of central tendency III
7. Measures of Dispersion
8. Permutation, combination and binomial expansion
9. Skewness
10. Arithmetic progression

1.14.0 ANALYSIS OF CURRICULUM AND TEXTBOOK

Curriculum evaluation is the weakest link of the Indian curriculum development scheme. Evaluation involves a tryout of the appropriateness of curriculum to achieve the basic objectives. When a new curriculum is to be developed unit wise as well as full curriculum try out is to be done. During the evaluation process, probable questions can be (1) whether the objectives of the instruction sets are within the competence of the students to achieve? (2) Whether the content matter is adequate to achieve the objectives? (3) Which one of the various methodologies tried is more suitable to be adopted as compared to the others? (4) What instructional materials or set of them help the students achieve the objectives better than the others?

Analysis of textbook involves the process of examining the physical as well as academic aspects of text books based on certain standard. Analysis is done to study the present features and as well as to suggest various measures to improve the standard to cater the needs of the users. Moreover sometimes analysis is done to reduce the syllabus if it does not cope up with the student's mental abilities.

1.15.0 RESEARCH QUESTIONS

1. Are the physical aspects of the statistics textbook suitable to its users?
2. Are the academic aspects of the Statistics textbook suitable to its users?
3. Does the Statistics textbook cater to the needs of teachers and students?
4. Is there any scope for improvement in the statistics textbook for XI standard?
5. Does the textbook provide enough exercises to help the learner for better understanding of the concepts and teachers for ensuring better education?

1.16.0 OBJECTIVES OF THE STUDY

1. To study the physical aspects of the GSHSEB statistics textbook of standard XI
2. To study the academic aspects of the GSHSEB statistics textbook of standard XI

3. To study the opinion of students of standard XI regarding the suitability of the statistics textbook
4. To study the opinion of students of standard XII regarding the suitability of the statistics textbook of standard XI
5. To study the opinion of teachers regarding the statistics textbook of standard XI in order to seek suggestions for its improvement.
6. To study the opinion of experts regarding the statistics textbook of standard XI in order to seek suggestions for its improvement.

1.17.0 STATEMENT OF THE STUDY

A critical analysis of GSHSEB statistics textbook of standard XI

1.18.0 SIGNIFICANCE OF THE STUDY

Textbook is the most important teaching tool in the hands of a teacher. All other teaching tools are considered as an additional support in the teaching learning process. Therefore a textbook must satisfy the required standards according to the age group of the children. A textbook must seek the attraction of students in its physical and academic concerns. A textbook must satisfy the physical as well the academic requirements so that the learning becomes easier and interesting. It is important to measure the contents in the textbook to confirm its objectivity. The investigator, through the present research, had put an effort to find out the suitability of the present standard XI statistics textbook.

1.19.0 CONCLUSION

The aim of the researcher is an analysis of standard XI statistics textbook with respect to the physical and academic aspect. The physical aspects cover the layout, the binding, the presentation of contents, the font size etc. Whereas the academic aspects mainly concerned with the contents in the curriculum.. A textbook must satisfy the physical as well the academic requirements so that the learning becomes easier and interesting. The curriculum includes all the learner's experience, in and outside school that are included in a program which has been devised to help him developmentally, emotionally, socially, spiritually and

morally. A text book is a book whose purpose is for instructional use. Textbook can include dictionaries, encyclopedias, software manuals etc. School text books pertain to an instructional sequence based on an organized curriculum. Textbooks and teachers' guides occupy a unique place in the teaching learning process. The investigator in her effort analyzed the textbook with respect to the objectives of physical and academic requirements of standard XI statistics textbook. Various studies in this regard were observed by the investigator and a quite good effort was done to measure the contents in the textbook which is both a teaching tool and study material for the students. The investigator also referred various agencies providing textbooks to acquire sufficient data to support the utility of the present textbook. The various reviews referred, the methodologies adopted and the analysis of different types of data are discussed in the coming chapters.

CHAPTER II

REVIEW OF RELATED STUDIES

2.0 INTRODUCTION

To be effective, any researcher has to move around the context of studies already conducted. A review of related literature provides the necessary context for the present study. An investigator gets useful information about tools used, nature of data, procedure of data analysis etc. from previous studies. Review of related literatures allows the researcher to acquaint himself with current knowledge in the field of area in which he is going to conduct his research. The review of related literature enables the researchers to define the limits of his field. By reviewing the related literature the researcher can avoid unfruitful and useless problems areas. He can select those areas in which his endeavor would be likely told to the knowledge in a meaningful way. The textbook is a very important and effective tool in the hands of a teacher as well as the students. It not only casts impression on the minds, of the learner but also helps the teacher in guiding their students. Moreover, it is a textbook that again is responsible for creating interest in the minds of the students.

Various studies have been conducted on the evaluation of curriculum as well as text books. Here the investigator had come across studies related to both categories. This has been mentioned under two categories (1) Studies related to curriculum (2) Studies related to analysis of textbooks

2.1 STUDIES RELATED TO CURRICULUM

A curriculum should deal with all the phases of the individual's life. It should train his intellect, teach him to control his actions and purify his spiritual aspirations and help him in his ascent towards the spirit. Many researchers had tried to study about the curriculum to satisfy their need for finding out the best suited curriculum for students which help them to grow holistically. Many of them have given their valuable suggestions based on the findings they made. Few such studies are mentioned below.

Deshpande, A.R. (1992) An enquiry into development of curriculum in mathematics in the secondary stage of education in Maharashtra State. Ph.D Edu. Nagpur University

Problem: This study focuses on the experimentation with the secondary level Mathematics curriculum in the state of Maharashtra

Objectives: (1) To assess how far the secondary – level mathematics curriculum is of practical utility for students (2) To find out whether the curriculum is rich enough to meet the new demands and fulfill the aims of secondary education (3) To assess how far the secondary level mathematics is based on psychological consideration and (4) To examine how well the secondary level mathematics curriculum articulates with the primary and secondary level mathematics curricula

Methodology: It was essentially a survey- based study. A survey was conducted on a sample of 655 mathematics teachers (359 from urban areas covering 164 males and 132 females), drawn from 200 schools of Vidharbha . Data were collected through an opinionnaire and an interview schedule. Besides books periodicals and units deleted from and added to mathematics syllabi of grades 8-10 were also made use of. Data analysis was done through percentage frequencies and chi square test.

Major Findings: The structure and rigor of the mathematics textbooks was appropriate. The rates of introduction of new terms were appropriate. Errors due to carelessness were found here and there in the textbook. Almost all topics needed gradation. The revision exercises, diagnostic test and general exercises were appropriate. The syllabus of the current year was better than that of the immediately preceding years. The coverage of the content of the textbook was different from NCERT syllabus. The addition to the syllabus suggested by the respondents were more exercises suitable for homework, problems related to life , English equivalent of new terms and life history and important events of mathematicians . The decision suggested included discovering patterns enrichment programmes, difficult problems and fundamental laws.

Dhand. H. and Lyons. J. (1991) An innovative social studies curriculum in Canada an experiment; Indian Educational Research Volume 26(4)

Problem: The study is an attempt at developing an innovative social studies course for Saskatchewan, Canada in view of the centre state controversy regarding the proposed introduction of new course in the middle school

Objective: To develop an innovative social studies course for the middle school

Methodology: A survey of innovative practices and major trends related to social studies education in the USA and Canada was conducted by investigator in order to formulate the proposed innovative course.

Major findings: Social studies curriculum concentrates mainly on citizenship education with special emphasis on cultural literacy. Humanistic methods were increasingly getting popularity For proposed innovative curriculum the investigators suggested a setoff guidelines for improving the new social studies like greater emphasis on open-ended questions, critical thinking and problem solving skills, emphasis on value analysis leading to value classification, linkages between real life and social studies content and visible emphasis on concept development using multiple and even unconventional sources, inclusion of current events and world affairs etc..

Devi Susila .A. (1990) A critical study of the environmental curriculum In Andhra Pradesh, Ph.D, Edu. Osmania University

Problem: This is an attempt at critical study of the environmental curriculum in the schools of Andhra Pradesh.

Objectives: 1. to content – analyze the environmental studies curricula of Great 1 to 5 in terms of the stated curriculum. 2. To assess how far the curricula were suited to the needs and interest of the learners. 3. To assess whether the curricula had any provision for gifted learners, and 4.To investigate the reactions of science Teachers to a need based curriculum.

Methodology: The data were collected using the survey method on a sample of 377 primary school teachers from three geo- politically Distinct areas of Andhra Pradesh, viz Costal Andhra, Rayalseema and Telengana, involving two representative districts each from East Godhavari, Guntur, Prakasam , Nellore , Warrangal and Medak. A comprehensive checklist with item on various aspects of the study was used for data collection and the data was content- analyze. Chi- square was used to assess the significance of differences.

Major findings: The Environmental Studies (EVS) curricula did not cater to the essential needs of learners for whom they were meant. The environmental curricula did not introduce children to the desired. The curriculum needed to be upgraded and various life examples are to be included for fixation of content. Moreover it was found that the curriculum must be balanced with individual differences and must cater the interest of gifted learners

Rao Sudha .K.(1992) Structural influence on restructuring the curriculum, independent study , National Institute of Educational planning and Administration, Council for International Educational Studies Washington , DC , USA funded.

Problems: This study aims at exploring the various organizational and structural factors that influence the restructuring the curriculum at the undergraduate level.

Objectives: (1)To identify the structural factors that influence the process of restructuring the curriculum (2) To analyze the relationship between structural factors and changes in curriculum, and (3) To suggest planning and managerial strategies for restructuring curriculum at the undergraduate level

Methodology: This survey based study was conducted on a sample of three institutions: a university, a liberal arts college and a community college. Besides documentary analysis, interviews were conducted with university and college presidents, vice-chancellors, secretary at the secretariat, and directors of accreditation councils, teacher union leaders, teachers, students and subject experts. The data collected through these interviews and documents were analyzed through qualitative data analysis techniques.

Major findings: The following major findings were observed by the investigator. It was found the larger the size of the institution and the greater the discipline within the department, the easier it was to introduce a change in the curriculum. Curriculum change was easier to introduce in a private organization than in a government or a constituent institution. It was a major concern that institutions in the vicinity of major institutions where curriculum have already been restructured found it easier to introduce curriculum change also institutions with innovator status found it easier to bring about curriculum change. It was relatively easier to introduce curriculum change where the faculty was comparatively more powerful than the administration. The suggestion was given that larger the number of people involved in introducing curriculum change, the easier was its achievement.) The faculty support for curriculum change depends on the discipline and the level of teaching, the science faculty, for instance, was hardly interested in curriculum change in science related subjects that were meant for undergraduate arts students

Pal, Rajendra (1989) Curriculum development in academic staff colleges for the orientating of teachers of higher education, M Phil. Edu Institute of Education, Indore

Problem: This study attempts to investigate the attitudes and relations of participant teachers in orientation courses conducted for the teachers of colleges and universities at the academic Staff college of Devi Abhiya Vishva Vidyalaya , Indore

Objectives: (1) To examine the need for academic orientation of teachers of colleges and universities (2) To study the relevance of the existing curriculum of the ASC based on UGC guide lines and (3) To develop an alternative curriculum for the orientation of college and university teachers.

Methodology: The sample comprises 1109 college or university from four universities of Madhya Pradesh participating in an orientation programme at ASC Indore. Of these 45 were female teacher. The survey method was employed for the study. A opinionative and a ratio scale were used for data collection. Chi- square and content analysis were used for data analysis.

Major findings: Only 36 % of the participants were felt that there was a need for an orientation programme for college or university teachers. An overwhelming majority (85%) of the participants felt that such orientation programmes should be arranged immediately after appointment. The participants felt that the orientation programme should have greater emphasis on methods of teaching, maxims and techniques of teachings, teaching aids and models of teachings and also curricula of foreign universities, use of available resources for teaching futurology, teaching for fostering secularism and democracy and eradication of drug addiction should also be added as topical dimensions to the orientation programmes.

Dharmadhikari, V.V (1973) A critical evaluation of Teachers handbook for work experience Government technical high school (Jalgaon)

Objectives: The main objective of the study were (1) to analyze whether the hand books were helpful in achieving the objectives of work experience in the syllabus (2) To

examine whether the handbooks contain any error with respect to illustration figures explanations etc

Methodology: The study was confined to the analysis of three handbooks namely, repairs and cares of electrical appliances, repairs and care of stoves and book binding. The study was undertaken in twenty seven urban and rural schools in Jalgaon district where the three work experience subjects were taught, and five technical high schools located in jalgoan. Data for the study were collected through two questionnaires send to twenty seven teachers of work experience and to 13 experts working in the five technical high schools.

Findings: Following important observations were made by the investigator The most important observation was the handbooks, in general, contained sufficient information and appropriate work chart for achieving the relevant educational objectives. The figures given in the book needed to be revised as some of them were unnecessary and some faulty. It was observed that British weights and measures are used in the hand books had not been replaced by the metric measures. The original English technical terms existed in the hand books and some books the time schedule did not permit demonstration and practical works specified in the hand book.

2.2 STUDIES RELATED TO TEXTBOOK

A text book is a book whose purpose is for instructional use. Text book can include dictionaries, encyclopedias, software manuals etc. School text books pertain to an instructional sequence based on an organized curriculum. Text books and teachers' guides occupy a unique place in the teaching learning process. Text book material is often divided into four categories as narration and discipline, prescription and directives, procedures and theoretical laws. A textbook is used as a teaching tool, a tool for artistic self expression, a faithful evaluation of discipline, text book provide understanding, to give guidance to young learners to link what they already know and what they are trying to learn. Keeping the use and importance of textbook in mind many researchers tried to find the quality of textbooks of various subjects through analysis at different times. These studies proved praiseworthy and later on taken into consideration for improvement in

textbooks by various means. Few such studies are mentioned below which provided adequate guidance to the investigator in her present study.

Sagarika.(2012) A Comparative evaluation of social science text book of standard IX as prescribed by GSHSEB and NCERT of English medium Schools in Vadodara city, Master of Education IGNOU New Delhi

Objectives:

1. To study the physical as well as academic aspects of the social science textbook prescribed by GSHSEB and NCERT.
2. To study the views of the teachers regarding social science textbook prescribed by GSHSEB and NCERT.
3. To study the views of the students regarding social science test book prescribed by GSHSEB and NCERT.

Methodology: The main tools of the study were questionnaire and interview schedule

Major findings: Almost all students and teachers of GSHSEB and CBSE seemed desirous to have various kinds of improvements in social science text book. Even though most of the students liked the size of the textbook the binding was not found durable. The students of the GSHSEB did not like the presentation of pictures, maps, and illustrations and even the font size of the headings and subheadings were not proper. A quite major share of teachers did not like the physical presentation of the textbook as well as the contents. When 605 of the teachers agree that the textbook gives enough suggestions for homework and assignments the remaining teachers did not find the given activities as per mental level of all students.

Sonal. A (2011) Analysis of GSHSEH Hindi Text Book of STD IX in Gujarat medium schools of Vadodara city

Objectives:

1. To study the Academic and physical aspects of the GSHSEB TEXTBOOK OF Standard IX
2. To study the opinion of Students of STD XI regarding the suitability of the Hindi text book
3. To study the opinion and suggestion of teachers and experts regarding the text book for improvement.

Methodology: Tools used for the study were 1. Check list for Students 2. Interview schedules for Expert 3. Interview schedule for Teachers

Major findings: Very few students were dissatisfied with physical layout. Majority students were satisfied with physical layout, durability and size of the book. Majority students were satisfied with selection and organization of the content language used presentation of the content and quality of pictorial illustrations, exercises and assignments. Few students were dissatisfied with selection and organization of the content, language used, presentation of the content quality of pictorial illustration and exercises and assignments. Majority teachers said that some of the poetry sections were difficult to understand. All the teachers believed that the exercises given at the end of the chapters were adequate. Most experts responded that there should be separate sections for grammar because students were confused when lessons and grammar were both put together. Majority experts said that the cover page should be redesigned. Most of the experts felt that the predetermined objectives were not fulfilled by the textbook. Majority experts said that the price of the textbook should be fixed according to the standard.

Katara Krishna (2010) An analysis of GSHSEB Textbook of std 9 in English medium schools of Vadodara city

Objective: The study aimed to study the academic and physical aspects of the Textbook, to study the opinion of students regarding the suitability of English textbook under study and to study the opinion of teachers regarding their satisfaction level and suggestions for improvement in the textbook.

Methodology: The tools used were Checklist for students, interview schedules for teachers and Interview schedules for experts. The sample comprised of 370 students and 30 teachers from 30 teachers of GSHSEB Board.

Major findings: The major findings of study were to study the academic and physical aspects of textbooks. It was documentary types of study the textbooks lacked in providing good explanation. Sometimes it provided feeble introduction due to which the students did not get any indication of what the chapter will discuss about .The textbook was considered dry due to the absence of current issues and lack of colorful pictures. Content should be made better .It should be more interactive and elicit active participation of students. The sample for both the studies was STD 9.It is important to determine the effectiveness of integrated approach to value education in other subjects also.

Gopal Krishnan, K. R. (1977) A critical analysis of the new mathematics syllabus and text books used in the upper primary classes in Kerala, PhD. Edu. Kerala University

Objectives: The objectives of the investigation were (1) To find out how far the syllabus prescribed in mathematics was adequate in the light of the main qualities expected of text books (2) To find out the constraints that affect the implementation of current syllabus (3) To attend the comparative study of the current syllabus (1970-73) with that of the immediately preceding years. (4) To locate areas of topics to be deleted from and/ or added to the syllabus under study, and (5) To find out how the syllabus in mathematics prescribed for the Kerala schools was comparable with that of advanced countries.

Methodology: The investigator used questionnaire for students and interview schedule for the teachers

Major findings: Following findings were observed by the investigator. The structure and figure of the mathematics textbooks were appropriate but the rate of introduction of new terms was uneven. Type of graphical errors due to carelessness and real errors were found here and there in the text books and almost all topic needed gradation. The revision exercises, diagnostic text and general exercise were in general appropriate. The inclusion of enrichment programmes was the good feature of the text book but the diagrams were not satisfactory. There was more disagreement between the syllabus and the text books

due to the omission of certain topics and sub units. It was also referred that the syllabus of 1972 to 73 was better than that of the immediately preceding year. The coverage of content of text book of Kerala was not at par with that of the NMSC and the SMP series. The Kerala syllabus differed from the NCERT syllabus and the addition to the syllabus suggested by the respondents were more exercises usable for home works, problems related to life, English equiv. - valence of new terms and life history and important events of mathematicians. The deletions suggested included discerning patterns, enrichment programs, difficult programs and fundamental laws.

Ponkshe . D.B. (1972) A Critical Evaluation of geography Textbook of standard VI, College of education, Dhule , 1972(MSBTPCR- Financial)

Objectives: The major objectives of the investigation were (i) to analyze the textbook in relation to the objectives of the geography syllabus for standard VI, (ii) to study the textbook in relation to the level of understanding of pupils in Standard VI, (iii) to find out if it was necessary to make any changes in the objectives of the syllabus and (iv) to make recommendation for the improving both the syllabus and the textbook.

Methodology: A stratified random sample of sixty schools in Dhuli district was selected. Of these sixty schools, twenty eight were urban and thirty-two rural, forty-nine were primary and eleven secondary. All the 150 geography teachers from these schools were respondents. A questionnaire was sent to the teachers in order to get their opinions.

