CHAPTER V

METHODOLOGY

Survey research - Sampling - Instruments of the study - Administration of the tools - Statistical procedures
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METHODOLOGY

This chapter describes the design of the present study. It has been done under the following major heads:

(i) Survey research
(ii) Sampling
(iii) Instruments of the study
(iv) Administration of the tools
(v) Statistical procedures used in the study

Survey Research

Survey research comes under the category of descriptive research. No type of research is more widely used or abused than the survey type. The first survey of census was conducted by Caesar Augustus. In survey research, an attempt is made to investigate the present status of the phenomenon under study.

Surveys are classified in various ways. Descriptive and Analytical are its two general categories. While the former describes the present status of the phenomenon under study, the latter
tries to analyze its main components. Sample and Census surveys are the other two categories. In sample surveys, an estimate of the result is made on the basis of data collected from the chosen member of the population. Another important kind of survey is the School Survey which is generally conducted for the evaluation of school programmes. And yet another classification is simple and complex surveys. Simple surveys are conducted to establish the nature of existing conditions. Complex surveys are used to explore the causes of that particular phenomenon.

The present survey undertaken by the researcher comes under the second category. An attempt has been made to survey not only the problems of training colleges but their reasons also. In addition, this survey involves Gorakhpur University, U.P. and Gujarat University, Ahmedabad for making a comparative study of the two systems.

**Sampling**

Sampling technique is widely used in survey type of research. It is very difficult to collect data from almost all the elements of a population. Researchers generally select samples that provide an estimate of the total picture of the population. In other words, sampling serves as a replica of the
population under study.

Sax (1979) states:

"A Sample is a Limited number of elements selected from a population to be representative of that population".

(Sax, 1979, p. 180).

Process of Sampling

The sampling technique involves three phases: (i) Defining the population; (ii) Drawing the sample from the population; and (iii) Making statistical inference.

Sampling Design

Sampling can be done by two designs: Probability and non-probability. Probability designs are based on the principles of randomness while the non-probability on the judgment of the investigator. The latter is subjective and generally done keeping in view the convenience of the researcher. Besides this broad category, other important kinds are the following:

Random Sampling

The most important of the sampling procedures is the random sampling. The basic idea behind it, is that all members of the population have an equal and independent chance of being included in the sample. To prevent the bias of the investigator, some
mechanical devices like lottery and use of random numbers are frequently used. The steps in random sampling are:

(i) Definition of the population
(ii) Listing the members of the population
(iii) Selection of the sample.

Stratified Sampling

It is a refined form of random sampling. It divides the population of interest into different strata with regard to a variable and collects information randomly. There is a procedure to collect data in equal number from each stratum. In other procedure, data from each stratum are collected in proportion to the size of the stratum in the population. An estimate of the whole population is made on the basis of the collected data. It should be emphasized here that the elements or individuals forming each stratum have similar characteristics.

Cluster Sampling

It is a process in which groups instead of individuals are selected on random basis. Members of the selected group have similar characteristics. This kind of sampling is very useful where the data are to be
collected from a large population which is scattered over large areas. The selected samples are representative of various geographical areas.

Systematic Sampling

It is also called the fixed interval method. The elements are selected at a fixed interval from the given list of elements.

Choice of the Sampling Design

As has been mentioned earlier that the aim of the present study was to make a comparative study of the problems faced by the training colleges of Gorakhpur University, U.P. and Gujarat University, Ahmedabad. In the present study a combination of random and cluster sampling was made. Teachers' training colleges of U.P. and those of Gujarat existing in different geographical areas were randomly selected for the purpose of the present study. It should be mentioned here that there are twenty one training colleges affiliated to Gujarat University and twenty five to Gorakhpur University, U.P.

The same design of sampling was followed for collecting data from the practising schools of Gujarat as well as U.P. Fishbowl technique was adopted for making random selection. In this
technique slips of paper which represent every unit of the population are placed in a fishbowl and after that sample is selected randomly.

