

CHAPTER : III

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M E T H O D O L O G Y

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In this study, a descriptive-evaluative-predictive approach was adopted for investigating on the Awareness and Knowledge of Recent Developments in Education and its correlates among the student-teachers. After a brief description of some significant Recent Developments in Education, the study attempts to evaluate using a norm-referenced approach the Awareness and Knowledge of Recent Developments in Education of the student-teachers. Professional Teacher Attitude, Utilisation of sources of Information relating to Recent Developments and the Grade Point Average of the student-teachers were viewed as related to student-teachers' Awareness and Knowledge of the Recent Developments in Education. How far did the student-teachers develop their Professional Teacher Attitude, Awareness and Knowledge of the Recent Developments, how much they had utilised the different Sources of Information and what was their performance level in the Theory part of the Courses as indexed by the Grade Point Average were some of the issues examined in this investigation. After a descriptive-cum-comparative-cum-evaluative discussion on these problems, the study attempted to predict the Awareness of Recent Developments, in Education and Knowledge of Recent Developments in Education of the B.Ed. and M.Ed. students, with

the knowledge of the other three educational variables, viz. utilisation of sources of Information, Professional Teacher Attitude and Grade Point Average of the B.Ed. and M.Ed. students, used as predictor variables with reference to this section of the study.

(B) THE VARIABLES :

B : 1 EDUCATIONAL VARIABLES :

Among the several educational variables that could be associated with B.Ed. and M.Ed. students, the following five were chosen for purposes of this investigation for reasons mentioned earlier and briefly recalled below:

(1) Awareness of Recent Developments in Education (ARDE):

There had been many significant Recent Developments in Education in the world at large as well as in India. Many changes in structure, pattern and mode of education had been taking place. So many curricular and organisational innovations had been undertaken in recent years. Several swifts in philosophy, policy and educational concepts have taken place in recent times. Student-teachers should be aware of a wide range of developments in education, so that they might be able to function effectively as teachers, after completing the B.Ed. and M.Ed. courses.

(2) Knowledge of Recent Developments in Education (KRDE) :

Besides developing a wide range of Awareness of Recent Developments in Education, the student-teachers should develop specific knowledge of certain Recent Developments that might be considered significant in the context of

Indian education and essential for the professional equipment of the student-teachers. The development of up-to-date professional knowledge in Education was viewed as one of the major educational requirements for teacher-education courses such as the B.Ed. and the M.Ed. and therefore this was chosen as one of the five educational variables, with which this study will be principally concerned.

(3) Utilisation of Sources of Information on Recent Developments in Education (USIRDE) :

In an era of tremendous developments in communication technology, plentiful Sources of Information could become available for developing Awareness and Knowledge in any field of professional concern. It was viewed, that B.Ed. and M.Ed. students should utilise the multiple Sources of Information that were available to them with respect to building Awareness and knowledge of Recent Developments in Education. Better utilisation of Sources of Information on Recent Developments could also promote development of right kind of Professional Teacher Attitude on the part of student-teachers and help in getting better Grades too. It was quite possible, that those cultivating right Professional attitude to teaching and Awareness of Recent Developments tended to make better use of Sources of Information. It was considered that B.Ed. and M.Ed. students should be educated and trained to make optimal utilisation of the many sources of Information; both inter-personal and multi-media so that they would be professionally suitably equipped. These considerations led to the choice of this educational variable as one of the five major concerns of this investigation.

(4) Professional Teacher Attitude :

The development of suitable attitude to one's profession had always been considered one of the chief purposes of any professional preparation course. This had become much more important educational requirement in teacher-preparation course, not only because teachers in schools deal with pupils of an impressionable age-group, but also the professional attitudes required for teaching had themselves been changing with changes in teacher's role in the process of education. The development of appropriate Professional Teacher Attitude on the part of B.Ed. and M.Ed. students had been viewed as one of the five educational variables in which this study would be interested.

(5) Grade Point Average (GPA) :

In university education, the level of achievement of the students had been considered as one of the worthwhile aspects for the success of that education. Within that context, In a system of Grades, Grade Point Average could be accepted as an index of level of over-all performance in the course. In this study Grade Point Average of B.Ed. and M.Ed. students was chosen as a variable to be studied, as a correlate of Awareness and Knowledge Students of Recent Developments in Education of the B.Ed. and M.Ed. students and study the nature of inter-relationship between Grade Point Average and the other four educational variables in the study.

B : 2 INSTITUTIONAL VARIABLES :

Two institutional variables, namely location and management

of the College of Education were chosen for this investigation for the reasons explained earlier in the first two chapters and briefly recalled below:

(1) The Location of the College of Education :

College of Education located in urban areas would have more Sources of Information related to Recent Developments in Education and therefore provide scope for more utilisation of Sources of Information by B.Ed. and M.Ed. students and lead to the development of better Awareness and Knowledge of Recent Developments in Education on their part. On the other hand, colleges of Education located in rural areas might have less Sources of Information on Recent Developments in Education and this might have its influence on the B.Ed. and M.Ed. students' Awareness and Knowledge of Recent Developments in Education. It was felt that location of the college of Education might have some significant effect on the student-teachers' Awareness and Knowledge of Recent Developments and therefore this independent variable was selected for this investigation.

(2) The type of management of the College of Education :

Some Colleges of Education were under Government Management and some others were under private/non-government management. The style of functioning between these two types of management was very markedly different with respect to selection of students for the B.Ed. and M.Ed. courses. The Government Colleges of Education had to follow an uniform Selection procedure while the non-government colleges had freedom to have their own selection procedures. It was expected that the college management could bring about difference to the Awareness and Knowledge of /

Recent Developments in Education of the B.Ed. and M.Ed. students and was therefore included as an independent variable in this study.

### B : 3 BIOGRAPHICAL VARIABLES :

Nine biographical variables with respect to the B.Ed. student sample and eight biographical variables regarding the M.Ed. student sample were chosen in this investigation as independent variables. Among the following nine biographical variables, the first eight were common for both the B.Ed. and M.Ed. samples and the last one was studied only with reference to the B.Ed. sample.

#### (1) Sex :

Sex had been an important variable in many studies relating to teachers and student-teachers and it could make a difference to the B.Ed. and M.Ed. Students' Awareness and Knowledge of Recent Developments in Education.

#### (2) Age :

On the basis of age, B.Ed. and M.Ed. students were classified into eight groups as follows : 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54 and 55-59.

#### (3) Level of General Education :

The level of general education of B.Ed. and M.Ed. students could make a difference to their Awareness and Knowledge of Recent Developments. On the basis of level of general education, the B.Ed. and M.Ed. students were classified into Graduates and Post-graduates in both the samples. In recent years, more post-graduates had been entering the B.Ed. and M.Ed. courses. Whether such post-graduates would have higher

Awareness and Knowledge of Recent Developments in Education could be examined in this study.

(4) Area of Specifisation :

Under area of specialisation, only two were considered: Whether the B.Ed. and M.Ed. students were Science or Arts graduates basically. The Calibre and study habits of these two groups could be different. This variable was included to see whether this made a difference to the Awareness and Knowledge of Recent Developments in Education of the Student-teachers.

(5) Personal Status :

There were only two categories of personal status : (1) Independent and (2) Dependent on parents/guardians. with reference to B.Ed. and M.Ed. students as included in this research.

(6) Socio-economic Status (SES) :

Socio-economic status was viewed as a trichotomous variable and B.Ed. and M.Ed. students were classified as High SES, Middle SES and Low SES. Since SES could make a difference in educational performance of students, this variable was included in this study.

(7) Financial Assistance for Studies :

B.Ed. and M.Ed. students were classified into two categories: (i) those in receipt of financial assistance for studies, & (ii) those not receiving financial assistance for studies.

(8) Teaching Experience :

This was viewed as a trichotomous variable for the purpose of



this research and B.Ed. and M.Ed. students were classified into three groups: (i) those without Teaching Experience (ii) those with less than 12 years Teaching Experience, and (iii) those with more than 12 years Teaching Experience. For those doing teacher-education course, Teaching Experience could be a significant variable to make a difference in their Awareness and Knowledge of Recent Developments in Education.

(9) Level of Achievement in Degree/Post-graduate degree course:

With reference to the B.Ed. sample, on the basis of their level of achievement in degree/post-graduate degree course, the B.Ed. students were categorised into two groups :

(i) those with First Class Degree/Post-graduate Degree and (ii) those with lower class Degrees. It was expected the possession of a First Class degree might make a difference in Awareness and Knowledge of Recent Developments in Education of the B.Ed. students and on that basis was selected as one of the independent variables included in this investigation.

B : 4 PLACEMENT OF VARIABLES IN THE STUDY :

In this investigation, there were five educational variables and among them Awareness and Knowledge of Recent Developments in Education of the B.Ed. and M.Ed. students were the criterion variables and the other three variables, viz. Utilisation of sources of Information, Professional Teacher Attitude and Grade Point Average of the B.Ed. and M.Ed. students taken for being examined as the correlates of Awareness and Knowledge of Recent Developments in Education.

There were two institutional variables associated with the B.Ed. and M.Ed. students and they were viewed independent variables. There were nine biographical variables associated with the B.Ed. students and eight such variables associated with the M.Ed. students, and they were also independent variables in this study.

The predictive study coming as the climax of this research was confined to the five educational variables only. Awareness and Knowledge of Recent Developments in Education of the B.Ed. and M.Ed. students as criterion variables were predicted using the other three educational variables, viz. Utilisation of sources of Information, Professional Teacher Attitude and Grade Point Average of the B.Ed. and M.Ed. students as the three predictor variables. The other independent variables viz. institutional and biographical variables of the B.Ed. and M.Ed. students were not cast into this predictive part of the study because this investigation was concerned in exploring the inter-relationships among these five educational variables, besides predicting Awareness and Knowledge of Recent Developments in Education of B.Ed. and M.Ed. students.

(C) SAMPLING :

C : 1 The Basis for Stratified Samples :

The two populations taken for this investigation were the B.Ed. and the M.Ed. students of the University of Madras in its affiliated colleges of Education during 1977-78. Using the technique of stratified sampling, B.Ed. and M.Ed. students were selected for the two samples. Stratification was made on the basis of two institutional variables, namely (i) the location of the college

of Education in urban or rural areas and (ii) the type of management of the college being government or non-government and (iii) the personal variable of sex of B.Ed. and M.Ed. students because these three variables were significant for studying the Awareness and Knowledge of Recent Developments in Education of the student-teachers. The urban colleges could have better and more Sources of Information for helping to build Awareness and Knowledge of the Recent Developments in Education on the part of student-teachers. The type of college-management was considered as an important variable, because the criteria for selection of student-teachers was different in government and non-government colleges. The government colleges followed certain government rules relating to giving representation to scheduled castes, backward classes and other condidates and the procedure for selection was the same in all government colleges. In the private-managed colleges of Education, they had large freedom in selecting candidates and hence there was no uniformity in selection of candidates in the private-management colleges.

The personal variable of sex was yet another significant variable in researches relating to school teachers and student-teachers. Therefore on the basis of the above mentioned two institutional variables and the personal variable of sex, stratification was effected and samples of B.Ed. and M.Ed. students were selected for the study.

C:2 SAMPLE OF B.Ed. STUDENTS :Table: 3.01 The Colleges of Education offering B.Ed. in the University of Madras constituting the population of the study and the sample selected :

	U R B A N				Total	R U R A L				Total	Grand Total
	Government		Non Government			Government		Non Government			
	Men	Women	Men	Women		Men	Women	Men	Women		
Popu- la- tion	3	2	1	5	11	2	Nil	1	Nil	3	14
Sample	1	2	1	2	6	1	Nil	1	Nil	2	5

As shown in Table : 3.01, out of 11 urban colleges of Education in the University of Madras 6 were selected and out of 3 rural colleges 2 were selected for the sample. Out of 7 Government colleges 5 colleges and out of 7 non-government colleges 3 colleges were selected for the sample (out of 7 non-government colleges 5 were women's colleges). Out of 7 men's colleges in the University 4 were selected, and out of 7 women's colleges 4 were selected for the sample. Totally out of 14 colleges of Education in the population, 8 were chosen for the sample by means of stratification based on two institutional variables and one biographical variable.

