CHAPTER III

METHOD AND PROCEDURE
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Introduction:

The methodology and procedure of a research study are closely linked with its purposes as they provide a framework within which the goals are to be achieved. The objectives of the present investigation were to locate and compare successful and less successful physical education teachers of government and private recognised high/higher secondary schools on the variables of sex, creativity, adjustment and socio-economic status so as to be able to predict their teaching success on the basis of these variables and to study the inter-relationship among these variables. Thus, it involved a number of steps to complete this investigation.

The study was conducted in two stages. First, the teacher success scale was constructed to identify successful and less successful physical education teachers. The second stage involved the administration of tests for adjustment, socio-economic status and creativity variables.

Construction of a teacher success scale for the physical education teacher:

First format of the scale:

The format was specially constructed by this investigator. The area of successful teaching behaviour was
split into sub areas and 171 items on teachers' success were framed. These were discussed with a jury of experts who were either working as qualified physical education teachers and had long experience of working on the job or were headmasters or principals who had for a long time been evaluating the work of physical education teachers. The items were also discussed with those research workers who were engaged in the work of educational, sociological or psychological research. As a result of discussions, some of these items were found to have been repeated, some did not pertain to the theme, some had a double-edged language and some were found to be irrelevant. All such items were dropped or combined or improved upon. As a result, 81 items left on the body of the scale after removing irrelevant items, eliminating duplication and improving upon the language.

Second format of the scale:

The second format of the scale consisted of 81 items which were then compiled and got cyclostyled. A letter was drafted to get further expert opinion on the items of the scale so as to improve upon it even more. Out of the 20 experts who were shown these items for their suggestions, only 14 responded, that too after follow-up by stamped self-addressed letters, reminders, telephone calls and personal contacts. The experts' suggestions received were pooled together, their opinions considered and given due
weightage and their remarks kept in view for the scale's improvement. In the light of the suggestions, the items were recast and re-arranged. As a result, the items were reduced to 68.

**Third format of the scale:**

The third format which thus emerged consisted of 68 items. Generally speaking, a teacher or researcher, while preparing items for a test, makes some judgement regarding the level of difficulty of each individual item and also the ability of the items to discriminate between different levels of abilities of the teacher or examinee taking the item in a test. It is necessary that, in addition to doing this, "prevalidation" about individual items is undertaken. Finley and Bendle (1970) demonstrated that there were many instances where trained and professional item writers misjudged the difficulty of their test items. Teachers could attempt to estimate the facility value of their class test items and compare their estimated values with the actual values obtained after analysing the responses. Teachers who reuse their items use both better and poorer items. But it would really be unfortunate if they failed to reuse better items; equally so if they reused poor items. If better items are discarded the time, effort and energy expended would be wasted. Items that possess content validity and those that discriminate between high and low achievers, could be filled and over a
period of time a collection of really very useful items could be built for future use. In order to build this kind of test file, it is necessary to find how an item behaves with those for whom it is made. A norm reference test used to provide valid and useful information, should be neither too easy nor too difficult and each item should be discriminating validity among high and low achieving subjects. The procedure used to judge quantitatively the quality of the item is called "item analysis". Item analysis is the process of examining students' and teachers' responses to each and every item.

But to get back to our own procedural steps, the 68 items of the third format were further treated for item analysis so as to work out the reliability and validity of the format and to ensure that it could be used profitably. Perception of 45 Heads of 100 physical education teachers working under them were recorded on 68 items of the format.

In order to do item analysis the point biserial method given by Garrett (1970) was used. The formula is as follows:

\[ r_{p_{bis}} = \frac{M_p - M_q}{\sigma} \times \sqrt{pq} \]

- \( r_{p_{bis}} \) = A coefficient of correlation
- \( M_p \) = Means of first category
- \( M_q \) = Mean of second category
- \( p \) = Proportion of sample in first group
- \( q \) = Proportion of sample in second group
q = Proportion of sample in second group

σ = Standard deviation of the entire sample.

The reliability of the scale was estimated through test-retest and the split-half methods on a random sample of 100 physical education teachers.

Besides content validity, which had already been done with the help of expert opinion, item validity as per the point biserial method was also carried out. Further, the validity of the scale was worked out by correlating the score of physical education teachers evaluated by their Heads, that is, the score of the scale, with the score of the performance of the teachers with respect to their achievement in games and sports during inter-school competitions.

