

CHAPTER III :

DEVELOPMENT AND SELECTION OF

RESEARCH TOOLS

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3.1 INTRODUCTION

Every research undertaking will have to depend on research tools of one kind or another, for the purpose of data collection. Carefully designed and systematically developed tools of research will yield information which is correct and reliable. Lack of care in the selection or standardization of instruments of measurement will lead to information which is wrong and misleading. The tools used in this investigation for collecting data comprise of those designed or developed by the researcher himself namely

- (A) i) Semester System Perception Description Questionnaire
- ii) a proforma for institutions, and
- iii) a proforma for personal data about responding college.

The standard tools used are :

- (B) i) Questionnaire on Institutional Climate (Baroda Version, Form 11)
- ii) Questionnaire on College Teachers Morale (Baroda Version, Form 11)
- iii) Leadership behaviour Description Questionnaire, and
- iv) The Dogmatism Scale (Adapted version of Milton Rokeach's Scale)

This chapter gives an account of the tools used.

3.2 TOOL NO. 1 : SEMESTER SYSTEM PERCEPTION

DESCRIPTION QUESTIONNAIRE

The object of the questionnaire was to elicit an expression of opinion of a samples of University and College teachers in Madras about the desirability and feasibility of introducing semester system. Adiseshiah and Sekhar (1977, pp.125-126) have called attention to five aspects of attitude measurement which might merit consideration here. First, attitude and beliefs can be measured only indirectly. They have in fact to be inferred from the behaviour or the immediate experience of the individual. Secondly, the situation in which an individual happens to be at the time, has a great deal to do with his attitude and beliefs. Although it may be true that attitudes and beliefs are enduring, it is true also that they are influenced by the immediate situation. Thirdly, when attitudes and beliefs are measured, considerable variations in the precision of measurement are liable to occur. Fourthly, different measurement of attitude and beliefs ought to exhibit a measure of consistency or reliability. Fifthly, the measurement of attitudes and beliefs ought to provide a basis for predicting behaviour.

Several methods have been applied for the measurement of attitudes and beliefs, but the most commonly used type of measurement is the attitude or opinion scale. The scale is designed in a way which enables the respondent to select a set of items or propositions, so that the acceptance or rejection of an item will indicate a favourable or unfavourable attitude. In this investigation the Likert method of attitude scale construction was used on account of its greater simplicity and reliability besides the greater amount of information this approach could provide.

Choosing the Questionnaire items.

The first step in the Likert method of attitude scale construction is the collection of a large number of items, referring directly or indirectly to the subject matter of the investigation. (Adiseshiah and Sekhar, 1977, p.128). Accordingly, keeping the objectives of the investigation in view, positive statements or items referring to the various aspects of the semester system were framed under the respective heads. This involved reading extensively literature on college calendar systems especially about semester system, consultation with college teachers and students and educational administrators who have considerable experience with the

working of the semester system.

A scale was then designed in a way which would enable the respondent to select a set of items or propositions, so that the acceptance or rejection of an item would indicate a favourable or unfavourable attitude or opinion which is termed in this investigation as perception. The overall perception would be measured on a four-point scale by a score which was the sum of the weights given to each of the responses on an arbitrarily decided weighting system 4-3-2-1 for the responses, "very much", "much", "somewhat" and "not at all" respectively marked against each statement.

In constructing the statement for each aspect of the semester system and scaling of the responses, a pre-pilot study was conducted with 18 teachers and 5 educationists who were known to have considerable knowledge about semester system and whose co-operation could be counted to check on the adequacy or not of the aspects covered and to discover the variety of possible responses (vide Table Nos.3.2). This study helped to detect flaws and ambiguities in the questionnaire. After making necessary corrections and alterations a provisional draft of the questionnaire was prepared.

Pilot Study and Pretesting for Determining Validity Index

The next step is to establish the criterion of validity of the questionnaire as an instrument of research which is not different from that of any other research tool. It must be recognized, however, that, though the instrument is oriented toward the whole problem, the questionnaire is comprised of specific and relatively independent statements, each dealing with a specific aspect of the overall situation. In a sense, then, it is the validity of the items rather than that of the total instrument that is under consideration.