Major findings: The major findings include the following There was a positive attitude towards the syllabus of the textbook and the textbook was greatly helpful in achieving the various objectives of the syllabus except for recognition of cause and effect relationship, stimulation of the power of observation and encouragement of the use of the maps. In all two lessons were unduly long and three others were disproportionately small. The language was easy and well within the understanding of the pupils and the pictures, maps and figures were adequate in numbers. It was necessary to have colour pictures and bigger maps showing natural regions.

2.3 OVERVIEW OF RELATED STUDIES

Many studies have been conducted in the field of text book and curriculum evaluation. Reviews show that researches on textbooks of any dimensions has a direct impact upon the improvement and development of education programme at school level. The reviews draw the attention to the need and importance of researches on textbooks. Textbooks have been criticized over the years for many reasons, one of them being that they are too simple and lack challenges for the students. On the other hand if the text book is too complex then the students may fail to learn, so it becomes necessary to ensure that a right balance is achieved between simple and complex and textbooks with good physical getup may not be effective due to its weakness in some other aspects like presentation of content, vocabulary etc. A text book may fulfill the conditions of syllabus but may not satisfy the needs of teachers and students. Therefore it seems that textbook evaluation should take into consideration all possible factors influencing a textbook. Investigators covered various subjects like physics, social science, mathematics etc. The findings from the studies proved worthy for future improvements. More studies are conducted on curriculum than on text books.

2.4 RATIONALE

Textbooks play an important role in the process of teaching and learning. It is the mirror of curriculum which is to be imparted to the new generation. A textbook must be with required contents so that a student can use it with confidence. Physical and academic factors consider a lot while evaluating a text book. When the physical factors throws attraction academic factors boost the knowledge required. Evaluation is the process of ascertaining the qualities based on certain requirements and suggest for further improvements. There is always scope for change and improvement, but it is not possible, unless the text book programmed is supported by adequate research.

We must remember that we have two different objectives, the first one is the general; education of citizens (for everybody, and this the minimum), meanwhile the second one is mainly concerned with scientific education. Whatever the objectives are and whatever the students are, we must keep in mind that a sensible curriculum must have some important functions.

Present study involves the analysis of standard XI statistics textbook. Statistics is required in each and every field of commerce and industry. The investigator decided to conduct a study on standard XI as it is felt important to learn all the basics in the first year of their higher education. Without proper basic concepts they will not be able to cope up with the subject in the higher studies. It is easy to learn from simple to complex. So it is logical to include all important aspects of collection of data along with presentation and analysis must be a part of the syllabus.

The present study focuses on the statistics. Statistics is the subject which helps us to do planning and budgeting. Without planning and budgeting commerce cannot reach in its heights. Statistics is an activity which is conducted after the occurrence of any event. So it helps to predict the future. It is the use of mathematical methods in collection, classification, analysis and interpretation of data. By statistics we mean aggregate of facts affected to a marked extent by multiplicity of causes numerically expressed, enumerated or estimated according to reasonable standards of accuracy, collected in a systematic manner for a predetermined purpose and plays in relation to each other.

The investigator collected information from students of standard XI to ensure the adaptability of the standard XI textbook. A textbook must satisfy the needs of students in all aspects. The physical and academic aspects must be at par with the age group. The standard XII children can understand the suitability of the textbook of standard XI since they have the same subject in standard XII. The topics covered in standard XII are of much use to them in standard XII.

A textbook is the mirror of the curriculum. It reflects all the topics needed according to the level of the children. A text book is a book whose purpose is for instructional use. Text book material is often divided into four categories as narration and discipline, prescription and directives, procedures and theoretical laws. A text book is a manual of instruction in any branch of study. Text books are produced according to the demands of educational institutions. A text book used in the study of a subject is a literary work or a presentation to the study of a subject. Text books are print books or e- books that accompany a specific class or subject at the school or university level, and suggest a curriculum that is a course of learning for that particular class. Since it is the main

teaching tool the investigator thought of analyzing the textbook in detail to ensure its suitability for the children as well as for the teachers.

Various studies have been conducted in the field evaluation of text books. Most of them are related to the curricular aspects and few for text books and its contents. All these studies showed the physical aspects of the text books from the point of view of the students, and experts. When text book helps teachers to teach it helps the students to cater the past knowledge. Gopalkrishnan, while evaluating the mathematics text book suggested the addition to the syllabus, more exercises usable for home works, problems related to life, life history and important events of mathematicians. The deletions suggested included discerning patterns, enrichment programs, difficult programs and fundamental laws.

In the present situation of advanced technology textbook's place is not less in the teaching learning process. Textbook often teach the teachers where there is lack of training. In a developing country like ours text cannot be replaced by the latest technology for whatever reason might be. It is like a weapon for the students to overcome many hurdles and tool for instruction for the teachers. Few studies revealed the implications of evaluation of text books for further studies .Deshpande, A.R.'s (1992) study was conducted on 655 teachers of mathematics from 220 schools of Vidarbha representing urban and rural areas. It tried to investigate practical utility of mathematics curriculum for student's weather the curriculum had enough variety to cater for individual differences. He concluded the study with suggestions for gradation of topics and commended the adequacy of exercises. Dhand. H. and Lyons. J. (1991) described the experiment on an innovative curriculum in social studies in Saskatchewan (Canada) which inhabited by a sizeable population of Indian origin. The pedagogic techniques recommended for transacting the new curriculum include open ended questions value – clarification and value –analysis. Linking social studies content to the real life around and focus on global and peace education. Devi, S.A (1990) examined environmental science (EVS-1) curriculum in Andhra Pradesh. The teacher sample was taken from three district geo- political areas, viz., coastal Andhra Rayalaseema and telangana. Two districts were selected from each of the three above – mentioned areas. Sagarika (2012) A Comparative evaluation of social science text book of standard IX as prescribed by

GSHSEB and NCERT of English medium Schools in Vadodara city, Master of Education IGNOU New Delhi , Her studies put forward the suggestion for improvement in the quality as well as quality of GHSEB textbook with respect to contents.

The present statistics textbook was published in the year 2004 and till today no revision was done in the topics. Moreover the textbook lacks in application and reasoning level for the children of the particular age group. The topics which are covered in the high school level are repeated in the textbook without any advancement. There is no particular use of statistics in business as well as day to day life is not mentioned in any of the topics. Therefore the investigator conducted the present survey in expectation of an immediate revision of the textbook. The use of statistics in business as well as in daily life is not mentioned in the textbook. So the textbook needs revision and up gradation to overcome the present limitations.

Apart from the above studies many studies were conducted and being conducted with a view to improve the curriculum to cater the future needs of the users. Teachers are curriculum translators. So their tool must be in accordance with the objective. So the evaluation must be on the need of the topic. Considering this studies were conducted and being conducted to get better results in future. But so far no one has conducted a study in statistics education in the higher secondary level. Keeping this in mind the researcher took the initiative of conducting an evaluation procedure of higher secondary statistics textbook.

2.5 IMPLICATION FOR THE STUDY

Investigator observed various studies conducted with respect to curriculum and textbooks. All the studies were related to the physical and academic aspects of textbook and also the suitability of curriculum based on the age group. These studies threw light on the present study to achieve its aim from different angles. Textbooks are source of knowledge to its users, the teachers and the students. Various studies have been conducted in the field of curriculum as well as textbooks. Most of the studies related to evaluation of textbooks are in the high school level. Even though many studies have been conducted for evaluation of textbooks very few are related to higher secondary textbooks especially commerce subjects. So it gives rise to the need of present study.

Analysis is the process of ascertaining the usefulness of a thing as well as the suggestions for improvement. From the present study the researcher will give a clear picture of the standard XI statistics textbook. **Dhand. H. and Lyons. J. (1991)** said that humanistic methods were increasingly getting popularity. For proposed innovative curriculum the investigators suggested a setoff guidelines for improving the new social studies like greater emphasis on open-ended questions, critical thinking and problem solving skills, emphasis on value analysis leading to value classification, linkages between real life and social studies content and visible emphasis on concept development using multiple and even unconventional sources, inclusion of current events and world affairs etc. This suggestion by Dhand and Lyons may help the investigator in her present study. **Sonal A (2011)** said that Majority experts said that the cover page should be redesigned. Most of the experts felt that the predetermined objectives were not fulfilled by the textbook. Majority experts said that the price of the textbook should be fixed according to the standard.

Whereas **Deshpande (1992)** suggested the addition to the syllabus suggested by the respondents were more exercises suitable for homework, problems related to life, English equivalent of new terms and life history and important events of mathematicians. The decision suggested included discovering patterns enrichment programmes, difficult problems and fundamental laws. All the studies previously conducted helped the investigator to conduct the present study in a meaningfully and worthy way and to arrive at fruitful conclusions.

2.6 CONCLUSION

Review of related literature gives an overall understanding of studies conducted in various areas. The reviews throw light to those areas where researchers have put their effort and also to those areas where no remarkable attempt has been made. In the present study the researcher tried to find the studies related to curriculum as well as textbooks of various subjects. The researcher was not able to trace much contribution in the commerce stream. Very few attempts were done to have a review of commerce subjects in spite of the fact that commerce is the back bone of any country towards development. Here the

investigator attempted to analyze the statistics textbook of standard XI after considering various studies with respect to curriculum and textbook.

CHAPTER III

METHODOLOGY

3.0 INTRODUCTION

Methodology is the part of research in which actual plan of the instigator is being executed. Here the investigator used various methods to complete the research. It is not easy to collect the required data in a stipulated time. Various methods are used by the investigator in obtaining the required information. The result of the data procedure is presented in the next chapter. The various tools used by the investigator include checklist for children of standard XI and XII and interview schedule for experts and teachers.

3.1 STATEMENT OF THE STUDY

A critical analysis of GSHSEB statistics textbook of standard XI

3.2 OBJECTIVES OF THE STUDY

1. To study the Physical aspects of the GSHSEB statistics textbook of standard XI
2. To study the Academic aspects of the GSHSEB statistics textbook of standard XI
3. To study the opinion of students of standard XI regarding the suitability of the statistics textbook
4. To study the opinion of students of standard XII regarding the suitability of the statistics textbook
5. To study the opinion of teachers regarding the textbook and suggestions for improvement.
6. To study the opinion of experts regarding the textbook and suggestions for improvement.

3.3 EXPLANATION OF TERMS

Textbook: A textbook is a manual of instruction in any branch of study

Critical Analysis: A process to find the quality of a product or work keeping in mind the standard required for the same.

Statistics: **Statistics** is the use of mathematical methods in collection, classification, analysis and interpretation of data

Textbook evaluation: To find out the worthiness of a book as a teaching learning tool in relation to the course of study and the objective of the course assigned to an age group.

3.4 METHODOLOGY OF THE STUDY

The present study is a descriptive survey in which a survey is conducted by using questionnaires and interview schedule executed during a fixed time to get valuable information from the sample selected from the population concerned.

3.5 POPULATION OF THE STUDY

The population of the study consisted all the students of standard XI and XII of commerce stream, all the teachers of statistics in the higher secondary commerce stream and all the statistics experts of Gujarat

3.6 SAMPLE AND SAMPLE TECHNIQUE

The investigator used a sample of 150 students of standard XI commerce, 50 students of standard XII commerce, 10 statistics teachers and 5 statistics experts. 4 schools were randomly selected from the city of Baroda which is a part of our selected population constituting all higher secondary standard XI commerce students in Gujarat.. Later on students of the particular class in these schools were taken for present study. In the same way a sample of 10 teachers was taken from the selected population all teachers in Gujarat. A sample of 5 statistics experts were taken randomly from the population of all statistics experts in Gujarat.

3.7 PREPARATION OF TOOLS

Data collection for the research was done by using four different tools. These tools were (1) Checklist for students of standard XI (appendix no 6 &7) (2) Checklist for students of

standard XII (appendix no 8 & 9) (3) Semi structured interview schedule for teachers (appendix no 10) and (4) Semi structured interview schedule for experts (appendix no 11)

A check list is a set of questions prepared with respect to the subject of research in which students are expected to give their opinion in the most appropriate way. In the present study the investigator administered the checklist of students of different schools and obtained information from the selected sample. The aspects covered in the checklist include physical aspects of the textbook like size and shape of the textbook, attractiveness, the durability, the font size, the page layout, the overall layout of the textbook etc. The checklist contain academic aspects like suitability of the textbook for the particular age group, the exercises and illustrations given in the textbook, the language used in the textbook etc.

A semi structured interview schedule contains questions with respect to the research topic in a partial way. It is the duty of the investigator to get necessary information from the respondents from various angles. In the present study the investigator approached the teachers and the experts and gathered information related to the present study. The investigator included questions which mainly cover the areas like the level of the textbook according to the age group of the children, whether the textbook contains real life example, global issues, current issues etc, the textbook is sufficient as a teaching tool or not, the suitability of textbook for the children and also how much the textbook can help the children in their future studies in college level. The tool also contained the suggestions for further improvement in the textbook along with deletion or addition of topics.

3.8 VALIDATION OF TOOLS

The actual process of research starts with collection of data from the sample selected. It is customary to get the tools validated before the beginning of the collection of data. It is important that the tools must satisfy the objectives of the research. The success of data collection depends on the nature of tools. In the present study the investigator approached five experts to get the tools validated and got it validated with necessary suggestions and changes. Some of them advised to add more questions related to statistics subject content.

One of them suggested a detailed bifurcation of individual chapters with respect to simplicity and complexity in learning the topics in the textbook. No major changes were being suggested by the experts after validation of tools. The investigator accepted all the relevant suggestions by the experts. List of experts is enclosed in appendix no 5

3.9 ADMINISTRATION OF TOOL

Sr No	Objective	Source of Data	Nature of Data	Tool	Data analysis	Time
1.	To study the Academic and Physical aspects of the GSHSEB statistics textbook of standard XI	Textbook	Qualitative	Checklist	Content analysis	One week
2.	To study the views of students of standard XI regarding the suitability of the statistics textbook	Students of Std XI	Qualitative	Questionnaire	Close ended questions by means of frequency and percentage. Open ended by content analysis	One week
3	To study the views of students of standard XII regarding the	Students of Std XII	Qualitative	Questionnaire	Close ended questions by means of frequency and	One week

	suitability of the statistics textbook				percentage. Open ended by content analysis	
4	To study the views of teachers and experts regarding the textbook and suggestions for improvement.	Teachers and experts	Qualitative	Questionnaire and interview	Close ended questions by means of frequency and percentage. Open ended by content analysis	Two weeks

3.10 PROCESS OF DATA COLLECTION

Phase One: The investigator obtained the permission from principals of various schools for collection of data from students, took prior appointments from teachers to conduct interviews and also visited M S University of Baroda to get permission of experts for data collection.

Phase Two: Investigator visited the schools directly to collect data from the students of standard XI and XII. Simultaneously the investigator collected the data from the teachers. In certain cases before meeting the teachers to conduct the interviews the investigator maintained a telephonic talk to make good rapport with them. The collection of data was smoothly done because of the cooperation of teachers in various schools. The teachers were quite happy to give their suggestions and opinion on the textbook as it was a matter of specific importance for up gradation of textbook.

Phase Three: A sample of five experts was taken from the population keeping in view of the possibility of required amount of information to satisfy the objective of data collection. In the third phase the investigator visited the experts to conduct the interviews.

The permission was taken in advance and the process of data collection was quite fast and easy for the investigator. Some of them accepted our visit and responded very well on the first visit only. But few of them expressed their inconvenience for giving their opinion since they wanted to go through the kind of information which the investigator needed. The investigator visited them after a week and collected the data. All these process took time period of about three weeks to complete the process.

3.11 PROCESS OF DATA ANALYSIS

The data collected by the investigator was organized and analyzed by the investigator by using appropriate techniques. The analysis of data was done in the following manner.

- (1) The analysis of physical and academic aspects of textbook was done by the investigator by the technique of content analysis.
- (2) The opinion of students of standard XI and XI was done by the method of frequency, percentage and content analysis.
- (3) The opinion of teachers and experts was done by content analysis.

Graphical representation of data analysis was done wherever necessary to confirm clarity of data analysis.

3.12 CONCLUSION

Thus, in this chapter methodology is explained in detail. The data collection process was done in a systematic way by the investigator keeping in view of the objectives of the present study. The time period was definitely appropriate as the students and teachers were in a relaxed situation after the hectic first semester of the academic year. Students appreciated the way of asking their opinion of their own textbook as if it was a new experience to them. After the collection of data the next important procedure was the analysis of data collected with the help of appropriate techniques and it is discussed in the next chapter in detail.

CHAPTER IV
ANALYSIS AND INTERPRETATION OF DATA

4.0 INTRODUCTION

In the third chapter the investigator discussed various methods used in collection of data based on the objectives of the present research. Collection of data is followed by analysis of the data through which the investigator tries to find the effectiveness of the research. In this chapter the investigator deals with the analysis of the collected data to arrive at proper conclusion. The present research includes the analysis of GSHSEB standard XI statistics textbook. The analysis was done quantitatively and qualitatively. The textbook was analyzed with respect to the physical and academic aspects. The investigator used different ways to conduct the research.

Analysis of Standard XI statistics Textbook

Analysis of Physical Aspects of textbook	Analysis of Academic aspects of textbook
Check list for standard XI students	Checklist for standard XII students
Semi structured interview schedule for teachers	Semi structured interview schedule for experts

4.1 ANALYSIS OF DATA

Analysis of data began with the completion of data collection. The collected data was arranged based on the objectives of study. Responses of students of standard XI and XII were separated and counted by frequency count and later percentages were calculated. The next step was to present the data with the help of graph and the observations from the analysis. The next stage was the analysis of opinions collected from the teachers and experts. This was done based on content analysis. Each and every response to the interview was considered for content analysis. Final conclusion was based on the all the above analysis including the analysis done by the investigator on the physical and academic aspects of the textbook.

4.2 OBJECTIVES OF THE STUDY

1. To study the Physical aspects of the GSHSEB statistics textbook of standard XI

2. To study the Academic aspects of the GSHSEB statistics textbook of standard XI
3. To study the opinion of students of standard XI regarding the suitability of the statistics textbook
4. To study the opinion of students of standard XII regarding the suitability of the statistics textbook
5. To study the opinion of teachers regarding the textbook and suggestions for improvement.
6. To study the opinion of experts regarding the textbook and suggestions for improvement.

4.3 OBJECTIVE WISE ANALYSIS OF DATA

Data was collected with the help of checklist for standard XI and standard XII and the opinion of teachers and experts based on interview schedule based on various objectives was analyzed in detail.