Convenient sampling was adopted for procuring views of ten experienced educationists. In this type of sampling, the researcher collects data in accordance with his own convenience.

**Determination of the Sample Size**

The question of fixing the adequate size of the sample is not easy. However, the general consensus is that large samples bring valid results and good generalization. But some educationists do not accept the idea and state that sample size should be fixed in accordance with the nature of the population. In a homogeneous population a small sample will do, while in a diversified or a heterogeneous population, a bigger one is required. According to them, representativeness should be the prime goal in the selection of the sample. Moreover, this question depends upon the nature of the area of research.

Gay (1979) opines: Minimum acceptable sample sizes should depend upon the type of research: *descriptive research* 10% of the population; *correlational research* - 30 subjects; *causal - comparative research* - 15 subjects per group and *experimental research* - 15 subjects per group. (Gay, 1976, p.81).
In the light of these facts, the researcher decided to solve the problem of fixing sample sizes. According to the need of the study, decisions about sample sizes were to be taken with regard to principals, teacher educators and student teachers of the training colleges as well as the headmasters and teachers of the practising schools. Keeping in view the descriptive type of the study and the homogeneous nature of the population, it was deemed proper to choose not less than 10 per cent subjects (principals, teacher educators and student teachers) of the training colleges. The decision about sample sizes of headmasters and teachers of practising schools were effected by the same criterion. Composition of the total sample has been illustrated in Table 5.1.

Table 5.1: Composition of the Total Sample

<table>
<thead>
<tr>
<th>Categories</th>
<th>States</th>
<th>Uttar Pradesh</th>
<th>Gujarat</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Principals</td>
<td></td>
<td>8</td>
<td>2</td>
<td>9</td>
<td>1</td>
<td></td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>2. Teacher Educ.</td>
<td></td>
<td>39</td>
<td>11</td>
<td>33</td>
<td>17</td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>3. Student Teach.</td>
<td></td>
<td>150</td>
<td>100</td>
<td>150</td>
<td>100</td>
<td></td>
<td></td>
<td>500</td>
</tr>
<tr>
<td>4. Headmasters</td>
<td></td>
<td>13</td>
<td>2</td>
<td>14</td>
<td>1</td>
<td></td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>5. Teachers</td>
<td></td>
<td>30</td>
<td>5</td>
<td>27</td>
<td>8</td>
<td></td>
<td></td>
<td>70</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>720</td>
</tr>
</tbody>
</table>
Table 5.1 indicates that

* of the 20 principals, 10 are from each state (U.P. and Gujarat)
* Out of the 100 teacher educators, 50 are from each state.
* The total sample of student teachers is 500.
* The samples of headmasters and cooperating teachers are 30 and 70 respectively.

A detailed description of qualification, experience and other allied matters concerning the subjects will be given in Chapter 6. Besides the samples presented in Table 5.1, ten educationists who gave their opinions regarding the topic under the study, added to the dimension of the sample. Hence the total sample of the study was 730.

Instruments of the Study

Interview, questionnaire, checklist and opinionnaire were used for carrying out the study. Questionnaires were constructed for collecting data from principals, teacher educators and student teachers. One common checklist was prepared for both headmasters and teachers of practising schools. An opinionnaire was prepared for procuring opinion from 10 educationists. Before
Pilot Studies

Every investigation of this type requires pilot studies in order to explore the nature of procedures, tryout the instruments and plan the main part of the investigation. The present study necessitated for these types of preliminary studies as the field of work was vast and new. Moreover, it was thought that these would help in fashioning the instruments more reliable and objective.

