CHAPTER-3
RESEARCH METHODOLOGY

3.1 MEANING OF RESEARCH

One of the vital keys to any research work is the research and analysis of its steps that are implemented. These steps must be appropriate to test hypotheses or questions of the research and also to facilitate the access ability of overall design of the research such as collection of data and analysis of data. This chapter describes the approaches that are used in this study in order to test the hypotheses of the problem under the study and provides the reader with a basis for evaluating the validity of findings, an understanding of the basis for choices that were made and sufficient details that another researcher can replicate this study. In this chapter, some vital objects related to research methodology such as problem under the study, initial literature review, objectives and hypotheses and their methodologies developed for them, data instruments including collection of data and analysis of data are in details explained and finally at the end of this chapter the limitations and conclusion of research methodology are stated.

Research in simple terms refers to search for knowledge. It is a scientific and systematic search for information on a particular topic or issue. It is also known as the art of scientific investigation. Several social scientists have defined research in different ways. Research is defined in simplest terms; research is searching for and gathering information, usually to answer a particular question or problem. It is a careful and detailed study into a specific problem, concern, or issue using the scientific method. It is a systematic inquiry to describe, explain, predict and control the observed phenomenon. Various researchers and international thinkers have been explained research in various definitions. Some definitions have included in this study. The following are the important definitions of research:\(^1\):

- J. Francis Rummel “Research is an endeavour / attempt to discover, develop and verify knowledge. It is an intellectual process that has developed over
hundreds of years ever changing in purpose and form and always researching to truth.”

- W.S. Monroes “Research may be defined as a method of studying problems whose solutions are to be derived partly or wholly from facts.”

- John W. Best “Research is considered to be the more formal, systematic intensive process of carrying on the scientific method of analysis. It involves a more systematic structure of investigation, usually resulting in some sort of formal record of procedures and a report of results or conclusion.”

- Kothari (2004) defines that the research is an original contribution to the existing stock of knowledge making for its development. The systematic approach concerning generalisations and formulation of a theory is also research.

- Greenfield (1996)2 As such the term ‘research’ refers to the systematic method consisting of enunciating the problem, formulating a Hypotheses, collecting the data, analysing the facts and reaching certain conclusions either in the form of solutions(s) towards the concerned problem or in certain generation for some theoretical formulation.

- P.M. Cook “Research is an honest, exhaustive, intelligent searching for facts and their meanings or implications with reference to a given problem. The product or findings of a given piece of research should be an authentic, verifiable contribution to knowledge in the field studied.”

- P.V. Younge “Social research may be defined as a scientific undertaking which by means of logical and systematized techniques aims to discover new facts or verify and test old facts, analyse their sequences, interrelationships and casual explanation which were derived within an appropriate theoretical frame of reference, develop new scientific tools, concepts and theories which would facilitate reliable and valid study of human behavior.”

- Godwin C.3 "In the broadest sense of the word, the definition of research includes any gathering of data, information, and facts for the advancement of knowledge."
John W. Creswell⁴, who states that "research is a process of steps used to collect and analyze information to increase our understanding of a topic or issue". It consists of three steps: pose a question, collect data to answer the question, and present an answer to the question.

Clifford Woody (Kothari 1988)⁵ research comprises “defining and redefining problems, formulating hypotheses or suggested solutions; collecting, organizing and evaluating data; making deductions and reaching conclusions; and finally, carefully testing the conclusions to determine whether they fit the formulated hypotheses”.

D. Slesinger and M. Stephenson (1930)⁶ defined research as “the manipulation of things, concepts or symbols for the purpose of generalizing to extend, correct or verify knowledge, whether that knowledge aids in the construction of theory or in the practice of an art”.

Redman and Mory (1923)⁷, research is a “systematized effort to gain new knowledge”. It is an academic activity and therefore the term should be used in a technical sense.

The Merriam-Webster Online Dictionary⁸ defines research in more detail as "a studious inquiry or examination; especially investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories or laws in the light of new facts, or practical application of such new or revised theories or laws”.