4.3.1 ANALYSIS OF PHYSICAL ASPECTS OF STATISTICS TEXTBOOK OF STANDARD XI

Table 4.1 Analysis of physical aspects of textbook

Particulars	
Date of publication	The book was first published in the year 2004
Cover Page	Moderately attractive with pictures of graphs and diagrams from chapter three of the textbook. Cover page does not present any other topics of the textbook. The publisher's name is written in Gujarati. Margins on all four sides are not equal.
Author	Gujarat State Board of School Textbooks
Subject Advisor	Dr. A V Gajjar
Writing and compiling	Dr. Rajashree Bhatt, Shri J. P Langalia, Shri Nitinbhai Pandya and

	Shri V N Ajbani
Translator	Dr. A V Gajjar
Reviewers	Dr. R T Tatani, Dr. c C Gujarathi, Shri D S Gandhi and Miss Harpeet Kaur Mehta
Artist	Shri Pooja Shah
Co-Ordinator	Dr. Chirag N Shah (He is the subject coordinator of commerce)
Preparation and Planning	Shri G I Shaikh
Layout and Planning	Shri Haresh S Limbachiya
Publisher	Mr. H K Patel, Director on behalf of Gujarat State Board of School Textbooks
Printing	Shri Gajanad Offset, Ramdev Estate, Ahmedabad
Binding	Binding is good enough to handle for the students
Font size	Headings ,sub headings and contents are of approximately 12
Layout of the contents	Contents are arranged in sequence by giving headings, subheadings and with explanation of new words. All chapters are started on a new page
Weight and Size	Approx 450gm ; 23cm x 16.5cm x 1.5cm
Price	₹ 30
Headings and subheadings	Headings and sub headings are bold in red colour. Headings are numbered but sub headings are not numbered
Spellings	Error free
Presentation of new words	New words are bold in black

Table 4.1 reveals the physical aspects of the textbook. The study shows that the textbook is low priced. The contents in the textbook is designed by a team of experts as Dr. Rajashree Bhatt, Shri J. P Langalia, Shri Nitinbhai Pandya and Shri V N Ajbani and it is reviewed by Dr. R T Tatani, Dr. C Gujarati, Shri D S Gandhi and Miss Harpeet Kaur

Mehta. The study also reveals a good layout; cover page, binding, font size etc. The headings and sub headings are bold and numbered. It is moderately sized for the age group. The author of the textbook is Gujarat state Board of Textbooks. Overall attractiveness of the textbook is quite good. The textbook was first published in the year 2004 and so far no revision was done with the textbook.

4.3.2 ANALYSIS OF ACADEMIC ASPECTS OF STATISTICS TEXTBOOK OF STANADARD XI

Table 4.2 Analysis of academic aspects of textbook

Particulars	
Language used	Simple language is used throughout the textbook so that children of all level can understand the basic concepts
Convenient for self study	All the illustrations are arranged in an order of simple to complex. There for an average student can understand and will help in self study.
Introduction of first lesson	The first lesson is collection of data which is the beginning of any statistical activity. The introduction of subject is explained well in the first chapter. The meaning of the word statistics is also given. Various examples are given to understand the concept of statistics and its uses.
Introduction of lessons	All lessons begin with a small introduction. Except in few lessons previous knowledge is repeated to facilitate easy understanding
Illustrations	Enough illustrations are given after each topic and detailed explanation is given facilitating self study. But at the same time no illustration is given by giving suitable real life examples or purely commerce and industry related practice exercises.
Exercises	In almost all lessons practice exercises are given immediately after each topic and a consolidated exercise

	containing all types of exercises previously done. Exercises are followed by kinds of illustrations given. But at the same time no questions are included in the exercises which can boost the reasoning power of brilliant students.
Extent of self study provision	Explanation of terms and illustrations are helpful for average students as a self study material
Provision of various tables	Tables of Logarithm and antilogarithm are provided at the end of the textbook
Appendices 1.	A very good sample questionnaire is given which is a tool for collection of data explained in chapter 1
2.	Explanation of logarithm and antilogarithm are given along with sample questions. Logarithm is used in the calculation of geometric mean in chapter 6

Table 4.2 reveals the academic aspects of the textbook. It gives a clear picture of the contents in the textbook. The study shows that the textbook gives necessary information and guidelines for the students and the teachers. The language used in the textbook is simple and there is a sequence in the textbook for the arrangement of topics. The table gives the idea that the introductory chapter is well suited for the students, enough practice exercises and illustrations are given in the textbook, various tables like logarithm table, appendix etc are given in the textbook.

Apart from all the above qualities of the present textbook it has certain limitations which are as follows.

*No revision is done since the publication of the book in the year 2004.

*No pictorial explanation is given to explain statistical events for example Population, Sample, permutation, combination etc

*No real life examples or global issues are given in the textbook

* Few graphs are not properly explained by showing difference with other methods. For example cumulative frequency polygon of discrete frequency distribution and graph associated with median. So students are totally confused with such topics.

* More than three methods to find an answer for any one question related to any topics in the textbook bring dilemma in students as they are unaware that it is for the convenience of calculation. Since the state board students are allowed to use calculators this approach of using different methods must be reconsidered.

Table 4.3 Topics of standard XI statistics textbook

Sr No	Name of the Chapter
1	Collection of Data
2	Classification and Tabulation
3	Presentation of Data by Diagrams and Graphs
4	Measures of Central Tendency-1 (Arithmetic Mean, Weighted Mean, Combined Mean)
5	Measures of Central Tendency-2 (Median, Quartiles, Deciles and Percentiles)
6	Measures of Central Tendency -3 (Mode and Geometric Mean)
7	Measures of Dispersion (Mean Deviation, Quartile Deviation and Standard Deviation)
8	Skewness of Frequency Distribution
9	Permutations and Combinations and Binomial Expansion

10	Arithmetic Progression
----	------------------------

Table 4.3 reveals number of chapters in the textbook. There are 10 chapters in the textbook beginning with collection of data. At the same time it is seen that all the measures of central tendency chapters arranged in an order and the remaining chapters are also arranged in the order of simple to complex.

4.3.3 CHAPTER WISE ANALYSIS TO FIND THE SUITABILITY OF EACH CHAPTER

A statistics textbook contains various formulae, graphs, illustration of sums etc. But the suitability of textbook depends on students' satisfaction with respect to all these aspects. Based on investigator's analysis the below given table explains whether the students face any difficulty in any portion of the topics with respect to concept, formulae, graphs, methodology or given illustrations in the textbook.

Table 4.4 Areas where children can face problems in each chapter

Chapter	Concept		Formulae		Graphs		Methodology		Illustration	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1		✓		✓		✓		✓		✓
2		✓		✓		✓		✓		✓
3		✓		✓		✓		✓		✓
4		✓	✓			✓		✓		✓
5	✓		✓			✓	✓			✓
6	✓		✓			✓		✓		✓
7	✓		✓			✓	✓			✓
8		✓		✓		✓		✓		✓
9	✓		✓			✓	✓		✓	
10	✓		✓			✓	✓		✓	

Table 4.4 reveals the areas where students can face problems with respect to formulae, concepts, graphs etc. In chapter 1, 2, 3 and 8 students do not face any problem with respect to any such problems. Students do not face any problems with respect to illustrations in any of the chapters. In few chapters they face problems in concepts mainly in dispersion, arithmetic progression, permutation and combination etc. But the overall feasibility of the textbook is quite good for the users.

Table 4.5 Number of Illustrations and Examples in each chapter

Chapter	Illustration	Examples	Total
1	Theory lesson		
2	21	18	39
3	16	26	42
4	18	38	56
5	16	33	49
6	15	30	45
7	29	42	71
8	14	30	44
9	30	49	79
10	15	26	41
Total	174	292	466

Table 4.5 reveals the number of illustrations and exercises in the textbook. The table shows that enough number of illustrations and exercises are in the textbook so that children can understand the concepts clearly and also helps the teachers as a teaching tool. The number of illustrations and exercises in the textbook shows the characteristics of a good and valid textbook.

4.3.4 ANALYSIS OF CHECKLIST FOR STUDENTS OF STANDARD XI

Table 4.6 Checklist schedule for physical aspects for standard XI

SrNo	STATEMENTS	A	SA	N	DA	SDA
A	PHYSICAL APPEARANCE					
	The size and weight of the book is appropriate for the students	71	11	43	15	10
	The cover page is attractive to the learner with respect to the content of subject	46	18	50	16	20
B	DURABILITY					
	The textbook is durable with respect to paper and binding	28	18	34	40	21
C	PRICE					
	The price of the textbook is reasonable	57	75	6	3	9
D	PHYSICAL LAYOUT					
	The font size is proper	89	31	20	7	3
	The printing is clear and without mistakes	32	14	36	45	23
	The margins, spacing between lines and paragraphs are proper	75	28	30	14	3
	The page layout is attractive to the learner	49	21	42	27	9
E	PRESENTATION OF CONTENTS					
	The headings and subheadings are bold	76	45	22	3	3
	Each chapter is started on a new page	73	71	4	3	-
	The topics layout in each chapter is attractive to the children	43	20	49	27	12

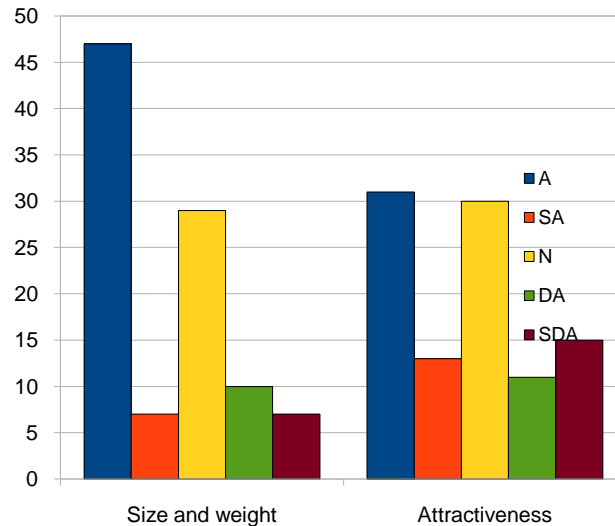
Table 4.7 Analysis of physical aspects in percentage

SrNo	STATEMENTS	A	SA	N	DA	SDA
A	PHYSICAL APPEARANCE					
	The size and weight of the book is appropriate for the students	47	7	29	10	7
	The cover page is attractive to the learner with respect to the content of subject	31	13	30	11	15
B	DURABILITY					
	The textbook is durable with respect to paper and binding	19	12	23	27	19
C	PRICE					
	The price of the textbook is reasonable	38	50	4	2	6
D	PHYSICAL LAYOUT					
	The font size is proper	59	21	12	5	3
	The printing is clear and without mistakes	21	9	24	30	16
	The margins, spacing between lines and paragraphs are proper	50	19	20	9	2
	The page layout is attractive to the learner	33	14	28	18	7
E	PRESENTATION OF CONTENTS					
	The headings and subheadings are bold	51	30	15	2	2
	Each chapter is started on a new page	49	47	2	2	-
	The topics layout in each chapter is attractive to the children	29	13	33	17	8

Table 4.7 shows the analysis of physical aspects of textbook in percentage. Almost 54% of students are in favor of the size and weight of the textbook. In case of cover page about 44% of students are in favor of the textbook's physical appearance. Students are not in favor of the durability and the table shows 46% of disagreement. A very large percentage of students are satisfied with the price and physical layout of the textbook. Almost 80 to 90 percentages of children are very much satisfied with the headings, subheadings and overall content presentation. Dissatisfaction can be seen in the durability, printing etc

4.3.5 ANALYSIS OF PHYSICAL ASPECTS WITH THE HELP OF CHARTS

Chart 1 The size and weight of the Textbook and the Attractiveness of Cover page

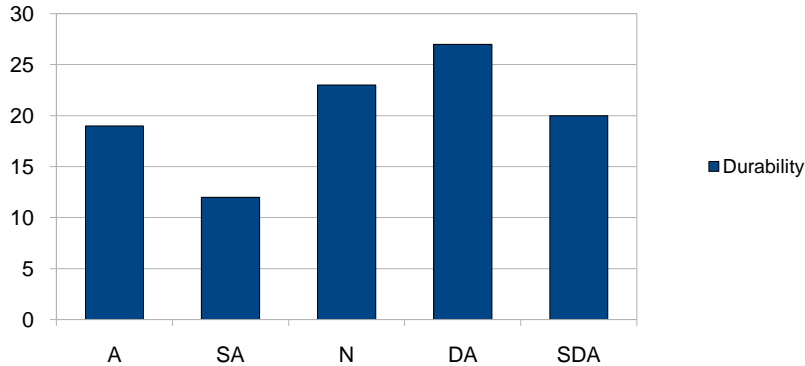


A textbook must be easy to carry for the students with respect to the size and weight. At the same time the cover page must be attractive to draw the attention of the children. In this regard after analyzing the students' response the following observations are made.

Nearly 47% of the children have agreed to the present size and weight of the textbook. Whereas 7% of children strongly agreed to this statement and the response of about 29% of children was neutral in this regard. But 10% of children disagreed with the size and weight of the textbook showing their dissatisfaction and 7% children strongly disagreed.

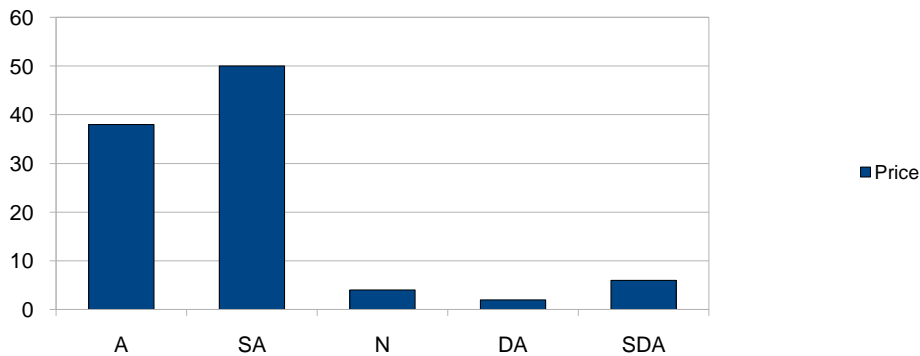
When it comes to the attractiveness of cover page the students who agreed and stood neutral with respect to the cover page were in the ratio 1:1 (31% and 30%). The students who strongly agreed and strongly disagreed were also almost same i.e. 13% and 15%. About 11% of children disagreed with the statement

Chart2 Durability of Textbook



A textbook must be durable so that students can handle freely without fear of being damaged. Students' response to the investigators question about durability of the textbook showed the given result. Maximum (nearly 27%) of children were disagreed with the durability of textbook and nearly 19% strongly disagreed with the durability of textbook. When nearly 23% of children showed neutral attitude, about 19% of children agreed with the durability and about 12% strongly agreed to the statement of durability.

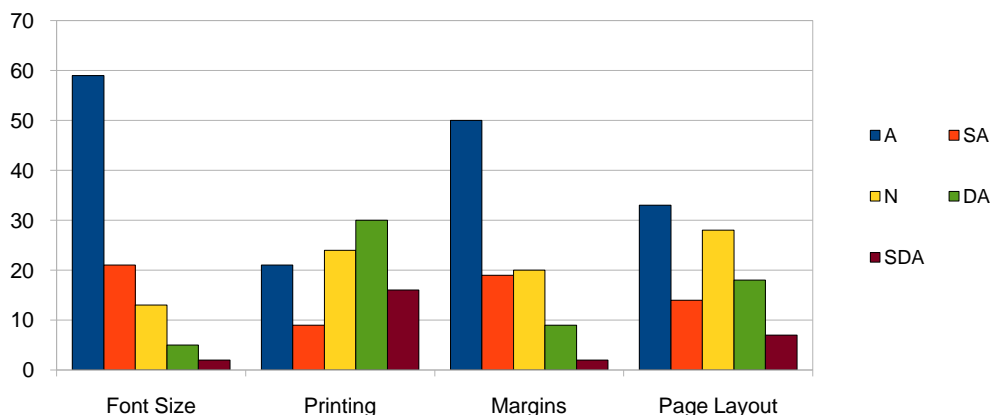
Chart 3 Price of the textbook



When the price of the textbook is fixed by the authorities they must consider different categories of children. In this regard when the investigator tried to find the opinion of children the following findings are made. There was a good response for the price of the textbook. Nearly 50% children strongly agreed to the price and about 38% agreed to the

statement. But 4% children stood with neutral attitude and nearly 2% and 6% showed their disagreement and strong disagreement.

Chart 4 Font size, Printing, Margins, Page layout



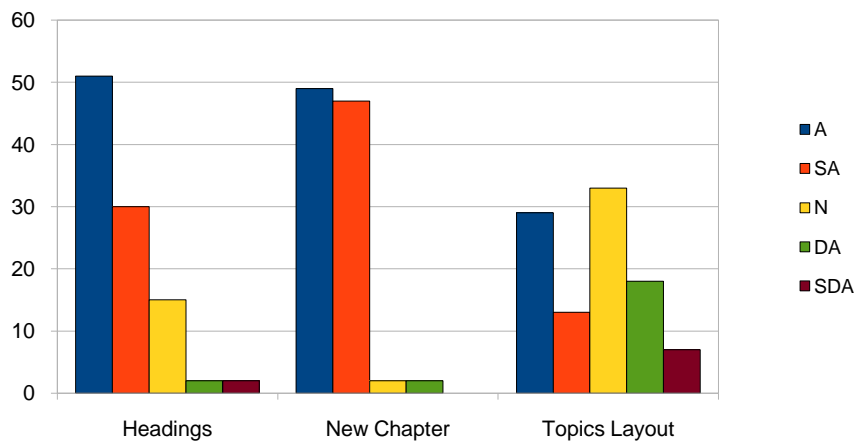
There are various aspects to be kept in mind during preparation of textbook so that it is convenient for children proper usefulness. In this regard the following observations are made by the investigator from the data analysis. With respect to the font size of the present textbook, about 59%, this is the maxim of all responses, agreed to the statement and favored to the current font size used in the textbook. Next to that about 21% strongly agreed, few disagreed (about 5%), very few strongly disagreed (3%) and 12% students gave a neutral opinion.

There was a about 30% disagreement towards the clarity of printing and about 16% of them strongly disagreed. About 24% of the students remained neutral towards the statement, a reasonably number of children (about 21%) agreed and about 9% strongly agreed.

When the opinions were asked about the margins, spacing etc a quite good percentage (50%) agreed and about 19% percent of them strongly agreed. Whereas 20% of them did not show their agreement or disagreement and 9% and 2% respectively disagreed and strongly disagreed.

A very good number of children (about 33%) agreed to the page layout and about 14% of them strongly agreed. At the same time 28% if the children gave a neutral opinion and about 7% of them strongly disagreed. 18% of them disagreed with the statement

Chart 5 Headings, Beginning of new Chapters, Topics layout



All the topics and sub topics must be separately visible from the contents to get a prior understanding of major contents in the textbook. Like that it is nice to have a new chapter on a new page with an attractive page layout.

On the basis of study conducted following results are obtained towards the above aspects. Nearly 51% of children agreed with the headings and subheadings given in the textbook. Moreover nearly 30% of children strongly agreed with the statement. Very few disagreed and strongly disagreed with the presentation of headings and subheadings (4%) and nearly 15% of them remained neutral to the statement.

There was a strong agreement for the beginning of a new chapter on a new page (about 47%) and about 49% of them agreed also. A disagreement was from 2%, and 2% of them had neutral opinion and no one strongly disagreed.

For the question about topics layout maximum students (nearly 33%) remained neutral, about 29% of them agreed and nearly 13% of them strongly agreed. But disagreement and strong disagreement were from nearly 17% and 8% of the students.

Major observation and interpretation of physical aspects of textbook from the analysis of checklist given to students of standard XI

The overall attitude of children for the physical aspects of textbook is satisfactory. The area where children are highly satisfied are the size and weight, price, font size, margins, spacing, beginning of new chapter, headings and subheadings etc. At the same time children are fairly satisfied with page layout, topics layout etc. Little dissatisfaction can be seen in durability and clarity in printing. According to the children the overall quality of textbook is without major limitations and they are quite satisfied.