The validity of the present questionnaire was tested by checking for internal consistency. For this copies of the draft questionnaire were administered to 100 college teachers at random (vide Table No.3.2). Their responses were scored giving the weightage 4,3,2,1 for the responses "very much", "much", "somewhat" and "not at all" respectively, and the total scores for each item under 'desirable' and 'problems' of semester system alone were obtained.

Then the internal consistency of the questionnaire was assessed by calculating the correlation between the score of each item under "desirable" and "problems" dimensions

only and its sub-test total using the Pearson Product moment Coefficient of Correlation formula. Items which showed coefficient of correlation of 0.3 or above were retained and those that did not satisfy this criterion were dropped. It may be noted here that the investigator assumed that the scores of items in the parallel column "feasible" would show the same degree of consistency with the total score as that shown by the scores of the items against "desirable", hence the coefficient of correlation was not calculated separately for the corresponding scores in the column "feasible".

The final form of the Semester System Perception Description Questionnaire (SSPDQ) is given in Appendix 3.3. This would contain 112 items as against 138 items of the original draft of the SSPDQ (vide Table 3.1). A list of items eliminated from the original draft in the validation process, and the Coefficient of correlation calculated for the items included in the final draft are given in Appendix 3.8 and 3.9 respectively.

Table 3.1 : Component-wise break-up of the Semester System Perception Questionnaire (SSPDQ)

Sl. No.	Components of SSPDQ	No.of items in the original draft	No.of items in the final draft
1.	Concept	12	8
2.	Philosophy	13	10
3.	Curriculum	14	12
4.	Teaching	12	10
5.	Class Strength	6	6
6.	Evaluation	23	19
7.	Learning	10	8
8.	Organization	11	7
9.	Plant & Equipment	13	13
10.	Problems	24	19
Total		138	112

Test of Reliability

The questionnaire was tested for its reliability before embarking on the final study. The questionnaire would be reliable when there is good reason to believe that the score it provides is stable and trustworthy. These characteristics would depend on the extent to which the score is free from chance error. The method used in this investigation for

testing the reliability of the questionnaire was Test-Retest Method.

The questionnaire was administered repeatedly at an interval of one week on a group of 50 college teachers. The scores in the two administrations of the questionnaire were correlated to determine the coefficient of reliability.

The reliability coefficient of the tests was found to be quite high for all the components of the Semester System studied, the figures in this regard being in the range of 0.69 to 0.97 for the SSPQD components and the average being 0.86, 0.82, 0.93 for the SSPQD dimensions desirable, 'feasible' and 'problem' respectively (Vide Table 3.3).

Table 3.2 : Subjects of the Prepilot, Validity and Reliability Studies

Sl. No.	Category of Institutions	No. of subjects		
		Prepilot study	Validity Index study	Reliability Study
1.	Autonomous Institutions	5	25	10
2.	Arts and Science Colleges	5	35	20
3.	Professional Colleges	4	25	10
4.	University Departments	4	15	10
5.	Educationalists	5	-	-
Total		23	100	50

Table 3.3 : Measures of reliability Coefficient obtained for the dimensions of the SSPQD in the reliability study

Sl. No.	Components of SSPQD	Reliability Coefficient		
		Desirable	Feasible	Problem
1.	Concept	.82	.89	-
2.	Philosophy	.95	.94	-
3.	Curriculum	.97	.89	-
4.	Teaching	.70	.69	-
5.	Class Strength	.84	.87	-
6.	Evaluation	.94	.78	-
7.	Learning	.92	.83	-
8.	Organization	.77	.74	-
9.	Plant & Equipment	.85	.78	-
10.	Problems	-	-	.93
Average		.86	.82	.93

Scoring of the SSPDQ

Each item in the questionnaire would be scored giving the weightage in the order 4,3,2,1 for responses 'very much', 'much', 'some what' and 'not at all' for those under 'desirable' and 'feasible' dimensions, and by giving the same weightage in the same order for the responses 'very serious

problem', 'a problem', 'very minor problem', and 'not at all a problem', for those under the 'problems' dimension of the Semester System Perception Description Questionnaire.