Thus, research is an original addition to the available knowledge, which contributes to its further advancement. It is an attempt to pursue truth through the methods of study, observation, comparison and experiment. In sum, research is the search for knowledge, using objective and systematic methods to find solution to a problem.

The term “research” refers to a scientific undertaking using logical and systematic techniques to develop new concepts/facts or to verify existing concepts/facts. The goal of research is to develop knowledge that is beneficial to society. “Research needs a strategy, good intentions and wishful thinking is not
enough. This research work has begun with the intention of finding some solution to the contemporary situation of the celebrity endorsement and its impact on social communication.

After an extensive survey of available literature and experience survey (informal discussions with experts of the field and research experts), it was found that the scope of the topic is very vast. Hence depending on available resources and time constraints a methodology was adopted to examine the celebrity endorsement impact on behaviour of persons.

3.2 RESEARCH METHODOLOGY

Research methodology is the way in which research problems are solved systematically. It is a science of studying how research is conducted scientifically. Under it, the researcher acquaints himself/herself with the various steps generally adopted to study a research problem, along with the underlying logic behind them. Hence, it is not only important for the researcher to know the research techniques/ methods, but also the scientific approach called methodology.

3.2.1 Objectives of the Present Study

The objective of research is to find answers to the questions by applying scientific procedures. In other words, the main aim of research is to find out the truth which is hidden and has not yet been discovered. Although every research study has its own specific objectives

The main purpose of control is to raise concern over errors, and detect the points of failure in order to prevent their re-emergence. Internal control system can be generally defined as a system which has the features of maintaining the assets of a company, ensuring accuracy and reliability of information and reports related to accounting and other operations, and increasing the effectiveness of the operations. Additionally, the system also covers all assessment and methods that are adopted in order to detect the suitability of operations in accordance with policies determined by management, implementing a chart of accounts and reporting system, specifying the duties, authority and responsibilities, and
organization plan of the cooperation (Cook et al. 1980, p.198). In other words, internal control system which is created by management and implemented by management and employees is a process which is designed to ensure reasonable assurance to achieve pre-specified objectives (Doyrangöl, 2002). Prior studies indicated that internal control system has positive impact on external audit, firm performance, employee's satisfaction and performance. It helps in safeguard of organizations assets and it has also helps in betterment of organization. This study, following objectives have been stabilised to analysed.

i. To undertake an in depth study of literature on internal control system in co-operative banks.

ii. To examine the impact of internal control system on employee.

iii. To examine the impact of internal control system on performance of co-operative bank.

iv. To put forth suggestions regarding betterment of internal control system.

3.2.2 Research Gap

A research gap is defined as a topic or area for which missing or insufficient information limits the ability to reach a conclusion for a question. A research need is defined as a gap that limits the ability of decision-makers (policy-makers, patients, practitioners) from making decisions. After going through the available literature, it was found that several research studies which are related with internal control system, role of internal audit function, effect of the Internal Audit and Firm Performance, Employee's Compliance to the Internal Control System on the Reliability and Creditability of Financial Statements, Internal Control System and Financial Performance etc. but those studies are mainly focused on foreign commercial banks and companies. There were few studies related with internal control system in co-operative banks in India. Therefore, this study proposes to study internal control system in co-operative banks in Udaipur.

3.2.3 Research Hypotheses

When a prediction or a hypothesized relationship is tested by adopting scientific methods, it is known as research Hypotheses. The research Hypotheses is a
predictive statement which relates to a dependent variable and an independent variable. Generally, a research Hypotheses must consist of at least one dependent variable and one independent variable. Whereas, the relationships that are assumed but not to be tested are predictive statements that are not to be objectively verified, thus are not classified as research hypotheses.

The following hypotheses have been tested in this study.

H₀₁: There is a no significant relationship between the internal control system and performance of co-operative banks.

H₀₂: There is a no significant relationship between the internal control system and employee satisfaction.

H₀₃: There is a no significant relationship between the internal control system and employee performance.

3.2.4 Research Design

The research design must also make appropriate provision for protection against bias and thus maximize reliability, with due regard to the completion of the research study in an economical manner. The research design in such studies should be rigid and not flexible. Kothari (2004)⁹ says, the research design is the conceptual structure within which the research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data. As such the design includes an outline of what the researcher will do from writing the Hypotheses and its operational implications to the final analysis of data. So the research design can be defined as a plan, structure and strategy of a research to find out alternative tools to solve the problems and to minimize the variances.