Table 4.8 Checklist schedule for academic aspects for standard XI

	STATEMENTS	A	SA	N	DA	SDA
A	SELECTION AND ORGANIZATION OF CONTENT					
	The number of chapters is adequate according to the learning capacity	67	20	30	17	16
	The chapters are arranged in a sequence of simple to complex	54	38	40	15	3
	The initial chapters have any link with previous knowledge	63	45	25	10	7
	Any chapter has link with any other subjects in commerce	57	22	40	15	16
B	PRESENTATION OF CONTENT					
	Introduction of each chapter is given in understandable manner	59	27	45	12	7
	The content is understandable with respect to the age group of the children	65	22	36	17	10
C	LANGUAGE USED					
	The language used is understandable for self study	81	24	28	13	4
D	QUALITY OF GRAPHICAL PRESENTATION					
	The graphical presentations are understandable	61	27	42	14	6
E	FORMULAE, ILLUSTRATIONS AND EXERCISES					
	Adequate explanation of formulae is given	68	39	26	11	6
	Enough illustrations are given for self practice	64	48	18	12	8

	Enough exercises are given for understanding the concepts	58	47	24	15	6
	The exercises given at the end of the chapters are easy for self practice	50	25	38	25	12
	The exercises are framed keeping in mind the individual differences (Capacity of every student)	35	24	53	26	14
F	AVAILABILITY OF TABLES					
	Necessary additional requirements like logarithm table, random table etc are provided	71	50	17	4	8
G	ADAPTABILITY OF TOPICS WITH CURRENT ISSUES					
.	Whether the topics addresses the current issues like inflation, population, census etc	52	22	35	25	16
	Real life examples are there so that children learn to apply the concept	40	19	49	21	21
H.	EVALUATION PROCEDURE					
	The weightage of each chapter for evaluation is mentioned	32	16	22	35	44

Table 4.9 Analysis of academic aspects in percentage

	STATEMENTS	A	SA	N	DA	SDA
A	SELECTION AND ORGANIZATION OF CONTENT					
	The number of chapters is adequate according to the learning capacity	45	13	20	11	11
	The chapters are arranged in a sequence of simple to complex	36	25	27	10	2
	The initial chapters have any link with previous knowledge	42	30	17	7	4
	Any chapter has link with any other subjects in commerce	38	15	27	10	10
B	PRESENTATION OF CONTENT					
	Introduction of each chapter is given in understandable manner	39	18	30	8	5

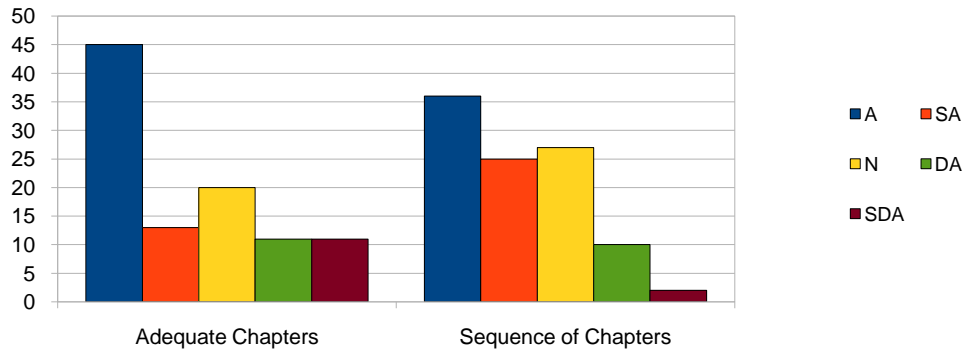
	The content is understandable with respect to the age group of the children	43	15	24	11	7
C	LANGUAGE USED					
	The language used is understandable for self study	54	16	19	9	2
D	QUALITY OF GRAPHICAL PRESENTATION					
	The graphical presentations are understandable	41	18	28	9	4
E	FORMULAE, ILLUSTRATIONS AND EXERCISES					
	Adequate explanation of formulae is given	45	26	17	7	4
	Enough illustrations are given for self practice	43	32	12	8	5
	Enough exercises are given for understanding the concepts	39	31	16	10	4
	The exercises given at the end of the chapters are easy for self practice	33	17	25	17	8
	The exercises are framed keeping in mind the individual differences (Capacity of every student)	23	16	35	17	9
F	AVAILABILITY OF TABLES					
	Necessary additional requirements like logarithm table, random table etc are provided	47	33	11	3	6
G	ADAPTABILITY OF TOPICS WITH CURRENT ISSUES					
.	Whether the topics addresses the current issues like inflation, population, census etc	35	15	23	17	10
	Real life examples are there so that children learn to apply the concept	27	13	32	14	14
H.	EVALUATION PROCEDURE					
	The weightage of each chapter for evaluation is mentioned	21	12	15	23	29

Table 4.9 gives an idea about the students' response to the academic aspects of the textbook. Except with the topics related to real life examples, current issues and weightage for evaluation students are much satisfied with the academic aspects of the textbook. More than 50% of the children are agreed with all aspects of the textbook like sequence of topics, illustrations and practice examples, provision of necessary tables,

graphical presentation, and language used etc. 75% of children are supporting the illustrations provided in the textbook and nearly 70% of children agreed with the exercises, tables etc.

4.3.6 ANALYSIS OF ACADEMIC ASPECTS WITH THE HELP OF CHARTS

Chart 6 Adequate chapters, Sequence of chapters

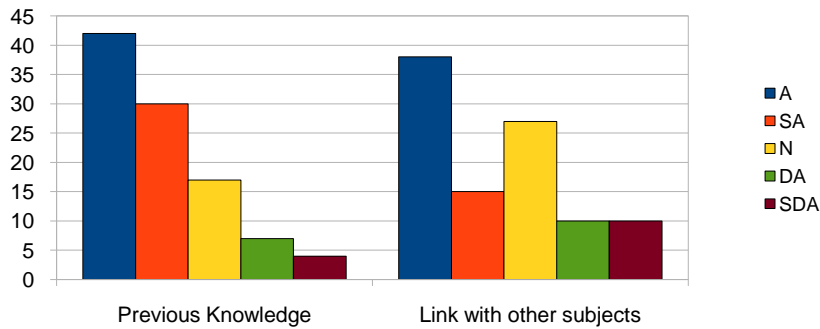


A textbook is tool of instruction for the teachers and a study material for the children. So a textbook must satisfy the needs. Contents must be sufficient and moreover it must be linked with the previous knowledge.

Nearly 45% of children agreed with number of chapters in the textbook followed by a strong agreement from nearly 13%. When 20% of them did not show agreement or disagreement nearly 11% children showed their disagreement and strong disagreement.

A total of about 61% of children agreed and strongly agreed (36% & 25%) with the statement of proper sequence in arrangement of chapters, about 27% of them remained neutral, 10% of them disagreed and a minimum of 2% strongly disagreed.

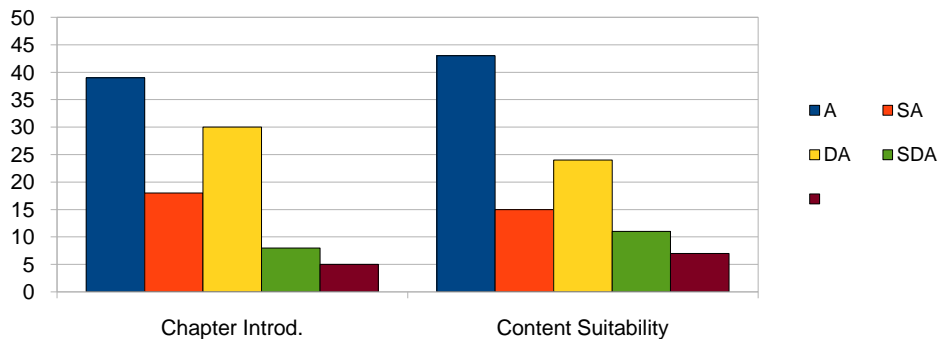
Chart 7 Link with previous knowledge and link with other subjects



About 42% of children agreed with the statement of previous link for the initial chapters and 30% of them strongly disagreed. Strong disagreement was only from about 4% of the students and nearly 7% of them disagreed. But 17% of them remained neutral.

The response of children with respect to the statement of relation of topics with other commerce subjects about 38% of them agreed, about 15% strongly agreed, about 27% of them remained neutral, 10% of each of them disagreed and strongly disagreed.

Chart 8 Introduction of new chapters and content suitability

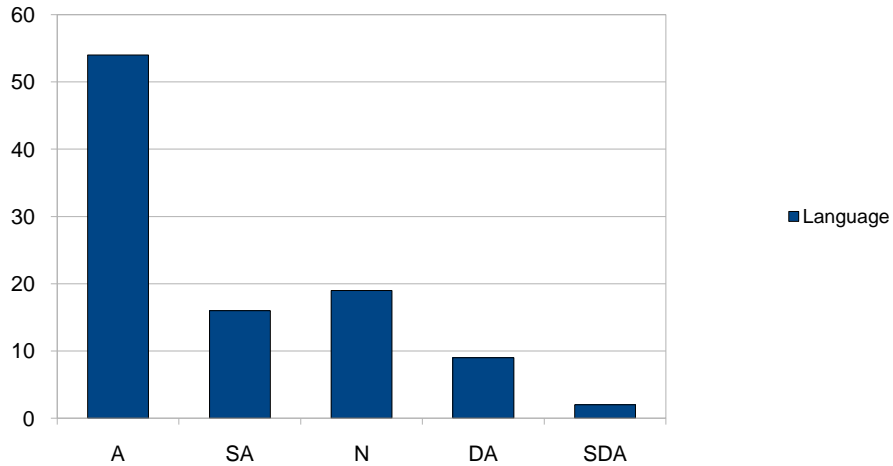


A good textbook must give contents in understandable manner and must consider the age group also.

Maximum students (39%) agreed with the understandability of introduction of chapters and nearly 18% of them strongly agreed. When a quite good number (30%) of them remained neutral about 8% of them disagreed. And a minimum of about 5% showed disagreement.

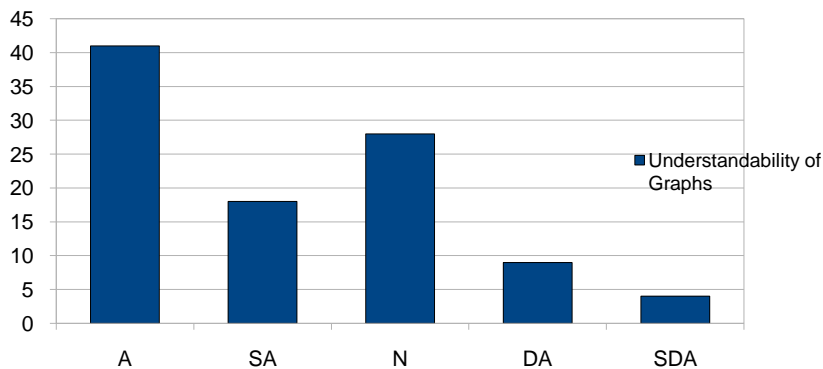
A total of about 58% of children agreed and strongly agreed for the content and age group (43% & 15%), nearly 24% of them were neutral to the statement, nearly 11% of children disagreed and strong disagreement was from only 7%.

Chart 9 Language Used



The language used in the textbook must be understandable based on the concept that a textbook must ensure self practice also. There was very good agreement of about 54% children for the language used in the textbook and strong agreement from 16%. When 19% approx. remained neutral, 9% of them disagreed but there was only 2% strong disagreement.

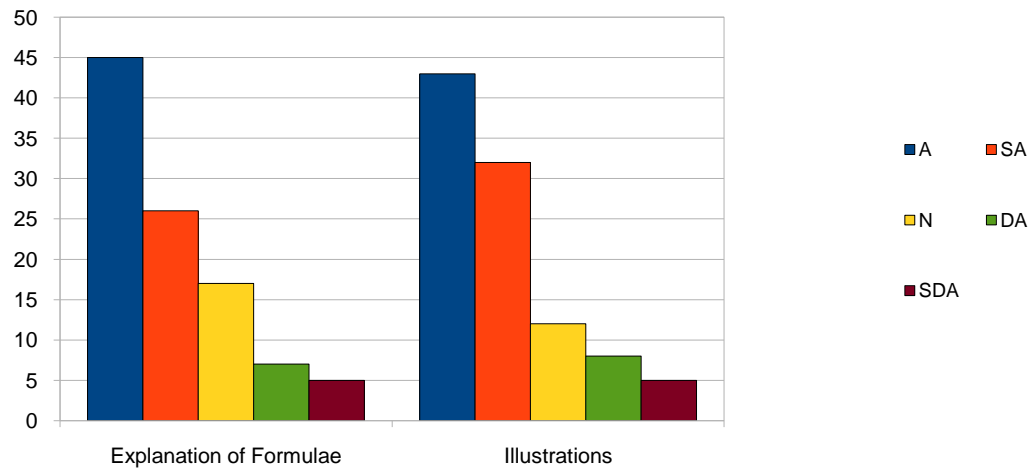
Chart 10 Understandability of graphs given



Data can be presented with help of graph to ensure understandability and to increase the interest of the children. So a textbook must contain sufficient graphical presentation and

at the same time in an understandable way. Towards the statement of understandability only 4% of children strongly disagreed and about 9% of them disagreed. A neutral response was obtained from about 28% of children. Nearly 41% of children agreed followed by a strong agreement from about 18% of children.

Chart 11 Explanation of terms and Illustrations given

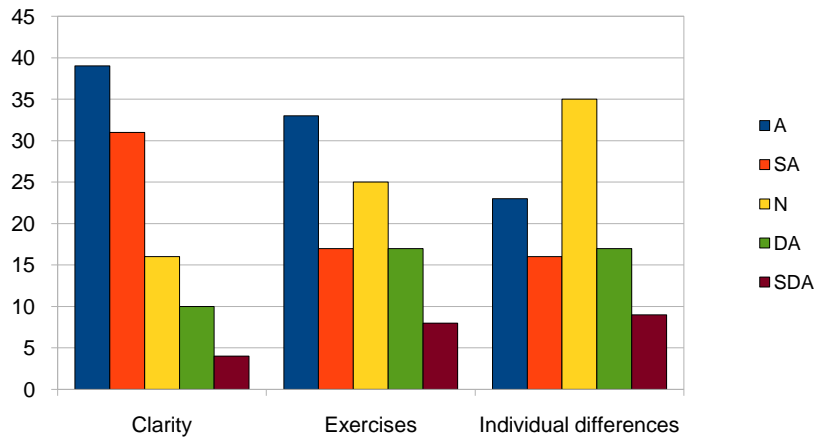


A statistics text textbook must have formulae with required explanation, enough exercises and illustration. Let us a look into the opinion of children in this regard.

Maximum children have agreed with the statement of explanation of formulae (45%), 26% of them strongly agreed, about 17% of them remained neutral, a small group of 7% disagreed and a very few of 4% strongly disagreed.

With respect to the self practice illustrations the investigator obtained the following results. Maximum students agreed with the statement (43%), 32% of them strongly agreed, a neutral response was obtained from 12% of students, 8% of them disagreed and finally only 5% strong disagreement.

Chart 12 Concepts clarity, practice exercises and concern for individual difference

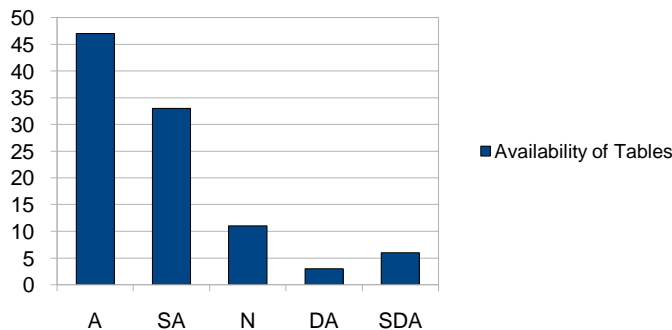


With regard to the understandability of concepts through exercises 39% of them agreed and a strong agreement was from nearly 31%. When 16% remained neutral 10% of them disagreed followed by a strong agreement from 4%.

Only 8% of children strongly disagreed with the statement of self practice exercises at the end of each chapter, but a total of nearly 50% of children agreed and strongly agreed with the statement (33% & 17%). When approximately 17% showed disagreement, 25% of them remained neutral.

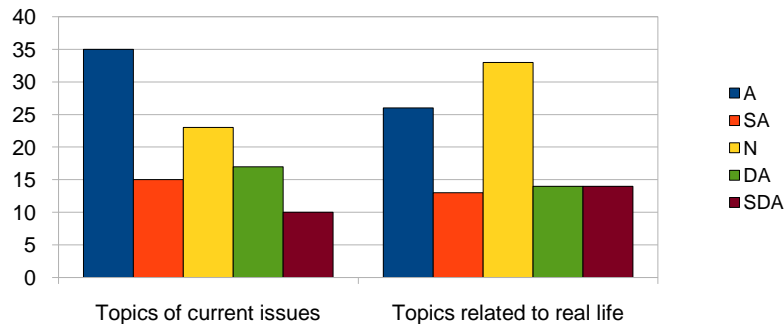
With respect to the individual difference maximum students remained neutral (about 35%), but 23% of them agreed and 16% of them strongly agreed. Almost 26% of children included in the group of disagreement and strong disagreement. (about 17% & 9%)

Chart 13 Provision of various tables



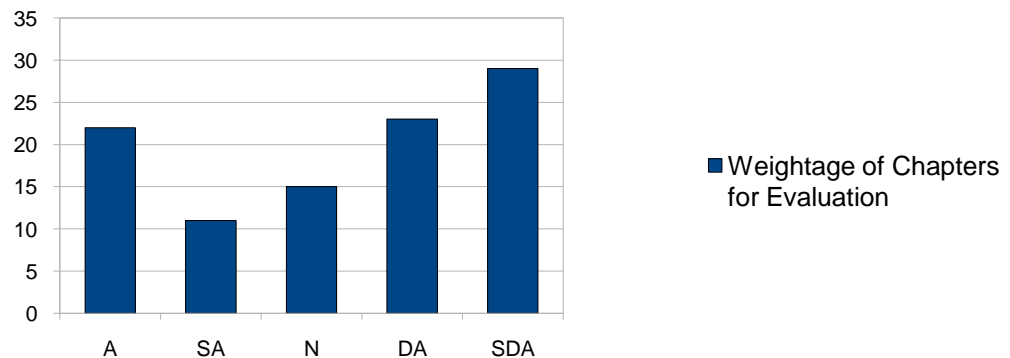
Logarithm table, random table etc are needed in a statistics textbook. With respect to the statement of availability of these kinds of tables' students' opinion was as follows. A good percentage of children agreed and strongly agreed with the statement (47% & 33% approx). 11% of them remained neutral followed by 3% disagreement and 6% strong disagreement.

Chart 14 Current issues and real life examples



Since the world has reached at a level of knowledge explosion a child must get necessary help to compete the current issues including real life problems. The students' responses inclusion of current issues in the textbook was as follows. There was a disagreement of 17% children followed by strong disagreement from 10% children. When 23% of children remained neutral 35% of them agreed followed by strong agreement from 15%. With respect to real life problems only 27% of children agreed and 13% of them strongly agreed. But 32% of them remained neutral and there was equal percentage of disagreement and strong disagreement from the children in this regard (14%).

Chart 15 Weightage of chapters



Evaluation is the process of measuring the present knowledge which they acquired from the respective subject. In this regard it is better to have an evaluation pattern along with weightage of each lesson to be included in the test. In this regard maximum students strongly disagreed (about 29%) and nearly 23% disagreed. When 15% remained neutral about 21% of them agreed to the statement followed by a strong agreement of 12%.