Table 3.02 B.Ed. students of the University of Madras during 1977-78:  
College-wise Number of Students in the Population and in  
the Sample :

Sl. No.	Colleges of Education in University of Madras	B.Ed. Student Population			B.Ed. Student Sample		
		Men	Women	Total	Men	Women	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	Meston Training College, Madras.	89	-	89	43	-	43
2.	Teachers' College, Madras.	173	-	173	75	-	75
3.	S.R.K.Vidyalays Teachers' College, Perianaickenpalayam Coimbatore.	100	-	100	37	-	37
4.	Govt. Training College, Orathanad.	63	-	63	-	-	-
5.	Govt. Training College, Komarapalayam.	91	-	91	69	-	69
6.	Govt. Training College, Pudukkottai.	105	-	105	-	-	-
7.	Govt. Training College, Vallore.	100	-	100	-	-	-
8.	Lady Willingdon Training College, Madras.	-	118	118	-	100	100
9.	N.K.T. Training College for Women, Madras.	-	72	72	-	-	-
10.	Stella Matutina College for Women, Madras.	-	99	99	-	88	88
11.	Govt. Training College for Women, Coimbatore.	-	110	110	-	95	95
12.	Sri Avinashilingam Training College for Women, Coimbatore.	-	131	131	-	-	-
13.	Sri Sarada Training College for Women, Salem.	-	94	94	-	-	-
14.	St. Christophers' Training College for Women Madras.	-	100	100	-	39	39
total ::		721	724	1445	224	322	546

With respect to Table 3.02, 546 B.Ed. students out of a population of 1,445 were selected and the B.Ed. student-sample constituted 37.8% of the B.Ed. student-population of the University of Madras.

Table 3.03 The B.Ed. students of the University of Madras :  
Percentage of students in different strata of the  
population and in the Sample :

Sl. No.	Strata	Percentage in popula- tion	Percentage in sample
1	2	3	4
1.	Students of urban colleges of Education:	82.4	80.6
2.	Students of rural colleges of Education:	17.6	19.4
3.	Students of Government Colleges of Education.	: 52.6	62.5
4.	Students of Non-government Colleges of Education.	: 47.4	37.9
5.	Men Students.	: 49.9	41.0
6.	Women Students.	: 50.1	59.0
7.	Students of Urban Government Colleges	: 41.9	49.4
8.	Students of Urban Non-government Colleges.	: 40.5	31.1
9.	Students of Rural Government Colleges	: 10.7	12.6
10.	Students of Rural Non-Government Colleges.	: 6.9	6.8
11.	Men Students of Urban Colleges.	: 32.3	21.6
12.	Women Students of Urban Colleges.	: 50.1	59.0

When the percentage of B.Ed. students in the different strata of the population was compared to the percentage of B.Ed. students in the different Strata of the sample, the percentages were found to be close as presented in Table:3.03 and hence the sample was very representative of the population.

On the basis of two institutional variables, and nine biographical variables, the percentage of students in the B.Ed. sample was presented in Table : 3.04.

Table : 3.04 Sample of B.Ed. Students - Certain Characteristics:

Sl. No.	Characteristics	No. of Students in the sample	Percentage in the sample
1	2	3	4
1.1	Colleges of Education Located in urban areas.	: 440	80.6
1.2	Colleges of Education located in rural areas.	: 106	19.4
2.1	Government Colleges of Education.	: 339	62.1
2.2	Non-Government Colleges of Education.	: 207	37.9
3.1	Men.	: 224	41.0
3.2	Women.	: 322	59.0
4.1	Age-groups : 20-24.	: 357	65.4
4.2	Age-groups : 25-29.	: 130	23.8
4.3	Age-groups : 30-34.	: 25	4.6
4.4	Age-groups : 35-39.	: 17	3.1
4.5	Age-groups : 40-44.	: 11	2.0
4.6	Age-groups : 45-49.	: 3	0.5
4.7	Age-groups : 50-54.	: 1	0.2
4.8	Age-groups : 55-59.	: 2	0.4
5.1	Graduates.	: 417	76.4
5.2	Post-graduates.	: 129	23.6
6.1	Science degree holders.	: 341	62.5
6.2	Arts degree-holders.	: 205	37.5
7.1	Independent of parents/guardian.	: 34	6.2
7.2	Dependent on parents/guardian.	: 512	93.7
8.1	High Socio-economic Status.	: 116	21.2
8.2	Middle Socio-economic Status.	: 256	46.9
8.3	Low Socio-economic Status.	: 174	31.9
9.1	Receiving financial assistance for studies:	167	30.6
9.2	Not receiving financial assistance for Studies.	: 379	69.4
10.1 (1)	Teaching experience in years 1 - 3	: 86	15.8
10.1 (2)	Teaching experience in years 4 - 6	: 11	2.0
10.1 (3)	Teaching experience in years 7 - 9	: 7	1.3
10.1 (4)	Teaching experience in years 10- 12	: 14	2.6
10.1 (5)	Teaching experience in years 13 -15	: 22	2.2
10.1 (6)	Teaching experience in years 16 -18	: 4	0.7
10.1 (7)	Teaching experience in years 19 -21	: 3	0.5
10.1 (8)	Teaching experience in years 22 -24	: 2	0.4
10.2	Without teaching experience.	: 407	74.5
11.1	First Class degree-holders.	: 146	26.7
11.2	Other than First class degree-holders.	: 400	73.3

As shown in Table : 3.04, about 90% of students in the sample were below 29 years of age. Nearly 75% of students did not have any teaching experience. It was worthy of note, that for every four graduates there was a post-graduate in the sample, and for every Arts graduate there were two Science graduates. One-fifths of the sample was from high socio-economic status and nearly one-third of the sample of students were receiving some form of financial assistance for their studies in the shape of a scholarship, stipend etc. Only about one-fourth of the sample of students were first-class degree holders and others had only lower class degrees. Most of them were of dependent status, depending on their parents or guardians.

C : 3 SAMPLE OF M.Ed. STUDENTS :

In the University of Madras, among the 14 colleges of Education, 11 were conducting the M.Ed. course. As seen in Table:3.05 out of 9 urban colleges, 6 were selected and both the rural colleges were selected for the sample. 5 out of 6 government colleges and 3 out of 5 non-government colleges were selected. Out of 6 men's colleges 5 and out of 5 women's colleges 3 were selected according to stratified sampling.

Table :3.05 The colleges of Education offering M.Ed. in the University of Madras, constituting the population and the sample selected:

U R B A N					Total	R U R A L					Total	Grand Total
<u>Government</u>		<u>Non-Govt.</u>				<u>Government</u>		<u>Non-Govt.</u>				
Men	Women	Men	Women			Men	Women	Men	Women			
Popula- tion.	3	2	1	3	9	1	Nil	1	Nil	2	11	
Sample.	2	2	1	1	6	1	Nil	1	Nil	2	8	



The College-wise number of men and women M.Ed. students both in the population and sample of the university of Madras had been presented in Table: 3.06.

The sample of M.Ed. students consisted of 78, constituting 65.5% of the M.Ed. student population in the university of Madras.

Table : 3.06 : The M.Ed. students of the University of Madras During 1977-78 : College-wise Number of students in the population and in the sample :

Sl. No.	Colleges of Education in Madras University	M.Ed. Student Population.			M.Ed. Student Sample.		
		Men	Women	Total	Men	Women	Total
1.	Meston Training College -Madras :	15	8	23	13	6	19
2.	Teachers' College - Madras. :	16	-	16	10	-	10
3.	S.R.K. Vidyalaya Teachers' College Perianaickenpalayam Coimbatore. :	18	3	21	14	3	17
4.	Government Training College Komarapalayam. :	8	-	8	8	-	8
5.	Government Training College Madras. :	7	1	8	-	-	-
6.	Government Training College Pudukkottai. :	8	-	8	7	-	7
7.	Lady Willingdon Training College-Madras. :	-	12	12	-	9	9
8.	Stella Matutina College of Education, Madras. :	-	1	1	-	1	1
9.	Government Training College for Women, Coimbatore. :	-	8	8	-	7	7
10.	Sri Avinashilingam Training College for Women, Coimbatore:	-	10	10	-	-	-
11.	St. Christophers' Training College for Women, Madras. :	-	4	4	-	-	-
TOTAL :		72	47	119	52	26	78

When the percentage of M.Ed. students in the different strata of the sample was compared with the percentage of students in the different strata of the population, the percentages were observed to

be close as seen in Table : 3.07 and hence the sample should be viewed as representative of the population.

Table: 3.07 : The M.Ed. Students of University of Madras :  
Percentage of students in different strata of the  
population during 1977-78 and in the sample :

Sl. No.	Strata of the M.Ed. student Population.	Percentage in Population	Percentage in sample
1	2	3	4
1.	Students of urban colleges of Education :	75.6	67.9
2.	Students of rural colleges of Education :	24.4	32.0
3.	Student of Government Colleges of Education. :	50.4	52.6
4.	Students of Non-government colleges of Education. :	49.6	47.4
5.	Men Students. :	60.5	66.7
6.	Women Students. :	39.5	33.3
7.	Students of urban Government Colleges. :	43.7	42.3
8.	Students of urban Non-government Colleges. :	31.9	25.6
9.	Students of rural Government Colleges. :	6.7	10.3
10.	Students of rural Non-government colleges. :	17.6	21.8
11.	Men students of urban colleges. :	46.2	46.2
12.	Women students of urban colleges. :	38.7	33.3
13.	Men students of government colleges. :	33.6	32.0
14.	Women students of government colleges. :	17.6	20.5

Certain characteristics of students M.Ed. in the sample based on two institutional variables and eight biographical variables were presented in Table : 3.08.

Table : 3.08 : Sample of M.Ed. Students - Certain Characteristics:

S.No.	Characteristics	No.of students in the sample	Percentage in the sample
(1)	(2)	(3)	(4)
1.1	Colleges of Education located in urban areas.	: 53	67.9
1.2	Colleges of Education located in Rural areas.	: 25	32.1
2.1	Government Colleges of Education.	: 41	52.6
2.2	Non-Government Colleges of Education.	: 37	47.4
3.1	Men.	: 52	66.7
3.2	Women.	: 26	33.3
4.1	Age Groups : 20-24	: 6	7.7
	25-29	: 13	16.7
	30-34	: 13	16.7
	35-39	: 21	26.9
	40-44	: 17	21.8
	45-49	: 7	9.0
	50-54	: 1	1.3
5.1	Graduates.	: 46	59.0
5.2	Post-graduates.	: 32	41.0
6.1	Science degree holders.	: 47	60.3
6.2	Arts Degree holders.	: 31	39.7
7.1	Independent of parents/guardian.	: 56	71.8
7.2	Dependent on parents/guardian.	: 22	28.2
8.1	High Socio-economic Status.	: 50	64.1
8.2	Middle Socio-economic Status.	: 19	24.4
8.3	Low Socio-economic Status.	: 9	11.5
9.1	Receiving financial assistance for study:	16	20.5
9.2	Not receiving financial assistance for studies.	: 62	79.5
10.1	(1) Teaching experience years 1 - 3	: 6	7.7
	(2) " " 4 - 6	: 4	5.1
	(3) " " 7 - 9	: 10	12.8
	(4) " " 10 - 12	: 9	11.5
	(5) " " 13 - 15	: 23	29.5
	(6) " " 16 - 18	: 10	12.8
	(7) " " 19 - 21	: 3	3.8
	(8) " " 22 - 24	: 1	1.3
	(9) " " 25 - 27	: 1	1.3
10.2	Without teaching experience.	: 21	26.9

According to Table : 3.08, one-third of the sample were women-students. Nearly 70% of M.Ed. students were below 40 years of

age. Nearly three-fourth of the students in the sample were having teaching experience and that proportion of students in the sample were also of independent status. The post-graduates in the sample were about 41%. Sixtypercent of the students had specialized in Science taching. Two-thirds of the students had high socio-economic status. When compared with the B.Ed. student-sample, M.Ed. students were by and large, older, more experienced in teaching and more of them so. Besides a larger percentage of them were independent and of high socio-economic status.