In this study, descriptive research design has been used. Because most of required conditions for descriptive research design have been fulfil by our study.

3.2.5 Scope of the Study

The scope of the study basically means all those things that will be covered in the research. It defines clearly the extent of content that will be covered by the means of the research in order to come to more logical conclusions and give conclusive and satisfactory answers to the research. The scope of the study has to be defined
at a preliminary stage and that is very important. It cannot be done in the later phase of doing the research as it creates a lot of ambiguity about the research goals. If the researcher fails to define the scope at the initial stage itself it is indicative that the research would eventually not meet the expectations set by the dissertation committee.

This research pertains to study various aspects of internal control system and its impact on co-operative banks and satisfaction of co-operative bank employees. For this purpose, this research is confined to Udaipur city of Rajasthan state.

3.2.6 Sampling Procedure

The sample for opinion survey has been convenient. Every effort has been made to keep the sample size as large as is feasible within the available time.

Sampling Method: Area basis sampling has been used to select sampling units (respondents) from sampling frame. Participant respondents have been selected such that they represent various streams. Also the approach of selecting participant respondents was such that sample represents almost equal number of participants.

3.2.7 Sample Size

To achieve the objective of the present study and test the opinions of respondents, it has been collected 217 questionnaires from respondents. All 217 questionnaires have been used in this study to draw conclusions.

3.2.8 Data Collection Instrument

Collecting data as in a research study, data collection is the most important and time-consuming phase. As know, the quality of evaluation findings is entirely dependent upon the data collected. Hence, the importance of data collection cannot be overemphasised. Whether quantitative or qualitative methods are used for data collection, it is essential to ensure that quality is maintained in the process. Researcher can have a highly structured evaluation, placing great emphasis on indicators and their measurement, or they can opt for an unstructured and flexible enquiry: as mentioned earlier, the decision is dependent upon the purpose of their evaluation. For exploratory purposes, flexibility and a
lack of structure is an asset, whereas, if the purpose is to formulate a policy, measure the impact of an intervention or to work out the cost of an intervention, a greater structure and standardisation and less flexibility are important. Designing appropriate measurement instrument is one of the most critical stages in the research process. It was attempted to search for available instrument but after a massive search no such instrument was found to address the design of this research. Hence a large number of statements relating to knowledge about internal control impact on co-operative banks and co-operative bank employees and necessity of internal control have been framed.

To achieve the objective of the present study, convenient sampling has been used for sampling and questionnaire has been developed for collection of primary data. Questionnaire has been distributed into various groups of respondents. Majorly respondent were belongs from Udaipur city. The questionnaire has been divided into four sections.

1. Sections A described the demographic profile of the respondents. This section has been also divided into five groups.
   a. Name of Respondents,
   b. Gender of respondents: - Gender of respondents has been also classified into two groups 1 was male and 2 were female.
   c. Age of respondents:- Age of respondents have been classified into four groups, 1 group was Less than 25 Years, 2 group was 25 years to 30 years, 3 group was 30 years to 35 Years and 4 group was More than 35 Years.
   d. Education Level: - Education level of respondents has been classified into four groups, 1 group was under graduate, 2 groups was Post-Graduate, 3 groups was Chartered Accountant and 4 groups was Professional.
   e. Type of Respondents:- Type of respondents have been classified into 5 groups, 1 group was Bank Employees, 2 group was Managers, 3 group was Chartered Accountant, 4 group was Academic and 5 group was Other respondents which was not included into other groups.
2. In the section B of the questionnaire, question asked from respondents on “what is the impact of internal control system on co-operative banks?” This section included 20 statements. To get respondents opinions, this section used 5 point scale. Where: 1 means strongly agree, 2 means agree, 3 means neutral, 4 means disagree and 5 means strongly disagree.