Major observation and interpretation of academic aspects of textbook from the analysis of checklist given to students of standard XI

The analysis of academic aspects gives a clear understanding of opinion about the present textbook. The children are quite satisfied with many of the topics in the textbook, the arrangement of topics, the language used, the graphical presentation, the exercises, illustrations etc. If students are dissatisfied with any of the factors in the textbook it is mainly related to the topics of current issues, global problems, real life examples etc. One more aspect of dissatisfaction is the non availability of weightage of each lesson for evaluation. Most of the major aspects achieve a quite satisfactory agreement of more than 50% of all responses from the children. The analysis proves the characteristics of a satisfactory textbook in academic sense.

4.3.7 ANALYSI OF CHECKLIST SCHEDULE FOR STUDENTS OF STANDARD XII

Table 4.10 Checklist schedule for physical aspects for standard XII

Sr No	STATEMENTS	A	SA	N	DA	SDA
A	PHYSICAL APPEARANCE					
	The size and weight of the book is appropriate for the students	32	9	5	3	1
	The cover page is attractive to the learner with respect to the content of subject	16	2	19	2	2
B	DURABILITY					

	The textbook is durable with respect to paper and binding	20	-	13	11	6
C	PRICE					
	The price of the textbook is reasonable	28	17	3	2	-
D	PHYSICAL LAYOUT					
	The font size is proper	25	8	17	-	-
	The printing is clear and without mistakes	9	6	16	11	-
	The margins, spacing between lines and paragraphs are proper	14	17	17	2	-
	The page layout is attractive to the learner	16	6	19	5	-
E	PRESENTATION OF CONTENTS					
	The headings and subheadings are bold	33	13	3	2	-
	Each chapter is started on a new page	25	22	3	-	-
	The topics layout in each chapter is attractive to the children	16	9	15	10	-

Table 4.11 Analysis of physical aspects in percentage

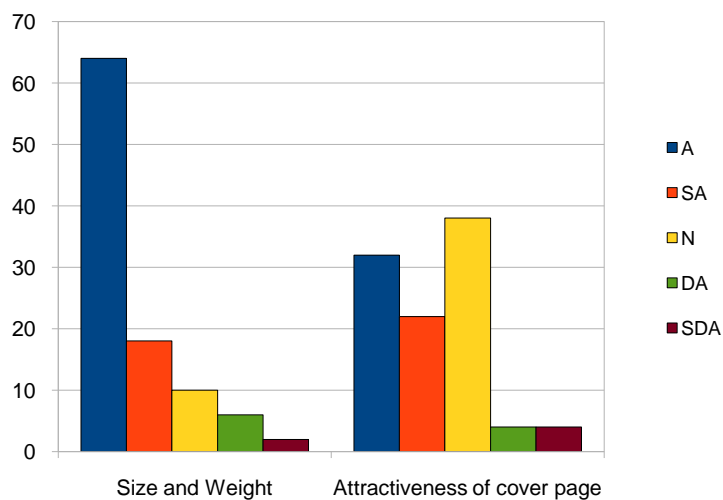
Sr No	STATEMENTS	A	SA	N	DA	SDA
A	PHYSICAL APPEARANCE					
	The size and weight of the book is appropriate for the students	64	18	10	6	2
	The cover page is attractive to the learner with respect to the content of subject	32	22	38	4	4
B	DURABILITY					
	The textbook is durable with respect to paper and binding	40	-	26	22	12
C	PRICE					
	The price of the textbook is reasonable	56	34	6	4	-
D	PHYSICAL LAYOUT					
	The font size is proper	50	16	34	-	-
	The printing is clear and without mistakes	18	12	32	22	16

	The margins, spacing between lines and paragraphs are proper	28	34	34	4	-
	The page layout is attractive to the learner	32	12	38	10	8
E	PRESENTATION OF CONTENTS					
	The headings and subheadings are bold	50	44	6	-	-
	Each chapter is started on a new page	56	34	-	4	6
	The topics layout in each chapter is attractive to the children	32	18	32	18	-

Table 4.11 shows the analysis of physical aspects of standard XI textbook from the responses by students of standard XII. The table gives a satisfactory response from the students. They are quite satisfied with the physical aspects of the textbook. About 90% responses are in favor of the size and weight of the textbook and at the same time above 80% responses are in favor of headings, subheadings, contents layout, price etc. The students are little disagreed with the durability, printing, etc

4.3.8 ANALYSIS OF PHYSICAL ASPECTS WITH THE HELP OF CHART

Chart 16 Size and weight of textbook and the cover page

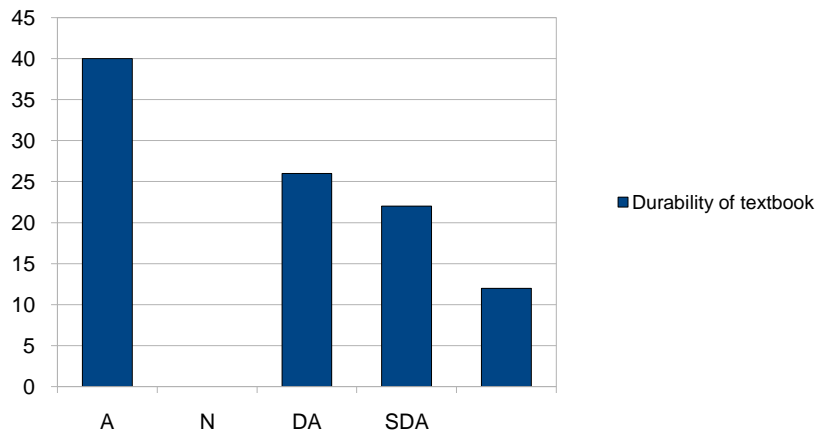


A textbook must be easy to carry for the students with respect to the size and weight. At the same time the cover page must be attractive to draw the attention of the children. IN this regard after analyzing the students' response the following observations are made.

Maximum (Nearly 64%) of the children have agreed to the present size and weight of the textbook. Whereas 18% of children strongly agreed to this aspect. Only 10% of children remained neutral in this regard. Very few of 6% of children disagreed with the size and weight of the textbook showing their dissatisfaction and only 2% children strongly disagreed.

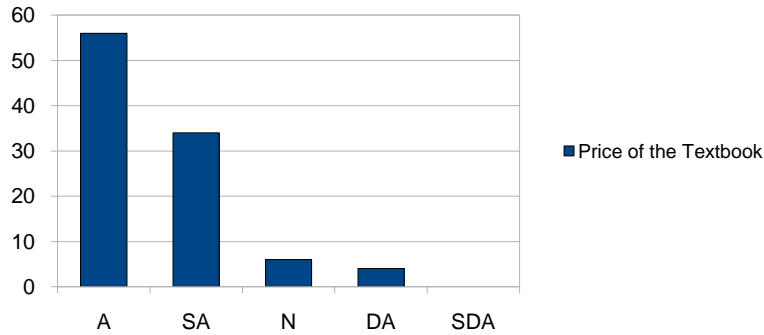
When it comes to the attractiveness of cover page the students who agreed and stood neutral with respect to the cover page were almost same (32% and 38%). The students who disagreed and strongly disagreed were also same i.e. 4%. About 22% of children strongly agreed to the statement.

Chart17 Durability of textbook



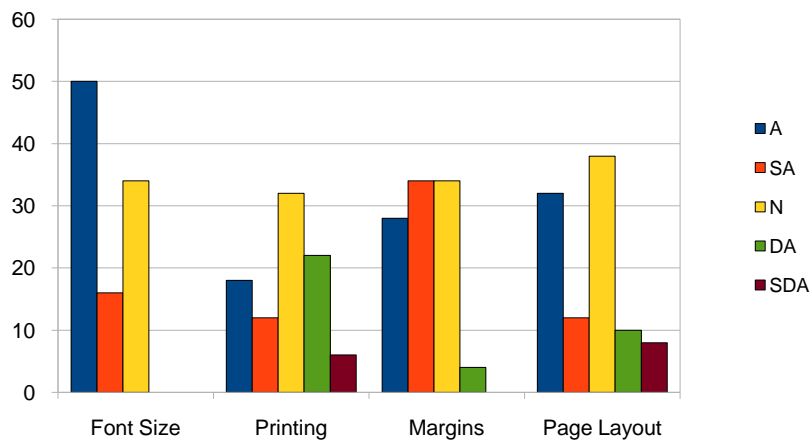
A textbook must be durable so that students can handle freely without fear of being damaged. Students' response to the investigators question about durability of the textbook showed the given result. Maximum (nearly 40%) of children agreed with the durability of textbook and nearly 26% remained neutral, 22% of them disagreed and 12% of them strongly disagreed. None of them strongly agreed. .

Chart18 Price of the textbook



When the price of the textbook is fixed by the authorities they must consider different categories of children. In this regard when the investigator tried to find the opinion of children the following findings are made. There was a good response for the price of the textbook. Nearly 34% children strongly agreed to the price and about 56% agreed to the statement. But 6% children stood with neutral attitude and nearly 4% with disagreement but none of them showed their strong disagreement.

Chart 19 Font size, Printing, Margins and Page layout of textbook



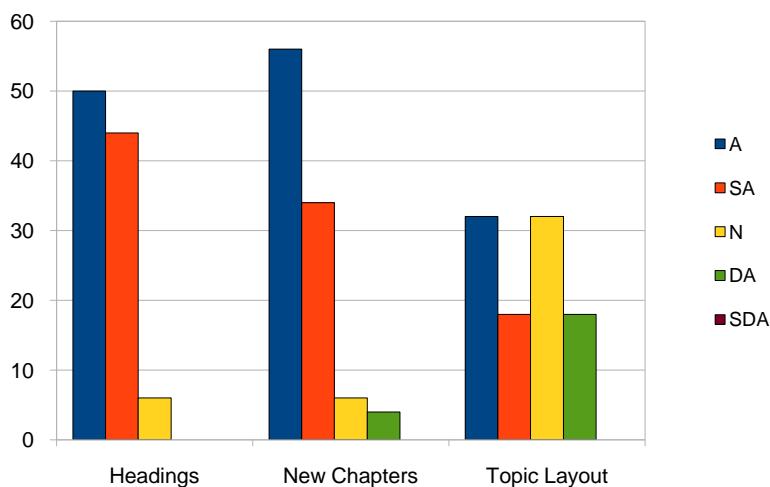
There are various aspects to be kept in mind during preparation of textbook so that it is convenient for children proper usefulness. In this regard the following observations are made by the investigator from the data analysis. With respect to the font size of the present textbook, about 50%, this is the maximum of all responses, agreed to the statement and favored to the current font size used in the textbook. Next to that about 16% strongly agreed, 34% remained neutral and there was no one with disagreement or strong disagreement.

There was an average of 22% disagreement towards the clarity of printing and 16% of them strongly disagreed. About 32% of the students remained neutral towards the statement, a reasonably number of children (about18%) agreed and about 12% strongly agreed.

When the opinions were asked about the margins, spacing etc a quite good percentage (28%) agreed and about 34% percent of them strongly agreed. Whereas 34% of them did not show their agreement or disagreement When 4% disagreed, none of them strongly disagreed

A very good number of children (about32%) agreed to the page layout and about 12% of them strongly agreed. At the same time 38% of the children gave a neutral opinion and about 10% of them disagreed and there was strong disagreement from 8% of the children

Chart 20 Headings, New chapters and Topics layout



All the topics and sub topics must be separately visible from the contents to get a prior understanding of major contents in the textbook. Like that it is nice to have a new chapter on a new page with an attractive page layout.

On the basis of study conducted following results are obtained towards the above aspects. Nearly 50% of children agreed with the headings and subheadings given in the textbook. Moreover nearly 44% of children strongly agreed with the statement. 6% of them remained neutral to the statement and there was no one against the statement.

With respect to the statement of beginning of new chapters on a new page 56% of them agreed with the statement and about 34% of them strongly agreed also. There was disagreement of 4% and 6% of them had neutral opinion.

For the question about topics layout maximum students (nearly 32%) remained neutral, about 32% of them agreed and nearly 18% of them strongly agreed. But disagreement was from nearly 18% but there was no strong disagreement.

Major observation and interpretation of physical aspects of textbook from the analysis of checklist given to students of standard XII

The analysis gives a very good opinion of the children for the physical aspects of textbook. The area where children are highly satisfied are the size and weight, price, font size, margins, spacing, beginning of new chapter, headings and subheadings etc. At the same time children are fairly satisfied with page layout, topics layout etc. Little dissatisfaction can be seen in durability and clarity in printing. According to the children the overall quality of textbook is very good and they are quite satisfied. In many cases children do not show any strong disagreement or disagreement.

**4.3.9 ANALYSIS OF ACADEMIC ASPECTS FOR CHECKLIST OF STUDENTS
OF STANDARD XII**

Table 4.12 Checklist schedule for academic aspects for standard XII

Sr. No	STATEMENTS	A	SA	N	DA	SDA
1	Did you get adequate knowledge from standard XI textbook to simplify your learning process in standard XII?	33	8	8	1	-
2	The standard XII textbook has its base in standard XI textbook	26	14	8	2	-
3.	Do you think that your XI standard statistics textbook increased understanding for the XII standard statistical concepts	25	10	10	2	3
4.	The standard XI textbook is a supplement for the XII standard textbook (as a guide to help you in standard XII)	25	8	14	3	-
5	Did you enjoy learning statistics in Standard XI?	21	9	16	2	2
6	The standard XII standard textbook is very complex than the XI standard statistics textbook	20	8	12	10	-
7	The weightage of each chapter for evaluation is mentioned	17	8	10	10	5

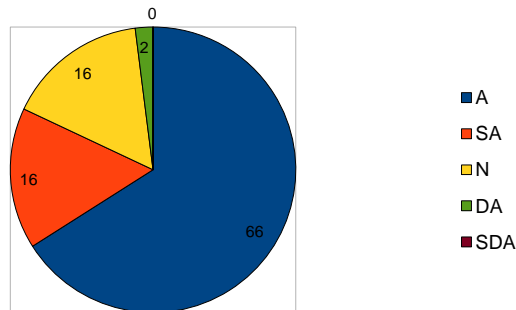
Table 4.13 Analysis of academic aspects in percentage

Sr. No	STATEMENTS	A	SA	N	DA	SDA
1	Did you get adequate knowledge from standard XI textbook to simplify your learning process in standard XII?	66	16	16	2	-
2	The standard XII textbook has its base in standard XI textbook	52	28	16	4	-
3.	Do you think that your XI standard statistics textbook increased understanding for the XII standard statistical concepts	50	20	20	4	6
4.	The standard XI textbook is a supplement for the XII standard textbook (as a guide to help you in standard XII)	50	16	28	6	-
5	Did you enjoy learning statistics in Standard XI?	42	18	32	4	4
6	The standard XII standard textbook is very complex than the XI standard statistics textbook	40	16	26	18	-
7	The weightage of each chapter for evaluation is mentioned	34	16	20	20	10

Table shows the academic aspects of standard XI textbooks from the responses given by students of standard XII. The table gives a clear picture on the academic aspects. Maximum students are in favor of the textbook. About 82% of students are agreed with the fact that the textbook gives adequate knowledge which will be of great help in standard XII. Nearly 80% of the children say that it gives adequate base for higher studies. In all aspects more than 70% children agree with the statements put forward in the checklist which ultimately results in a good quality textbook.

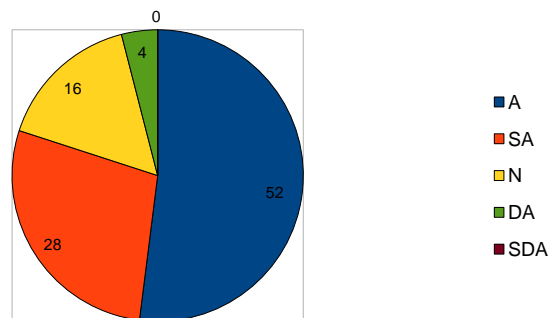
4.3.10 ANALYSIS OF ACADEMIC ASPECTS WITH THE HELP OF CHARTS

Chart 21 Provision of necessary basic knowledge



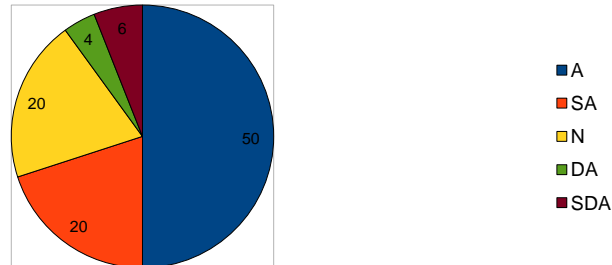
Maximum students (66%) agreed that they had acquired necessary basic knowledge from the standard XI textbook to simplify their learning process in standard XII and 16% of them strongly agreed with the statement. A group of 16% remained neutral and the least group went with disagreement (2%). No one showed strong disagreement.

Chart 22 A base for standard XII



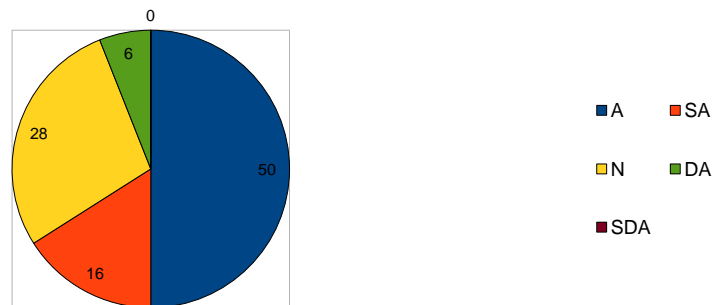
With respect to the statement of the base of standard XII textbook in standard XI about 52% of them agreed, 28% of them strongly agreed, 16% of them remained neutral and only 4% expressed their dissatisfaction. No one expressed strong dissatisfaction.

Chart 23 Understanding of statistical concepts



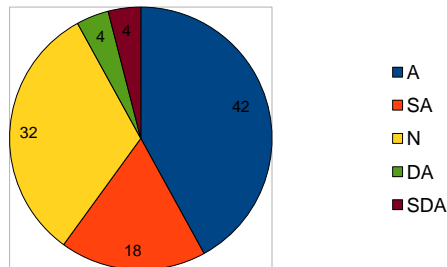
With respect to the question for understanding statistical concepts in standard XI maximum students agreed (50%) and when 20% strongly agreed, 20% remained neutral. 4% of them expressed dissatisfaction whereas 6% of them showed strong dissatisfaction.

Chart 24 A guide to standard XII



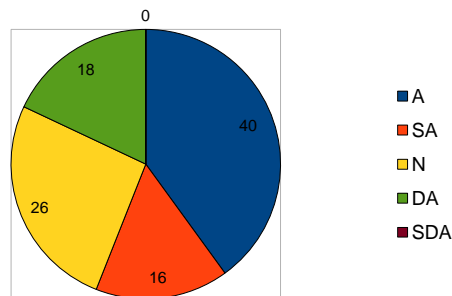
For the statement of standard XI textbook as a guide to standard XII, 50% of them agreed and 16% of them showed strong agreement. There was no strong disagreement for the statement but 6% of them showed disagreement and 28% of them remained neutral.