(D) TOOLS FOR THE INVESTIGATION : STANDARDISED TOOLS :

Two types of tools were used in this investigation :

(i) Standardised Tools and (ii) Tools specially designed and constructed for this study. Professional Teacher Attitude and Socio-Economic Status of B.Ed. and M.Ed. students were measured by standardised tools. Tools were specially designed in this research for studying B.Ed. and M.Ed. students' Personal and environmental variables, Awareness of Recent Developments in Education, Knowledge of Recent Developments in Education and utilisation of Sources of Information on Recent Developments in Education.

D : 1 Ahluwalia's Teacher Attitude Inventory (TAI) :

Teacher Attitude Inventory, standardised by Ahluwalia under Indian conditions was used for measuring B.Ed. and M.Ed. students' Professional Teacher Attitude. This was placed in Appendix I. The TAI is an attitude scale consisting of Six sub-scales for measuring the attitudes of prospective and practising teachers towards (i) teaching

(ii) class-room teaching (iii) child centered practices, (iv) educational process, (v) pupils and (vi) teachers. It is a Likert-type of a scale having five points, namely, strongly Agree, Agree, Undecided, Disagree, and Strongly Disagree. The TAI has 43 favourable items and 47 unfavourable items. There were 56 positive items, and 34 negative items in the inventory. It had totally 90 items. It had no time-limit, but it ordinarily took about 20 - 25 minutes. The TAI and the principles involved in scoring the same were placed in Appendix I.

The split-half reliability correlation Coefficient was 0.88. The Corrected Coefficients of test-retest reliability after interval of 3 and 9 months were 0.75 and 0.78 respectively. The validity of TAI was built up by selection of suitable items and appraisal of item validity had also been carried out with satisfactory results. The technique of "Stimulus" and known groups was used to establish validity. The mean scores of B.A. students not offering Education as an elective, prospective teachers (B.Ed. students both the time of admission and at the final stage of training) and practising teachers were compared and the scores were found to be increasing in the expected direction. The scores obtained on TAI were also found to correlate with the Indian Adaptation of Minnesota Teacher Attitude Inventory (Ahluwalia, 1976)

#### D : 2 SOCIO ECONOMIC STATUS SCALES :

The socio-economic status of urban B.Ed. and M.Ed. students was measured by Dr. B.Kuppuswamy's Scale. The socio-economic status of B.Ed. and M.Ed. students belonging to Rural families, was measured by the Scale of Dr.U.Pareek and G.Trivedi.

D:2:1 Socio-economic Status Scale (Urban) :

Dr. B. Kuppaswamy's Socio-economic Status Scale (Urban) had three aspects, namely education, occupation and income. The scale was revised in 1976 for weightage to income. The scale follows with weightage for items appearing in parantheses.

(A) EDUCATION :

1. Professional degree or Honours or M.A. and above. (7)
2. B.A. or B.Sc. degree. (6)
3. Intermediate or Post-High School Diploma. (5)
4. High School certificate. (4)
5. Middle School Completion. (3)
6. Primary School or Literate. (2)
7. Illiterate. (1)

(B) OCCUPATION :

1. Profession. (10)
2. Semi-profession. (6)
3. Clerical, shop-owners, farm-owners etc. (5)
4. Skilled worker. (4)
3. Semi-skilled worker. (3)
2. Unskilled worker. (2)
1. Unemployed. (1)

(C) INCOME :

1. Above Rs.2,000 per month (12)
2. Between Rs.1,000 and Rs.1,999. (10)
3. Between Rs.750 and Rs.999. (6)
4. Between Rs.500 and Rs.749. (4)
5. Between Rs.300 and Rs.499. (3)
6. Between Rs.101 and Rs.299. (2)
7. Below Rs.100. (1)

For Total Score Add A, B, and C

	<u>Total Score</u>	<u>SES Class</u>	<u>In this investigation</u>
S	26 - 29	I	) High Socio-economic status.
C	16 - 25	II	
A	11 - 15	III	Middle socio-economic status.
L	5 - 10	IV	) Low Socio-economic status.
E	Below 5	V	

The Scale's validity had been tested and reported to be satisfactory by its author based on methods such as (i) Matching against outside criterion; (ii) Distribution patterns of Socio-economic status and (iii) Comparison of dichotomous groups.

The responding B.Ed. and M.Ed. students, who were independent of their parents got <sup>SES purely on their</sup> ~~their~~ education, occupation and income. The students who were dependent on either parents or guardians got their SES based on parent/guardian's education, occupation and income. This was only with reference to students who were from urban families.

Dr.Kuppuswamy's scale classified socio-economic status into five categories. Since such a five-fold classification was not necessary in this investigation for purposes of comparing the performance of student-teachers of different socio-economic status on the five educational criteria, socio-economic status was classified into only three categories in the following manner: Class I and II of socio-economic status were treated as High Socio-Economic Status (High SES), Class III was treated as Middle Socio-Economic Status (Middle SES) and class IV and V were taken as Low Socio-Economic Status (Low SES).

D:2:2 SOCIO-ECONOMIC STATUS SCALE (RURAL) (SES(R)):

The Socio-economic status Scale of Dr.U. Pareek and G.Trivedi was utilised for measuring SES of Student-teachers from rural families. This Scale was incorporated in the student Information Blank (SIB). This tool covers nine aspects of a rural family, namely (i) Caste; (ii) Occupation; (iii) Education; (iv) Social participation; (v) Land; (vi) House; (vii) Farm-powers; (viii) Material possession and (ix) Family type. The SES Scale (Rural) is given below:

If your family is a RURAL FAMILY, complete the following:

(1) Caste : (encircle the appropriate number).

Scheduled caste	1	(3) Can read & write	2
Lower Caste	2	Primary	3
Artisan Caste	3	Middle	4
Agricultural caste	4	High School	5
Prestige caste	5	College	6
Dominant Caste	6		

(2) Occupation of family Head:

Labour	1
Caste occupation	2
Business	3
Independent Profession	4
Cultivation	5
Service	6

(4) Social Participation family head :

Social of one organisation	1
Member of more than one organisation.	2
Office holder	3
Wide public leader.	6

(3) Education of Family Head:

Illiterate	0
Can read only	1



(5) <u>Land :</u>		(8) <u>Material Possession :</u>	
No land	0	Bullock-cart	1
Less than 1 acre	1	Cycle	1
1 to 5 acres	2	Radio	1
5 to 10 acres	3	Chairs	1
10 to 15 acres	4	Improved Agricultural implements.	2
15 to 20 acres	5		
More than 20 acres	6	(9) <u>Family :</u>	
(6) <u>House :</u>		Type	
No home	0	Single	( )
Hut	1	Joint	( )
Katcha house	2	Size	
Mixed house	3	Upto 5	(1)
Pucca house	4	Above 5	2
Mansion	6	Distinctive features	2
(7) <u>Farm Power :</u>			
No drought animal	0		
1-2 drought animals	2		
3-4 drought animals or 1 or more prestige animal.	4		
5-6 drought animal or Tractor.	6		

The respondents were requested to give information regarding their rural families by encircling the appropriate scores against the items under the nine categories of information. A mere summing of these scores represented the total score of a respondent regarding his socio-economic status. The maximum score obtainable on the Scale is 53. The classification of SES is on the following basis:

<u>Scores of the Scale</u>	<u>Category</u>	<u>Symbol</u>	<u>In this Investigation</u>
Above 43	Upper class	A	High SES
33 - 42	Upper Middle Class	B	
24 - 32	Middle Class	C	Middle SES
13 - 23	Lower Middle Class	D	Low SES
Below 13	Lower Class	E	

The SES Scale (Rural) had been standardised on Indian sample. The Scale's reliability was found to be satisfactory since the co-efficient of stability by test-retest method was 0.87 and rho obtained was 0.93 on inter-judge reliability (Parak, Udai and Venkateswara Rao T.1974).

The content validity of the scale was established by the authors by the method of collecting items. The universe of the concept was covered widely and sampled through interviews with the various persons-farmers and other villagers, experts, outside persons knowing the villages well and Indian and foreign studies. They have also reported satisfactory concurrent validity for the tool. Construct validity was tested by the test of normality of distribution and by factor analysis.

The SES Scale (Rural) Classifies socio-economic status into five categories. As mentioned earlier with reference to Dr. Kuppaswamy's SES scale (urban), such a five-category classification was not necessary in this investigation for purposes of comparing the performance of student-teachers of different SES on the five educational criteria specified in this research, SES was

classified into three categories only in the following manner:

The first two classes, namely upper and upper Middle class were treated as one class called High SES, the Middle Class of the Scale was retained as Middle SES and the bottom two classes namely Lower Middle and Lower Class were combined as Low SES category.

(E) TOOLS FOR THE INVESTIGATION :  
Specially Designed Instruments:

E:1 Student Information Blank (SIB):

Student Information Blank (SIB) was constructed for B.Ed. and M.Ed. students. There were 18 items in all in this form and they related to the following particulars of the student-teachers:

- (i) College of Education; (ii) Course; (iii) Roll No. in the College (iv) Register Number in the University Semester Examination
- (v) Sex; (vi) Age; (vii) Highest academic qualification;
- (viii) First class or not in degree or post-graduate course
- (ix) Elective subjects in B.Ed. course; (x) Receipt of any financial assistance such as Scholarship/stipend etc.
- (xi) Teaching experience; (xii) Schol or College Level Teaching experience (xiii) Personal status such as Regular Student/Part-time Student/deputed to take the course etc. (xiv) Grades in B.Ed. Semester Examinations of the University; (xv) Elective subjects in M.Ed. and (xvi) three items relating to Socio-economic status. Vide Appendix II, Section I for the Student Information Blank (SIB).

E:2 MEASUREMENT OF AWARENESS :

E:2:1 A Taxonomical Approach :

In the Taxonomy of Educational Objectives (Affective Domain),

the following approach has been adopted for testing and measuring Awareness:

- (1) The essential behaviour to be measured at the Awareness level is whether the student is conscious of something; whether he is aware of the existence of some person, phenomenon, event or state of affairs. The notion of awareness carries with it a strong cognitive component. To be aware of something or of some one is certainly to know of it, even if the knowing is at the most superficial level conceivable. The major problem in testing for Awareness is to devise test-situations which allow awareness to emerge without any direct hint from the examiner that the object or phenomenon exists. Awareness can be tested by constructing less structured situations. As an example, a student may be asked to see a series of paintings one by one and describe what he sees. From his description, his awareness can be measured. If he does not mention certain characteristics of the paintings, it can not be inferred that he is unaware of them.
- (2) A more structured but less direct approach to testing for Awareness, for example, is to present 40 paintings at once to a student, requiring him to arrange the paintings in pairs with similar artistic properties. Essentially this is a sorting and matching task. At the awareness level, we are interested in knowing what he is attending to in these pictures. The examiner can develop a scoring scheme to measure his awareness.
- (3) Sharp clues for a testing strategy can often be suggested by those Awareness objectives which are stated with a high degree

of specificity, consider for example, this objective "Awareness of the importance of early recognition and treatment of behaviour problems of children. "This can be tested by asking a student to read statements of both normal and disturbed behaviours in the class-room and he is asked to assume that he is the teacher in the class-room and suggest action to be taken in response to each critical incident. If he suggests action only in cases of deviant behaviour his awareness is accepted, but if he suggests action in all cases, then it is presumed he does not have the awareness in question. A more structured form of this testing situation can be arranged by offering the student a list of five or six courses of action against each critical class-room incident after his reading he is asked to arrange in rank order from 'most desirable' to 'least desirable' courses of action. Appropriate procedures may be devised to score his awareness.

- (4) A more direct way of testing for Awareness is by means of simple information. In a test of that kind items should be simple and "easy" in terms of the age and experience-level of the students being tested. The influence of higher-order intellectual abilities and such other cognitive abilities as memory and inference should be kept to an absolute minimum in the response situation. As an illustration, "awareness of the existence of the chief statesmen" such as Churchill, Johnson, De Gaulle, Nasser, Mao, Khrushchev etc. whose photos appeared in the press in the last year and the student is required to write the names of

the statesmen underneath the photographs. The degree of awareness is proportionate to the number of photographs so identified. In case photographs are not available, another variation of the test can be tried. The student is presented some names of statesmen and some names of countries and he is required to match statesmen<sup>s</sup> with their countries.

