STUDENTS' ASSESSMENT OF THEIR TEACHERS' ENCOURAGEMENT IN THE CLASSROOM FOR THE PROMOTION OF CREATIVITY

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ABSTRACT

The present study was aimed to assess the teachers' encouragement in the classroom for the promotion of students' creativity. A survey method was used for the present research with a sample of 373 subjects from ninth class. For collection of data four instruments were used, namely Student Information Sheet (SIS), two tests of 'Creative Thinking' (Verbal and non-verbal) and Teacher Encouragement Scale (TES). The TES was developed specially for this research project. It was designed for the students to rate the extent to which their teachers encouraged creativity in the classroom. The analysis of Teacher Encouragement Scale (TES) showed no significant difference was found regarding the sex and medium of instruction. Students from boys' schools were more favourable towards the teacher encouragement than girls and co-education school students. The highly creative students had more favourable attitudes towards teacher encouragement as perceived by students than their counterparts of average and low creative groups. It indicates that level of students' creativity is proportionate to the teacher encouragement.

INTRODUCTION

The educational process in school is a bipolar process; one pole is formed by the teacher and other by the pupil. There should be an interaction between them; they should influence each other mutually. Teachers must also learn to be creative in their educational activity (Duric, 1979). Creativity is an important resource to nurture the students in the new millennium. It enables them to cope with the tremendous changes in the world. This is the reason why many Asian societies are striving to promote creativity in the classroom (Ng and Smith, 2004).

The NACCCE (1999) (National Advisory Commitee of creative and cultural Education) proposed that teaching for creativity involves three key tasks or principles such as encouraging[1], identifying[2] and fostering[3] (p.90). Jeffrey and Craft (2004 a/b) have added four tasks that are adopting an inclusive approach to pedagogy, which is inherent in passing back control to the learner and in which teacher and learners enter a co-operative processes around activities and explorations, posing questions, identifying problems and issues together and debating and discussing their thinking.

The teacher's success or failure lies in his capacity and ability to reach, catch and promote potential creativity in pupils; He has to identify this creativity, reach it, and provide a congenial environment and a warm and friendly atmosphere that promotes creativity (Goodale, 1970). If the teachers are not creative, it is not possible for them to develop the pupils' creativity (Duric, 1979). Teacher has to encourage children to explore alternative ways of being and doing, analyzing whether their courage is appropriate or to be different; giving children enough time to incubate their ideas; and provide an

[1] *Encouraging - encouraging young people to believe in their creative potential, self-esteem and confidence.*

[2] *Identifying - Identifying young people's creative abilities in different areas.*

[3] *Fostering - fostering creativity by developing some of the common capacities and sensitivities of creativity such as curiosity, recognising and becoming more knowledgeable about the creative processes that help foster creativity development, and providing opportunities to be creative, a hands-on approach.*

environment in which children can go beyond what is expected and are rewarded for doing so (Craft, 2005).

The teacher serves as facilitator rather than director of learning, (Rogers, 1959). To facilitate learning the teacher must be a genuine human being, must be able to interact with children in such a way to demonstrate human concern, must build a relationship of mutual trust with students and must demonstrate empathetic understanding in dealing with children.

Wallace (1986) says that, the teacher is the guide, the promoter, and the change-agent. The teacher opens up new avenues of interest, demonstrates new techniques in works or performance, shows how great minds have thought, and helps the child to evaluate his work. Creativity can be encouraged by allowing children to work alone. Teachers' efforts in encouraging children to use their creative talents, receptive and accepting attitude of the teachers play an important role in fostering creativity in children.(Torrance and Myers, 1974, Powell Jones, 1972, Passi, 1989, Poole,1979).

Torrance (1965) demonstrated that a positive attitude to creativity among teachers fosters creativity in pupils. It is generally believed that the favourable / positive attitude of teachers towards creative learning of children and teaching plays a vital role in promoting creativity. On the other hand unfavourable or negative attitudes of teachers will depress the children's creative thinking (Sing and Das, 1989).

The liberal-democratic teacher is likely to reap the love and affection of students because he/she works with them in the enterprise of learning. In contrast, the conservative-autocratic teacher is likely to reap the resentment of students because (s)he works against them in the enterprise of learning (Ng and Smith, 2004). The non-creative classroom by comparison is one in which the teacher is authoritarian, rigid, dominated by time, insensitive to pupils' emotional needs, preoccupied with discipline and the giving of information (Wallace, 1986).

As one of the teachers in Fryer study (1989, 1996) expressed the opinion that 'you can't teach creativity but you can facilitate it', it may be broadly hypothesised that teacher's perception of the students has a substantial bearing on his classroom climate, either promoting or hindering the creative development of students (Agarwal, 1992).

In the present research, it is aimed to measure the students' perceptions about their teachers' degree of encouragement in the classrooms through a rating scale. Students are better judges in rating their teachers' behaviour in the classroom than outside observers (Naidu, 1987). As the students meet their subject teacher daily, they also know the merits and demerits of each and every subject teacher; and the behaviour patterns and interactive processes of these teachers in classroom situations.

The review of the literature shows that most researches have been undertaken on the behaviour of the teacher and teachers' perceptions in relation to creativity; hardly any work has been reported on the perceptions of the teachers' behaviour by their students in relation to their gender, medium of instruction, type of school and level of students' creativity.