In the beginning, the researcher studied the relevant literatures concerning the topic and prepared a semi-structured schedule for conducting the interviews successfully. This form of interview contains both 'open-end' and 'closed' forms of questions. The interview was conducted not only for exploring significant information which were not anticipated in the original plan of the investigation but deleting some irrelevant points also. The following outlines of various main problems concerning various categories of respondents were included in the preliminary drafts:

For Student teachers:
(i) Responsibilities of student teachers.
(ii) Demonstration lessons.
(iii) Lesson plans.
(iv) Practising schools.
(v) Motivation.
(vi) Supervision.
(vii) Shortage of time.
(viii) Inadequate nature of practice teaching.
(ix) Evaluation.

For Teacher Educators:

(i) Responsibilities of teacher educators.
(ii) Supervision.
(iii) Demonstration lessons.
(iv) Guidance and correction of lesson plans.
(v) Practising schools.
(vi) Evaluation
(vii) Motivation.
(viii) Block teaching.
(ix) Integration of theory with practice.

For Principals:

(i) Objectives of student teaching.
(ii) Arrangement of student teaching.
(iii) Practising schools.
(iv) Supervision.
(v) Student teachers.
(vi) Teacher educators.
(vii) Evaluation.
(viii) Artificial nature of practice teaching.

For Headmasters and Teachers of Practising Schools:

(i) Time-table.
(ii) Accommodation.
(iii) Audio-visual aids.
(iv) Student teachers.
(v) Teacher educators.
(vi) Cooperation.
(vii) Course coverage.

The reasons and divisions of the problems and the suggestions for their solutions which were included in the preliminary draft have not been mentioned above.

For constructing the opinionnaire, the researcher consulted some educationists of Ahmedabad city regarding the main problems about which opinions were sought. It should be emphasized here that the problems mentioned in the questionnaires and the checklist provided the main base and some useful clues for preparing it.

Before the formal start of the interviews, the number of persons to be interviewed were fixed. Five principals, seven teacher educators and six student teachers of Gujarat were selected for the purpose.
Four headmasters and three experienced teachers of various practicing schools of Ahmedabad city were chosen for the same purpose. It was not practicable to go to U.P. for doing the same work but the researcher was successful in getting views of two heads and eight teacher educators of U.P. through correspondence. Views of headmasters and teachers of practicing schools of U.P. were not available at all.

Procedures of Eliciting Responses through Interviews:

Though the description of the procedures is related to an individual case but it should be treated as applicable to all the cases.

Definite appointment for the interview was fixed. Friendly and permissive atmosphere was created before the formal start of the interview. For realizing this aim, the researcher besides applying other devices, acquainted the interviewee with the significance of the study.

In the beginning, the researcher asked the respondent to tell the problems faced by him with regard to the topic of the study. The points told by the respondent were noted down simultaneously in a brief way. In order to enable him to recall and give more concrete and specific informations, some alternative
and penetrating questions from the prepared schedule were asked. For extracting useful information, some clues were also given. With a view to motivating and redirecting the interview on proper lines, some encouraging and courteous comments were presented occasionally. The interview was generally terminated after getting all possible information from the concerned respondent.

**Recording of Information**

The points noted during the interview were elaborated systematically just after the interview so that the possibility of omission and distortion of facts may be avoided.

**Construction of the Questionnaires:**

The procedures adopted for the construction of the questionnaires concerning principals, teacher educators and student teachers were more or less the same. Hence, the general description of the procedures should be treated as applicable to all.

The pilot study had provided adequate knowledge of and orientation to the content and nature of the study as well as the data to be collected. Now the question was to decide the format of the questionnaire.
In this process, the first work done was to consult and follow the following points:

(i) The questionnaire should be attractive and easy to respond to.

(ii) Items should relate to the objectives of the study.

(iii) Embarrassing, leading and double barrelled questions should be avoided.

(iv) A combination of 'open-end' and 'closed form' of questions should be followed.

(v) Some questions should be of 'yes or no' type.

(vi) Questions dealing with complex aspect of the problems should be answered on different points of the scale.

(vii) Questions should be arranged from general to specific order.

(viii) In order to ensure better comparability and facilitate the tabulation of responses, some items should be ranked in order of preference.

(ix) Simple language should be used to enhance effective communication.