- (5) Awareness can be tested and scored by asking True or False type of questions. Awareness of the works of famous musical composers may be tested by giving these statements and requiring True or False response.

- i) One of Bach's most celebrated compositions is the symphonic poem, "Death and Transfiguration."
- ii) Haydn was outstanding in the composition of string quartets and symphonies.
- iii) Mozart composed every type of music except opera.

- (6) Awareness of works in literature can be tested by the following matching type of question:

- |                                      |   |
|--------------------------------------|---|
| 1. In Man and Superman by Shaw (D).  | A. the hero's father has been executed.             |
| 2. In Emperor Jones' by O' Neill (B) | B. the hero had been a pull-man porter.             |
| 3. In Winterset' by Anderson (A)     | C. the hero is a white ruler of a South Sea Island. |
|                                      | D. the hero finally becomes engaged to the heroine. |
|                                      | E. the hero is finally hanged.                      |

#### E:2:2 Problems in Measurement of Awareness in the Taxonomical Way:

The problem in testing awareness is the designing of test situations which will allow awareness to emerge without

direct hint from the examiner that the objector phenomenon exists. When awareness is tested by less structured situations such as already given in the illustration i.e. the student is asked to describe what he sees, given a series of paintings, it cannot be said that the student is unaware of whatever he has not described of the paintings. That shows the difficulty in measuring awareness in less structured situations. This approach would not be suitable for measuring Awareness of Recent Developments in Education.

In a more structured, but less direct approach to testing awareness, the student, in the illustration cited earlier has to arrange in pairs given 40 paintings. The awareness of the student has to be measured by developing a scoring scheme. He is expected to conform to the standards of the test-designer in seeing certain characteristics in the paintings. Such students who are not conformistic in seeing these characteristics may not be getting fair scoring for their responses to this type of awareness test.

A student's awareness may be tested by giving him as many as six alternative courses of action, as illustrated earlier regarding treating 'behaviour problems' of children and he has to arrange from 'most desirable' to 'least desirable' course of action. This type of test mentioned in the Taxonomy is not just testing student awareness of behaviour problems of children but is testing more difficult and less concrete things such as the social values of the student.

In testing student-awareness of certain statesman the

student is required to write the names of statesmen under the photographs given or given two lists of statesmen and their countries he should match them correctly. This may not be a perfect way for testing awareness of statesmen. Student may know about Churchill though he might not have seen his photograph. In the second situation a student may match statesmen with their countries by guess or chance. Awareness can be tested and scored by asking true or false questions. This has all the weakness usually associated with True or False type of questions. Chance can play a more dominant role in this type of testing. Awareness may be tested by asking matching questions and this is a better way of testing awareness than the previous ones. Such test construction is difficult.

In this research, Awareness of Recent Developments in Education of the B.Ed. and M.Ed. students, testing approach was not adopted for the following reasons:

This study was interested to study Awareness of Recent Developments and Knowledge of Recent Developments in Education of the B.Ed. and M.Ed. students at the same time. If a test, using matching type of test items had been used for testing awareness of the student-teachers regarding the 130 items under Recent Developments in Education, it would have been a long test and it could itself contribute to their Knowledge of Recent Developments. In the design of this research, it was planned to study and measure the Awareness and Knowledge of Recent Developments of the B.Ed. and M.Ed. students at the terminal stage of the course. It was therefore decided that Awareness would be measured by the



student-self-judging and rating given the list of Recent Developments, while Knowledge of Recent Developments would necessarily be measured by an objective Test. The details regarding the approach adopted for the measurement of Awareness in this study would be discussed in the next paragraph.

### E:2:3 Measurement of Awareness in this Study :

In this research, student-teachers' Awareness of Recent Developments in Education was measured by a five point Rating Scale and it was assumed that they were capable of self-judging their awareness of 130 Recent Developments in Education at the terminal stage of the B.Ed. and M.Ed. courses. A Rating Scale was viewed to be the appropriate tool because the respondents were professional course students, the list of items to be marked was long, and the time of administration of the tool was at the terminal stage of the course when students need not present themselves in a very desirable way by faking and above all the construct involved in awareness demanded least suggestion or clue other than the list included in the Rating Scale.

### E : 3 Rating Scale for Measuring Awareness of Recent Developments in Education (RSARDE) :

E:3:1 Tool Development - First Tier :  
The Rating Scale on Awareness of Recent Developments in Education was prepared in a three-tier research process as given below:

In the first tier, the research made an extensive and comprehensive survey of literature, which included Books, journals, periodicals, research abstracts, Encyclopaedias, Year books of Education, Conference Souvenirs, Seminar

Reports, newspaper articles and many other sources, Discussions and consultations with educational leaders were held by the researcher on Recent Developments in Education during visits to progressive educational institutions in India, Sri Lanka, the United Kingdom and the Republic of Ireland. The rich experience of the researcher in education in India and abroad and the experience of participating and conducting conferences, seminars and workshops stood in good stead in the collection of items of Recent Developments in Education. While identifying items, (care was taken for including items that could be considered as developments only. Further such developments should be of recent significance. It was quite possible that such developments might not have originated in the Indian soil but they were considered, if in some respects they had influenced Indian education conceptually or operationally or both. Certain developments might not have originated recently, wherever they had originated, but they were considered only if they happened to influence Indian education in recent years.

In this process at the first tier of research, a list of Recent Developments in Education with 204 items was prepared and this would be known as List I in the subsequent pages of this study, List I Recent Developments in Education was placed in Appendix V.

#### E:3:2 Tool Development - Second Tier :

In the Second-tier of the research, outstanding experts in education were consulted for judging the relevance and significance of the items of Recent Developments in Education, as included in List D. Hence, an eminent Jury of five experts in

education consisting of both men and women were chosen. These experts had done considerable work in India and had travelled a lot, studied researched and taught in other countries. It was expected that they had a definite perspective of the Indian education. The Jury of experts was consulted for the triple purpose of getting their (i) classification of the 204 items in List I of Recent Developments in Education into twelve or more categories; (ii) rating of these items of Recent Developments in Education for their significance in Indian education on a five point scale and (iii) suggestion of further items to List I of Recent Developments in Education. The instructions given to the Jury in this regard was placed in Appendix V.

The Jury of experts was given the following suggestive list of twelve categories together with their respective codes for the purpose of classifying items of Recent Developments in Education:

(1)	Education and the State	:	ES
(2)	Education and the Teachers	:	ET
(3)	Educational Psychology	:	E Psy
(4)	Educational Management and Administration	:	EMA
(5)	Teaching and Learning Methods	:	TL
(6)	Educational Evaluation	:	EE
(7)	Education and the Curriculum	:	EC
(8)	Education and the Community	:	E Com
(9)	Educational Reports	:	ER
(10)	Educational Planning	:	EP
(11)	Educational Literature	:	EL
(12)	Educational Agencies	:	EA

For rating the 204 items of Recent Developments on their significance, the Jury of experts was provided with the following scoring principle:

Strongly significant	Score of 4
Somewhat significant	Socre of 3
Un-certain	Socre of 2
Not significant	Score of 1
Not at all significant	Score of 0

They were requested to suggest further additions to the List of Recent Developments in Education and use new categories of their own for classifying the items given.

The written responses of the members of the Jury were tabulated and each one of them was consulted intensively thereafter. These consultations were very illuminating and they helped in further classification of the items into Sub-Categories within the broad twelve categories and also in deciding ultimately whether to retain or reject an item. Appendix VI gives particulars on the classification of 204 items into categories and sub-categories and item mean significance score based on Jury-judgement. Items that got less than 2.60 mean score in Jury-rating, and items that were not considered relevant to the Indian situation and items that were not very significant or recent in the view of one or more members of the Jury were deleted/rejected. From 204 items in List I of Recent Developments in Education only 176 were selected for inclusion in List II of Recent Developments in Education. Vide Appendix VII for particulars relating to specific reasons for rejecting or dropping 28 items, based on Jury-rating and Jury-judgement.

Table : 3.09 : The titles of categories and sub-categories of Recent Developments in Education in the Finalised List.II, and their Corresponding Codes and the number of items included therein.

Category No.	Code	Titles of Categories and Sub-Categories	Total Items in sub-categories	Total Items in the categories
(1)	(2)	(3)	(4)	(5)
1	E S	Education and the State		8
	E S.A	Matters of State Policy	5	
	E S.B	National Schemes for the Talented	3	
2	E T	Education and the teachers		10
	E T.A	Teacher Development	5	
	E T.B	Quality Control of teaching	2	
	E T.C	Professionalism of teachers	3	
3	E Psy	Educational Psychology		7
4	EMA	Educational Management & Administration		23
	EMA.A	Conceptual Stage	12	
	EMA.B	Practice Stage	11	
5	TL	Methods of Teaching and Learning		25
	TLA	Educational Technology	10	
	TL.B	Focussed on the Learner	9	
	TL.C	Focussed on the Group	3	
	TL.D	Focussed on the Teacher	3	
6	EE	Educational Evaluation		25
	EE.A	Conceptual Dimension	10	
	EE.B	Administrative Dimension	11	
	EE.C	Statistical Dimension	4	
7	EC	Education and the Curriculum		9
8	E Com	Education and the Community		13
	E Com.A	New Outlook	4	
	E Com.B	The Education System's Response to Community-Needs	6	
	E Com.C	Community Support for Education	3	
9	E R	Educational Reports		8
	E R.A	National	3	
	E R.B	British	4	
	E R.C	American	1	
10	E P	Educational Planning		21
	E P.A	Policy and Planning	3	
	E P.B	Approaches to Planning	4	
	E P.C	Plan	6	
	E P.D	From Planning to Implementation	7	
11	EA	Educational Agencies		17
	EA.A	State Level	4	
	EA.B	Regional Level	3	
	EA.C	National Level	8	
	EA.D	International Level	2	
Total in the List			176	176

Table 3.09 has shown that nine out of twelve categories have sub-categories. The number of items range from 7 to 25 in the categories.

E:3:3 Tool Development - Third Tier :

In the third-tier of the research-process for constructing the Rating Scale for Awareness of Recent Developments in Education, the teacher-educators of the university of Madras were requested to determine by rating the Significance of the items in List II. There were in all 134 teacher-educators in the University of Madras taking into account the fourteen affiliated colleges of Education and the University Department of Education and the University Department of Adult and Continuing Education. The researcher approached all of them personally in their respective places and sought their assistance in Rating the Significance of the 176 items in List II Recent Developments in Education.

Table : 3.10 : The Population of Teacher-Educators and the responding sample in the University of Madras.

S.No.	Name of the Institution	Number of educators population	Teacher-in the and sample
(1)	(2)	(3)	(4)
1	Meston Training College, Madras 14	: 10	10
2	Teachers' College, Saidapet, Madras 15	: 15	15
3	Lady Willingdon Training College for Women, Madras.5.	: 12	12
4	N.K.T. Training College for Women, Madras 5.	: 6	6
5	St.Christophers' Training College for Women, Madras.	: 9	7
6	Stella Matutina College of Education, Madras-4.	: 9	9
7	Government Training College for Women Coimbatore.	: 10	7
8	Sri Avinashilingam Training College for Women, Coimbatore.	: 8	7
9	S.R.K. Vidyalaya Teachers' College, Perianaickenpalayam.	: 8	6
10	Government Training College, Orthanad.	: 8	6
11	Government Training College, Pudukkottai.	: 10	8
12	Government Training College, Komarapayam, Salem Dt.	: 8	6
13	Sri Sarada Training College for Women Salem 4.	: 8	5
14	Government Training College, Vellore	: 8	7
15	University Departments of Education & Adult and Continuing Education.	: 5	5
TOTAL		: 134	114

114 teacher-educators from a population of 134,  
approximating to 85% of the population of teacher-educators in

in the University of Madras had constituted the data producing sample, as presented in Table: 3.10. Since the researcher had met every one of them personally for handing over the Rating Scale on Recent Developments in Education and after a week had personally collected the completed forms, there was ample scope for feedback from most of them and these discussions were found helpful in studying the awareness and Knowledge of Recent Developments in Education of B.Ed. and M.Ed. students.