1. Methodology

1.1. Research Method

There are different methods of educational research that are very commonly used in the field of Education. The difference in methodology is largely due to the difference in purpose and approach. *Normative Survey (or Survey)* is one of the methods suitable for this study. The method of research which concerns itself with the present phenomena in terms of conditions, practices, beliefs, processes, relationships or trends is variously termed as the 'Normative Survey' or 'Survey'. It focuses our attention towards existing educational problems and also suggests ways of meeting them. Survey studies can collect three types of information. (1) What exists? (2) What do we want? (3) How to get there?

1.2. Tools used in the study

- The Student Information Sheet (SIS) was devised to collect students' personal and parental background data.
- Two tests of 'Creative Thinking' (Verbal and non-verbal)

constructed and standardised by Baqer Mehdi (1973, 1985) were adopted for the study.

- The Teachers' Encouragement Scale (TES) was developed for the present research purpose to assess the teachers' encouragement in the classroom for the promotion of creativity by the students.

1.1.1 The SIS

This information sheet includes preliminary data about the students, that is, name of the student, name of the school, sex, age, class, mother tongue, religion and caste. Parental education, occupation and income were also included in the SIS. This information was required to explore the personal and parental background of the government school students and enable correlation between students' creativity and personal background variables. The responses to these questions enabled exploration of the differences in teachers' assessment with respect to high and low creative groups.

1.3 The Tests of Creative Thinking

Two tests of 'Creative Thinking' (Verbal and non-verbal) constructed and standardised by Baqer Mehdi (1973, 1985) were adopted for the study. As there are no right or wrong responses for the test, each item is scored for originality, flexibility, fluency and elaboration. The summary of the scores and procedure for converting raw scores into standard scores (T-scores) were carried out as mentioned in the test construction manual. Two questionnaires were developed and administered to 373 students.

1.4 The development of TES

This scale was developed by the investigator to measure the degree of encouragement given by the teachers in their classrooms. It is mainly concerned with classroom questioning, teacher behaviour and the freedom given to the students. The literature on teachers' classroom questioning behaviour by Ellis (1993), Perrott (1982), and Cohen (1976) and guidelines for promotion of creativity by Torrance(1962,1962b,1965), Torrance and Myers(1974), Foster(1971), and Passi (1989) were used to develop a tool to measure encouragement in quantitative terms. The investigator constructed a rating scale covering the following relevant important areas:

- Accepting students' feelings in the classroom (Question numbers 2, 22)
- Classroom questioning (Question numbers 6, 7, 20, 21)
- Teachers' praise and criticism (Question numbers 8, 9)
- Teacher-pupil relationships (Question numbers 10, 11, 12, 13, 14)
- Organisation of classroom activities (Question numbers 4, 5, 17, 18, 19)
- Encouragement/discouragement of students' interests and other activities.

(Question numbers 1, 3, 15, 16)

The wording of items in the scale was made as clear as possible and technical terms were kept to a minimum. The students were asked to rate their teachers in the classroom using the five point scale 'Always, Usually, Often, Sometimes and Never'. If an item given in the scale was positive then the scores were awarded in the order 4,3,2,1 and 0 respectively; if the item in the scale was negative, then the reverse procedure was followed. The total score gives an indication of the degree of freedom and encouragement in the classroom. A low score indicates a lack of freedom and encouragement. The scale should be administered in the absence of teachers because this may affect the freedom of the students in marking their responses.

Survey work with school children requires additional care in piloting and fieldwork. For example, interviewing children in a school presents the problem of overcoming the children's possible fear of strangers and getting genuine and valid responses; also there are the logistics of lessons and break-times to cope with. Further, after the third or fourth interview every child in the school will have heard a (probably inaccurate) version of the questions being asked: Group - administered questionnaires can overcome some of these problems, at least with children above the age of nine or ten. (Oppenheim, 1992).

Even then, very great care is required in the pilot stages, and it is best to have several field workers present in each

classroom to help with spelling, to answer questions and to distribute and collect questionnaires. Bearing these precautions in mind, and with a promise of confidentiality, excellent results can be obtained quite rapidly from large numbers of school children with the use of pre-coded questionnaires and other closed techniques (Oppenheim,1992).

Some of the items in the teacher encouragement scale (TES) were very sensitive. It might be embarrassing for students to give honest answers. All the students were given pre-coded numbers on the TES, so that they need not to write their names. A guarantee of anonymity, can do much to overcome these problems.

1.4.1 Piloting the Teachers Encouragement Scale (TES)

The TES was developed specially for this research project. It was designed for the students to rate the extent to which their teachers encouraged creativity in the classroom. After the development of the research tools, the researcher conducted a pilot study on a small sample (N=75) from one government high school having both teaching mediums - English and Telugu, to test the feasibility of the research questions and the clarity of the instruments. Five subject teachers using the English medium were rated by an average of 8 students (N=39), 7 teachers were rated by an average of 5 students (N=36) from the Telugu medium class IX. The instruments were drafted in English and translated into the Telugu language. Item responses were carefully examined to see how the respondents performed. Accordingly, modifications were made to the instruments. The chi-square (X^2) values and significance levels for all the items were computed with Statistical Package for Social Sciences (SPSS). All the items are statistically significant, except Questions 5 & 21.These two items were dropped from the test for the main study.