A respondents sub-test scores would be computed by summing up the item scores in a subtest, and the global score, by adding the relevant subset scores under the SSPDQ dimensions, 'desirable', 'feasible' and 'problems', there being 9 subtests each under the said first two dimensions and only one under the last dimension. For all practical purposes the scores would be converted to percentage. The maximum score one could obtain in the SSPDQ is given in the following table.

Table 3.4 : Maximum possible scores on 'Desirable', 'Feasible' and 'problems' dimensions of SSPDQ

Sl. No.	SSPDQ Subtests	No. of test items	Maximum Possible Scores in		
			'Desirable'	'Feasible'	'Problems'
1.	Concept	8	32	32	-
2.	Philosophy	10	40	40	-
3.	Curriculum	12	48	48	-
4.	Teaching	10	40	40	-
5.	Class strength	6	24	24	-
6.	Evaluation	19	76	76	-
7.	Learning	8	32	32	-
8.	Organization	7	28	28	-
9.	Plant & Equipment	13	52	52	-
10.	Problems	19	-	-	76
	Total	112	372	372	76

Classification of College for Its Teachers' Level of Perception.

In classifying the colleges perception-wise, the mean score for each of the subtest would be computed for the respective colleges. This would give 19 subtest scores for each of the 28 colleges selected for the study. These scores in percentage would then be put on a Stanine Scale (Garrett, H.E.p.319) and each score given its weightage in stanine. The average weightage in stanine obtained by a college on the relevant subtest scores in the SSPDQ dimensions, 'desirable', 'feasible' and 'problems' would give its respective standing in terms of perception on these dimensions. The stanine weightage scheme applied for classification is as follows :

- (a) Stanine weightage 1-3 means low perception
- (b) Stanine weightage 3-6 means average perception
- (c) Stanine weightage 7-9 means high perception

3.3 TOOL NO.2 : QUESTIONNAIRE ON INSTITUTIONAL CLIMATE

(QIC) (BARODA VERSION, Form II)

Organizational climate of an institution shows the pattern of social interaction that takes place within the institution's community. The main units of interaction are

the individuals constituting the community in the institution, the said community as a whole and the leader. Halpin and Croft (1963) did pioneering work in developing an instrument and a procedure to measure the organizational climate of an institution and the tool developed in this regard was known as "Organizational Climate Description Questionnaire". In this investigation the tool used for identifying the organizational climate is entitled "Questionnaire on Institutional Climate" (Baroda Version, Form II) developed in 1976 in the Faculty of Education & Psychology, M.S. University of Baroda. The tool is composed of 91 Likert-type items placed on a five point scale. (Vide - Appendix 3.4). The sub-tests describing the interpersonal behaviour of the college faculty, and the break-up of the items dimension-wise are given in the following table.

Step 1 : Identification of Institutional Climate.

In this investigation three types of institutional climates namely, Open, Intermediate, and Closed, are sought to be studied and in the identification of which the following procedure would be followed :

Table 3.4 : Dimensions of Institutional Climate Questionnaire.

Sl. No.	Dimensions	Item number in the questionnaire	Total
1.	Disengagement	14,16,20,21,(31),35,56,77,78,83,84	11
2.	Hindrance	3,27,38,47,55	5
3.	Esprit	(17),34,49,53,58,(59),67,74,76	9
4.	Intimacy	2,5,10,18,37,40,61	7
5.	Aloofness	6,8,13,26,41	5
6.	Production Emphasis	52,60,66,68,91	5
7.	Thrust	12,19,57,64,69,79	6
8.	Consideration	1,36,(44),70,85	5
9.	Organizational Structure	7,9,15,23,24,(29),(32),(82)	8
10.	Human Relations	42,45,50,51,62,80,(81),(87),(88),89,90	11
11.	Communication	11,25,30,(39),(43),71,72	7
12.	Freedom and Democratization	4,22,28,33,(40),48,54,63,65,73,75,76	12
Total			91

Note: The item numbers shown within brackets are negative and the others are positive. The items are scored by giving the weightage 1,2,3,4 and 5, for the responses on the scale "never true", "rarely true", "sometimes true", "often true" and "very frequently true" respectively for the positive items, and weightage 5,4,3,2 and 1 respectively for the responses on the same scale for the negative items.