The investigator gave every teacher-educator the Rating Scale for determining the significance of the 176 items of the Recent Developments in Education. Vide Appendix VIII, for the same. A five point rating scale was used with the scoring principle as given below:

Strongly significant	Score of 4
Somewhat significant	Score of 3
Uncertain	Score of 2
Not Significant	Score of 1
Not at all Significant	Score of 0
I myself do not know this item	X

The teacher-educators were requested to encircle X in the case of items that they did not know themselves. Vide Appendix IX for particulars regarding the number of teacher-educators responding and rating each item of Recent Development, the total significance score and average significance score for each one of the 176 items and each one of the 12 categories of the Recent Developments. Out of 176 items, 130 items secured a mean significance score of 3.00 or more on the basis of the ratings made by the teacher-educators of the University of Madras. Vide Appendix X for items selected or



rejected for inclusion in the Rating Scale of Awareness.

E:3:4 The Rating Scale for Awareness of Recent Developments in Education for B.Ed. and M.Ed. Students (RSARDE) :

In the actual RSARDE, against the list of items of Recent Developments, the five point rating scale of Awareness had been provided as 0 1 2 3 4 and the student-teacher was required to encircle the appropriate number/score for each item.

Vide Appendix II Section II for the Rating Scale on Awareness of Recent Developments in Education (RSARDE).

The Awareness score of a student-teacher could be obtained by merely adding all the encircled scores in the RSARDE. The maximum obtainable score was  $130 \times 4 = 520$  only. In this study, the raw awareness scores were converted as percentage scores.

E:3:5 Psychometric Properties :

The Rating Scale for Awareness of Recent Developments in Education was meant for both the B.Ed. and M.Ed. student sample, so that it would facilitate a comparative study of their Awareness. The psychometric properties such as reliability and validity were established separately for the two groups.

(1) RELIABILITY :

The reliability of the Rating Scale for Awareness of Recent Developments in Education was established by using the Split-half method for the B.Ed. and the M.Ed. samples separately and after the application of the Spearman Brown prophecy formula the reliability coefficients were 0.99 and 0.97 for the two samples respectively.

(2) VALIDITY :

(a) Content Validity :

As described earlier, the Rating Scale for Awareness of Recent Developments in Education (RSARDE) was developed in a three-tier research. To recall briefly in the first tier of research by consulting literature, leaders in education and visits to progressive institutions in India and abroad, List I Recent Developments in Education with 204 items was prepared. In the second tier of the research, a Jury of experts rated the significance of the items in List I and based on that List II Recent Developments in Education with only 176 items emerged as relevant and significant to Indian conditions. In the third tier of research, teacher-educators of the University of Madras rated items in List II for their significance for the B.Ed. student population and following this List III Recent Developments in Education was evolved and only 130 items qualified and they were incorporated in the Rating Scale of Awareness of Recent Developments. Since the B.Ed. and M.Ed. samples had to be compared for their Awareness of Recent Developments in Education, the same tool was used for both the samples. Content validity of the tool was carefully built by the strenuous process of perfecting the List of Recent Developments in Education to match the target group of student-teachers.

(b) Concurrent Validity :

The Rating Scale for Awareness of Recent Developments in Education was found to have concurrent validity for both the B.Ed. and M.Ed. samples because (i) the coefficient of correlation by the product moment method between Awareness of

Recent Developments in Education and Utilisation of the Sources of Information on Recent Developments was  $r = 0.28$  ( $P < .01$ ) in the B.Ed. sample and was  $r = 0.39$  ( $P < .01$ ) in the M.Ed. sample.

(c) Construct Validity :

Construct Validity might be defined as the extent to which test performance could be interpreted in terms of certain psychological constructs. The process of determining construct validity involved the following steps:

- (i) Identifying the Constructs presented to account for test-performance.
- (ii) Deriving hypotheses regarding test performance from the theory underlying the construct.
- (iii) Verifying the hypothesis by logical and empirical means.
- (iv) Comparing the performance of known groups on the test.

The hypothesis based on the theory underlying the construct of awareness was that Awareness of Recent Developments in Education would be reciprocally related to student-teachers' exposure to multiple Sources of Information on Recent Developments. This was verified in this research and the intercorrelation between Awareness of Recent Developments in Education and the Utilisation of Sources of Information on Recent Developments was significant at .01 level in both B.Ed. and M.Ed. Student samples.

Besides the Rating Scale on Awareness of Recent Developments in Education brought about normality in distribution of the Awareness scores in both B.Ed. and M.Ed. student-samples.

E:4 CHECK LIST FORMeasuring Utilisation of the Sources of Information (CLUSI):E:4:1 Techniques for Measuring Utilisation of Sources:

For this purpose of measuring the Utilisation of Sources of Information for Awareness-knowledge of Recent Developments in Education, it was thought that a check-list would be appropriate. In a check-list all the 130 items of Recent Developments could be mentioned and the sources of Information may be readily given, and the required response from the student-teachers was simply making circle marks on the sources they had used. There was no need for B.Ed. and M.Ed. students at the terminal stage of their courses to give false responses in this matter and it was expected they could give true responses. Other methods that could be thought for data collection were from Records of the College, through Interview with student-teachers or tests of Utilisation of the Sources of Information. Since the sample was large and located in different Colleges of Education and the List of Recent Developments in Education had 130 items and ten Sources of Information were covered, these alternate methods of collecting data might have been uneconomical generally. When each method was considered specifically, it was felt the college records such as Library Attendance Register and Book Issue Register might give only partial data regarding some sources only. Records may not be a feasible method of collecting data regarding the use of Mass Media Sources such as The Press, The Radio, and The T V etc. Records might not be available for data regarding utilisation of college faculty (informally) and class-mates. The Method of Interview would mean a lot of time for data-collection and since the sources of Information had to be mentioned for all the 130 items of Recent Developments, it would have been monotonous from

the point of view of the student-teachers. Testing the Utilisation of Inter-personal Sources of Information particularly would have been a fruitless method of collecting data in this subject. When something could be done simply, economically and without compromising with truth, other alternative ways of data collection may not be necessary. It was therefore decided that the problem being what it was, the checklist would prove adequate as a data gathering device.

#### E:4:2 Preparing the Tool :

A checklist for Utilisation of the Sources of Information was prepared with the same List III of Recent Developments in Education, as was there in the Rating Scale on Awareness of Recent Developments in Education and the following ten Sources of Information were included:

- (i) The College faculty - formally.
- (ii) The College faculty - informally.
- (iii) Class-mates
- (iv) School Contacts.
- (v) College library-reading.
- (vi) Public library-reading.
- (vii) The Press.
- (viii) The Radio.
- (ix) The TV.
- (x) Others.

These ten Sources of Information were given against the items of Recent Developments in the numerical form as 1 to 10 sources, and the student-teachers were required to encircle the appropriate numbers representing the Sources of Information against each

ITEM of Recent Development in Education. It was envisaged that the student-teacher should be able to indicate as many Sources of Information as he had utilised for building his awareness-Knowledge of the 130 Recent Developments in Education. In this system of multiple marking of the Sources, out of the ten mentioned for the check-list, the maximum possible score could be  $130 \times 10 = 1300$ .

E:4:3 (1) Psychometric Properties :

The Check-list on utilisation of Sources of Information on Recent Developments in Education was prepared as a tool to be used commonly for both the B.Ed. and M.Ed. student-samples, so that it would be convenient to make a comparative study at the two levels of teacher-education. The Psycho-metric properties of the tool such as reliability and validity were established separately for B.Ed. and M.Ed. samples.

(1) Reliability :

The reliability of the check-list was established by the split-half method for the two samples separately. After the application of Spearman Brown prophecy formula, the reliability Coefficients were 0.99 for the B.Ed. and 0.97 for the M.Ed. sample.

(2) Validity :

(a) Content Validity :

The checklist of utilisation of the Sources of Information for Awareness-Knowledge relating to Recent Developments in Education had incorporated List III Recent Developments in

the same way as the Rating Scale of Awareness of Recent Developments and therefore the tool had content validity for both the samples of B.Ed. and M.Ed. students. The ten Sources of Information included in the checklist were based on a critical review of related research and the professional experience of the researcher in dealing with M.Ed. Classes for years.

(b) Concurrent Validity :

The Concurrent validity of the Checklist on Utilisation of Sources of Information was determined by the product-moment inter correlation between utilisation of Sources and Awareness of Recent Developments in Education ( $r_{42}$  was 0.28 and  $P < .01$  in the B.Ed. sample and  $r_{42}$  was 0.30 and  $P < .01$  in the M.Ed. sample) and the inter-correlation between Utilisation of Sources of Information and Knowledge of Recent Developments in Education ( $r_{43}$  was 0.30 and  $P < .01$  in both B.Ed. and M.Ed. student samples).

(c) Construct Validity :

It was hypothesised that utilisation of Sources of Information on Recent Developments by B.Ed. and M.Ed. students would be related significantly to their Awareness and Knowledge of Recent Developments in Education. These two hypotheses were tested and established with .99 confidence level in both the samples. Therefore, the tool had construct validity for B.Ed. and M.Ed. groups.

## E:5 MEASUREMENT OF KNOWLEDGE :

In this research, the knowledge of Recent Developments in Education of the student-teachers had been measured, following the Taxonomical Approach of Bloom et al. (1956).

In the Taxonomy of Educational objectives (Cognitive Domain), the knowledge category consists of nine sub-categories. Based on the Taxonomy, these sub-categories are defined and described below, two illustrative educational objectives and one specimen test-item are offered below with reference to each one of the sub-categories.

### E:5:1 Testing of Knowledge of Terminology :

#### (1) Difining Knowledge of Terminology :

Each field contains a large number of symbols, either verbal or non-verbal, which have particular referents. These represent the basic language of the field the shorthand used by the workers in a field to express what they know.

#### (2) Illustrative Objectives :

- (i) To define technical terms by giving their attributes, properties or relations.
- (ii) Knowledge of important accounting terms.

#### (3) Test Item :

A synapse may be described as :

- (a) a mass or layer of protoplasm having many nuclei but lacking distinct cell boundaries.
- (b) a lapse of memory caused by inadequate circulation of blood to the brain.
- (c) the pairing of material with paternal chromosones



during maturation of the germ cells.

(d) the long cylindrical portion of an axon.

(e) the point at which the nervous impulse passes from one neuron to another.

**E:5:2 Testing - Knowledge of Specific Facts :**

**(1) Defining Knowledge of Specific Facts :**

Knowledge of dates, events, persons, places, sources of information etc.

**(2) Objectives :**

(i) Knowledge of Physical and chemical properties of common elements and their compounds.

(ii) Acquiring information about major natural resources

**(3) Test Item :**

A cesidium differs from a sodium atom in that

(a) it is an isotope of sodium.

(b) it is more reactive.

(c) it has a positive charge on its nucleus.

(d) it exists only in solution.

(e) it has fewer electrons.

**E:5:3 Testing - Knowledge of Conventions :**

**(1) Defining Knowledge of Conventions :**

Knowledge of characteristic ways of treating and presenting ideas and phenomena - These are the usages, styles, and practices which are employed in a field because the workers find they suit their purposes or because they appear to suit the phenomena with which they deal.

(2) Illustrative Objectives :

- (i) Familiarity with the forms and conventions of the major types of works, e.g. verse, plays, scientific papers, etc.
- (ii) Knowledge of the standard representational devices and symbols in maps and charts.

(3) Test Item :

Magnetic poles are usually named:

- (1) Plus and Minus.
- (2) Red and Blue.
- (3) East and West.
- (4) North and South.
- (5) Anode and Cathode.

E:5:4 Testing Knowledge of Trends and Sequences :(1) Defining Knowledge of Trends and Sequences:

Knowledge of the processes, directions, and movements of phenomena with respect to time...It includes trends as attempts to point up the interrelationship among a number of specific events which are separated by time. It also includes representations of processes which may involve time as well as Causal interrelations of a series of specific events.