2. The Sample selection and distribution of main study

The sample for the main study was selected in two stages. In the first stage, the selection of schools was made. In stage two, students and teachers were chosen from the selected schools. A total of nine schools were selected from the current list of the 98 government high schools in Hyderabad, capital city of Andhra Pradesh, India by applying a stratified sampling technique. All the students of standard IX were included in this study from the selected 9 schools, if the school had one class of students. In the case of more classes in the school, a random number selection procedure was followed. The students' sample included both boys and girls studying in government boys', girls' and co-educational schools.

In class IX, the student's age would normally vary from 13 to 15 years. A total of 373 class IX students were asked to rate their teachers. Table-1 explains the school and subject sample distribution. The entire range of subject teachers in the schools was covered. The percentage of subject teachers ranged from 11.8% to 16.4%.0

School	Telugu	Hindi	English	Maths	BS	PS	SS	Total	%
1	6	4	6	6	6	-	7	35	(9.4)
2	9	8	8	9	8	-	9	51	(13.7)
3	4	7	6	7	8	7	5	44	(11.8)
4	6	6	6	6	7	7	7	45	(12.1)
5	5	5	5	4	2	4	5	30	(8.0)
6	5	5	8	8	7	6	6	45	(12.1)
7	6	7	3	5	3	5	3	32	(8.6)
8	11	-	6	11	7	6	6	47	(12.6)
9	3	2	4	5	8	14	8	44	(11.8)
Total	55 (14.7)	44 (11.8)	52 (13.9)	61 (16.4)	56 (15.0)	49 (13.1)	56 (15.0)	373	(100.0)

BS = Biological Sciences PS= Physical Sciences SS= Social Studies

Table1. The distribution of students by school and taught subjects.

2.1 Data collection procedure

The SIS was distributed among the students (N=373) of class IX. The students were asked to fill in the columns for name, school name, family and parental background, etc., The other questions asked in SIS were explained. After the general instructions had been given, the researcher confirmed that the children understood. The students were allowed to ask any questions regarding the SIS during the session. The researcher was present throughout to answer questions.

The SIS was administered in the morning session, with English medium students in the first hour and with Telugu medium students in the next hour. These precautions were adhered strictly to avoid consultation between students of both mediums until they had completed the activities. Forty minutes' time was given for the students to complete the SIS. The two versions of the instruments i.e., English and

Telugu, were used during the pilot / main study for the different media students. They are also asked to write their responses either in English or in their mother tongue, Telugu. The headteacher, class teachers and students co-operated during the entire study.

The standardised creative thinking tests (both verbal and non-verbal) and the translated Telugu version both verbal and non-verbal were administered to IX standard students in normal classroom conditions with good light and ventilation with the help of the headteacher and class teacher. Students, those who finished the test were seated sufficiently far apart to prevent copying. The researcher explained briefly why the tests were being administered and emphasised the personal value of the tests for all the students, motivated to complete the tests.

Special instructions were given to the group. Students were asked to read the directions given in the booklet, and the researcher read them again aloud. Each student was given one Verbal Creative Thinking Test booklet. The test booklets provide a place for the responses to each activity. The booklets were scored according to the procedure explained in the manuals. The non-verbal test of creative thinking was conducted on the next working day. The whole pilot / main study work was carried out in the morning sessions only, to avoid boredom and to hold the interest of the students.

The TES scale was administered in the normal classroom with the same students as mentioned earlier. The students of English were asked to rate all their subject teachers. The same procedure was adopted with Telugu medium students. The students were discouraged from writing their name on the TES. The TE scale was pre-coded with the list of students. The code numbers were randomly given. Later the researcher decoded the corresponding names. This was done to maintain confidentiality. While administering the instrument the researcher was presented in the classroom to clarify any doubts about filling in the scale. Teachers were discouraged to participate as the presence of teachers might have greatly affected the responses made.

3. Data Analysis of TES

3.1 Analysis of TES items

The frequencies, X^2 values, Mean and SDs of each item of the TES are presented in Table 2. The X^2 values indicate that all the items are significant (beyond the 0.001) level, except item 4 (which is significant at 0.01 level). The item means range from 1.19 to 3.22, while SDs range from 1.22 to 1.49. Item 9, 'Does the teacher criticise you for no good reason in the classroom?' has the highest mean; while the second highest mean item is 13, 'Do you trust the teacher?'. The items with lowest and second lowest means are item 18, 'Does the teacher encourage you to discus things in groups?' And item 22, 'Are the students' ideas/suggestions used during classroom discussion?