After scoring each item in the questionnaire, a respondent's each sub-test score would be computed by summing up the item scores sub-test by sub-test. To construct the college profile, the mean sub-test score for the college on each of the twelve sub-test is computed. These scores define the average response of teachers for each respective sub-test. Thus the profile of scores would show how most of the teachers in a college characterise the institutional climate of their particular college. Specifically, the scores indicate how often certain types of behaviour occur among the teachers, with the Principal and college administration.

The raw scores thus obtained for each institution are then converted to standard scores, first, normatively and then ipsatively. Normative standardization is done across the sample of each college so that each of the 12 sub-test scores could be compared on a common scale. Thus, each sub-test is standardized according to the mean and standard deviation of the total sample for that sub-test. Then the ipsative standardization is made with respect to the mean and standard deviation of the profile scores for each institution. For both standardization procedure, a standard score system based upon a mean of 50 and standard deviation of 10 is chosen.

These double standardized scores indicate two things: first, a score above 50 on a particular sub-test indicate that the given institutional climate score is above the mean score of the sample taken on that sub-test, and second, that the same score is above the mean of the institution's other sub-test scores.

Step 2 : Construction of the Profile Chart

As the next step, the mean standard scores of all the 12 dimensions are distributed over stanine score system ranging from 1 to 9 with the rank Nos.9 and 8 as indicating 'highest level', rank Nos.7 and 6 as 'high level', rank Nos.5 and 4 as 'low level', and rank Nos.3,2 and 1 as 'the lowest level' respectively. The profile chart is thus prepared for comparing the position of the respective scores of the various dimensions.

Step 3 : Distribution of weightage or numerical value to each level of the Climate Dimensions.

For this investigation, the weightage assigned for the 12 dimensions of the institutional climate for purposes of classifying the institutions studied under the climates, Open, Intermediate, and Closed, are given in the following table :

Table 3.5 : Numerical values assigned to each level of organizational climate for the Climate Dimensions. The numerical values are given in brackets.

Sl. No.	Climate Dimensions	Organizational Climate Level		
		Open	Intermediate	Closed
1.	Disengagement	Low(3)	High(2)	Highest(1)
2.	Hindrance	Low(3)	High(2)	Highest(1)
3.	Esprit	Highest(4)	Low(2)	Lowest(1)
4.	Intimacy	Highest(4)	Low(2)	Lowest(1)
5.	Allofness	Lowest(4)	High(2)	Highest(1)
6.	Production Emphasis	Lowest(4)	High(2)	Highest(1)
7.	Thrust	High(3)	Low(2)	Lowest(1)
8.	Consideration	High(3)	Low(2)	Lowest(1)
9.	Organizational Structure	High(3)	High(3)	Highest(4)
10.	Human Relations	High(3)	Low(2)	Lowest(1)
11.	Communication	Highest(4)	Low(2)	Lowest(1)
12.	Freedom and Democratization	Highest(4)	Low(2)	Lowest(1)
Total weightage		(42)	(25)	(15)

Step 4 : Determining Point Value

The Stanine proto-type profile developed in Step No.2 above is used to assign the stanine value of each dimension to any of the four categories, viz., the highest, the high,

the low, and the lowest. These categories are assigned 4,3,2 and 1 point value in the case of dimensions denoting positive behaviour and 1,2,3 and 4 in the case of dimensions denoting negative behaviour.

In this way point values for institutional climate dimension for each college are determined. These values summed up gives the total stanine value score for the college.

Step 5 : Classification of Colleges for Institutional Climate.

The total stanine value obtained following step No.4 is now placed on a continuum from the Open to the Closed climate on a score range of 15 to 42 (being the range of numerical value for the three categories of institutional climate assigned in Step No.3 above). Institutions getting the upper one-third, i.e. 34 and above, are designed as having "Open Climate". Those colleges falling in the middle range, i.e. 24 to 33 are classified as belonging to "Intermediate climate" and those falling in the lowest one-third, i.e. 15 to 23 are classified as having "closed climate".