(x) The directions should be clear and acceptable.

(xi) The instrument should be used to get only that information which cannot be obtained through other sources.

(xii) There should be exhaustive list of alternative choices.
Choice of Scales on Questionnaires:

Stevens (1951) has described four types of scales: nominal, ordinal, interval and ratio. Nominal scales merely classify the responses, ordinal scales involve ranking; interval scales contain equal intervals between two successive ranks and ratio scales have absolute zero besides possessing all characteristics of the interval scales.

The present study has followed mainly nominal and ordinal scales in the construction of its items. Sometimes 3-point scales and sometimes 5-point scales have been adopted depending upon the nature of issues involved. In respect of complex and opinion seeking issues, 5-point scales have been invariably used.

Selection of Items:

There are three types of items that are generally used in the questionnaires. They are:

(i) Open-end and Short Answer Form. It allows the respondent to give his ideas freely and in his own words.

(ii) 'Yes or No' or True-False Form. This form consists of the statements which are to be answered either by yes or no or by marking true or false.
(iii) **Multiple Choice Form.** This type provides a statement with four or more suggested statements of answers. The respondent chooses that answer that seems most accurate.

The questionnaires constructed for the present study, contain all the three types of forms of items. But more weightage and coverage has been given to the closed form because it is easy to fill out, it economizes time and effort and is easy to tabulate and analyze. As has been mentioned earlier that the closed form requires short and check responses. In the questionnaires, at the end of every closed form of items "If others, please specify" has been provided so that the respondents might indicate the reasons not anticipated by the investigator.

Some items used in the questionnaires are of open-end form. This form has been utilized with a view to getting original responses of the respondents. 'Yes or No' type of items have also been accommodated to ascertain the presence of main problems and to seek certain information.

**Construction of the Tentative Questionnaires and Preliminary Try outs:**

Tentative questionnaires for principals, teacher
educators and student teachers were constructed separately. Content obtained through pilot studies and relevant literatures blended with personal experience of the investigator and study of some guide-lines for questionnaire construction, provided much help in this process. Discussions with some experienced persons in this context helped the investigator not only in focussing his attention on relevant questions and in preparing the questionnaires in adequate size but proved useful in weeding out certain irrelevant questions and unnecessary fields of inquiry also. For instance, the portion concerning suggestions for solving the problems of teachers' training colleges with regard to practising schools was deleted from the preliminary drafts. Thus following these procedures the tentative forms of the questionnaires were prepared.

The tentative forms were given for pretesting to a few concerned subjects. The pretesting was carried out for knowing its shortcomings, getting suggestions and thereby ensuring smooth administration. As a result, ambiguous and repetitive portions were deleted and questionnaires in final forms were constructed.
Length of the Questionnaires

About the appropriate length of the questionnaire, a rule of thumb is that it should not involve the respondent for more than half an hour in filling out. Besides, the general consensus is that a questionnaire should be short to ensure better response. About this aspect, Mouly (1963) states:

The significance of the population and the proper choice of a population, as well as the scholarship of the construction of the questionnaire, are much more important determinants of returns than is the length per se. Sieto for example, was able to obtain a 69 per cent return to a questionnaire of fifty two pages of printed material. (Mouly, 1963, p.257).

Giving his opinion in the same context, Rummel (1964) states:

However, if it seems necessary to have a long questionnaire to secure adequate information upon which to base valid conclusions, it should be developed to the length needed even though the percentage of returns is likely to be small, especially as this can be offset somewhat by sending the instrument to a larger sample of the population being studied. The length of the questionnaire should be dependent entirely upon the extensiveness of the data required and should not be controlled by the unexpected number of returns. (Rummel, 1964, pp.128-129).