Q.No	N	S	O	U	A	TOTAL	x^2(df=4)	Mean	SD
+1	23	134	30	45	141	373	180.5ψ	2.39	1.45
+2	24	101	41	90	117	373	86.1ψ	2.47	1.35
+3	97	99	52	68	55	371	27.4ψ	1.69	1.41
+4	72	100	73	69	56	370	13.9£	1.83	1.35
+5	-	-	-	-	-	-	-	-	
+6	200	79	38	28	28	373	287.2ψ	3.06	1.27
-7	191	79	27	37	37	371	251.5ψ	2.94	1.37
+8	39	102	35	75	119	370	75.1ψ	2.36	1.44
+9	234	54	36	29	20	373	434.1ψ	3.22	1.22
+10	46	49	36	47	194	372	241.7ψ	2.79	1.49
+11	43	104	39	53	132	371	92.9ψ	2.34	1.48
+12	49	145	42	74	60	370	93.1ψ	1.87	1.33
+13	20	49	26	40	234	369	441.8ψ	3.14	1.31
-14	65	130	41	69	65	370	59.6ψ	2.17	1.39
-15	191	72	32	42	28	365	254.7ψ	2.98	1.33
+16	45	65	44	82	129	365	67.2ψ	2.51	1.44
+17	35	127	40	44	125	371	121.1ψ	2.26	1.46
+18	154	103	40	36	38	371	150.1ψ	1.19	1.34
+19	41	73	35	68	154	371	121.9ψ	2.60	1.46
+20	60	148	38	73	51	370	101.3ψ	1.75	1.32
+21	-	-	-		-	-	-	-	-
+22	83	133	51	53	52	372	67.4ψ	1.62	1.35

+ = Positive items - = Negative items

ψ=Significant at 0.0001 level £ = Significant at 0.01 level

Table 2. The Itemwise responses for the Teacher Encouragement scale (TES)

3.2 Nature of the distribution of TES Scores

The TES consists of 20 items; each item statement is anchored with a 5-point scale 'Always', 'Usually', 'Often', 'Sometimes', and 'Never'. The positive items (1, 2, 3, 4, 8, 10, 11, 12, 13, 16, 17, 18, 19, 20, 22) were responded in the order 4,3,2,1, and 0; the negative items (6,7,9,14,15) were responded to in the reverse order, 0,1,2,3, and 4. The highest possible score that could be obtained is 80 and the lowest possible score is 0.

For the purpose of statistical analysis the data were grouped. The scores obtained for the 373 pupils of standard IX who marked the TES are presented in the form of a frequency distribution in Table 3.

Class Interval	Frequency (f)	Cumulative (f)	Smooth frequency	Descriptive Statistics	
10-19	5	5	7.7	Mean=46.86	Minimum=14
20-29	18	23	32.0	Median=46.00	Maximum=75
30-39	73	96	72.0	Mode=42.00	Range=61
40-49	125	221	99.7	SD=11.40	Skewness=-.03
50-59	101	322	89.3	Variance=129.96	Kurtosis=-.14
60-69	42	364	50.7	SE^M=0.59	
70-79	9 9	373	17.0		
Total	373				

Table 3. Frequency distribution and descriptive statistics of TES

The descriptive statistics for the TES are given in Table 3. The mean, median and mode of the TES were 46.86, 46.00 and 42.00 respectively. The SD of the scale was 11.40. The maximum score obtained by the sample was 75 while the minimum score obtained was 14, giving a range of 61. To determine the .95 and .99 confidence interval limits of the population means, the Standard Error of Mean (SE_M) was calculated. This was found to be 0.59. The .95 and .99 confidence level limits[4] of the true values of this sample mean are 45.70 and 48.02; and 45.33 and 48.38 respectively. A standard frequency polygon (figure.1) has been drawn from the data given in table 3. The result indicates that the distribution is only slightly negatively skewed (Skewness = -.03). In this distribution Kurtosis is -0.14, which indicates distribution of the scores is platykurtic (fig.1).

[4]*Mean 1.96SE_M = 46.86 1.96 0.59 for 0.95 confidence level*
Mean 2.58SE_M = 46.86 2.58 0.59 for 0.99 confidence level

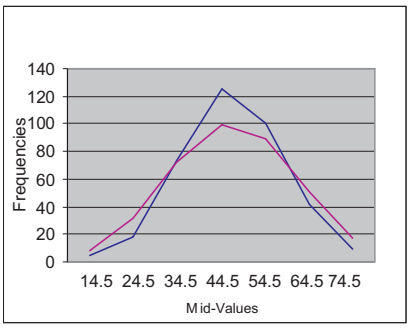

Figure 1. Original and Smoothed frequency polygon based on data given in table 3

3.3 Factor Analysis of the TES

A factor analysis procedure had been employed in order to identify the latent or common traits of the items in the TES and also to see whether the selection of items had been justified. Another reason was to formulate a series of summated scales in order to compare the views of students in relation to the selected variables. So, firstly, Principal Component Analysis (PCA) was employed to extract the latent trait or the underlying factors of the 20 TES items. Secondly, Varimax Rotation was used to maximise the relationships between the variables and some of the factors.

Principal Component Analysis of TES				Rotated Factor matrix of TES		
Factors	Eigenvalue	Percent of variance	Cumulative percent	Factors	Items	Factor loading
1	3.71	18.5	18.5	1	Q10 Q11 Q13 Q12 Q19	.74 .72 .57 .52 .39
2	1.70	27.0	27.0	2	Q3 Q4 Q1 Q2 Q8	.70 .66 .61 .53 .33
3	1.30	33.5	33.5	3	Q22 Q18 Q20	.64 .62 .50
4	1.22	39.6	39.6	4	Q_6 Q_7	.70 .68
5	1.16	45.4	45.4	5	Q17 Q16 Q_15	.66 .43 -.66
6	1.01	50.4	50.4	6	Q_14 Q_9	.76 .67

Table 4. Principal Component Analysis (PCA) and Varimax Rotation of TES

Table 4 shows the result of the PCA where the Eigenvalues and the percentage of variance extracted by the factors are shown. Only factors having Eigenvalues greater than 1 were considered for the proposed analysis (Kaiser, 1960).