Chart 25 Feasibility in studying statistics in standard XI



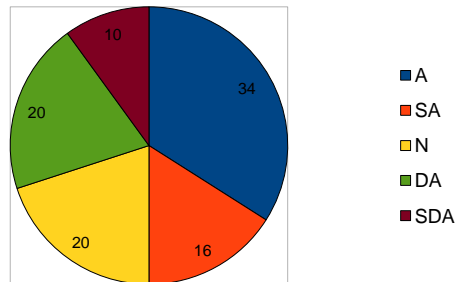
Enjoyment with respect to study of statistics in XI standard the percentage of disagreement and strong disagreement was almost same with 4% each. When 32% of them remained neutral 42 % of them showed agreement and 18% of them strongly agreed.

Chart 26 Complexity of contents in standard XII compared with standard XI



With respect to the complexity of the contents in standard XII 40% of them agreed followed by a strong agreement from 16%. When 26% of them remained neutral about 18% showed disagreement and there was no strong disagreement

Chart 27 Weightage of each chapter for evaluation



With respect to the weightage of evaluation process maximum (34%) students agreed, 16% of them strongly agreed, 20% of them remained neutral and the percentage of students who showed disagreement and strong disagreement was in the ratio 2:1 (20% & 10%)

4.3.11 CONTENT ANALYSIS OF OPINION OF STUDENTS OF STANDARD XII

Most of the students pointed towards the use of mean, standard deviation, permutation and combination and the Pascal's triangle in standard XII which they covered in standard XI. They expressed their happiness for such a beginning in standard XI. Many of them suggested the introduction of probability, time series and index number in standard XI for better performance in standard XII. All the students are satisfied with the topics of standard XI textbook and they did not suggest any deletion from the existing textbook.

Major observation and interpretation of academic aspects of textbook from the analysis of checklist given to students of standard XII

The analysis shows that the students of standard XII are in favor of the standard XI textbook as it gives a very good base in standard XI and for them it is a supplement for standard XII. Majority of the students are in favor of the feasibility of textbook which

helps them to understand the basic concepts. The textbook has increased their reasoning power. They showed little dissatisfaction when weightage is not provided for evaluation. They do not want any deletion from the present textbook as the textbook gives them proper guidance.

4.3.12 ANALYSIS OF TEACHERS' OPINION

Most of the teachers have positive opinion about the introductory chapter, the collection of data. Still few of them suggested for more explanation of new terms, information about history of statistics, the uses and objectives of statistics and the necessity of statistics in our daily life. Generally the topics in a textbook must be arranged in a sequence with respect to contents and complexity. Most of the teachers agreed with the sequence of topics in the textbook but very few had different opinion.

A textbook is considered a teaching tool for the teachers, the response of the teachers with respect to the textbook as a teaching tool was 50-50. 50% of the teachers were quite happy with the textbook as a teaching tool but the remaining recommended the use of practice book, teaching aides with the help of technology etc to give more guidance to the children. All students are not with same caliber. So while framing syllabus in a textbook this must be kept in mind. All teachers are not satisfied with the topics with respect to individual difference. Especially the topics of permutation and combination are not convenient for below average students.

Statistics textbook mainly contains illustrations of sums, graphs etc. All these things must be self explanatory also so that students can use the material for self study. In this regard all the teachers have good opinion about the illustrations given in the textbook. All illustrations are self explanatory and students are able to understand the concept with an exception of individual difference. Without graphs and diagrams statistical data cannot be represented. But at the same time the data represented must be understandable to the user. Children also must understand the importance of this aspect. The teachers' opinion in this area was good. Most of the teachers have very good opinion about the various graphs and diagrams given and also the explanation of them.

Exercises will be provided in the textbook after completion of each lesson. But these exercises will be helpful to the students of various categories. With respect to the exercises given in the textbook different teachers have different opinion. Few recommended more exercises for children based on the fact that the department is not providing any extra study materials. At the same time some of the teachers are satisfied with the exercises given in the textbook. Generally exercises are framed keeping in mind the illustrations based on topics covered so that children can solve sums including below average children. Some exceptions are there for brilliant students who can manage any kind of questions. With respect to the question of illustrations and exercises majority of the teachers said that all the exercises have its root in the illustrations but hardly few showed the discontent of exercises given.

Education is the process of bringing out the aspirations of a child. Textbook must contain topics which can increase the reasoning power of the children. Majority of the teachers said that there are no such topics which may improve the reasoning power of the children. Examples are given in such a way that they do not have to think for a while but with little effort they can overcome the situation. Here also they gave the exception of permutation and combination. Statistics is a subject which deals with data related to population, inflation, and cost of living etc Therefore the textbook must contain topics which resembles day to day experiences. For example which measures of central tendency is while doing a selection of average size of shoes. Different opinions were given by various teachers with respect to the question of day to day examples in the textbook. Most of the teachers gave positive response to this question because most of the chapters contain examples of production census etc. While framing a textbook the level of the children is always considered as education must improve the present knowledge. In this regard the teachers after considering the considering the individual difference of children they said that the textbook is not below standard but some of them have the opinion that few chapters are below standard for example measures of central tendency 1 which is already covered in secondary level.

With respect to the inclusion of current issues in the textbook all the teachers have same opinion that various current issues are included. Still extra information can be given by

adding topics like index number, time series in standard XI. The world has changed a lot due to technological advancement. Therefore children must be trained in that way so that they can compete with the world around them. But the response of the teachers in this regard was not at all satisfactory. They did not give any positive response to the question on global issues in the textbook moreover they showed the disappointment of absence of global issues in the textbook.

All teachers have same opinion about simplicity in teaching statistics without any major challenges but understanding the formulae and using them in various topics makes difficulty for weak students. Especially it is difficult to make them understand the concept of permutation and combination. Teaching of subjects like mathematics, statistics etc material other than textbook can add quality in teaching. Generally extra materials designed by some authorities including the education department have certain extraordinary qualities. Ensuring quality education to students by teachers they suggested the use of practice book. Some of them preferred teaching aids for quality education specially chapters like skewness and permutation combination.

Teaching can be done in various methods like discussion, problem solving, questioning etc. In this regard very few teachers answered to the question of teaching methods in statistics as there are no such practical problems in the textbooks but few suggested problem solving method in statistics to ensure better understanding. As a part of new teaching procedures projects play an important role. Few teachers said that they give project from the introductory chapters where as some said that any chapter can be used for giving projects.

Many teachers have the opinion of addition of basics of probability in standard XI to strengthen their base for probability in standard XI. When they were asked about the need of deletion of any chapter they said that arithmetic progression can be deleted since it is a mathematic topic. They also suggested basics of measures of central tendency mean, median and mode etc as all these things are covered in secondary level. If these topics are included then application level topics must be involved. The textbook must be improved by considering the brilliant students to improve their logical power. Explanation of chapter nine and ten must be given in detail so that average students can also cope up

with contents. The textbook must give use of statistics in the field of business, education as well for society. Practical approach must be there along with each topic in the textbook to make the concepts clear and to know the importance of statistics in various fields. Higher order sums must be included in each topic so that reasoning power of brilliant students can be enhanced. Few teachers gave a suggestion that statistics can be better taught by Masters in statistics.

Interpretation of opinion of teachers about the textbook

A textbook is an important teaching tool for teachers. The opinion of teachers on the textbook is explained well in 4.3.11. All of them have certain common opinions in favour of the textbook. They have positive opinions on the introductory chapter, the arrangement of topics from the point of view of simple to complex, self explanatory illustrations etc. At the same time they are not satisfied with the points like consideration of individual difference, practical examples for real life situations, helping the children to enter into the global world etc. All of them have common suggestion to include application based sums to increase the reasoning power of the children in the textbook. Few teachers suggested the elimination of pure mathematical chapters like arithmetic progression from the textbook. But the overall attitude of teachers towards the present textbook is quite good.

4.3.13 ANALYSIS OF OPINION OF EXPERTS

Experts in statistics can be from any level of education which includes Phd scholars in statistics, university professors or higher secondary teachers who are specialized in the subject. In the present study none of the experts have the experience of teaching statistics in the higher secondary level but they have little awareness about the present standard XI statistics textbook from various other sources. Most of the topics in standard XI will have its further use in standard XII or in college. All of them have the opinion of further use of the topics of measures of central tendency in standard XII as well as in higher studies. In higher studies students will follow different patterns of sums even though the topics remain same.

Application level questions and topics are included in a textbook for the use in daily life as well as every field of commerce and industry. No specific answer was given for the

question because the textbook contain various topics but no such examples are given in such a way that they can compare it with real life situations. But they suggested that addition of few examples will make the textbook application based. There should be a sequence for arrangement of topics with respect to simple to complex, similar topics etc. This will ensure children's interest as well as easy understanding. All the experts have positive opinion about the sequence of topics arranged in the textbook. They said that the textbook has followed a fixed pattern starting from the collection followed by various measures of central tendency.

The aim of textbook is to provide necessary information to the teachers and students. But at the same time a textbook must provoke the children to ask questions to themselves and find solutions. In this sense all the experts have same opinion that the textbook is quite good to increase the reasoning power of the children. Statistics is used in all day to day activities. Therefore the topics must resemble the kind of activities that the children come across daily. The experts have the opinion that the topics are related to day to day experience of the students but they suggested that few examples must be given for better understanding.

Statistics textbook of standard XI has its further use in undergraduate level. All the experts agreed with the use of topics in undergraduate level but the application level will be different. R: All have the opinion that most of the topics in the present textbook is further used in the under graduation level with certain level of applicability. The present textbook has many topics which are already covered in earlier classes. It is enough for commerce children with certain changes like measures of central tendency 1, 2 and 3 can be merged together. Moreover they suggested for more application based sums.

With respect to the inclusion of current issues in the textbook all the teachers have same opinion that various current issues are included. Still extra information can be given by adding topics like index number, time series in standard XI. All of them have the opinion that even though few topics are there clarity is not maintained due to lack of suitable examples. The world has changed a lot due to technological advancement. Therefore children must be trained in that way so that they can compete with the world around them. They did not give any positive response to the question on global issues in the

textbook moreover they showed the disappointment of absence of global issues in the textbook. Statistics is the subject which is used to get current information, predict future and make planning based on past data. Whereas mathematics is a subject which gives solutions to certain topics for which formulae and theories was used. All have strong support for substituting statistics in place of business mathematics because commerce and industry cannot move ahead without statistics.

Improvement is needed in every field to meet the changing needs of the society. Textbook needs improvement because many new areas are being used in the field of commerce and industry. And children must understand the changes in the society. All the experts strongly suggested application based sums for understanding the concepts as well as better use of statistical measures. Occupancy based sums can be included for development of reasoning power in permutation and combination topics.

Following topics are suggested by the experts in standard XI

1. Harmonic Mean along with arithmetic mean because in certain circumstances harmonic mean is more useful Eg: To measure the typing speed. The logic behind including harmonic mean is that in some cases simple mean cannot give better result.
2. Since skewness is included in the topics moments and kurtosis are suggested along with that. Numerical numbers can be available with the help of moments.

Following topics are suggested by experts for deletion from the present textbook.

1. Arithmetic Progression and binomial expansion being mathematics topics can be excluded from the syllabus because arithmetic progression and binomial expansion are purely mathematical subjects.
2. Few of them have the suggestion of deleting permutation and combination from the textbook since it is totally different from the previous topics in the textbook. Moreover few children find it very difficult to understand because basics of probability are not mentioned.

Apart from the above, the experts suggested following measures to enhance the interest of students as well as to increase efficiency in teaching statistics at higher secondary level.

1. Comparison of arithmetic mean, geometric mean and harmonic can be discussed.
2. Arithmetic progression can be included with any other chapter instead of keeping as a separate chapter
3. Pictures can be included to illustrate sums
4. Group activity can be conducted in selected topics
5. Case studies and recent issues can be included to make the concepts clear
6. Masters in statistics can give better practical examples
7. Above all, all of them commended that the topics are selected very wisely by a very good team of experts but its benefit can be enhanced by better application techniques and up gradation of facts.

Interpretation of opinion of experts about the textbook

All the experts who gave their opinion about the textbook agreed that the present textbook is designed by a team of very talented people. Even though none of the experts have experience in teaching statistics in the higher secondary level most of them are aware of the present textbook. They all opined that the topics in the textbook are well organized in the order of simple to complex considering the age group of the children. The topics have further use in the higher studies in college level and they also agreed that the textbook has the qualities to increase the reasoning power of the children if they try to involve themselves in the topics. They suggested the addition of application based sums to understand the real world problems. As the teachers suggested the experts also have the suggestion to eliminate mathematical based topics like arithmetic progression and binomial expansion from the textbook. They suggested including many topics like harmonic mean, moments, kurtosis etc as these topics can be related to the existing topics in the textbook. All of them have a common suggestion to appoint statisticians to teach statistics in the higher secondary level to enhance mastery over the subject.

4.4 CONCLUSION

In order to achieve the objectives of the study the data were analyzed objective wise. Data analysis and interpretation of data was done. The data is numerical as well as descriptive in nature. The technique of data analysis was textbook analysis. The first objective was to study the physical aspects of the textbook and the second objective was to study the academic aspects of the textbook. The third objective was to get opinion of students of standard XI for which a checklist was prepared for the students. The fourth objective was to get opinion of standard XII students for which a checklist was prepared. The fifth objective was to get opinion of teachers about the textbook for suggestions and improvement for which semi structured interview schedule was prepared and finally to fulfill the six objectives to get opinion of experts a semi structured interview schedule was prepared. The findings of the study are mentioned in the next chapter.

The present study was an attempt to do an analysis of GSHSEB textbook of statistics of standard XI. The study concluded that overall students of standard XI and XII were satisfied with physical aspects as well as academic aspects of the textbook. Majority of teachers were satisfied with the academic aspects of the textbook. The experts were also satisfied with the academic aspects of the textbook.

In totality ,the GSHSEB textbook satisfy on in terms of providing strong academic contents which was required for building upon further knowledge and a rich content for the subject.

CHAPTER V

SUMMARY AND FINDINGS

5.0 INTRODUCTION

Education is the form of learning in which the knowledge, skills, values, beliefs and habits of a group of people are transferred from one generation to the next through storytelling, discussion, teaching, training or research. In earlier days this was not at all a comprehensive activity and students used to stay at Guru's place and education used to be carried out at the places of Guru. In those days there was a complete dependence of students on the teachers. There was no place for text book during those days or not available. But as time passed and printing has become an easy process text book has given an important place in the teaching learning process, it is considered as the mirror of curriculum which is of great help to the teachers as well as to the students. Evaluation of textbook is one of the ways to find out the physical as well as academic aspects of any text with respect to the needs of the users.

5.1 DEFINING CURRICULUM

Belly defines curriculum with four factors as objective, content, method and evaluation

The secondary education commission report describes curriculum as "Curriculum does not mean only the academic subject traditionally taught in the school but it includes the totality of experience that the pupil receives through the manifold activities that go in the school, in the class rooms, library, laboratory, workshop, playground and in the numerous informal contacts between teachers and pupils. In this sense the whole life of the school becomes the curriculum which can touch the life of the student at all point and help in the evaluation of a balanced personality"

5.1.1 BASIC PARADIGMS IN CURRICULUM CONSTRUCTION

Curriculum must satisfy the basic aims of education. So it must have the following considerations on its developments

- (1) The individual: A curriculum must consider the children, their age group, level of mental growth, family and social back ground as well as the knowledge possessed aspirations of a child
- (2) The society: A curriculum should be in harmony with the social order, national economic policies, political system, cultural heritage etc
- (3) The human knowledge: The existing level of human knowledge must be a consideration for curriculum development.

5.1.2 SUGGESTED PRINCIPLES FOR HIGHER SECONDARY CURRICULUM

Curriculum of this stage needs to satisfy the psycho- physical requirements of he boys and girls of the age group of 14 to 17 years. Higher secondary curriculum is of vital significance from both individual and social considerations. Socio economic development of a country as a whole primarily depends upon its secondary curriculum. So it is necessary to consider the following principles. Diversification of courses into different channels should be encouraged on the basis of need, interest and aptitude of the children

- (1) Should have subjects which can train the students for social efficiency and self sufficiency in the students
- (2) Vocationalisation of curriculum to increase economic efficiency and attain self sufficiency in the students
- (3) I t should develop a sense of patriotism, loyalty and national discipline
- (4) It should help the students in making effective adjustments with modern science and technology and develop scientific outlook towards modernization

5.1.3 SUGGESTED SEQUENCE OF THE CURRICULUM

Design of curriculum needs certain sequence to ensure the interest of the learners and to help the teachers to motivate them towards their goals. Following points suggest a fair sequence for curriculum.

- Simple content should precede complex content

- The content should match the maturation level of learners
- The content must satisfy the immediate needs of the learners
- The content should provide direction to sequence
- Sequence should follow a Chronological Order

5.2 COMMERCE STREAM AND ITS MAIN SUBJECTS

Commerce, one of the streams offered by the state government to the students who passed standard X, has many interesting subjects including language. The main subjects apart from English and mother tongue are Accountancy, Statistics, Economics and Organization of commerce.

Accountancy covers the various procedures of accounting of economic transactions and there by arrive at the profit and loss of the business, which is the main motive, and to know the financial status of the business. **Statistics** is the use of mathematical methods in collection, classification, analysis and interpretation of data. **Commerce** is the whole system of an economy that constitutes an environment for business. The system includes legal, economic, political, social, cultural and technological systems that are in operation in any country. **Economics** is the social science that studies economic activities Adam Smith, considered to be the founding father of modern Economics, defined Economics a study of the nature and causes of nations' wealth or simply as the study of wealth.

5.2.1 STATISTICS IN THE COMMERCE CURRICULUM

The science of statistics has assumed a great importance in recent years. It was once known as the 'Science of Kings' and its scope was extremely limited. But today the science of statistics has become an all important science without which no other science can progress. Statistics is a very commonly used word but surprisingly enough it is understood by different people in different sense. To someone it is just a set of figures and to someone just representation of facts with charts, figures, diagrams etc However, if we analyze the way the word statistics is looked at, we find that broadly speaking there

are two categories-one, in which the word refers to a set of figures and the other in which refers to a set of techniques and methods.

5.2.2 DEFINING STATISTICS

According to Horace Secrist “By statistics we mean aggregate of facts affected to a marked extent by multiplicity of causes numerically expressed, enumerated or estimated according to reasonable standards of accuracy, collected in a systematic manner for a predetermined purpose and plays in relation to each other”

Statistics is a science in which data collected by either conducting experiments or inquiries of different phenomena and events are classified tabulated and analyzed by mathematical methods.

5.2.3 IMPORTANCE OF STATISTICS IN THE FIELD OF EDUCATION

- Statistics provide simple yet instant information on the matter it centers on
- Statistical methods are useful tools in aiding researches and studies in different fields such as economics, social science, medicine etc
- Statistics provides a vivid presentation of collected and organized data through the use of figures, charts, diagrams and graphs
- It also helps critical analysis of the presented data
- Helps in processing certain evaluation and surveys given to help improve the school system.

5.3 ORIGIN AND DEVELOPMENT OF TEXTBOOK

In earlier days the activity called education was done by teachers called Gurus at their homes. Children were sent to guru's house to get them educated. An overall development of a child was censured by gurus. There was no need of textbooks in those times. Whatever things were taught by the Gurus was learnt by the students. Apart from mathematics, science and social studies children were getting lessons of philosophy and religious education from this kind of Gurukula education system. There was a close

relationship between the teacher and the student and a close link with nature. The boundaries of knowledge were very limited. As time passed the acquisition and accumulation of knowledge became a normal activity in man's life. To impart this accumulated knowledge text books acted as a media and this might have given the need of textbooks in the field of education.