(2) Illustrative Objectives :

- (i) To develop a basic knowledge of the evolutionary development of man.
- (ii) To develop a knowledge of how hereditary and environmental factors interrelate to influence the development of the individual.

(3) Test Item :

The stages in the life-history of the housefly are, in order

- (a) larva-egg-pupa-adult.
- (b) pupa-larva-egg-adult.
- (c) pupa-egg-larva-adult.
- (d) egg-larva-adult-pupa.
- (e) egg-larva-pupa-adult.

E:5:5 Testing of Knowledge of classifications and categories;

(1) Defining Knowledge of Classifications and categories:

Knowledge of the classes, sets, divisions, and arrangements which are regarded as fundamental or useful for a given subject field, purpose, argument or problem.

(2) Illustrative Objective :

- (i) To recognise the area encompassed by various kinds of problems or materials.
- (ii) Knowledge of the features of various forms of business ownership.

(3) Test Item :

The branch of biological science which deals with the structure of living organism is called.

- (a) Physiology.
- (b) Pathology.
- (c) Ecology.
- (d) anatomy.
- (e) embryology.

E:5:6 Testing - Knowledge of Criteria :(1) Defining Knowledge of Criteria :

Knowledge of the criteria by which facts, principles, opinions and conduct are tested or judged.

(2) Illustrative Objectives :

- (i) Knowledge of the criteria by which a valid source of information in the social sciences can be recognised.
- (ii) Knowledge of the basic elements (balance, unity, rhythm etc.) which can be used to judge a work of art.

(3) Test Item :

In the view of John Ruskin, the greatest picture is

- (a) that which imitates best.
- (b) that which teaches most.
- (c) that which exhibits the greatest power.
- (d) that which conveys the greatest number of the greatest ideas.

E:5:7 Testing - Knowledge of Methodology :(1) Defining - Knowledge of Methodology :

Knowledge of the methods of inquiry, techniques, and procedures employed in a particular subject field as well as those employed in investigating particular problems and phenomena.

(2) Illustrative Objectives :

- (i) Knowledge of scientific methods for evaluating health concepts.
- (ii) Knowledge of the techniques and methods used by scientists in seeking to answer questions about the world.

(3) Test Item :

One use of the Periodic Table has been to

- (a) determine the solubility of gases.
- (b) find the degree of ionisation of many compounds.
- (c) Predict undiscovered elements.
- (d) determine molecular weights of compounds accurately.

E:5:8 Testing-Knowledge of Principles and Generalisations :(1) Defining Knowledge of Principles and Generalisations:

Knowledge of particular abstractions which summarise observations of phenomena.

(2) Illustrative Objectives :

- (i) Knowledge of biological laws of reproduction and heredity.
- (ii) To develop an understanding of such basic biological principles as cell theory, osmosis, and photosynthesis.

(3) Test Item :

If the volume of a given mass of gas is kept constant, the pressure may be diminished by

- (a) reducing the temperature.
- (b) raising the temperature.
- (c) adding heat.
- (d) decreasing the density.
- (e) increasing the density.

E:5:9 Testing-Knowledge of Theories and Structures :(1) Defining-Knowledge of Theories and Structures:

Knowledge of the body of principles and generalisations together with their interrelations which present a clear, rounded and systematic view of a complex phenomena, problem or field.

(2) Illustrative Objectives :

- (i) To understand the basic structural organisation of the local city government.
- (ii) Knowledge of a relatively complete formulation of the theory of evolution.

(3) Test Item :

Directions : The test item is concerned with possible evidence in support of the theory of biological evolution. Select from the key list the category to which the evidence mentioned in the item belongs.

The human heart has two chambers at a very early developmental stage.

- (a) comparative anatomy.
- (b) comparative physiology.
- (c) classification.
- (d) Embryology.
- (e) Paleontology.

E : 6 TEST ON KNOWLEDGE OF RECENT DEVELOPMENTS IN EDUCATION (TKRDE):

The TKRDE was prepared following the following steps:

E;6:1 Construction of TKRDE :

Rating the Essentiality of the Knowledge of Recent Developments by Teacher-educators :

The Teacher-educators of the university of Madras were requested to rate the essentiality of items of Recent Developments in Education of List II from the point of view of the target population of the B.Ed. students on a five point scale with the scoring principles as given below:

The B.Ed. student ought to know <u>completely</u>	4
The B.Ed. student is expected to know <u>a good deal</u>	3
The B.Ed. student is expected to know <u>something</u>	2
The B.Ed. student may happen to know about <u>its mere existence</u>	1
The B.Ed. student <u>need not know</u> even about its mere existence	0

This rating of essentiality of items, they carried out while they rated the significance of the items, as mentioned earlier. Vide Appendix IX for particulars regarding the number of teacher-educators responding and rating each item of Recent Development, the total essentiality score and average essentiality score for each one of the 176 items and each one of the 12 categories of Recent Developments. Only 55 items secured a mean essentiality score of 3.00 or above. Since it was designed to test the B.Ed. students on the knowledge of the items of Recent Developments declared essential to them by the teacher-educators of the University, it was viewed that a Test of 55 items might not represent an adequate sample of the Recent Developments in Education. This led to accepting the mean essentiality score of 2.90 for an item for being included in the proposed Test and with 2.90 as the cut-off point, 69 items became eligible. Vide Appendix XI for items selected for inclusion in the Test of Knowledge of Recent Developments.

It was found that the teacher-educators had freely and frankly admitted when they did not happen to know certain items in the List of Recent Developments in Education. Out of a total of 176 items, 32 items were not known to more than 10% of the

teacher-educators in the sample and among them 15 items were not known to more than 20% of the teacher-educators in the sample. A detailed report on the background of the teacher-educators and their rating of Recent Developments for their significance and essentiality including the details regarding items not known to more than 20% of teacher-educators had been given in Appendix XII.

**E:6:2 Construction of an Objective Pilot Test on Knowledge of Recent Developments in Education - Planning Aspect :**

As judged by the teacher-educators, the knowledge of 69 items of Recent Developments in Education was considered essential for B.Ed. students. The particulars of items so selected were placed in Appendix XI. The Knowledge of B.Ed. students in this respect needed to be tested objectively. It was designed that the test should be only at the knowledge Level. The Taxonomical Approach of Bloom et al had been followed in test-construction in this research. The following nine sub-categories of Bloom's knowledge category had been used here:

- (1) Knowledge of Terminology.
- (2) Knowledge of Specific Facts.
- (3) Knowledge of Conventions.
- (4) Knowledge of Trends and Sequences.
- (5) Knowledge of Classifications and Categories.
- (6) Knowledge of Criteria.
- (7) Knowledge of Methodology.
- (8) Knowledge of Principles and Generalisations.
- (9) Knowledge of Theories and Structures.

At the time of test-construction, it was anticipated that some of the test-items might need to be dropped on the basis of rigorous



item-analysis of the Test. Therefore by way of abundant caution, instead of preparing 69 items, actually 99 were prepared. For 41 items of Recent Developments in Education, there were straight single test items available in the Test, for 28 items of Recent Developments there were duplicate test items in the Test and for only one item of Recent Development there were quadruplicate test-items available in the Test. The details regarding the 69 items of Recent Developments in Education for which single, duplicate and quadruplicate test items were included in the Pilot Test of knowledge of the Recent Developments in Education had been placed in Appendix XIII.

E:6:3 Taxonomical Classification of the Items of the Pilot Test by Expert Judges :

The Pilot Test on knowledge of Recent Developments in Education was submitted to a Panel of five expert judges who were outstanding in the field of Educational Evaluation at the University education level and they were requested to do the following five functions:

- (1) Review each test item critically and edit, if necessary.
- (2) Identify the item of Recent Development, the knowledge of which was being tested by each test item, given a copy of List II of Recent Developments in Education by writing the item number of List II against the item number of the Test.
- (3) Classify each Test-Item, broadly within the framework of Bloom's Taxonomy to the nine Sub-Categories in the Category of knowledge in the cognitive Domain of the Taxonomy.
- (4) Identify the best answer out of the four choices provided

for every test-item.

- (5) Estimate the difficulty level of each test item, using the numerical score of a three point scale: 3-Difficult; 2-Appropriate; 1-Easy.

Vide Appendix XIV for full particulars regarding the Instructions to Expert Judges (Educational Evaluation) for perfecting the Pilot Test on knowledge of Recent Developments in Education. The judges identified quite perfectly the items of Recent Development, the knowledge of which was being tested by each test item by consulting a copy of List II of Recent Developments in Education by marking the item number of List II against the item number of the Test. In the matter of classifying the test items, however it was found to be different. Out of 5 expert judges all the five experts agreed in 33 out of 99 test items, four experts agreed in classifying another 27 test items, three experts agreed in classifying another 31 test items, and there was no majority agreement in classifying the rest of 8 items.

Table 3.11 : Classification of Pilot Test items in terms of Bloom's Taxonomy of Educational Objectives (Cognitive):

Judges in Agreement	The nine Sub-Categories in Knowledge Category									Total
	1	2	3	4	5	6	7	8	9	
Five	2	14	-	8	-	5	2	2	-	33
Four	-	7	-	5	2	5	3	4	1	27
Three	3	4	-	4	1	10	2	6	1	31
Two	-	1	-	2	2	-	1	-	2	8
	5	26	-	19	5	20	8	12	4	99

Vide Appendix XV for details of classification of the Pilot test-items on the basis of expert judgement of the judges.

**E:6:4 The estimated difficulty-Level of the Pilot Test items :**

The five expert judges in Educational Evaluation estimated the difficulty level of each one of the test item keeping the B.Ed. students as the target population for the test. The estimated difficulty level of the five judges for each item was averaged. It was found that based on average difficulty level estimated, 30 test-items were above the appropriate difficulty level, their average difficulty level being more than 2.00. Twenty-six test-items were just at the appropriate difficulty level, their average difficulty level being exactly 2.00. 43 test items were below the appropriate difficulty level or easy, their average difficulty level being lower than 2.00. For Detailed particulars in this respect, were placed in Appendix XV.

In a situation of norm-referenced testing and evaluation, a test should have certain proportion of items at three levels, namely, difficult, appropriate and easy so that the test could have the capacity to discriminate from among the students the high ability students and the low ability students. It was decided to assemble items having the three levels of difficulty for this test of Knowledge, based on norm-referenced approach. Further it was thought that a criterion-referenced approach might not be the most appropriate approach for the reason, the student-teachers would not have viewed developing knowledge of Recent Developments in Education as their criterion behaviour.

**E:6:5 Pre-testing the Objective Test on Knowledge of Recent Developments in Education :**

**(1) The Sample for Pre-Testing the Test :**

The objective Test on Knowledge of Recent Developments in Education with 99 multiple-choice test items was pre-tested on a sample of 274 B.Ed. students of the University of Madras as detailed in Table 3.12 below. Vide Appendix XVI for the Pilot Test.

**Table : 3.12 The Sample for Pre-Testing - The Test on Knowledge of Recent Developments in Education:**

S.No.	College of Education	No.of students	Description of students.
1.	Teachers' College Madras.	61	Urban Govt.College men students.
2.	Government Training College,Orthanad.	53	Rural Government College men Students.
3.	N.K.T.Training College for Women, Madras.	68	Urban Non-Government College Women-students.
4.	Sri Sarada Training College for Women,Salem.	92	" "
	Total Sample .. .. .	274	

The investigator personally administered the Test in the four Colleges of Education and on each occasion a duration of two hours was provided to the students to write the answers on a specially designed Answer Sheet.

**(2) Scoring the Answer Sheets :**

Each test item carried one mark. All the 274 answer sheets were scored. Vide Appendix XVII for the key to the Pilot Test on Knowledge of Recent Developments in Education. Since the Pilot test was administered in December 1977 (while they were scheduled

to complete the course in first week of April 78), it was thought that student-teachers might guess the correct answers, whenever they did not happen to know them straightway. The raw scores in every instance were therefore corrected for guessing using the following formula

$$\text{True score} = R - \frac{W}{(N-1)}$$

R = The number of right answers.

W = The number of wrong answers.

N = The number of options for each item.

Vide Appendix XVIII for the raw scores and corrected scores of the 274 B.Ed. students of the sample.