The twenty statements are as follows:-

1. It plays important role in ensuring objective achievement of banks
2. It helps of co-operative banks to reduce their operational risk
3. It helps in improve the reliability of financial reporting
4. It influences the effectiveness of internal audit
5. It encourage incorruptibility
6. It helps deter fraudulent activities
7. It helps in Risk measurement
8. It provides helps in independent financial statement audit
9. It reduce detailed testing
10. It reduce audit fee
11. It increases operational effectiveness and efficiency
12. It system improves compliance with laws regulations and policies
13. It increases efforts of the employees of a department
14. It increases effective use of assets
15. It assure the reliability and integrity of information
16. It helps in the economical and efficient use of resources
17. It encourage adherence to prescribed managerial policies
18. It increase in monitoring performance
19. It is helps in taking corrective action
20. Reviewing compliance with existing financial regulations, instructions, procedures
3. In the section C of the questionnaire, question asked from respondents on “what is the impact of internal control system on co-operative banks employees?” This section included 24 statements. To get respondents opinions, this section used 5 point scale. Where: 1 means strongly agree, 2 means agree, 3 means neutral, 4 means disagree and 5 means strongly disagree.

The twenty four statements are as follows:-

1. It increases co-ordination between employees and management
2. It provide reasonable assurance that the department will achieve its mission
3. It increases ethical values in employees
4. It increases corporate governance
5. It increases Integrity of employees
6. It increases Objectivity of employees
7. It increases Professional Competence and Due Care in employees
8. It increases Confidence of employees
9. It increases Professional Behaviour of employees
10. It identify the areas in which the greatest threat or risk of inaccuracies or loss exist
11. It increases the accuracy of the employees
12. It increases the reliability of the employees
13. It increases efficiency of employees
14. It reduces mismanagement of employees
15. It reduces irregularities between employees
16. It helps in the economical and efficient use of resources
17. It encourage adherence to prescribed managerial policies.
18. Sound personnel policies and practices
19. It helps in separation of duties between employees
20. It increases in monitoring performance
21. It increases motivation of employees
22. It provides better direction to employees
23. It helps in better training to employees
24. It increases performances of employees

4. In the section D of the questionnaire, question asked from respondents on “which co-operative banks functional Activities have to needs of internal controls?” This section included 15 statements. To get respondents opinions, this section used 2 point scale. Where: 1 means yes and 2 means no.

Functional Activities are as follows:-

1. Audit services
2. Credit extension (may be enumerated by types)
3. Deposit collection and investment products
4. Financial investments and placement
5. Human resources
6. Information systems
7. Insurance services
8. Legal proceedings
9. Management and safe keeping of customer funds
10. New technologies
11. Payment systems
12. Private banking operations
13. Treasury management (including on-and-off- balance sheet trading transactions)
14. Operating Activities
15. Directors, managers and employees board of directors

5. In the section E of the questionnaire, question asked from respondents on “what is the limitations on effectiveness of internal controls”. This section included 16 statements. To get respondents opinions, this section used 5 point scale. Where: 1 means strongly agree, 2 means agree, 3 means neutral, 4 means disagree and 5 means strongly disagree.

Limitations are as follows:

1. It dependent on the segregation of duties can also be rendered ineffective where collusion by several individuals is involved

2. Authorization controls can be abused by the person in whom the authority is vested

3. Management is frequently in a position to override the controls

4. To maintain an internal control structure that would eliminate the risk of loss is not realistic

5. Would probably cost more than is warranted by the benefit derived

6. Internal control structure depends on the human factor

7. It is subject to flaws in design, errors of judgment or interpretation misunderstanding, carelessness, fatigue, or distraction

8. While the competence and integrity of the personnel designing and operating the system may be controlled by selection and training

9. Organizational changes and management attitude can have a profound impact on the effectiveness of an internal control structure

10. Management needs to continually review and update controls, communicate changes to personnel

11. Internal control is affected by people. It’s not merely policy manuals and forms, but people at every level of an organization.

12. Internal control can be expected to provide only reasonable assurance, not absolute assurance, to an entity’s management and board
13 Internal control is geared to the achievement of objectives in one or more separate but overlapping categories

14 Weak Internal control systems lead to corporate losses and failure

15 Management perception that internal auditors have little to offer

16 Low status of internal auditors (minor bean-counters)

Further secondary data also used for study. Secondary data were collected from research studies, books, journals, newspapers and ongoing academic working papers. The collected data may be processed and analyzed in order to make the study useful to the practitioners, researchers, planners, policy makers and academicians.