The results of Varimax Rotation for the extraction of underlying traits are presented in the same table. In this rotation, the axes were turned about the origin until an alternative position of the loadings was reached. Only the maximum values of item loading (greater than 0.30) with respect to their factors are presented in Table 4, to facilitate interpretation.

Altogether, 6 factors emerged with Eigenvalues above 1. These explain 50.4% of the variance. The first factor extracted had an Eigenvalue of 3.71 and accounts for 18.5% of the variance. The second factor had an Eigenvalue 1.70 and accounts for 8.5% of variance. Factors 3, 4, 5 and 6 extracted account for 6.5%, 6.1%, 5.8% and 5.0% of the variance respectively.

Factor one: The five items in factor one reflect relationships between teacher and students: teachers having good relations with students, teachers being friendly with students, students trusting in the teacher, teachers being humorous with students, and teachers encouraging students to participate in classroom activities. The significant loadings ranged from 0.74 to 0.39. This factor may be called "Teacher-Pupil relations".

The remaining five factors, which did not meet the criterion of accounting for at least 10% of the variance, will be explored to create summated scales which could be used in an analysis of TES in relation to students' personal, cognitive and motivational, and organisational variables.

Factor two: This factor contains five items related to teachers directing students in the classroom: encouraging students to take decisions, creating imaginative situations, encouraging independent thinking, encouraging students to ask any type of question and praising openly new ideas expressed by students. This factor could be identified as "Teacher-Initiation ".

Third factor: This had significant loadings ranging from 0.64 to 0.50 related to organisation of classroom activities. The items were students' ideas or suggestions being used during classroom discussions, encouraging discussion in groups and students asking questions. This factor was called "Classroom organisation"

Fourth factor: This describes "teachers'-attention" in the classroom - becoming anxious about unexpected questions and ignoring the students when they raise questions.

Fifth factor: The significant scores of this factor are the students getting the chance to speak in the class and the teacher giving interesting examples from different fields. High negative scores indicate disagreement with " Does the teacher discourage you from following your own interests? This factor is called "Creating Interest"

Sixth factor: This final factor indicates agreement that the teacher is strict with students and that 'the teacher criticises for no good reason'. This factor may be described as "Strict control"

3.4 Formulation of sub-summated scales

The six summated sub-scales, which emerged as a result of PCA, were each given a name. The six sub-scale totals were pooled to give the total score of TES. The assigned total TES scores ranged from 0 to 80, and the obtained scores ranged from 14 to 75. The basic statistics Mean and SD of the scales are presented in table 5.

Sub-scale / Scale	Possible scores	Obtained scores	Mean	SD
	Minimum-Maximum	Minimum-Maximum		
1. Teacher-Pupil relationship (TP)	0 - 20	0 - 20	12.74	4.66
2. Teacher-Initiation	0 - 20	1 - 20	10.72	4.28
3. Classroom Organisation (CO)	0 - 12	0 - 12	4.58	2.71
4. Teacher Attention (TA)	0 - 8	0 - 8	6.01	2.04
5. Creating Interest (CI)	0 - 12	0 - 12	7.78	2.47
6. Strict Control (SC)	0 - 8	0 - 8	5.38	2.06
Total TES	0 - 80	14 - 75	46.86	11.40

Table 5. The summated sub-scales of TES and its basic statistics

[5]*The Alpha values were calculated by the SPSS software package by using formula Where k= number of items; V(or s^2_i) is the variance of item 'i'*
V_t(or S^2_t) is the variance of total test for the 'k' items

$$\alpha = k / (k-1)[\sum_{i=1}^{K} 1 - V_i / V_t] \text{ or } \alpha = k / (k-1)[1 - \sum_{i=1}^{K} S^2_i / S^2_t]$$

3.5 Reliability and Validity of the TES

A Cronbach Alpha is used to estimate the internal consistency index of a set of Likert scale items. This ranges between 0 and 1. Higher Alpha indicates high reliability of a test. All the 20 items were entered and the Cronbach Alpha[5] was calculated. The reliability coefficient of the TES was found to be 0.75 for the 20 items (Table-6)

Splits	Items	Alpha	Alpha for whole test	Spearman-Brown Split-half	
				For Two parts	For whole parts
Part 1	10	.71	75	.54	0.70
Part 2	10	.50			

The other method the Spearman-Brown Split for reliability, can also be used to estimate reliability from a single administration of a single form of a test. The test is split into two halves; the first half is called odd items and second half-even items. These produces two scores for each pupil. Correlation of these two sets of scores yields the reliability coefficient. The reliability coefficient for the TES was 0.70. This coefficient indicates the degree to which consistent results are obtained from the two halves of the scale.