Use of Teachers Success Scale

A letter was drafted to guide and help the headmasters and principals to give their weightage on each item of the 68 item scale which was found reliable and valid through statistical treatment. The headmaster or the principal was to give his opinion on any one out of five points of every item. This scale was used as the Teacher Success Scale of Physical Education Teachers (Appendix I).

To get the rating of the teachers on this five-point scale, the teacher-success scale along with instructions was circulated among headmasters and principals. If the
quality depicted in the item was highly possessed by the individual, then the headmaster or the principal of the school was to put a tick mark (✓) at 1. If the teacher had possessed the qualities to the extent of 80 to 60 per cent then he was to tick mark 2. In case the teacher was a mediocre one and possessed these qualities to the extent of 60 to 40 per cent then he was to tick mark 3. If the teacher had 40 to 20 per cent qualities of the item in his behaviour, then a tick mark was put at 4. However, if the teacher did not have more than 20 per cent of the quality indicated in the item of the scale in his behaviour, then the headmaster or principal put the tick mark at 5. Each item had five points and the head of the institution was to mark any one of the five points for every item on the scale.

Sample:

It is not correct to assume that if a study is conducted on the total population, the results will be ideal and representative of the whole. It is not even possible to conduct each and every study on the total population because of the restraints of time, money and resources. Besides, if one type of error decreases on conducting a study on the total population, then another type of error increases with it, making the situation equally difficult. It is thus always advisable to conduct a study on a scientific representative
sample, especially when it is to be undertaken for the award of a degree (because of the limitations of time and money) and the population is rather big.

In the present investigation the population on which the investigation was to be conducted was that of physical education teachers of high and higher secondary schools of the State of Punjab and Chandigarh. There are 12 districts in Punjab and Chandigarh is a Union Territory. First of all 10 of the 12 districts of Punjab were selected for this investigation by a draw of lots. The districts that were drawn were the following:

1. Patiala
2. Sangrur
3. Gurdaspur
4. Faridkot
5. Jalandhar
6. Ludhiana
7. Amritsar
8. Ropar
9. Hoshiarpur

In addition to these districts, the Union Territory of Chandigarh was also selected and treated as a district. The study was thus conducted on 11 districts.
The District Education Officer of each district and Chandigarh were contacted and a list of high/higher secondary schools, both government and recognised private institutions, was put together with their help, the details of which are given in table 3.1.

The headmasters/principals of all these schools were contacted and information about their physical education teachers was obtained from them by posting them letters accompanied by self-addressed envelopes. Some of the Headmasters and Principals were also contacted through District Education officers.

All the headmasters and principals who responded to our query were then contacted by the research worker and her team of investigators in person. The Teacher Success Scale for Physical Education Teachers was got filled in by them after making it clear to them its purpose. This scale was then scored with the help of the scoring key specially meant for the scale. In all 267 headmasters and principals were contacted for this study. The break up of their physical education teachers numbering 617 whose teacher success scale for physical education teachers was filled in is given in Table 3.2.
### Table 3.1

Showing the number of government and private recognised schools in each district and U.T., Chandigarh

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the District</th>
<th>No. of Govt. high/ higher secondary schools</th>
<th>No. of Private high/ higher secondary schools</th>
<th>Total No. of high/ higher secondary schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Patiala</td>
<td>158</td>
<td>39</td>
<td>197</td>
</tr>
<tr>
<td>2</td>
<td>Sangrur</td>
<td>175</td>
<td>28</td>
<td>203</td>
</tr>
<tr>
<td>3</td>
<td>Gurdaspur</td>
<td>116</td>
<td>35</td>
<td>151</td>
</tr>
<tr>
<td>4</td>
<td>Faridkot</td>
<td>198</td>
<td>34</td>
<td>232</td>
</tr>
<tr>
<td>5</td>
<td>Jullundur</td>
<td>213</td>
<td>78</td>
<td>291</td>
</tr>
<tr>
<td>6</td>
<td>Ludhiana</td>
<td>218</td>
<td>71</td>
<td>289</td>
</tr>
<tr>
<td>7</td>
<td>Amritsar</td>
<td>206</td>
<td>68</td>
<td>274</td>
</tr>
<tr>
<td>8</td>
<td>Ropar</td>
<td>92</td>
<td>24</td>
<td>116</td>
</tr>
<tr>
<td>9</td>
<td>Hoshiarpur</td>
<td>160</td>
<td>50</td>
<td>210</td>
</tr>
<tr>
<td>10</td>
<td>Kapurthala</td>
<td>67</td>
<td>17</td>
<td>84</td>
</tr>
<tr>
<td>11</td>
<td>Chandigarh(U.T.)</td>
<td>56</td>
<td>29</td>
<td>85</td>
</tr>
</tbody>
</table>
Table 3.2