Keeping in view these facts, sizes of the questionnaires were decided. Questionnaires concerning
teacher educators and student teachers are in eight pages each in printed forms, while for the principals, it is in twelve pages in cyclostyled form. On the face of it, the size of questionnaires would seem to be lengthy. But this doubt can be removed if one looks at the nature of the complex survey which has been conducted in this study. To repeat it again, complex survey, unlike the simple survey finds out not only the location of problems but also their reasons that are responsible for breeding them.

Validity of the Questionnaires

A questionnaire is valid if it truly measures the area for which it has been developed. But validation of the questionnaire is not an easy task.

Gay (1976) points out:

A too-often-neglected procedure is validation of the questionnaire in order to determine if it measures what it was developed to measure. Validation is probably not done more often because it is not easy and requires much additional time and effort. (Gay, 1976, p.130).

Ary, et al. (1979) also confirm:

All too often questionnaires in research are used without any prior consideration of their appropriateness for measuring what they intend to measure.... It is important to note here that the validity of a questionnaire cannot be assumed but must be established. (Ary, et al., 1979, pp.178-179).
The above mentioned facts underline the fact that establishing the validity of a questionnaire is a difficult task.

The questionnaires of the present study contain independent questions, each dealing with a specific aspect of the overall situation. An attempt was made to make the individual items valid rather than the total instruments under consideration. It must be recognised that in respect of some questions, it is very difficult to get valid answers. For instance, "Do you feel that you lack professional growth?" cannot elicit valid answers from teacher educators or principals. Hence the investigator tried to achieve face validity (each item should be related to the topic) and adequate coverage of the whole topic. The estimate was that the synthesis of the answers of each individual item would present the total picture.

**Reliability of the Questionnaires**

According to Sax (1979), by calculating coefficients of stability, equivalence or internal consistency, the reliability of the questionnaire can be obtained. For ascertaining stability, the same questionnaire is administered twice to the same
respondents after a reasonable interval of time. The correlation between these two scores would be the coefficient of stability. Equivalence, as a form of reliability involves construction of two or more kinds of the same questionnaire. They are administered to the same respondents and are expected to yield the same result. Items that correlate highly with the total score are internally consistent.

Considering the exhaustive forms of the questionnaires and other practical issues, it was not possible to apply any of the discussed methods. Mouly (1963) also verifies:

The question of reliability of the questionnaire is often ignored, partly because it is difficult to establish with any degree of precision. The usual procedures for calculating the reliability of tests are difficult to apply here. (Mouly, 1963, p. 254).

Construction of the Checklist

Checklist is a very simple device which consists of a list of items. The respondents are required to check the presence or absence of the phenomenon under study. It should be emphasized that the responses to the checklist are concerned with facts and not with judgements or opinions.
In the present study, one checklist applicable to both headmasters and teachers of practising schools was prepared. Procedures of its construction were more or less like those of the questionnaires.

After studying pertinent literature and conducting pilot studies, information about the problems faced by headmasters and teachers of practising schools were obtained. Hints for constructing the checklist were consulted and a tentative format was prepared. The tentative form was administered personally to a small group of respondents. The points of embarrassment experienced by the respondents and ambiguous items were noted down. On the basis of these guidelines, the final checklist containing twenty items was prepared.

Construction of the opinionnaire

An opinionnaire is similar to an attitude scale. The opinionnaire tries to measure the attitude or belief of an individual towards certain facts, events or persons. Attitude signifies inner feelings which are expressed through the opinion and are measured. In order to measure the attitude of an individual, the following methods are generally followed:

(1) By the use of questionnaire or interview, a person is asked in a direct way to state his feelings.
(ii) The individual is asked to check only those statements from the given list with which he is in agreement.

(iii) The individual is required to state his agreement or disagreement with regard to some statements.

(iv) An individual's attitude is estimated by his reactions to certain projective devices.

Besides these, Thurstone technique of scaled values and Likert's method of summated ratings are commonly used for measuring attitudes.