3.3 STATISTICAL TOOLS USED

Statistical methods is collecting, summarizing, analyzing, and interpreting variable numerical data. Statistical methods can be contrasted with deterministic methods, which are appropriate where observations are exactly reproducible or are assumed to be so. Statistical tests employed to check the validity and reliability of instruments and to test the Hypotheses were as follows:

1. For the presentation of demographic profile of respondents percentage has been calculated.

2. To find out the significant difference between overall opinions of respondents Z-test has been used.

3. To compare type wise respondents’ opinions, ANOVA test has been used.

4. To compare education level wise respondents’ opinions, ANOVA test has been used.

3.3.1 ANOVA Analysis

Analysis of variance (ANOVA) is a collection of statistical models used to analyze the differences between group means and their associated procedures (such as "variation" among and between groups), developed by R.A. Fisher. In the ANOVA setting, the observed variance in a particular variable is partitioned into components attributable to different sources of variation. In its simplest
form, ANOVA provides a statistical test of whether or not the means of several groups are equal, and therefore generalizes the t-test to more than two groups. As doing multiple two-sample t-tests would result in an increased chance of committing a statistical type I error, ANOVAs are useful in comparing (testing) three or more means (groups or variables) for statistical significance. ANOVA is an extension of independent sample t test for more than two groups.

ANOVA is used in the analysis of comparative experiments, those in which only the difference in outcomes is of interest. The statistical significance of the experiment is determined by a ratio of two variances. This ratio is independent of several possible alterations to the experimental observations: Adding a constant to all observations does not alter significance and multiplying all observations by a constant does not alter significance. So ANOVA statistical significance results are independent of constant bias and scaling errors as well as the units used in expressing observations. SPSS calculates the probability (p-value) of a value of F greater than or equal to the observed value. The null Hypotheses is rejected if this probability is less than or equal to the significance level (α).

In one way ANOVA, the F Statistics test whether treatments effect are all equal i.e. that there are no differences among means of j groups. A significant F value indicates that there are differences in means but it does not tell us whether it does not tell us where these differences are for example mean of group 1 may be significant different from mean of group 2 but it does not necessarily differ from mean of group 3. To isolate where the differences are, Post Hoc analysis can be used. Post-hoc analyses are usually concerned with finding patterns and/or relationships between subgroups of sampled populations that would otherwise remain undetected and undiscovered. Post-hoc tests also known as a posteriori tests greatly expand the range and capability of methods that can be applied in exploratory research. Post-hoc analysis is an important procedure without which multivariate Hypotheses testing would greatly suffer, rendering the chances of discovering false positives unacceptably high.
3.3.2 Z-Test

A z-test is a statistical test used to determine whether two population means are different when the variances are known and the sample size is large. The test statistic is assumed to have a normal distribution, and nuisance parameters such as standard deviation should be known for an accurate z-test to be performed.

This is exactly the same formula as \( z = \frac{x - \mu}{\sigma} \), except that \( \bar{x} \) (the sample mean) is used instead of \( \mu \) (the population mean) and \( s \) (the sample standard deviation) is used instead of \( \sigma \) (the population standard deviation). However, the steps for solving it are exactly the same.

A t-test is used for testing the mean of one population against a standard or comparing the means of two populations if you do not know the populations' standard deviation and when you have a limited sample (\( n < 30 \)). If you know the populations' standard deviation, you may use a z-test.

\( Z \) scores are measures of standard deviation. For example, if a tool returns a \( Z \) score of +2.5 it is interpreted as "+2.5 standard deviations away from the mean". P-values are probabilities. Both statistics are associated with the standard normal distribution. The p-value associated with a 95% confidence level is 0.05.