5.3.1 TEXTBOOK

A textbook is a book whose purpose is for instructional use. Textbook can include dictionaries, encyclopedias, software manuals etc. School textbooks pertain to an instructional sequence based on an organized curriculum. Textbooks and teachers' guides occupy a unique place in the teaching learning process. Textbook material is often divided into four categories as narration and discipline, prescription and directives, procedures and theoretical laws. A textbook is a manual of instruction in any branch of study. Textbooks are produced according to the demands of educational institutions. A textbook used in the study of a subject is a literary work or a presentation to the study of a subject. Textbooks are print books or e- books that accompany a specific class or subject at the school or university level, and suggest a curriculum that is a course of learning for that particular class

5.3.2 NATIONAL STANDARD FOR TEXTBOOK

Following are few suggestions of the education commission 1952 towards the standards for textbooks.

(1) It should not be with an overloaded syllabus in narrow bookish and theoretical manner. It had suggested that the curriculum should not be divided into a number of watertight subjects but all the subjects should be interrelated.

(2)The curriculum should not be divided in different ways but all subjects should be interrelated and should include relevant significant topics so that it could touch the lives of students.

(3)No single textbooks should be prescribed for any subject but a reasonable number.

(4) It also recommended that a high powered committee be set up in every state for selecting textbooks.

5.4 ANALYSIS OF CURRICULUM AND TEXTBOOK

Curriculum evaluation is the weakest link of the Indian curriculum development scheme. Evaluation involves a tryout of the appropriateness of curriculum to achieve the basic objectives. When a new curriculum is to be developed unit wise as well as full curriculum try out is to be done. During the evaluation process, probable questions can be (1) whether the objectives of the instruction sets are within the competence of the students to achieve? (2) Whether the content matter is adequate to achieve the objectives? (3) Which one of the various methodologies tried is more suitable to be adopted as compared to the others? (4) What instructional materials or set of them help the students achieve the objectives better than the others?

Analysis of textbook involves the process of examining the physical as well as academic aspects of textbooks based on certain standard. Analysis is done to study the present features and as well as to suggest various measures to improve the standard to cater the needs of the users. Moreover sometimes analysis is done to reduce the syllabus if it does not cope up with the student's mental abilities.

5.5 RESEARCH QUESTIONS

1. Are the physical aspects of the statistics textbook suitable to its users?
2. Are the academic aspects of the Statistics textbook suitable to its users?
3. Does the Statistics textbook cater to the needs of teachers and students?
4. Does the statistics textbook for standard XI have any scope for improvement?
5. Does the textbook provide enough exercises to help the learner for better understanding of the concepts and teachers for ensuring better education?

5.6 REVIEW OF RELATED LITERATURE

To be effective, any researcher has to move around the context of studies already conducted. A review of related literature provides the necessary context for the present study. An investigator gets useful information about tools used, nature of data, procedure

of data analysis etc. from previous studies. Review of related literatures allows the researcher to acquaint himself with current knowledge in the field of area in which he is going to conduct his research. The review of related literature enables the researchers to define the limits of his field. By reviewing the related literature the researcher can avoid unfruitful and useless problems areas. He can select those areas in which his endeavor would be likely told to the knowledge in a meaningful way. The textbook is a very important and effective tool in the hands of a teacher as well as the students. It not only casts impression on the minds, of the learner but also helps the teacher in guiding their students. Moreover a, it is a textbook that again is responsible for creating interest in the minds of the students.

Various studies have been conducted on the evaluation of curriculum as well as textbooks. Here the investigator had come across studies related to both categories. This has been mentioned under two categories (1) Studies related to curriculum (2) Studies related to analysis of textbooks

5.7 RATIONALE

Textbooks play an important role in the process of teaching and learning. It is the mirror of curriculum which is to be imparted to the new generation. A textbook must be of with required contents so that a student can use it with confidence. Physical and academic factors consider a lot while evaluating a textbook. When the physical factors throws attraction academic factors boost the knowledge required. Evaluation is the process of ascertaining the qualities based on certain requirements and suggest for further improvements. There is always scope for change and improvement, but it is not possible, unless the textbook programmed is supported by adequate research.

We must remember that we have two different objectives, the first one is the general; education of citizens (for everybody, and this the minimum), meanwhile the second one is mainly concerned with scientific education. Whatever the objectives are and whatever the students are, we must keep in mind that a sensible curriculum must have some important functions.

Present study involves the analysis of standard XI statistics textbook. Statistics is required in each every field of commerce and industry. The investigator decided to

conduct a study on standard XI as it is felt important to learn all the basics in the first year of their higher education. Without proper basic concepts they will not be able to cope up with the subject in the higher studies. It is easy to learn from simple to complex. So it is logical to include all important aspects of collection of data along with presentation and analysis must be a part of the syllabus.

The present study focuses on the statistics. Statistics is the subject which helps us to do planning and budgeting. Without planning and budgeting commerce cannot reach in its heights. Statistics is an activity which is conducted after the occurrence of any event. So it helps to predict the future. It is the use of mathematical methods in collection, classification, analysis and interpretation of data. By statistics we mean aggregate of facts affected to a marked extent by multiplicity of causes numerically expressed, enumerated or estimated according to reasonable standards of accuracy, collected in a systematic manner for a predetermined purpose and plays in relation to each other.

The investigator collected information from students of standard XI to ensure the adaptability of the standard XI textbook. A textbook must satisfy the needs of students in all aspects. The physical and academic aspects must be at par with the age group. The standard XII children can understand the suitability of the textbook of standard XI since they have the same subject in standard XII. The topics covered in standard XII are of much use to them in standard XII.

A textbook is the mirror of the curriculum. It reflects all the topics needed according to the level of the children. A textbook is a book whose purpose is for instructional use. Textbook material is often divided into four categories as narration and discipline, prescription and directives, procedures and theoretical laws. A text book is a manual of instruction in any branch of study. Textbooks are produced according to the demands of educational institutions. A textbook used in the study of a subject is a literary work or a presentation to the study of a subject. Textbooks are print books or e- books that accompany a specific class or subject at the school or university level, and suggest a curriculum that is a course of learning for that particular class. Since it is the main teaching tool the investigator thought of analyzing the textbook in detail to ensure its suitability for the children as well as for the teachers.

Various studies have been conducted in the field evaluation of textbooks. Most of them are related to the curricular aspects and few for text books and its contents. All these studies showed the physical aspects of the textbooks from the point of view of the students, and experts. When textbook helps teachers to teach it helps the students to cater the past knowledge. Gopalkrishnan, while evaluating the mathematics text book suggested the addition to the syllabus, more exercises usable for home works, problems related to life, life history and important events of mathematicians. The deletions suggested included discerning patterns, enrichment programs, difficult programs and fundamental laws.

In the present situation of advanced technology textbook's place is not less in the teaching learning process. Textbook often teach the teachers where there is lack of training. In a developing country like ours text cannot be replaced by the latest technology for whatever reason might be. It is like a weapon for the students to overcome many hurdles and tool for instruction for the teachers. Few studies revealed the implications of evaluation of textbooks for further studies .Deshpande, A.R.'s (1992) study was conducted on 655 teachers of mathematics from 220 schools of Vidarbha representing urban and rural areas. It tried to investigate practical utility of mathematics curriculum for student's weather the curriculum had enough variety to cater for individual differences. He concluded the study with suggestions for gradation of topics and commended the adequacy of exercises. Dhand. H. and Lyons. J. (1991) described the experiment on an innovative curriculum in social studies in Saskatchewan (Canada) which inhabited by a sizeable population of Indian origin. The pedagogic techniques recommended for transacting the new curriculum include open ended questions value – clarification and value –analysis. Linking social studies content to the real life around and focus on global and peace education. Devi, S.A (1990) examined environmental science (EVS-1) curriculum in Andhra Pradesh. The teacher sample was taken from three district geo- political areas, viz., coastal Andhra Rayalaseema and telangana. Two districts were selected from each of the three above – mentioned areas. Sagarika.(2012) A Comparative evaluation of social science textbook of standard IX as prescribed by GSHSEB and NCERT of English medium Schools in Vadodara city, Master of Education

IGNOU New Delhi , Her studies put forward the suggestion for improvement in the quality as well as quality of GHSEB textbook with respect to contents.

The present statistics textbook was published in the year 2004 and till today no revision was done in the topics. Moreover the textbook lacks in application and reasoning level for the children of the particular age group. The topics which are covered in the high school level are repeated in the textbook without any advancement. There is no particular use of statistics in business as well as day to day life is not mentioned in any of the topics. Therefore the investigator conducted the present survey in expectation of an immediate revision of the textbook. The use of statistics in business as well as in daily life is not mentioned in the textbook. So the textbook needs revision and up gradation to overcome the present limitations.

Apart from the above studies many studies were conducted and being conducted with a view to improve the curriculum to cater the future needs of the users. Teachers are curriculum translators. So their tool must be in accordance with the objective. So the evaluation must be on the need of the topic. Considering this studies were conducted and being conducted to get better results in future. But so far no one has conducted a study in statistics education in the higher secondary level. Keeping this in mind the researcher took the initiative of conducting an evaluation procedure of higher secondary statistics textbook.

5.8 METHODOLOGY

Methodology is the part of research in which actual plan of the instigator is being executed. Here the investigator used various methods to complete the research. It is not easy to collect the required data in a stipulated time. Various methods are used by the investigator in obtaining the required information. The results of the data procedure will be presented in the next chapter. The various tools used by the investigator include checklist for children of standard XI and XII and interview schedule for experts and teachers.

The present study is a descriptive survey in which a survey is conducted by using questionnaires and interview schedule executed during a fixed time to get valuable information from the sample selected from the population concerned.

5.8.1 STATEMENT OF THE STUDY

A critical analysis of GSHSEB statistics textbook of standard XI

5.8.2 OBJECTIVES OF THE STUDY

1. To study the Physical aspects of the GSHSEB statistics textbook of standard XI
2. To study the Academic aspects of the GSHSEB statistics textbook of standard XI
3. To study the opinion of students of standard XI regarding the suitability of the statistics textbook
4. To study the opinion of students of standard XII regarding the suitability of the statistics textbook
5. To study the opinion of teachers regarding the textbook and suggestions for improvement.
6. To study the opinion of experts regarding the textbook and suggestions for improvement.

5.8.3 POPULATION OF THE STUDY

The population of the study consisted all the students of standard XI and XII of commerce stream, all the teachers of statistics in the higher secondary commerce stream and all the statistics experts of Gujarat

5.8.4 SAMPLE AND SAMPLE TECHNIQUE

The investigator used a sample of 150 students of standard XI commerce, 50 students of standard XII commerce, 10 statistics teachers and 5 statistics experts. 4 schools were randomly selected from the city of Baroda which is a part of our selected population constituting all higher secondary standard XI commerce students in Gujarat.. Later on

students of the particular class in these schools were taken for present study. In the same way a sample of 10 teachers was taken from the selected population all teachers in Gujarat. A sample of 5 statistics experts were taken randomly from the population of all statistics experts in Gujarat.

5.8.5 PREPARATION OF TOOLS

Data collection for the research was done by using four different tools. These tools were (1) Checklist for students of standard XI (2) Checklist for students of standard XII (3) Semi structured interview schedule for teachers and (5) Semi structured interview schedule for experts

A check list is a set of questions prepared with respect to the subject of research in which students are expected to give their opinion in the most appropriate way. In the present study the investigator administered the checklist of students of different schools and obtained information from the selected sample.

A semi structured interview schedule contains questions with respect to the research topic in a partial way. It is the duty of the investigator to get necessary information from the respondents from various angles. In the present study the investigator approached the teachers and the experts and gathered information related to the present study.

5.8.6 VALIDATION OF TOOLS

The actual process of research starts with collection of data from the sample selected. It is customary to get the tools validated before the beginning of the collection of data. It is important that the tools must satisfy the objectives of the research. The success of data collection depends on the nature of tools. In the present study the investigator approached five experts to get the tools validated and got it validated with necessary suggestions and changes. Some of them advised to add more questions related to statistics subject content. One of them suggested a detailed bifurcation of individual chapters with respect to simplicity and complexity in learning the topics in the textbook. No major changes were being suggested by the experts after validation of tools. The investigator accepted all the relevant suggestions by the experts.

5.8.7 PROCESS OF DATA COLLECTION

Phase One: The investigator obtained the permission from principals of various schools for collection of data from students, took prior appointments from teachers to conduct interviews and also visited M S University of Baroda to get permission of experts for data collection.

Phase Two: Investigator visited the schools directly to collect data from the students of standard XI and XII. Simultaneously the investigator collected the data from the teachers. In certain cases before meeting the teachers to conduct the interviews the investigator maintained a telephonic talk to make good rapport with them. The collection of data was smoothly done because of the cooperation of teachers in various schools. The teachers were quite happy to give their suggestions and opinion on the textbook as it was a matter of specific importance for up gradation of textbook.

Phase Three: A sample of five experts was taken from the population keeping in view of the possibility of required amount of information to satisfy the objective of data collection. In the third phase the investigator visited the experts to conduct the interviews. The permission was taken in advance and the process of data collection was quite fast and easy for the investigator. Some of them accepted our visit and responded very well on the first visit only. But few of them expressed their inconvenience for giving their opinion since they wanted to go through the kind of information which the investigator needed. The investigator visited them after a week and collected the data. All these process took a time period of about three weeks to complete the process.

5.8.8 PROCESS OF DATA ANALYSIS

The data collected by the investigator was organized and analyzed by the investigator by using appropriate techniques. The analysis of data was done in the following manner.

- (1) The analysis of physical and academic aspects of textbook was done by the investigator by the technique of content analysis.
- (2) The opinion of students of standard XI and XII was done by the method of frequency, percentage and content analysis.

(3) The opinion of teachers and experts was done by content analysis.

Graphical representation of data analysis was done wherever necessary to confirm clarity of data analysis.

5.9 MAJOR FINDINGS OF THE STUDY

The investigator undertook a detailed analysis of the physical aspects of the textbook based on objective one and the major findings are as follows.

The cover page of the textbook is fairly attractive and average in size and weight. It was found that the textbook is designed under the guidance of many experts. It was originally designed in Gujarati but translated to English by Dr. A. V Gajjar who is also the advisor of the textbook. The publication was done on behalf of the Gujarat state board of school textbooks. The textbook is quite good with respect to binding, font size, headings and sub headings and its planning and layout is done by Mr. G.I Shaikh and Mr. Hareh and everything is found appropriate. It is commendable that many experts were involved in the preparation and planning of the textbook. An outstanding quality of the textbook is totally without spelling error and all new words are in bold letters and last but not the least it is a low priced one.

At the same time it is advisable that the textbook can be made more attractive by giving colourful cover page. The quality of paper as well as binding can be enhanced for easy handling. Figures associated with skewness and permutation or combination along with new formulae can be included in the cover page.

Based on objective two the investigator studied and analyzed all the academic aspects of the textbook in detail and arrived at the following major findings

The language used in the textbook is simple considering the individual difference. The introductory lesson as well as the introduction of each lesson is presented in a meaningful way so that students get an idea of each topic in the textbook. All the illustrations given in the textbook and the exercises given at the end of each topic and the consolidated exercises give the complete understanding of each and every topic to children of all levels. Based on all these aspects the textbook can be considered as a self study material

in many ways. Moreover for better understanding a sample questionnaire is given to understand the meaning of collection of data. The textbook provides logarithm and antilogarithm tables which help the children to find geometric mean without the use of any additional material. The textbook is designed after selection of major topics wisely by a group of experts and properly reviewed by eminent people.

No such example is given in the textbook to understand the concept of real life experiences, current issues or global problems. Examples given at the end of each topic or lesson are not creating any reasoning power in children. The textbook is in use for the last 11 years. No revision is made in the textbook in these many years. It shows that no new topics or current issues are reflected in the textbook. The topic such as arithmetic mean, median, mode etc are already covered in secondary level. If it was to be included it should have been at an application level. But in the present textbook no such major improvement is seen.

The investigator approached nearly 150 students of standard XI children to collection for the third objective i.e. the physical aspects of the textbook. From the analysis of data collected with the help of checklist the investigator arrived at the following major findings.

Nearly 50% of students are in favor of the size and weight of the textbook, attractiveness of cover page and the page layout. Majority of students (33% each) stood neutral for the statements of attractiveness of cover page and topics lay out in the textbook. Maximum students (nearly 50%) disagreed with the durability and clarity in printing of the textbook. 80% of children are much satisfied with the font size of the contents in the textbook. About 70% of children gave satisfactory responses for margins, spacing etc of the textbook. The areas where students showed dissatisfaction include the durability and the clarity in printing. The overall result of the research shows that the textbook has almost all qualities which are needed and the students are much satisfied with the textbook.

Based on objective three the findings of the analysis of data collected from the students of standard XI for the academic aspects of the textbook are mentioned here.

Nearly 80% of students are in favor of the textbook with respect to the provision of necessary tables like logarithm, antilogarithm etc. 75% children agreed with the illustrations and supported that they are good for self practice. Nearly 70% of children are agreed with the statements and supported the textbook in matters of explanation of formulae, previous link for the topics, language simplicity and availability of enough exercises for understanding the concepts. 50% to 60% students favor the textbook with respect to its number of topics according to the learning capacity of the children, sequential and logical arrangement of chapters, link of statistics with other subjects, introduction of each and every lesson, and consideration for different age group to understand the basic concepts in the various topics. Students who supported the textbook with respect to exercises given in the textbook and its self practice, consideration for individual difference, inclusion of topics of current issues in the textbook and examples of real life problems etc range from 40% to 50%

A little dissatisfaction can be seen in the students towards the present textbook in matters considering provision of weightage of each lesson for evaluation and the examples for real life problems. Majority of students stood with neutral attitude in matters regarding topics of current issues, real life examples and consideration for individual difference.

The overall attitude of students towards the academic aspects of the textbook is quite satisfactory. They are very much satisfied with the textbook and the investigator could not find any major issues or complaints towards the textbook from the point of view of children.

The investigator approached nearly 50 students of standard XII to get their opinion about the standard XI textbook. The major findings based on objective four are as follows.

Majority of students (94%) are in favor of the textbook with respect to the presentation of contents, the headings and the sub headings. 90% of students supported the statements in favor of the price of the textbook. 82% children supported the size and weight of the textbook. The strength of students, who supported the statements of the attractiveness of cover page, the font size and the margins, spacing etc, lies between 60% and 70%. Even though there is little dissatisfaction for durability and printing of the textbook nearly 40% to 50% children are satisfied with the durability and printing. There was equal likes and

dislikes in matters such as page layout and topics layout of the textbook. The findings give a satisfactory opinion from the students of standard XII towards the textbook.

Based on the objective four the major findings in academic aspects of the textbook are the following

Percentage of students who agreed with the statement that the textbook gives adequate knowledge to simplify their learning process in standard XII and enough basic knowledge of statistics from the textbook lies between 80% and 85%. When 70% children supported the statement that the textbook has helped them to understand the concepts in statistics the remaining took a neutral opinion or disagreed which shows their dissatisfaction. A majority of children supported the fact that the standard XI textbook is a supplementary material for standard XII and they accepted that they enjoyed learning statistics in standard XI. When almost all aspects of the textbook get a positive response nearly 50 to 60 percent children have the opinion that standard XII textbook is much complex than standard XI textbook. The response for academic aspects of the textbook is highly appreciable except the fact that there is less (Nearly 50%) agreement for the provision of weightage of each lesson for evaluation.