Break-up of government and private, male and female physical education teachers whose success scale was filled in by the heads of their institutions.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Government school physical education teachers</th>
<th>Private school physical education teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Total</td>
<td>327</td>
<td>290</td>
</tr>
<tr>
<td>2. Male</td>
<td>178</td>
<td>190</td>
</tr>
<tr>
<td>3. Female</td>
<td>149</td>
<td>100</td>
</tr>
</tbody>
</table>

The standard deviation of the group of teachers was worked out along with its mean. The standard deviation was 9.88 and the mean 22.06. Those falling between 1/2 SD on either side of the case were dropped from the data and the remaining were kept as the sample. Those who were left in the sample are shown in Table 3.3.

Table 3.3

Successful and less successful physical education teachers who constituted the sample

<table>
<thead>
<tr>
<th>Government school physical education teachers</th>
<th>Private school physical education teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Successful</td>
<td>Less successful</td>
</tr>
<tr>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>110</td>
<td>96</td>
</tr>
</tbody>
</table>
All the teachers indicated in Table 3.3 above were selected as sample for this study.

In the second phase of the investigation the following tools were used for evaluating the scores of Physical Education teachers on the six variables of fluency, flexibility originality, creativity, adjustment and socio-economic status.

**TOOLS USED:**

**Torrance Thinking Creativity Test:**

In order to find out the creativity/creative thinking of a physical education teacher, the Thinking Creativity by Words by Torrance (1966) alongwith its manual, was procured and used in this investigation. The test is given in Appendix II.

The test is mostly based on the explanation, interpretation, creation and imagination of the pictures shown in the test and language used for the instructions for different kinds of activities in the test is very simple, since the tool was being used in Punjab State, it was got translated in Punjabi by the Jury of three experts in the language. The test was administered as a whole as it existed, without any type of interference in its original get-up.

**Teacher Adjustment Inventory:**

In order to find out the total adjustment of physical education teachers the Teacher Adjustment Inventory (MTAI) by Mangal (1982) was used. It is available in Hindi and English as well. Most of the teachers in the State of Punjab, where the
The investigation was to be conducted, are not very well conversant with the Hindi language and are more fluent in Punjabi. Therefore, the inventory was got translated into Punjabi. The translation was done by a jury of three experts. The Punjabi version is given in Appendix III.

**Socio-Economic Status Schedule:**

In order to find out the socio-economic status of the teachers, the socio-economic status schedule prepared by Srivastava (1978) was used. The tool has been prepared in Hindi as well as English. It was translated into Punjabi by the jury of three experts. The Punjabi version of the scale is given in Appendix IV. The manual, along with the scoring key, was also got from the publisher.

**Administration of the tools:**

A team consisting of the investigator and four more co-workers who had been awarded an M.A. or M.Phil. in Education or Physical Education and had the experience of conducting and administering psychological tests was constituted. The total study, its procedures, objectives and the techniques to administer the tests were explained to these associates. They were specially trained to conduct the psychological tests. They were also requested to read the instructions thoroughly and discuss their difficulty with the investigator.

The contact with the teachers of physical education was established through the Principal or Headmaster of the
institution. After ensuring that the teacher concerned was seated comfortably, the Socio-economic Scale was administered under normal conditions. The teacher was given the scale in the language with which he was most conversant.

After the scale was completed, the teacher was given a break of about five minutes. Then the Teacher Adjustment Inventory was administered. At the time of the administration of this test, the teacher was asked about the language with which he was most conversant and supplied the test in that language. After completion of this inventory the teachers were given break of about 10 minutes.

In the end Thinking Creativity With Words by Torrance was administered. The subject was explained the motives of the test and the method to deal with different types of activity. At first the test was made clear by giving examples of each type of activity. Then the subject was made to think and write down his ideas on each of seven types of activity. The instructions laid down in the manual were strictly adhered to. The time to be taken by the subject for the completion of each type of activity was recorded with the help of a stop watch. In all about one hour was given to each subject to complete the test. The following instructions were adhered to at the time of the administration of this test.