(3) Item Analysis of the Test after Pre-testing :

(3)a Difficulty Index of the Test Items :

The performance of the entire sample of 274 B.Ed. students was considered for establishing the Difficulty Index of each item. The following formula from Garrett (1962) was applied for correcting difficulty indices for chance success:

$$P_c = \frac{R - \frac{W}{K-1}}{N - HR}$$

P<sub>c</sub> = the percent who actually know the right answer.

R = the number who got the right answer.

W = the number who got the wrong answer.

N = the number of examinees in the sample.

HR = the number of examinees who did not reach the item (and hence did not try it).

K = the number of options or choice.

The difficulty indices relating to the test items were reported in Table 3.13.

The particulars relating to the performance of the entire sample of 274 B.Ed. students in the Pilot Test and the Difficulty Indices of the 99 test-items could be referred in Appendix XVIII.

(3)b Validity Index of the Test items :

The procedure originally suggested by Kelly and reported by Garrett (1962) had been followed in the matter of establishing validity index of the test items. The procedure was as follows:

- (1) The answer papers were arranged in the order of size for corrected test score, with the highest score on the top.
- (2) The sample consisted of 274 students. The top 27% of papers and the bottom 27% of papers were placed into two separate piles, with 74 answer papers in each pile. These two were called upper group and lower group respectively.
- (3) The middle 126 answer papers were placed aside and were not utilised for validity index purpose (They were of course utilised for Difficulty index purpose only).
- (4) The number in each group (upper and lower group) passing each test item was tallied and later converted to percentages.

- (5) The percentages were corrected for chance success using the formula

$$P_c = \frac{R - \frac{W}{K-1}}{N - HR}$$

- (6) By referring Garrett's Table 51-Normal biserial coefficients of correlation as determined from proportions of correct responses in upper and lower 27% of the group-the validity

index (or the discriminating power) was found.

The particulars relating to item-wise performance of Upper and Lower Groups of B.Ed. students at the Pilot Test and the validity indices of the items could be referred in Appendix XIX.

The test items were classified based on Difficulty Index & validity Index and presented in Table 3.13.

Table 3.13 : Classification of Test items of the Pilot Test on the basis Difficulty Index and Validity Index :

Difficulty Index	Validity Index of Items				Total Items
	Negative to 0.00	0.01 to 0.25	0.26 to 0.50	0.51 to 0.75	
(1)	(2)	(3)	(4)	(5)	(6)
-0.50 to -0.26	2	-	-	-	2
-0.25 to 0.00	15	-	-	-	15
0.01 to 0.25	14	5	11	3	33
0.26 to 0.50	3	5	14	6	28
0.51 to 0.75	1	8	8	-	17
0.76 to 1.00	1	1	2	-	4
TOTAL	36	19	35	9	99

As shown in Table:3.13, 17 out of 99 items got difficulty indices with negative signs. The items with negative validity index were larger in number than could otherwise be the case because of the application of the correction formula for guessing. It was quite plausible to contemplate that students would have guessed the answers, whenever they did not know the correct answer and this guessing behaviour might have been pronounced among

the lower ability group. However two-third of the test items had positive validity at this pre-testing stage itself.

(3)C The Choice of Alternatives in the Test-Items :

All the 99 test-items were multiple-choice items. It was interesting to study the choices made by the upper and lower ability group students in this respect for every item. This helped to find out the behaviour of the alternatives and in deciding whether the item could be retained for the Final Test as such, or should it be improved for being retained or was it in bad shape and malfunctioning to demand its delection from the Test. For example, item number 3 in the Pilot test was answered correctly by choosing d by 18.9% of students in the Upper Group and 21.6% of students in the Lower Group choice d was made by 44.6% of students in the Upper Group while in the Lower Group 29.7% chose the same. This item's alternative answers were not functioning as expected and the item had a Difficulty Index of -0.06. Hence this item had to be dropped totally. Vide Appendix XX for the percentages of the students in both the upper and lower ability groups choosing the four alternatives for each item in the Test.

(4) The Reliability of the Pilot Test :

The reliability as internal consistency of the Pilot-Test was found using Kuder Richardson's formula

$$r = \frac{K}{K-1} \frac{1 - 2n \frac{(NU + NL)}{(NU + NL)^2}}{0.667 \left[ \frac{(NU - NL)^2}{(NU + NL)^2} \right]}$$

K = Number of items in the Test.

n = Number of Candidates in either group.

NU = Number in the Upper group answering correctly.

NL = Number in the Lower group answering correctly.



The reliability of the Pilot Test on Knowledge of the Recent Developments in Education was found to be 0.48.

(5) Results of Item Analysis :

As a result of item-analysis, every item was carefully reviewed in the light of its difficulty index, validity index and the performance of the upper and lower groups of students in the choice of alternatives for each item. It was decided to retain only one test item for the purpose of testing the knowledge of one item of Recent Development in Education. In the Pilot Test, there were 99 test items for testing 69 Recent Developments in Education. Out of the thirty extra test items, 28 were duplicate test items, 1 was a triplicate and another was a quadruplicate.

Vide Appendix XXI for test item-wise results on the basis of item analysis. Finally the test items were classified for retaining effective items, dropping ineffective and effective duplicate items and improving certain essential items for being retained in the final test, as shown in Table 3.14 . . . . .

Table.3.14 : Classification of Test-Items of the Pilot Test, based on the Results of Item-Analysis :

Sl. No. (1)	Qualitative description of the Test-items and Results (2)	Test item Numbers in the Test (3)	Total Items (4)
1	Effective items retained	2,4,7,8,10,12,13,15,17,19, 23,25,26,29,30,33,34,36, 38,40,42,43,45,48,53,55, 59-62,64,65,67,68,70,72, 74,75,83,85,88-92,95-97, 99	53
2	Effective items, dropped for they were duplicates	5,6,16,21**,35,37,41,46,66, 86.	10
3	Ineffective duplicate items dropped.	3,9,11,14,18,20*,22,24,27, 28,31,32,39,54,78,79,82, 93,98,	20
4	Not particularly effective but essential. Modified and Retained.	1,44,47,55,57,58,63,69,71, 73,76,77,80,81,84,94.	16
	TOTAL :		99

Note : \* Triplicate item ; \*\* Quaduplicate item.

It was decided to have only 69 out of the 99 items in the Pilot Test for testing the Knowledge of 69 items of Recent Developments in Education.

The qualitative status of the 69 Items so chosen was given in Table : 3.15.

Table: 3.15 : The qualitative status of Test items of the Pilot Test for testing Knowledge of items of Recent Developments in Education according to List II and selection for the Final Test :

The Categories of Recent Developments	Item No. in the List II of Recent Developments in Education being tested				Total Test Items
	Test-items found fit	Total in(2)	Test-items to be improved	Total in(4)	
(1)	(2)	(3)	(4)	(5)	(6)
1	2-8	7	1	1	9
2	1-3, 6	4		-	4
3	4-7	4		-	4
4	13, 15, 20, 21	4		-	4
5	1-3, 11, 13, 15, 17-19, 24	11	4, 12, 23, 25	4	15
6	4-7, 9, 11-13	8	2, 8, 15	3	11
7	1, 5, 7, 8	4	4, 6, 9	3	7
8	6, 8, 9, 11-13	6	1, 2, 5, 7	4	10
9	1	1		-	1
10	2	1		-	1
11	1	1		-	1
12	1, 11	2		-	2
TOTAL		53		16	69

The total number of test-items for testing the Knowledge of Recent Developments in Education had been presented category-wise in Table 3.15, above.

**E:6:6 Follow up to Item-analysis :**

On the basis of the item analysis, 16 test items were modified and improved. Since some items were modified, the final test having 69 test items was placed with a Group of three outstanding Principals of colleges of Education, who had been experienced Senior Professors of Education for classifying the items in terms of the nine-sub-categories of knowledge category in the Bloom's Taxonomy of Educational objectives (Cognitive Domain). Vide

Appendix XXII for the total view of the classification of the Test items by the Eight Judges, out of whom five were pre-eminent experts and three Principals of the Colleges of Education. Besides the difficulty-level of the test items for B.Ed. students was estimated by the eight judges. Vide Appendix XXIII for three point rating of difficulty level of the test items of the Final Test. The improved ones were tested with a small group of B.Ed. students and after they took the test, the items, were discussed with them to ascertain whether the items were behaving well with the target group. After this step, the final Test of Knowledge of Recent Developments in Education was ready for being administered to B.Ed. and M.Ed. students. The Test was placed in Appendix III and its Key in Appendix IV. Since it was designed to have only one common test for both B.Ed. and M.Ed. students, the pre-testing was confined to B.Ed. student sample only. Administration of the same test for both the student groups was expected to facilitate a comparative study of their knowledge of Recent Developments in Education. The reliability and validity of the test for the B.Ed. and M.Ed. groups had been established separately and reported.

E:6:7 : Psychometric Properties of the Final Test :

(1) Reliability :

The reliability was found out by the split half method for the two samples separately. The reliability Coefficients were 0.88 for the B.Ed. Sample and 0.84 for the M.Ed. sample after the application of Spearman-Brown Prophecy Formula.

(2) Validity :(a) Content Validity :

In order to claim that the Test on knowledge of Recent Developments in Education had content validity, it should be shown that it was truly a representative sample of the Recent Developments in Education and the test items were only measuring "Knowledge" of Recent Developments in Education and the test difficulty was just of the appropriate level for the target populations. As explained earlier, the items of Recent Developments were carefully chosen from the List III. Recent Developments in Education based on the expert rating of the University teacher-educators for the "essentiality" of these items for a Knowledge Test for B.Ed. students. Evaluation experts had carefully examined whether these test items were testing only knowledge ability and also judged the difficulty levels of the items for the B.Ed. students. As described in detail earlier and briefly recalled here, everything was done in the process of this research to build content validity for the Knowledge Test on Recent Developments in Education. Since a comparative study was thought of, the same tool was used for both the B.Ed. and M.Ed. samples, construct validity of the tool was established separately for B.Ed. and M.Ed. student-samples.

(b) Concurrent Validity :

The Concurrent validity of the Test on Knowledge of Recent Developments was determined by product moment inter-correlation between Knowledge of Recent Developments in Education and Professional Teacher Attitude measured by a standardised tool

developed by Ahluwalia (  $r = 0.10$ ;  $P < .05$  in the B.Ed. Sample and  $r = 0.25$ ;  $P < .05$  in the M.Ed. sample) and the inter-correlation between Knowledge of Recent Developments in Education and Utilisation of Sources of Information (  $r = 0.10$ ,  $P < .05$  with B.Ed. sample and  $r = 0.30$ ;  $P < .01$  in the M.Ed. sample).

(c) Construct Validity :

The mental process involved in responding to the Test on Knowledge of Recent Developments was essentially memory which would depend on the student-teachers' Professional Teacher Attitude and Learning style as reflected in utilisation of Sources of Information. Therefore, it was hypothesised that Knowledge of Recent Developments in Education would be significantly related to B.Ed. and M.Ed. students' Professional Teacher Attitude and Utilisation of Sources of Information on Recent Developments in Education. These research hypotheses were established in this research for B.Ed. and M.Ed. student groups with 95 confidence level.

Further when the performance of the two samples were compared, as hypothesised, the M.Ed. students had significantly higher Knowledge of Recent Developments in Education (  $t = 9.776$  at 0.01 level). The Test thus had construct validity for the two samples.