In the present study, on the basis of questionnaires and checklist, the researcher found out fifteen most important problems faced by the training colleges as well as practising schools during student teaching. General methods which are applied in the construction of an opinionnaire were consulted. Thereafter, an opinionnaire containing fifteen main questions was prepared. Each question has some parts. Majority of the questions and its sub-parts are in open-end form. Through a courteous and insisting cover letter attached to the opinionnaire, the respondents were requested to offer their opinions freely and briefly.

**Administration of Tools**

Questionnaires, a checklist and an opinionnaire were the main tools which were to be administered.
Administration of the Questionnaires Concerning Student Teachers

First of all, the questionnaires concerning student teachers were administered to 550 student teachers of U.P. and Gujarat of which 275 were from each state. In the administration of the questionnaires, the group Questionnaire technique was followed.

"This involves meeting with groups of respondents and having all members of each group fill in the questionnaire at the same time". (Rummel, 1964, p. 157).

In order to obtain group responses and to solve the problems of non-returns, this technique was followed. This enabled the researcher to meet the student teachers in groups and encourage them to fill in the questionnaires at the same time. Before the administration of the questionnaires, permission from the principals/heads were sought. In this process, help of some competent teacher educators was also solicited. In some colleges of Gujarat, the teacher educators used to translate some difficult items in Gujarati language to ensure correct responses. In U.P., the researcher himself performed the same work. During the process of administration, the student teachers were reminded
orally to see that no item is left unmarked. Inspite of all these precautions, many questionnaires in incomplete form were returned. However, the researcher was successful in procuring 500 questionnaires in complete form for data analysis.

**Administration of the Questionnaires Concerning Principals and Teacher Educators**

Questionnaires concerning principals and teacher educators were administered partly by direct method and partly by mailing. At the outset, questionnaires concerning these two were administered to 12 principals and 43 teacher educators of Gujarat simultaneously and personally. The researcher could not get any questionnaire fully filled up on the same day. Five questionnaires for principals and 58 questionnaires for teacher educators were mailed to the training colleges affiliated to Gujarat University, Ahmedabad. After a few days, the researcher succeeded in procuring 8 questionnaires of principals and 31 of teacher educators who were contacted personally. Only one questionnaire of principals and 4 questionnaires of teacher educators were returned in complete forms through correspondence.
After a lapse of one month, correspondence with non-respondents was started with a letter soliciting their cooperation and another questionnaire with a stamped envelope. The responses from some respondents could not be available even after the third mailing. However, the researcher could get 11 questionnaires of principals and 59 of teacher educators. Finally, ten questionnaires for principals and 50 for teacher educators which were in complete forms were retained for final analysis.

Procedures for administration of questionnaires with regard to principals and teacher educators of U.P. were somewhat different. In order to avoid the problem of non-returns, the researcher met the respondents personally and got 10 questionnaires of principals and 50 of teacher educators of various colleges completely filled up.

Administration of the Checklist

The check lists which were applicable to both headmasters and teachers of practising schools were administered personally to 15 headmasters and 35 teachers of various practising schools of U.P. The procedures and figures of administration of the checklists in
respect of these two (headmasters and teachers) were the same for practising schools of Gujarat. The check-lists were collected the same day to avoid difficulties that appear through mailing the instruments.

**Administration of the Opinionnaire**

Fifteen opinionnaires were mailed and 6 respondents were contacted personally for administering the opinionnaires. In the process of direct administration, the researcher used to ask questions and record the responses of the respondents himself. So, this process was like that of a schedule. Of the total opinionnaires mailed, two were returned. As a result of the follow-up, three more sent their responses. One respondent had written his opinion too briefly on the instrument itself, hence it was rejected. As a result, 10 opinionnaires were retained for the present study.