A Z-test is any statistical test for which the distribution of the test statistic under the null Hypotheses can be approximated by a normal distribution. Because of the central limit theorem, many test statistics are approximately normally distributed for large samples. For each significance level, the Z-test has a single critical value (for example, 1.96 for 5% two tailed) which makes it more convenient than the Student's t-test which has separate critical values for each sample size. Therefore, many statistical tests can be conveniently performed as approximate Z-tests if the sample size is large or the population variance is known. If the population variance is unknown (and therefore has to be estimated from the sample itself) and the sample size is not large (\( n < 30 \)), the Student's t-test may be more appropriate.

If \( T \) is a statistic that is approximately normally distributed under the null Hypotheses, the next step in performing a Z-test is to estimate the expected value
θ of T under the null Hypotheses, and then obtain an estimate s of the standard deviation of T. After that the standard score \( Z = (T - \theta) / s \) is calculated, from which one-tailed and two-tailed p-values can be calculated as \( \Phi(-Z) \) (for upper-tailed tests), \( \Phi(Z) \) (for lower-tailed tests) and \( 2\Phi(-|Z|) \) (for two-tailed tests) where \( \Phi \) is the standard normal cumulative distribution function.

**Breaking Down 'Z-Test'**

A one-sample location test, two-sample location test, paired difference test and maximum likelihood estimate are examples of tests that can be conducted as z-tests. Z-tests are closely related to t-tests, but t-tests are best performed when an experiment has a small sample size. Also, t-tests assume the standard deviation is unknown, while z-tests assume it is known. If the standard deviation of the population is unknown, the assumption of the sample variance equalling the population variance is made.

**Hypotheses Test**

The z-test is a Hypotheses test in which the z-statistic follows a normal distribution. The z-test is best used for greater than 30 samples because, under the central limit theorem, as the number of samples gets larger, the samples are considered to be approximately normally distributed. When conducting a z-test, the null and alternative hypotheses, alpha and z-score should be stated. Next, the test statistic should be calculated, and the results and conclusion stated.

**Requirements of Z Test.**

Several different types of tests are used in statistics (i.e. f test, chi square test, t test). You would use a Z test if:

- Your sample size is greater than 30. Otherwise, use a t test.
- Data points should be independent from each other. In other words, one data point isn’t related or doesn’t affect another data point.
- Your data should be normally distributed. However, for large sample sizes (over 30) this doesn’t always matter.
• Your data should be randomly selected from a population, where each item has an equal chance of being selected.

• Sample sizes should be equal if at all possible.

**Z-Test's for Different Purposes**

There are different types of Z-test each for different purpose. Some of the popular types are outlined below:

1. **Z test for single proportion** is used to test a Hypothesis on a specific value of the population proportion. Statistically speaking, we test the null Hypotheses $H_0: p = p_0$ against the alternative Hypotheses $H_1: p > p_0$ where $p$ is the population proportion and $p_0$ is a specific value of the population proportion we would like to test for acceptance.

2. **Z test for difference of proportions** is used to test the Hypotheses that two populations have the same proportion.

3. **Z test for single mean** is used to test a Hypothesis on a specific value of the population mean. Statistically test the null Hypotheses $H_0: \mu = \mu_0$ against the alternative Hypotheses $H_1: \mu > \mu_0$ where $\mu$ is the population mean and $\mu_0$ is a specific value of the population that we would like to test for acceptance.

   Unlike the t-test for single mean, this test is used if $n \geq 30$ and population standard deviation is known.

4. **Z test for single variance** is used to test a Hypothesis on a specific value of the population variance. Statistically test the null Hypotheses $H_0: \sigma = \sigma_0$ against $H_1: \sigma > \sigma_0$ where $\sigma$ is the population mean and $\sigma_0$ is a specific value of the population variance that we would like to test for acceptance. In other words, this test enables us to test if the given sample has been drawn from a population with specific variance $\sigma_0$. Unlike the chi square test for single variance, this test is used if $n \geq 30$. 
5. *Z-test for testing equality of variance* is used to test the Hypotheses of equality of two population variances when the sample size of each sample is 30 or larger.

**Decision and Conclusions**

Since $p < 0.05$, we reject the null Hypotheses that the sample mean is equal to the hypothesized population mean and conclude that the mean height of the sample is significantly different than the average height of the overall adult population.
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