3.4 TOOL NO.3 : QUESTIONNAIRE ON COLLEGE TEACHER MORALE (QCTM)

The tool is a opinionated questionnaire intended to measure teacher morale. It contains items which require responses on a four point scale namely "agree", "probably agree", "probably disagree" and "disagree" as indicated by the letters A, PA, PD and D respectively given against each statement. In all, the questionnaire contains 77 items under 8 factors. The tool was standardized in 1976 in the Faculty of Education and Psychology, M.S. University of Baroda and is known as Questionnaire on College Teacher Morale (QCTM), Baroda version form II (Vide Appendix 3.5). The various dimensions of the teacher morale sought to be measured and the corresponding test items are given in the following table 3.6, given on ^{the} next page.

Classification of a College on the Basis of Staff Morale

The opinionnaire yields both a total global score indicating a general level of a teacher's morale and also the sub-scores for each of the eight components or the factors. The factor scores are obtained by summing up the scores of each item under the given factor. The total score is obtained by summing up the factor scores.

Table 3.6 : Distribution of Items in OCTM.

Sl. No.	Dimensions	Item Nos.	Total	Maximum scores
1.	Teacher Welfare	14, (17), 27, (55), 59, 60, 73, 74	8	32
2.	Conditions of work	4, 6, 8, 11, 13, 22, 23, 36, 39, 40, 41, 45, 47, 48, 69, (76), (77)	17	68
3.	Interpersonal Relations	2, 5, 7, 20, 33, 37, 44	7	28
4.	Job satisfaction	24, 25, 46, 53, 56, 61, 63 , 64, 75	9	36
5.	Administration	9, 10, 15, 32, 35, 43, 49, 50, 65, 67, 68, (71), (72)	13	52
6.	Security	3, (12), 16, 18, 31, 58, 62	7	28
7.	Need Satisfaction	28, 29, 30, 38, 43, 51, 52, 54, 57, 66, 70	11	44
8.	Cohesion	1, 19, 21, 26 (34)	5	20
Total			77	308

Note: The item numbers in the brackets are negative and the rest positive. The positive items are scored 4, 3, 2 and 1 for the scale points A, PA, PD and D respectively and the negative items are scored 1, 2, 3 and 4 for the same for the same scale points.

The faculty morale score for each college is computed by finding the average total score for each of the eight factors and by summing up the factor scores. To interpret

the score, i.e., to decide whether the score is indicative of 'high', 'average' or 'low' morale, the scores would be converted to stanine scale. As the stanines are equally spaced steps in a scale, the level of morale in one college could be easily compared with the level of morale in another college.

3.5 TOOL NO.4 : LEADERSHIP BEHAVIOUR DESCRIPTION QUESTIONNAIRE (LBDQ)

The tool related for use in this investigation for measuring leadership behaviour of principals is based on 'Initiating Structure' and 'Consideration' components of the LBDQ by Andrew W. Halpin and Don B. Croft (1956) and was developed and standardized by the Faculty of Education and Psychology, M.S. University of Baroda in 1975 (Vide- Appendix 3.6).

The questionnaire contains 49 short and direct statements about leadership behaviour description, of which the first 24 statements measure the 'initiating structure' behaviour and the following 25, 'Consideration' behaviour. Of these statements, items 2,6,18,24,30,39,40,41,43 and 46 are negative

and the rest positive. Each item is scored on a 5 point scale indicated by the letters A, B, C, D and E denoting the behaviour 'always', 'often', 'occasionally', 'seldom' and 'never' respectively. The members of a leader's group indicate the frequency with which he engages in each form of behaviour by checking one of these five behaviours for each item. The positive items are scored on the scale 5 to 1 and the negative items, 1 to 5. The theoretical range of scores on 'initiating structure' is 24 to 120, and on 'consideration' 25 to 125.