In this way, the tools were administered for collecting data. Some difficulties which appeared in this process are stated below:

**Difficulties Encountered**

The first was the language difficulty which appeared during the administration of tools in Gujarat.
It was felt especially with regard to student teachers. The second was the non-cooperation on the part of some respondents. The researcher is tempted to mention the case of one principal who was approached seven times personally for procuring the questionnaire but without success. Some teacher educators were suspicious and unwilling. Before filling in the questionnaires, they used to ask several questions about the validity of the questionnaire, though it appeared that some of them did not have any knowledge of the procedures of the construction of the questionnaire. One lady teacher educator after being reminded to return the questionnaire replied bluntly: "Why should I help you to get your Ph.D. degree? I am not going to be benefitted any way." The third difficulty was concerned with the vast scope of the study and administration of the tools in large areas. As the scope of the study was concerned with Gujarat University, Ahmedabad and Gorakhpur University, U.P., the researcher had to face some difficulties in spanning the distance of vast areas. The difficulties were acute in the rural areas of U.P. where the transport facilities are woefully lacking.

But the researcher is gratified to envisage the consummation of the work in the wake of some
difficulties which are common in the field of research.

Statistical Procedures used in the Study

The major statistical procedures used in the study are indicated below:

(i) Chisquare
(ii) Critical Ratio
(iii) Simple percentage
(iv) Ranking and weighting of items.

Chi Square

Chisquare ($X^2$) is used to test the significance between the observed and the expected frequencies. For using this technique, the following are the major assumptions:

(i) It is used to calculate a comparative study between two or more independent samples.

(ii) Frequencies instead of means of observed data are used.

(iii) The nominal scale is used in it.

(iv) There should be random sampling.

(v) The expected frequencies in any cell should not be less than 5. Yates's formula of correction is used for a 2x2 problem in the wake of an expected frequency falling below 10. But when there are two or more than two sets of data like 2x3, or 2x4 or 3x3 etc., there is no hard and fast rule regarding the minimum cell frequencies.
As all the assumptions are satisfied in the present study, it was thought proper to apply technique. For calculating it, the following formula was applied:

$$\chi^2 = \sum \left( \frac{(f_o - f_e)^2}{f_e} \right)$$

where

- $f_o = \text{the obtained frequency in any cell.}$
- $f_e = \text{the expected frequency in any cell.}$
- $\chi^2 = \text{Chi square.}$

Interpretation of results when the null hypothesis is retained, was done following the views of Ary and others (1979). They state:

"A retained well hypothesis must be interpreted as lack of evidence for either the truth or falsity of the hypothesis" (Ary, et al., 1979, p.345).

(1) C.R.

It was calculated to find out the difference between the percents of answers given by two groups of respondents. Frequencies of answers in respect of the major problems concerning the present study
were converted into percents for its calculation. The following formula was used:

\[
CR = \frac{(P_1 - P_2) - 0}{6D%} 
\]

Where:

\[
CR = \text{Critical Ratio} 
\]

\[
P_1 - P_2 = \text{the difference between two percents.} 
\]

for calculating 6D%, the following formula was applied:

\[
6D% = PQ \sum \frac{1}{N_1} + \frac{1}{N_2} 
\]

where

\[
P = \text{Percent occurrence of the observed behaviour.} 
\]

\[
Q = (1-P) 
\]

\[
N = \text{Size of the sample.} 
\]

(2) Percentages

Simple percentages were calculated to facilitate the calculations of CR values and in respect of various information sought in the study. By translating the frequency counts into percentages, a common base was provided for comparison.
(3) Ranking and Weighting of Items

In the questionnaires, in respect of some items, the respondents were asked to give ranks in order of preference. After counting the frequencies for each item, weightages were assigned as follows:

1st rank 5 points
2nd rank 4 points
3rd rank 3 points
4th rank 2 points
5th rank 1 point

By multiplying the frequencies with the numerical values, quantitative scores for each item were obtained and the total of these scores were converted into new ranks for the sake of comparison.

With regard to the sample of principals, another technique was adopted. As the sample of the principals was merely twenty, it was not possible to calculate . In this case, weighted scores of each item by assigning arbitrary weightages were calculated. The total of the weighted scores of each item was converted into new ranks for the sake of comparison.
List of References Cited