Major findings from the opinion of teachers about the textbook based on objective five are as follows.

The teachers opined that the topics in the textbook are quite enough to get adequate knowledge and all the topics are arranged in a logical sequence from simple to complex. They suggested the inclusion of little detail about history of statistics and statistical uses in real life in the introductory lesson and they are quite satisfied with the introductory lesson. 50% of the teachers are quite satisfied with the textbook as a teaching tool but the remaining accepted the fact of use of extra teaching materials to increase the teaching efficiency. Very few teachers are not satisfied with the consideration of individual difference in the textbook but they also agreed that some application based questions can help the students in this regard. Teachers are satisfied with the illustrations and exercises given in the textbook and few of them recommended more exercises keeping in mind the brilliant students. According to the opinion of teachers the textbook is designed in a

simple understandable way, and they regret for not having any questions which can increase the reasoning power of the children. Teachers accepted the fact that the textbook contain real life examples, current issues etc but at the same time they expect few more practical application of data in the textbook. When they were asked the question about the level of the textbook all agreed that the textbook is not below standard but the topics which are already covered in high school classes can be deleted to avoid replication. Eg. Arithmetic mean. According to few teachers, they have to meet the challenge in teaching topics like permutation and combination. These two topics require basic knowledge of probability which is not covered in the textbook before permutation and combination. Very few have the opinion that the textbook is not up to the level of the children of the particular age group.

The overall opinion of teachers about the textbook is satisfactory but they suggested the application of application based questions in all chapters so that the children can understand the use of statistics in trade and industry and in daily life. They suggested the deletion of pure mathematical topics such as arithmetic progression, binomial expansion etc from the textbook. The most important aspect of the study covers the consideration for sums which can increase the reasoning power of the children and the reframing of textbook by including application based questions.

Based on objective six the investigator arrived at the following findings from the opinion of experts.

All the experts highly appreciated the textbook with its contents and accepted the fact that the topics covered in the standard XI textbook has further use at college level. All of them agreed that the topics are arranged in a logical order starting from collection of data for easy learning. Few of them suggested that the chapters of various measures of central tendencies can be merged together so that few more topics can be included in the textbook. The experts accepted the fact that the textbook contains majority of details of current issues, daily life examples but clarity is not maintained due to lack of application based questions. They suggested the inclusion of application based questions in the textbook to improve its quality. They have the strong opinion that commerce curriculum must have statistics instead of business mathematics which was earlier in the commerce

curriculum. All the experts strongly suggested practical sums which ultimately use the measures of central tendency like mode to increase the interest as well as to understand the concepts clearly. Their major suggestions include – addition of topics like harmonic mean, kurtosis, moments etc along with other topics, deletion of mathematics topics such as arithmetic progression and binomial expansion, include pictures to clarify various concepts, conduct group activity, include case studies and recent issues Apart from the limitation put forward by the experts with respect to the application based examples in the textbook they all suggested that the benefit can be increased if teachers who are masters in statistics can be engaged to teach statistics to ensure mastery over the subject.

5.10 DISCUSSION

The present study was to analyze the statistics textbook of standard XI. The investigator analyzed the different aspects based on checklists, semi structured interviews and self evaluation of the textbook. Based on the analysis it is found that the textbook has many outstanding qualities in academic as well as physical aspects. When most of the teachers are satisfied with the quality and standard of textbook very few objected that the level is below the standard of the age group and it must be increased. All experts and teachers have same opinion with respect to the topics and contents in the textbook and all of them suggested application based questions so that the children may understand the concepts clearly. The students of standard XII are quite satisfied with the physical and academic aspects except in few matters than students of standard XI.

The study revealed that the teachers, the experts and the students of standard XI and XII are fairly satisfied with selection of topics in the present textbook. They all agreed that the textbook can be used as a self study material because of the simplicity in language and the method of illustrations and exercises given in the textbook. At the same time they all expressed their dissatisfaction about the lacking of more application based sums including global problems.

Gopalkrishnan (1997), while evaluating the mathematics text book suggested the addition to the syllabus, more exercises usable for home works, problems related to life, life history and important events of mathematicians. The deletions suggested included discerning patterns, enrichment programs, difficult programs and fundamental laws. The

opinion of experts and teachers in the present study also suggested deletion of few chapters which are of pure mathematical topics. **Deshpande R. (1992)** suggested the addition to the syllabus as suggested by the respondents were more exercises suitable for homework, problems related to life , English equi- valent of new terms and life history and important events of mathematicians. The investigator also has across same suggestions for rela life problems, exercises for homework etc. **Devi Sushila (1990)** in her findings revealed that the curriculum must be balanced with individual differences and must cater the interest of gifted learners. The investigator is also satisfied with such findings the present study. Therefore the present study mainly reveals that the quality of textbook can be enhanced by adding real life examples, case studies, global problems etc which is not seen in the present textbook.

5.11 IMPLICATIONS OF THE STUDY

Investigator observed various studies conducted with respect to curriculum and textbooks. All the studies were related to the physical and academic aspects of textbook and also the suitability of curriculum based on the age group. These studies threw light on the present study to achieve its aim from different angles. From the present study the researcher will give a clear picture of the standard XI statistics text book. The present study will be beneficial to two particular classes of people. (1) The Textbook Bureau and (2) The Teachers

- * The textbook bureau can make necessary changes in the textbook considering the suggestions arrived from the present study.
- * The immediate need of the textbook is a revision, since the year of publication (2004) no new topics have been included in the textbook.
- * There are various changes in the field of statistics due to information technology. The new changes must be brought to the children with the help of the textbook only.
- * The findings may help the teachers to adopt new methods of teaching including application based questions, real life examples etc.

* Children can be explained how statistical data can be used in analyzing global problems.

* Scholastic performance can also be discussed with the children with the help of statistical data.

5.12 SUGGESTIONS FOR FURTHER STUDY

In the present study the investigator used various tools like checklist for students and semi structured interview for teachers and experts. The information achieved is quite satisfactory for further improvement in the textbook. Suggestions for further studies include the following.

(1) A study can be conducted on the students who are in higher education like B.Com, B.B.A, and C.A to get their feedback about the level of the present textbook.

(2) The study can further extended to the mathematics teachers of secondary to get information about the topics which are already covered in secondary level so that repetition can be avoided in the higher secondary level.

(3) Again the study can be extended to professors of statistics who are engaged in the teaching of statistics in the graduation level so that necessary topics can be included.

(4) Can think about training program which can be arranged for statistics teachers to understand various activities that can be associated with the teaching of statistics

REFERENCES

REFERENCES

Creswell, J.W. (2007) *Qualitative Inquiry and Research Design: Choosing among the five approaches*, (2nd ed.) Thousand Oaks, CA: Sage

Dash, B.N. (2010) *Curriculum Planning and Development*, New Delhi: Wisdom press.

Deshpande, A.R. (1992) study was conducted on 655 teachers of mathematics from 220 schools of Vidarbha representing urban and rural areas.

Dhand, H. and Lyons, J. (1991) Experiment on an innovative curriculum in social studies in Saskatchewan (Canada) which inhabited by a sizeable population of Indian origin.

Devi, S.A. (1990) Environmental Science (EVS-1) curriculum in Andhra Pradesh. The teacher sample was taken from three district geo-political areas, viz., coastal Andhra Rayalaseema and Telangana.

Dharmadhikari, V.V. (1973) A critical evaluation of Teachers handbook for work experience Government technical high school (Jalgaon)

Elhance, D.N. (1990) *Fundamentals of statistics*, Patna: Kitab Mahal.

Education Wikipedia, the free encyclopedia (n.d) Retrieved Aug 31.2014 from <http://www.en.wikipedia.org/wiki/education>

Gopal Krishnan, K. R. (1977) A Critical Analysis of the new mathematics syllabus and text books used in the upper primary classes in Kerala, PhD. Edu. Kerala. U.

<http://ejce.southwestern.edu/article/view/7579/5346>

Joseph, (1990) An evaluative study of STD VI social studies text book of Gujarat state. Unpublished thesis.

Katara, K. (2010) An analysis of GSHSEB Textbook of standard IX in English medium schools of Vadodara city

Mangal, S.K. (2010) Statistics in Psychology and Education, New Delhi: PHI learning Private Limited.

Pal, Rajendra (1989) Curriculum development in academic staff colleges for the orientating of teachers of higher education, M Phil. Edu Institute of Education, Indore

Pandya, S. (2010) Educational Research, New Delhi: APH Publishing Corporation

Ponkshe. D.B. (1972) A Critical Evaluation of geography Textbook of standard VI, College of education, Dhule, (MSBTPCR- Financial)

Rao, K. (1992) Structural influence on restructuring the curriculum, independent study , National Institute of Educational planning and Administration.(Council for International Educational Studies Washington ,DC , USA funded.

Rao, (1993) undertook the study of an evaluation of senior secondary schools physics text book produced by NCERT.

Sharma, M. (2004) Research Methodology, New Delhi: Anmol Publications

Sharma, S.R. (2004) History of Education Research, New Delhi: Anmol Publications

Shrivastava, H.S. (2010) Curriculum and Methods of teaching, New Delhi: Shipra Publications,

Sonal, A.B. (2011) Analysis of Hindi Text Book Std IX M.Ed Navrachana Universit, Unpublished Thesis

Sagarika, B (2012) A Comparative study of text book of social study text book of NCERT and CBSE M.Ed IGNOU, New Delhi, Unpublished Thesis

Shailesh, A. Shirali and Jonaki, B. G. (2012) *Rishi Valley School, Andhra Pradesh, Lady Shri Ram College, New Delhi*

Sonal.A. (2011) Analysis of GSHSEH Hindi Text Book of STD IX in Gujarat medium schools of Vadodara city, Unpublished Thesis

BIBLIOGRAPHY

National curriculum framework (2005) NCERT, Delhi

A Survey of Research I Education Centre of Advanced Study in Education, Faculty of Education and Psychology M.S University of Baroda- 1974

Third Survey of Educational Research in education 1978-1983

Fifth Survey of Educational Research in education 1988-92

Mangal, S.K. (2010) Statistics in Psychology and Education, PHI learning Pvt. Ltd: New Delhi

Mohnty, J. (2005) Modern Trends in Indian Education, Deep and Deep Publications pvt. Ltd

Sharma, S.R. (2003) Statistical Methods in Educational Research, New Delhi: Anmol Publications Private Limited.

WEBLIOGRAPHY

www.ncert.nic.in Www-way madeDU.org

http://en.wikipedia.org/wiki/statistics_education

<http://www.mathsisfun.com/links/curriculum-highschool-statistics.html>

<http://wmbrings.com/bolg>

APPENDICES

APPENDIX NO.2

LIST OF EXPERTS FOR TOOL VALIDATION

1. Dr. Mandiara Sikdar

Associate Professor

Navrachana University, Vadodara

2. Dr. Pramila Ramani

Assistant Professor

Navrachana University, Vadodara

3. Ms. Lipika Majumdar

Assistant Professor

Navrachana University, Vadodara

4. Mr. Mahesh Solanki

Assistant Professor

Navrachana University, Vadodara

5. Ms. Hemlatta Rajput

Higher Secondary teacher

Jay Ambe School, Amit Circle

Vadodara

APPENDIX NO.3

LIST OF TEACHERS FOR SEMI STRUCTURED INTERVIEW SCHEDULE

1. Ms. Rita Sharma

Refinery School

Vadodara

2. Ms. Chaitali Shembekar

Ashokraje Gaekwad School

Lalbaug, Vadodara

3. Ms. Shejal Shah

Auxilium Convent

Makarpura, Vadodara

4. Mr. Haresh Modi

Baroda High School, Baghikhana

Alkapuri, Vadodara

5. Mr. Rasik Shah

Baroda high School, ONGC

Makarpura, Vadodara

6. Mr. Harnish Mahera

Yanshi School

Makarpura, Vadodara

7. Mr. Ammar Sulaimani

Don Bosco High School

Makarpura, Vadodara

8. Mr.Kirit J Purani

Shreyas Vidyalaya

Manjalpur, Vadodara

9. Mr. Vijay J Shah

Shreyas Vidyalaya

Manjalpur, Vadodara

10. Mr. Jagrup Gulia

Dharam Institute

Makarpura, Vadodara

APPENDIX 5

LIST OF EXPERTS FOR SEMI STRUCTURED INTERVIEW SHCHEDULE

1. Dr. K Muralidharan

Head of the Statistics Department

Department of Statistics, Faculty of Science

M.S University of Baroda, Vadodara

2. Prof.D.K Patel

Department of Statistics, Faculty of Science

M.S University of Baroda, Vadodara

3. Prof. R. Shrivastava

Department of Statistics, Faculty of Science

M.S University of Baroda, Vadodara

4. Ms.Pratima Basvagosai

M.S University of Baroda,

Department of Statistics, Faculty of Science, Vadodara

5. Ms. Jayashree Shah

Department of Statistics, Faculty of Science

M.S University of Baroda, Vadodara

APPENDIX NO.6

CHECKLIST OF STUDENTS OF STANDARD XI

Dear student, I am M. Ed student from the Navrachana University and doing my research on the state board standard XI statistics textbook. I request you to read the questions given in the questionnaire and answer the questions.

Name of the student: ----- Name of School: -----

Physical Aspects

Sr No	STATEMENTS	A	SA	N	DA	SDA
A	PHYSICAL APPEARANCE					
	The size and weight of the book is appropriate for the students					
	The cover page is attractive to the learner with respect to the content of subject					
B	DURABILITY					
	The textbook is durable with respect to paper and binding					
C	PRICE					
	The price of the textbook is reasonable					
D	PHYSICAL LAYOUT					
	The font size is proper					
	The printing is clear and without mistakes					
	The margins, spacing between lines and paragraphs are proper					
	The page layout is attractive to the learner					
E	PRESENTATION OF CONTENTS					
	The headings and subheadings are bold					

	Each chapter is started on a new page					
	The topics layout in each chapter is attractive to the children					

APPENDIX NO.7

CHECKLIST OF STUDENTS OF STANDARD XI

Academic Aspects

	STATEMENTS	A	SA	N	DA	SDA
A	SELECTION AND ORGANIZATION OF CONTENT					
	The number of chapters is adequate according to the learning capacity					
	The chapters are arranged in a sequence of simple to complex					
	The initial chapters have any link with previous knowledge					
	Any chapter has link with any other subjects in commerce					
B	PRESENTATION OF CONTENT					
	Introduction of each chapter is given in understandable manner					
	The content is understandable with respect to the age group of the children					
C	LANGUAGE USED					
	The language used is understandable for self study					
D	QUALITY OF GRAPHICAL PRESENTATION					
	The graphical presentations are understandable					
E	FORMULAE, ILLUSTRATIONS AND EXERCISES					
	Adequate explanation of formulae is given					
	Enough illustrations are given for self practice					
	Enough exercises are given for understanding the concepts					
	The exercises given at the end of the chapters are easy for self practice					
	The exercises are framed keeping in mind the individual differences (Capacity of every student)					
F	AVAILABILITY OF TABLES					

	Necessary additional requirements like logarithm table, random table etc are provided					
G	ADAPTABILITY OF TOPICS WITH CURRENT ISSUES					
.	Whether the topics addresses the current issues like inflation, population, census etc					
	Real life examples are there so that children learn to apply the concept					
H.	EVALUATION PROCEDURE					
	The weightage of each chapter for evaluation is mentioned					

APPENDIX NO.8

CHECKLIST OF STUDENTS OF STANDARD XII

Dear student, I am M. Ed student from the Navrachana University and doing my research on the state board standard XI statistics textbook. I request you to read the questions given in the questionnaire and answer the questions.

Name of the student: ----- Name of School: -----

Physical aspects

Sr No	STATEMENTS	A	SA	N	D A	SDA
A	PHYSICAL APPEARANCE					
	The size and weight of the book is appropriate for the students					
	The cover page is attractive to the learner with respect to the content of subject					
B	DURABILITY					
	The textbook is durable with respect to paper and binding					
C	PRICE					
	The price of the textbook is reasonable					
D	PHYSICAL LAYOUT					
	The font size is proper					
	The printing is clear and without mistakes					
	The margins, spacing between lines and paragraphs are proper					
	The page layout is attractive to the learner					
E	PRESENTATION OF CONTENTS					
	The headings and subheadings are bold					

	Each chapter is started on a new page					
	The topics layout in each chapter is attractive to the children					

APPENDIX NO.9

CHECKLIST FOR STUDENTS OF STANDARD XII

Academic aspects

Sr. No	STATEMENTS	A	SA	N	DA	SDA
1	Did you get adequate knowledge from standard XI textbook to simplify your learning process in standard XII?					
2	The standard XII textbook has its base in standard XI textbook					
3.	Do you think that your XI standard statistics textbook increased understanding for the XII standard statistical concepts					
4.	The standard XI textbook is a supplement for the XII standard textbook (as a guide to help you in standard XII)					
5	Did you enjoy learning statistics in Standard XI?					
6	The standard XII standard textbook is very complex than the XI standard statistics textbook					
7	The weightage of each chapter for evaluation is mentioned					

1. Name few topics of standard XI which are commonly used in standard XII
2. Do you suggest any extra topics in standard XI so that it will be helpful to you in standard XII?
3. Do you want to delete any topics from standard XI? (Name them)

APPENDIX NO.10

SEMI STRUCTURED INTERVIEW SCHEDULE FOR TEACHERS

Is the introductory chapter in the textbook is most appropriate to the subject?

Are the topics arranged in the increasing order of difficulty?

Is textbook sufficient as a teaching tool?

Whether all topics match with the individual differences or not?

Are the Illustrations self explanatory?

Whether the graphs and diagrams help to understand concepts clearly?

Are the exercises given at the end of the lessons or chapters sufficient for better understanding for the students?

Whether the exercises follow the kinds of illustrations given in the textbook?

Are there topics to increase the reasoning power of the children?

Are there any topics which resemble the day to day experience of the students?

Any topics are there which are below the standards of the children?

Subjects of current issues and topics are included (Inflation, population, census etc)

Topics will help the students to learn global needs and enter into global world

What are the challenges you face in teaching statistics?

Which reference books do you use to ensure quality education in teaching statistics?

Which teaching methods do you use to ensure quality education in teaching statistics?

Does the textbook give ideas to give projects to XI standard in statistics?

Do you give assignment or project work to the children? If so which are the topics you generally include?

Are the changes in textbook accompanied with workshops?

Do you want to add or delete any topics from XI standard textbook?

Can add.....

Can delete.....

APPENDIX NO.11

SEMI STRUCTURED INTERVIEW SCHEDULE FOR EXPERTS

Do you have teaching experience in statistics in higher secondary level?

Which topics in the standard XI textbook have its further use in standard XII or in higher education?

How much is the application level of the topics in standard XI statistics textbook considering the age group of the children?

Are the topics arranged in sequence for easy learning?

Are there topics to increase the reasoning power of the children?

Are there any topics which resemble the day to day experience of the students?

How much help can be achieved from the present textbook for undergraduate academics?

Is the statistics textbook enough for commerce student to understand?

Subjects of current issues and topics are included (Inflation, population, census etc)

Are there any topics which can help the students to learn global needs and enter into global world?

Earlier business mathematics was in the curriculum instead of statistics. What is your opinion about that?

What are the suggestions for improvement of standard XI statistics textbook?

Which topics are according to you should be added to the standard XI statistics textbook?

Which topics are according to you should be deleted from the standard XI statistics textbook?