For the first three activities, which were based on the picture given on page 2 of the test, three types of
questions were to be framed, i.e. asking, guessing causes and guessing consequences. These activities gave to the subject a chance to show how good they were at asking questions to find out things that they did not know, in making guesses possible causes and guessing possible consequences of what is happening in each picture. For example, the following type of questions were asked:

1. What is happening in the picture?
2. What can you tell for sure?
3. What do you need to know to understand what is happening?
4. What could cause it to happen and what will be the result?

Activity 1:

The first activity was allowed five minutes. It was the activity of "ASKING". The subject was told to ask the questions which came to his mind regarding the picture so that he could be sure about what was happening in it. He could see the picture time and again. He was not to ask questions which could be replied by just looking at the picture but was to ask questions which needed a certain amount of creativity.

Activity 2:

The second activity, pertained to "GUESSING". The subject was told to look at the picture on page 2 and guess what could have happened earlier, which led to the situation which existed in the picture. The response could include
something which might have happened long ago and because of which these things might have happened. The subject was to make as many guesses as he liked and list these on pages 5 and 6 of the test, for which space is provided.

**Activity 3:**

The third kind of activity was called "GUESSING CONSEQUENCES". It also was given for five minutes. The subject was given instructions to look at the picture on page 2 and to imagine what would happen after the situation which existed in the picture either in the immediate future or after a long time. As many guesses as possible were allowed. It needed a high degree of imagination to guess the consequences of the situation.

**Activity 4:**

The fourth kind of activity is called "PRODUCT IMPROVEMENT" activity. On pages 10 and 9 of the test the subject was to list the cleverest, most interesting and most unusual ways to change a toy elephant so that children could have more fun playing with it. He was not to worry about the cost of the time to be taken in changing the toy elephant but was to think of maximising the fun. The subject was encouraged to spend a full 10 minutes on this activity and to go on thinking if he stopped earlier than 10 minutes.
Activity 5:

The fifth activity is called "UNUSUAL USES OF CARDBOARD BOXES". On pages 12 and 11, the subject was asked to give as many unusual but interesting uses of waste cardboard as he could think of. He was told not to think of only one size for the box. He could think of its uses in as many sizes as he liked. He was not to limit himself to the uses he had already seen. He was to think as many new uses as he could. This exercise took 10 minutes.

Activity 6:

There then followed the activity of "UNUSUAL QUESTIONS". Here the subject was asked to enumerate as many unusual questions as he could on the cardboard boxes. The questions were to be unique and of the type that people did not generally ask or think about. This exercise was also given 10 minutes. In case the subject wanted to finish earlier and to go on to next activity, efforts were made to encourage him to spend more time on it.

Activity 7:

The final kind of activity is called "JUST SUPPOSE" activity. The activity was attempted on page 15 of the test. It was allotted five minutes, on page 14; there is a picture which is an improbable picture, i.e. one that would never happen. This picture is portrayed to give the subject a
chance to use his imagination to think about all the other exciting things that would happen if that improbable situation was true. In his imagination, he was to suppose also all the other things that could have happened because of that imagined situation. The subject was not only encouraged to spend a full five minutes on it, but also to use the next page if the space provided was insufficient.

When all the activities were completed the test booklets were collected and the subjects were thanked for the co-operation extended to the investigator and her co-workers.

Scoring of the tests

Socio-Economic Status :

The socio-economic status scale was scored with the help of the values given to five components of the scale:

1. Education
2. Occupation
3. Income
4. Cultural living or cultural standards
5. Social participation.

The values given to each of the components are given on pages 5 to 7 of the manual and these were awarded on each of the items of the scale. The raw score for each teacher was thus obtained.
Teacher Adjustment Inventory:

In all there are 253 items in the body of the test. Each item carries three alternatives, i.e. "yes", "?" and "no". In this inventory the positive and negative items are mixed. In all there are 41 such items in which the response "yes" shows adjustment whereas for the remaining 212 items, the response "no" also shows adjustment. The scoring scheme is planned to assign the score "two" for the response indicating adjustment, score "one" for undecided and score zero for the response indicating lack of adjustment or maladjustment. The scoring scheme is given in Table 3.4 given below:

Table 3.4

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Serial numbers of the items whose response &quot;yes&quot; shows adjustment</th>
<th>Mode of score responses</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>44, 53, 57, 61, 75, 76, 83, 87, 88, 90, to 94, 101 to 103, 110, 111, 117 to 119, 123, 124, 126, 137, 140, 145, 148, 154, 157, 165, 167, 176, 181, 182, 189, 192, 196, 203 and 207</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>?</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>41</td>
</tr>
</tbody>
</table>

2 For the remaining 212 items whose response "No" shows adjustment

<table>
<thead>
<tr>
<th>No</th>
<th>Yes</th>
<th>?</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

This tool could have been used to evaluate adjustment with the academic and general environment of the institution,
socio-psychophysical adjustment, professional relationship adjustments, personal life adjustments, financial adjustments and job satisfaction, in addition to total adjustment. However, in this study it was used for total adjustment only. Therefore, it was evaluated totally in place of different fragments and the total score of each of the teachers was worked out.