3.6 Intrinsic Validity or Index of Reliability of TES

The intrinsic validity of a test is directly related to reliability. The degree to which a test measures what it measures may be called its "intrinsic validity". It is indicated by the square root of the reliability coefficient (Guilford,1965) and is also designated as the "index of reliability".

The correlation between a set of obtained scores and their corresponding true counter parts is given by the formula.

$r_1 = \sqrt{r_{11}}$

r_1 = the correlation of obtained true scores.

r_{11} = reliability coefficient of the test.

So the index of reliability of the TES is $\sqrt{0.70} = 0.84$. Therefore 0.84 is the highest correlation, which the present TES is capable of yielding in its present form.

3.7 Content validity of the TES

Six experts in the field of Education and Psychology determined the content validity of the TES. Initially they were asked to comment whether the items measured teacher encouragement in the classroom, secondly whether there was sufficient coverage of items and the language used. The items were scrutinised by the judges, who were conversant with classroom teaching and had knowledge of creativity and its development. The suggestions given by them were incorporated in to the TES before the final data collection. Some sentences were rephrased, although no new information was added.

3.8 The construct validity of the TES items

The construct validity of the TES was established through Pearson's correlation. The internal consistency or homogeneity of the items involves the product-moment Pearson correlation of the items with the total scale scores. Hence, the Pearson correlations(r) between items and TES were computed. If an item is measuring similar traits to the main scale TES then it should correlate positively with it. The higher the correlation coefficient, the stronger the relationship and therefore the validity of the items grew stronger.

Item No.	Corr. with total score on TES	Item No.	Corr. with total score on TES	Item No.	Corr. with total score on TES
1	0.54	9	0.38	17	0.37
2	0.48	10	0.58	18	0.37
3	0.37	11	0.53	19	0.49
4	0.44	12	0.46	20	0.33
5	Deleted	13	0.50	21	Deleted
6	0.24	14	0.35	22	0.48
7	0.27	15	0.23		
8	0.42	16	0.49		

$ = Significant at 0.001 level (df=371)

Table 7. Correlation coefficients between TES items and total score on TES

The correlation matrix (Table 7) indicates that almost all the TES items had significant high correlations with the total scores of the TES. The correlation indices ranged between 0.23 and 0.58. The highest correlation was between item 10 and the total score, while the lowest was between item 15 and the total score. Item 10 was, " Does the teacher have good relations with students?" while item 15 was, "Does the teacher discourage you from following your own interests?"

Another more detailed analysis to examine the construct validity of the instrument, TES was attempted through factor analysis of all the 20 items. Firstly, Principal Component Analysis (PCA) was employed to extract the

latent trait or the underlying factors of the TES items. All the items tend to cluster together and all of them were loaded significantly on the factors that emerged. This provides some evidence for the validity of these items.

4. Analysis of TES in relation to selected variables

The Teacher Encouragement Scale might be an intervening variable affecting creativity. To explore this it is necessary to undertake a detailed analysis of TES in relation to selected variables. Hence, an attempt has been made to analyse TES in relation to the following variables:

- Sex and Teacher Encouragement
- Medium of Instruction and Teacher Encouragement
- Type of school and Teacher Encouragement
- Level of students' Creativity and Teacher Encouragement

Initially a correlation analysis was employed, followed by a t-test or Analysis of Variance (ANOVA) to test the significance of mean differences of selected variables.

The results of the correlation analysis are presented in Table-8. This shows that sex and medium of instruction have a negative correlation with TES, which is not significant even at 0.05 level, although some of the sub-scales of TES were found to be significant at various levels.

Type of school consists of three groups, Girls', Boys' and Co-educational schools, which enabled creation of two dummy vectors. The correlation matrix shows that the Girls' schools had a negative relationship with TES (-0.05; $p>0.05$), which is not statistically significant. For Boys' schools (coded as '1') the relationship was positive ($r=.14$) and highly significant. The mean (51.00) for boys school students was higher than the mean scores of students from co-educational schools (46.41) and girls (45.96)

The correlation ($r=.22$) between students' level of creative thinking as measured by Tests of Creative thinking and TES was highly significant at 0.001 level. The correlations between TES sub-scales and level of creative thinking were also significant at various levels. The positive relationship may be interpreted as the greater the teacher encouragement, the higher the level of the students' creative thinking.

Further, an attempt has been made to probe into the question of variance between TES and selected variables. ANOVA or t-tests were used to find the mean differences. These are presented in Tables-9 to 12..

Variable	TP	TI	Co	TA	CI	SC	Total TES
1. Sex	-.11*	.00#	-.12*	.08#	-.03#	-.09#	-.08#
2. Medium of instruction	-.08#	.19***	-.09#	-.22***	.08#	-.21***	-.06#
3. Type of School (TS-Girls)	-.00#	.00#	.04	-.22***	.01#	-.10#	-.05#
4. Type of School (TS-Boys)	.05	.31***	-.09#	.02#	.13*	-.06#	.14**
5. Level of creativity	.12*	.14**	-.03#	.24***	.14**	.14**	.22***
Total TES	.78***	.71***	.58***	.33***	.61***	.44***	1.00

.TP = Teacher-Pupil relationship
TI=Teacher-Initiation
CO= Classroom Organisation
TA = Teacher Attention
CII=Creating Interest
SC - Strict Control
* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

Table 8. Correlations of selected variables with TES and its sub-scales

4.1. Sex and Teacher Encouragement

A t-test analysis to look into the differences in mean between the boys and girls was attempted. The results are revealed in table 9. On the overall assessment of Teacher Encouragement Scale (TES) girls and boys did not significantly differ ($t=1.49$, $p>0.05$), although the girls' mean (47.56) was slightly higher than the boys' mean (45.77).