(F) GRADE POINT AVERAGE :

The B.Ed. and M.Ed. courses of the University of Madras during 1977-78 followed the Semester Pattern, with due weightage for Internal Assessment in the affiliated colleges of Education. The University gave a weightage of 20% and 40% for Internal Assessment for B.Ed. and M.Ed. courses

respectively. However, there was no prescribed minimum for obtaining 'pass' in Internal Assessment. The University followed a seven-point Grade System as follows:

<u>Grades</u>	<u>Description</u>	<u>Grade Point</u>
O	Outstanding	6
A	Very Good	5
B	Good	4
C	Average	3
D	Below Average	2
E	Poor	1
F	Very Poor	0

The University was following the University Grants Commission (UGC) Method of Converting marks into grades with the help of grade tables for awarding grades. The UGC Method of Grading was as follows:

" In this method, top marks usually awarded in the subject in the University are awarded an 'O'. Fail marks are awarded grades E and F and the remaining marks are distributed on the basis of equal intervals. For example, suppose the pass mark is 35 (taken as lower limit of D Grade) the highest average mark awarded in a subject during the last three years is 79. Then the distribution of marks between different grades is worked out as follows:

The difference between highest

Average marks and 35     =     79 - 35     =     44

Length of range of marks for

five grades O to D     =     44/5     =     8.5     =     9

Therefore the grade table is worked out as :

<u>Grade</u>	<u>Marks Range (%)</u>
O	71 and above
A	62 - 70
B	51 - 61
C	44 - 52
D	35 - 43
E	25 - 34
F	0 - 24

The range for 'O' grade is kept open, some candidate may score above the highest average marks scored in the last three years, although this will be quite rare. Such tables may be constructed easily for each subject/paper and these will immediately provide a dependable standard for awarding grades. The assumption is that in the last three years, many hundreds of students have taken the examination and this standard, based on a large number of candidates (of the last three years) can be taken to be a fairly dependable and stable standard. Besides adopting this UGC method of awarding grades, the University of Madras had decided to keep these grade tables for different subjects/papers constant for three years and after this period, they will be updated based on the latest marks data available".(Bhat-1978)

Following this UGC Method of Grading, the marks obtained by the students in Internal Assessment and University-held-Examinations had been expressed in Grades. The passing minimum was Grade 'C' in University Examination and also in the aggregate of Internal Assessment and University Examinations for the B.Ed. class. The passing minimum was Grade 'B' in University



Examinations and Grade C + in the weighted aggregate of Internal Assessment and University Examinations for the M.Ed. Course in each Theory Paper.

For purposes of this investigation, the performance of the student-teachers in Internal Assessment was ignored, and their performance in the University-held Examinations at the end of Semester I alone had been considered with a view to getting more objective indices of performance. In the case of the B.Ed. students, their performance in the following three Core Subject Papers alone had been considered for getting the Grade Point Average:

- (i) Philosophical Foundations.
- (ii) Psychological Foundations of Education and Evaluation.
- (iii) Education in India-Historical Approach.

Their performance in two Elective subjects was not included for if included the Grade Point Averages so obtained would be distorted because of variables such as different marking standards in different subjects and different Calibre of students being admitted in different subjects. It is possible to overcome the lack of uniformity in marking standards by resorting to the Scaling technique. But it is not possible to control the variable of different Calibre of students being selected for different Elective Subjects in the B.Ed. course in the various colleges of Education. On the other hand, the performance of B.Ed. students, in three Core Subject papers had been judged against a uniform criterion and therefore the Grade Point Average was derived from this step only.

In the case of the M.Ed. students, they had appeared for

only three Theory Papers in the University Examinations and all the three were included for getting the GPA. Out of the three Papers, two were common and Compulsory subjects for them as follows: (i) Philosophical and Sociological Foundations of Education and (ii) Research Methodology and Educational Statistics. The Third was an 'Elective' subject and they could select one out of the following five (i) Pre-Primary and Primary Education, (ii) Secondary and Higher Secondary Education; (iii) Teacher Education; (iv) Higher Education and (v) Non-Formal Education. All the five elective subjects are in the Education discipline only. In the case of M.Ed. Students, their performance in all the three subjects in the University Examinations had been considered for getting the GPA.

The Grade Point of each student-teacher in the three Theory Papers of the University Examinations were added and an average was taken for each student-teacher and this represented his/her GPA. Hence the GPA was taken as a dependable and standard index of student-achievement in the Theory part of the B.Ed. and M.Ed. courses.

(G) DATA COLLECTION :

G:1 The Administration of the Research Tools :

The investigator contacted the Principals of colleges of Education, and fixed schedule of dates for the final administration of the research tools to the B.Ed. and M.Ed. students. It was planned to administer the test in the last fortnight of B.Ed. and M.Ed. courses, so that their performance would truly reflect their level of attainment at the terminal point of the course of

teacher-education. In each college of Education, the investigator was provided with one block session of three hours for this purpose for meeting the B.Ed. student-group. In the case of M.Ed. students, in many colleges they were students in the Evening College and hence they met at their own time in the Evening Colleges. In colleges, whose full time M.Ed. students attended day college, they were also available at the same time as B.Ed. students.

The following research tools were administered to the student groups and they were requested to complete them in the order given below and they took the range of time indicated for completing them:

(1)	Ahuwalia's Teacher Attitude Inventory	15 - 20 minutes
(2)	Student Information Blank including Socio-economic Status	5 - 10 minutes
(3)	Scale of Awareness of Recent Developments in Education (130) items.	60 - 75 minutes
(4)	Checklist on Utilisation of the Sources of Information on the Recent Developments in Education (130 items).	
(5)	Objective Test on Knowledge of Recent Developments in Education (69 items)	50 - 75 minutes
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		130 -180 minutes.
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In all Colleges of Education, wherein the tools were administered, whether it was the B.Ed. or M.Ed. group the investigator met, the Principals arranged to provide the students available in one group invariably in the College Examination Halls and introduced the researcher and the purpose of such meeting

appropriately. The students were very cooperative and evinced lot of interest in the research instruments and responded enthusiastically. The theme "Recent Developments in Education" was particularly fascinating to them. In all the colleges, the researcher made a very brief introduction and gave oral instructions at the beginning crisply. The researcher was assisted by one or two senior faculty members of the college while supervising the students at the time of these sessions, when they made their written responses.

G:2 Collecting the Grades of B.Ed. and M.Ed. Students:

The Grades obtained by B.Ed. and M.Ed. students in the sample were collected from their respective colleges for three theory subjects for B.Ed. and M.Ed. Classes relating to the First Semester-end University Examinations. Subsequently Grades were converted to Grade Points and Grade Point Averages were computed for all the Students in the two samples.

G:3 Time of Data Collection:

The data was so collected during the last fortnight of the academic year 1977-1978 in the Colleges of Education.

(H) THE SCHEME OF ANALYSIS OF DATA :

H:1 Statistical Analysis :

For the purpose<sup>of</sup> studying the performance of student-teachers on the five educational variables, namely, (i) Professional Teacher Attitude (PTA); (ii) Awareness of Recent Developments in Education (ARDE); (iii) Knowledge of Recent Developments in Education (KRDE); (iv) Utilisation of the Sources of Information (USI) and (v) Grade Point Average (GPA), the raw scores obtained

by the student-teachers with regard to the first four educational variables were converted to percentage scores and for all the five variables, frequency distributions were prepared for the B.Ed. and M.Ed. student-samples separately. The Mean, Median, Mode, Standard Deviation, Skewness, Kurtosis etc. were computed for all of them.

(2) In order to study the ARDE, KRDE and USI, item-wise descriptive analysis <sup>was</sup> carried out was for the 'Rating Scale for Awareness of Recent Developments in Education', 'Utilisation of Sources of Information for Awareness-Knowledge relating to Recent Developments' and the 'Test on Knowledge of Recent Developments in Education' for B.Ed. and M.Ed. samples.

(3) The performance of the B.Ed. and M.Ed. students on the first four educational variables was compared and studied in the following ways:

- (i) On the basis of their performance on the first four educational variables, the B.Ed. and M.Ed. students were classified into certain number of categories and the percentage of students in different categories was compared.
- (ii) The performance of the B.Ed. and M.Ed. samples was compared graphically by preparing o-gives with regard to the four educational variables.
- (iii) The difference in the mean performance of B.Ed. and M.Ed. students on the four educational variables was tested for significance by applying the Critical Ratio Test.
- (iv) The percentage of students at different levels of Awareness of the 12 categories of Recent Developments in Education, the weighted Arithmetic Mean Awareness

Scores and Mean Utilisation of Sources of Information pertaining to the 12 categories of Recent Developments of the B.Ed. and M.Ed. samples were compared.

- (v) The Weighted Mean Awareness and Mean Utilisation of Sources of Information relating to the top ten items and bottom ten items (in terms of awareness) for both the B.Ed. and M.Ed. sample were compared.
- (vi) The Knowledge of Recent Developments in Education of the B.Ed. and M.Ed. students was compared with reference to Average Facility Value of the Test for the two samples, the Average Facility value of the best known and least known ten items of Recent Developments and the Corresponding weighted Mean Awareness and Mean USI.
- (4) With a view to studying the Awareness of the B.Ed. and M.Ed. student-teachers of Recent Developments, their Awareness of both item and category-wise (there were 130 items under 12 categories) was discussed in terms of percentages for both the samples separately. The percentage of B.Ed. and M.Ed. students at five different levels of awareness with regard to 130 items, weighted item mean-awareness and weighted arithmetic Mean Awareness of the 12 categories of Recent Developments and the rank status of the categories in terms of weighted arithmetic Mean Awareness for B.Ed. and M.Ed. student-samples separately were worked out.
- (5) For the purpose of studying, the utilisation of the sources of Information on Recent Developments in Education by the B.Ed. and M.Ed. students; both item and category-wise

utilisation was discussed in terms of percentages for both the samples separately. Based on the percentage of students using the ten Sources of Information, the Mean Utilisation of Sources of Information for each item and category of Recent Developments was calculated for the two samples separately. The relationship of the utilisation of the ten Sources of Information with the Awareness of Recent Developments in Education was studied by comparing Mean Utilisation of Sources of Information of each item and category with the Weighted Mean Awareness of each item and category for the two samples separately.

- (6) The Chi-square test of independence between two attributes was applied for each one of the two criterion variables, viz. Awareness and Knowledge of Recent Developments, and the two independent institutional variables and the nine independent biographical variables for the two samples separately.
- (7) For the sake of comparing the performance on the two educational criteria of the student-teachers of different groups based on the two dichotomous institutional variables, seven dichotomous and two trichotomous biographical variables and studying the significance of the difference between the Means of Groups, the critical Ratio Tests were carried out in cases where the F Test had confirmed homogeneity in the variances between pairs of groups of B.Ed. and M.Ed. students. One tail and two-tail tests were applied for testing the concerned null hypotheses.

- (8) Whereinsoever the F test brought out heterogeneity in the variances between the pairs of groups of students, the significance of the difference between the means was sought to be established by applying Fisher and Behren's d test.
- (9) Towards the purpose of studying the correlates of Awareness and Knowledge of Recent Developments in Education, Pearson's Product Moment Correlations were computed for establishing the linear relationship between the five educational variables with respect to the B.Ed. and M.Ed. student samples separately.
- (10) Towards the object of studying the relationship between the five educational variables in the B.Ed. and M.Ed. student-samples separately, multivariate analysis was undertaken and partial correlations of the first, second and third order were worked out. Tests of significance for the partial r's were applied.
- (ii) The study adopted the Multiple Linear Regression approach for predicting the performance of the student-teachers with regard to Awareness and Knowledge of Recent Developments in Education, Utilisation of Sources of Information Professional Teacher Attitude and Grade Point Average were the three educational variables used as predictor variables in this respect. Multiple linear Regression analysis was attempted. The backward solution approach was utilised to arrive at the Multiple regression equation producing the best fit and accounting for relatively the highest variance in the criterion variable, With the



lowest number of predictor variables. The multiple regression Co-efficients were subjected to the test of significance. Multiple correlations were also computed and they were tested for their significance with regard to the population of B.Ed. and M.Ed. students of the University of Madras.

#### H:2 Computerisation and Manual Analysis :

The bulk of the research data was punched on IBM cards. One part of this was punched and verified at the Data centre of the University of Madras, another part was done by Thomas & Co. Software Research Company of India, Madras. A third part of the data punching and verification was done at the IIT computer centre at Madras. The researches learnt card punching using automatic machines and did a small part of it personally too. The researcher utilised the services of trained programming specialists for designing the Card punch as well as programming the analysis of major part of the data. Data was stored in a tape in the Indian Institute of Technology Computer Centre, Madras and later used for analysis step by step. Yet a lot of data had also to be handled by the researcher with the assistance of electronic calculator.



Chapter : 3

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--: R E F E R E N C E S :--

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