**Torrance Test of Creative Thinking:**

In this test, three types of categories were to be scored, i.e. fluency, flexibility and originality. For this purpose a scoring worksheet was used.

**Fluency:**

First, the category of fluency was worked out. In each type of category the number of statements were counted. If any statement had one idea, it was given one value. If it had more than one idea it was given two values, in accordance with the values decided upon by E. Paul. Torrance. These values were rendered on the worksheet against each of the seven activities in the column of categories. The total number of categories in the worksheet showed the number of fluencies. The fluency was recorded in score summaries in the worksheet for all the seven categories. The score summaries showed the fluency of each of the seven activities separately. These were additive, could be summed up and showed the total score of the subject on the variable of fluency.

**Flexibility:**

From amongst the scores of fluency, the common values
were taken into one category and counted as one value. Suppose value 13 was arrived at in this category's worksheet thrice, then it was counted three so far as fluency was concerned but its value was taken as one for flexibility score purposes. In this way the value of flexibility of every one of the seven categories was put into score summary of every subject. It was additive and could be summed up. The total score showed the score of the subject on the variable of flexibility.

Originality:
The originality of respondents may differ from country to country and because of cultural differences. Thus the scoring guide for originality valid in the USA may not be applicable to an Indian sample. It has been confirmed by several investigators, including Torrance, Singh and others, that the responses of subjects differ from country to country and culture to culture. Because many of the responses given by Torrance in the manual were different from the responses given by the sample of the study, this researcher decided to prepare her own scheme for scoring against originality those responses which carried values in the manual. The values given in the manual were filled for the rest of the items in each category. She prepared a table of the responses on a sheet of paper of all the subjects by making tallies. The statement which was attempted by only one candidate was given the weightage 2. In the same way the statement which was tick
marked (✓) by more than one but less than any other number of subjects was given the weightage of 1. All other categories were given the weightage zero. The scoring method adopted was based on the responses of 100 physical education teachers forming the sample of study. Statistical uncommonness was the main criterion in determining the originality of the responses of the teachers. This procedure was used as the measuring stick for the evaluation of the test of each subject in all the seven categories. The scores of a subject on all the seven categories were then summed up. This was the score of that subject for originality.

**Raw Scores and standard scores:**

The above scheme gave the raw scores of each subject on the variables of fluency, flexibility and originality. After the scoring of individual test activities was completed, the investigator summarized the scoring in the "score summary" box of the scoring worksheet. The totals for each of the columns of the "score summary" box were computed and they provided the total scores for fluency, flexibility and originality—the three scores derived for the creativity measures. In accordance with the objectives of the investigation, a composite or total creativity score was also worked out for each subject by adding all the three scores. This reflected an index of one's creativity. Elaboration scores were not worked out as this dimension of creativity was not encouraged in the instructions to the subjects.
The data, thus collected, from the three tools employed in this study, comprised the following sets of scores:

1. Teacher's Socio Economic Status score.
2. Teacher's total adjustment scores.
3. Creativity test scores (fluency, flexibility, originality and composite creativity).

**Statistical analysis of data:**

The mean, median and standard deviation and 't' ratio were worked out to study and analyse the data available on the six variables of adjustment, socio-economic status, fluency, flexibility, originality and creativity.

The coefficients of correlation were computed to determine the relationship between the dependent variable, creativity, and the independent variables, adjustment and socio-economic status.

A regression equation was framed to predict creativity from adjustment and socio-economic status.

Multiple correlation was used to determine the composite effect of socio-economic status and adjustment on creativity. To determine the level of significance, "t" ratios were computed (Clarke and Clarke, 1970). The levels of significance to test the hypotheses was chosen as .05 which was recognised as appropriate in relation to the research process adopted.
Tabulation of the data:

The data thus thrown up by the investigator was put into different tables which were analysed and discussed and scientific conclusions drawn from these.