The mean differences between boys & girls on the TES-sub-scales for teacherinitiation, teacherattention, creating interest and strict control were not significantly different.

Table 9 shows that, on the Teacherpupil relation sub-scale, the girls' assessment mean score was greater ($M=13.15$) than the boys' ($M=12.12$). This difference was significant ($p<0.05$) and suggests that girls are more happy about their relations with their teachers than boys.

Similarly, on the classroom-organisation sub-scale, the girls' ($M=4.85$) mean score is greater than the boys' ($M=4.19$). This was statistically significant ($p<0.05$) and suggests that the girls are more satisfied with the teachers' classroom organisation, for instance their ideas/suggestions being used in the classroom, discussing things in groups and asking questions on their own.

Scale/sub-scale name	Sex	N	Mean	SD	SE_m	t-value
Teacher-puplic relation	Girls(0)	226	13.15	4.73	0.32	2.06*
	Boys(1)	147	12.12	4.51	0.38	
Teacher Initiation	Girls(0)	226	10.71	4.17	0.28	0.04#
	Boys(1)	147	10.73	4.46	0.37	
Classroom Organisation	Girls(0)	226	4.85	2.83	0.19	2.30*
	Boys(1)	147	4.19	2.48	0.21	
Teacher attention	Girls(0)	226	5.88	2.13	0.14	1.48#
	Boys(1)	147	6.21	1.90	0.15	
Creating Interest	Girls(0)	226	7.84	2.51	0.17	0.57#
	Boys(1)	147	7.68	2.42	0.21	
Strict control	Girls(0)	226	5.54	2.09	0.14	1.86#
	Boys(1)	147	5.14	2.01	0.17	
Overall TES	Girls(0)	226	47.56	11.92	0.79	1.49#
	Boys(1)	147	45.77	10.46	0.86	

* = Significant at 0.05 level # = Not Significant

Table 9. Mean Scores, SDs, SE_m and t-values of TES of subjects (SS) in relation to their Sex

4.2 Medium of Instruction and Teacher Encouragement

On the basis of the obtained average scores (Table-10) of the Telugu-medium students (M=47.45), it seems that, they were more positive about teacher encouragement than the English medium students (46.16), But the difference is not statistically significant (t=1.09, p>0.05.)

As Table-10 illustrates, there is a significant relationship between the, medium of instruction and the mean scores on three out of the six sub-scales of TES. There is a tendency for the English medium students to score significantly higher on the "Teacher-Initiation" sub-scale (p<0.01), which means they perceived that the teacher encourages them to take decisions, creates imaginative situations, promotes independent thinking, encourages them to ask any type of question in the class and praises new ideas expressed by students.

Scale/sub-scale name	Medium	N	Mean	SD	SE_m	t-value
Teacher-puplic relation	Telugu(0)	202	13.08	4.69	0.33	1.54#
	English(1)	171	12.33	4.62	0.36	
Teacher Initiation	Telugu(0)	202	9.99	4.33	0.31	3.61**
	English(1)	171	11.59	4.06	0.31	
Classroom Organisation	Telugu(0)	202	4.83	2.76	0.20	1.90#
	English(1)	171	4.29	2.63	0.20	
Teacher attention	Telugu(0)	202	6.42	1.99	0.14	4.32**
	English(1)	171	5.52	2.00	0.15	
Creating Interest	Telugu(0)	202	7.61	2.49	0.18	1.41#
	English(1)	171	7.98	2.44	0.19	
Strict control	Telugu(0)	202	5.77	1.99	0.14	4.04**
	English(1)	171	4.92	2.06	0.16	
Overall TES	Telugu(0)	202	47.45	12.14	0.85	1.09#
	English(1)	171	46.16	10.42	0.80	

** = Significant at 0.05 level # = Not Significant

Table 10. Mean Scores, SDs, SE_m and t-values of TES of subjects (SS) in relation to their English Medium of instruction

There is a tendency for the Telugu-medium students to score a significantly higher mean on the "teacher attention" sub-scale (p<0.01), which indicates that the teachers are not anxious about unexpected questions and do not ignore the students when they raise questions in the class.

Similarly, on the "strict control" sub-scale the difference is significant (p<0.01). The English-medium students' mean score (M=4.92) is lower than Telugu-medium students mean scores (M=5.77). This indicates that the teachers in English medium are more strict and critical than teachers in Telugu medium, as perceived by the students.

4.3 Type of school and Teacher encouragement

It is evident from Table11 that the F-ratio (3.67) obtained the differences in the TES means for different types of schools, i.e., Girls', Boys' and Co-educational, is significant at the 0.05 level. Boy's school students perceive greater teacher encouragement when compared with Girls' and Co-educational school students. With regard to the sub-scales of TES, significant differences between the type of school and the mean scores on four of the six sub-scales of TES were found.