Identification of Leadership Behaviour Pattern

The total scores based on the summation of the item scores would be obtained for each respondent separately for the 'initiating structure' and 'consideration' components of leadership behaviour separately. Institutions are labelled 'high' or 'low' in respect to the leadership behaviour of the principal, on the basis of their mean score position above or below the grand mean of the respective scores. Thus, four different patterns of leadership viz., HH, HL, LH and LL would be obtained by combining the levels in the 'initiating structure' and 'consideration' factors. These four patterns

have specific meaning. The HH pattern in which both "initiating structure" and "consideration" are high is evaluated as most effective whereas the LL pattern in which both these aspects are low is evaluated as most ineffective which results in group confusion and chaos. As regards the HL pattern, the leader here is a strict disciplinarian intent upon getting a job done in utter disregard of human consideration. The LH pattern on the other hand is so full of human consideration that it contributes little to effective performance.

3.6 TOOL NO.5 : THE DOGMATISM SCALE

(Adapted Version of Milton Rokeach's Scale).

The fifth research instrument to be used in the present study is the Dogmatism scale. It was developed by Rokeach (1960) to measure individual differences in openness or closedness of organisation of belief-disbelief system and was employed to measure open and closed mindedness of teachers. The instrument is given in the Appendix 3.7.

The Dogmasism Scale (Form-E) is a self-administered tool consisting of 40 items covering three main areas viz.,

(1) The belief-disbelief dimension, (2) the Central peripheral dimension, and (3) the time-perspective dimension of dogmatism. On this instrument subjects are directed to respond to each of the forty items by writing +1, +2, +3, -1, -2, -3, corresponding respectively to 'I agree a little', 'I agree on the whole', 'I agree very much', 'I disagree a little', 'I disagree on the whole' or 'I disagree very much'.

The instrument is scored by adding the constant +4 to the algebraic value of each item and summing the forty converted item scores. The theoretical range of score on the list is from 40 to 200. The interpretation will be, the higher the score, the more dogmatic or closed minded the respondent.

Validity and Reliability of the Dogmatism Scale.

Data on the validity of the Dogmatism scale have been provided through the use of the 'method of known groups'. Psychology students in a graduate seminar conducted by Rokeach selected high and low dogmatic persons from among their personal friends and acquaintances. In this way, a total of 20 subjects was obtained 10 judged to be extremely high and 10 extremely low in dogmatism. A t-test of the

differences of the means of the two independent samples was applied to test the prediction that individuals selected as high dogmatic persons would differ in mean dogmatism scale scores from individuals judged to be low in dogmatism. Using a one-tailed test, the calculated t-value was found to be 4.08, indicating a difference in the expected direction, significant at the .01 level. Relevant data in this regard are given in the table below

Table 3.7 : Comparison between High and Low Dogmatic group on Dogmatism

Persons judged as	N	Dogmatism score mean
High Dogmatic	10	157.2
Low Dogmatic	10	101.1
$t = 4.00$ $df = 18$ P is greater than .01		

The Scale's reported reliabilities range from .68 to .93 using both the split-half and test-retest techniques with samples of English workers, students at several universities, and individuals at a veterans' Administration domiciliary.

3.7 TOOL NO.6 PROFORMA FOR INSTITUTIONS

This tool is the researcher's own composition and is meant for eliciting information about the Institution — type of management, type of enrolment, teachers, students, types of courses offered, performance in examinations etc. (Vide Appendix 3.1)

3.8 TOOL NO.7 PROFORMA FOR BASIC DATA ABOUT THE RESPONDING TEACHER

This tool composed by the researcher seeks information about the teacher responding to the questionnaires of this research. From the data elicited it would be possible to get a biographical background of the responding teacher — his/her age, sex, qualifications, experience, academic status, etc. (Vide Appendix 3.2).

3.9 CONCLUSION

Thus the present investigation makes use of 7 different tools of which the tool to measure the degree of perception of the college communities in Madras was framed and standardized by the researcher. Besides the proforma for collecting information about the Institutions and its teaching

staff studied (vide tool Nos.6 to 7) were the composition of the researcher. The rest of the tools meant for studying the Institutional climate, Leadership Behaviour, Teacher morale, and 'Dogmatism' were standardised tools already validitated and tested in the Faculty of Education and Psychology, M.S. University of Baroda. In the selection or devising of the tools care had been taken to ensure the objectivity and comprehensiveness of the tool so that the data was valid and reliable enough to study the perception of the college teachers in Madras about the adoption of Semester System from their biographical and institutional points of view.