Scale/sub-scale name	Type of the school	N	Mean	SD	SE_m	F-ratio	Mean
Teacher-puplic relation	G1-Girls	111	12.71	4.54	0.44	0.42#	
	G2-Boys	47	13.33	3.88	0.57		
	G3-Co-edu	215	12.63	4.88	0.33		
Teacher Initiation	G1-Girls	111	10.75	3.89	0.37	20.66****	G2
	G2-Boys	47	14.20	3.93	0.58		G1 *
	G3-Co-edu	215	9.94	4.18	0.29		G3 *
Classroom Organisation	G1-Girls	111	4.75	2.68	0.26	1.48#	
	G2-Boys	47	3.96	2.35	0.35		
	G3-Co-edu	215	4.63	2.79	0.19		
Teacher attention	G1-Girls	111	5.34	2.02	0.19	9.14***	G1
	G2-Boys	47	6.11	1.90	0.28		G2 *
	G3-Co-edu	215	6.34	2.01	0.14		G3 *
Creating Interest	G1-Girls	111	7.81	2.52	0.25	3.16*	G2
	G2-Boys	47	8.59	2.28	0.34		
	G3-Co-edu	215	7.58	2.46	0.17		G3 *
Strict control	G1-Girls	111	5.08	12.14	0.20	3.19*	G1
	G2-Boys	47	5.04	2.11	0.31		
	G3-Co-edu	215	5.61	1.99	0.14		G3 *
Overall TES	G1-Girls	111	45.96	10.39	0.99	3.67*	G2
	G2-Boys	47	51.00	9.27	1.35		G1 *
	G3-Co-edu	215	46.41	12.12	0.82		G3 *

**** = Significant at 0.0001 level *** Significant at 0.001 level
* Significant at 0.05 level

Table 11. Mean Scores, SDs, SE_m and F-ratio of TES of subjects (SS) in relation to the type of the school (sex wise)

On the Teacher-Initiation sub-scale, the Boys' school

students perceive greater teacher-initiation in the classroom ($p<0.0001$). They also perceive that their teachers create interest($p<0.001$). This suggests that teachers working in Boys' school are perceived as creating interest among the students and encouraging the students to be self-reliant to a greater extent than those in girls or co-educational schools.

With regard to the sub-scales for "teacher attention" and "strict control", the students from co-educational schools scored higher means 6.34 and 5.61 respectively, when compared to their counterparts. The F-ratios for "teacher-attention" scale and "Strict control" scales are found to be 9.14 ($p<0.001$) and 3.19 ($p<0.05$) respectively. This indicates that the teachers working in co-educational institutions are perceived as more flexible and more attentive in the classroom.

4.4 Students' level of creative thinking and TES.

As given in table 8 the correlation ($r=.22$, $p<0.001$) between level of creativity and teachers' encouragement as measured by TES was highly significant at 0.001 level (see table-8). Further, Analysis of Variance (ANOVA) was applied to see the mean differences among the three categories[6] of low, average and high creativity.

Table-12 shows that the TES mean scores of low, average and high creativity groups were 43.00, 46.68 and 51.47 respectively. There seem to be differences in the mean scores between the groups. The Analysis of variance (ANOVA) reveals that the F-ratio for these groups is 9.11($p<0.001$), which is highly significant.

Further, the significant mean differences between the groups show that the levels of the highly creative students mean' scores on TES are higher than those of the average creative group, followed by the low creative group. This indicates that the level of students' creativity may be proportionate to the teacher's encouragement. The highly creative students perceived greater teacher encouragement as measured by TES than their counterparts, the average and low creative students.

Table-12 shows that there is a significant relationship between the level of creativity and the mean scores on four out of the six sub-scales of TES.

As the results shown in table12 indicate on the Teachers' Initiation sub-scale, the highly creative students' mean score (12.27) is more than the average (10.49), and low groups (10.11). The F-ratio 4.99 ($p<0.01$), is significant. This means that highly creative children perceive, compared with their counterparts that their teachers encourage students to take decisions, create imaginative situations in the class, encourage them to think independently, encourage them to ask any type of question, and praise them for their creative.

Scale/sub-scale name	Level of creativity	N	Mean	SD	SEm	F-ratio	Mean
Teacher-puplic relation	Low (1)	63	11.83	4.51	0.58	2.45#	
	Avg (2)	248	12.72	4.75	0.31		
	High (3)	62	13.69	4.34	0.55		
Teacher Initiation	Low (1)	63	10.11	4.12	0.53	4.99**	G1 G2
	Avg (2)	248	10.49	4.24	0.27		
	High (3)	62	12.27	4.32	0.56		G3 * *
Classroom Organisation	Low (1)	63	4.50	2.90	0.36	0.19#	
	Avg (2)	248	4.56	2.61	0.17		
	High (3)	62	4.77	2.94	0.37		
Teacher attention	Low (1)	63	5.2	2.14	0.27	11.78****	G1
	Avg (2)	248	6.09	2.05	0.13		G2 *
	High (3)	62	6.71	1.52	0.19		G3 *
Creating Interest	Low (1)	63	7.28	1.97	0.26	3.76*	G1 G2
	Avg (2)	248	7.72	2.57	0.17		
	High (3)	62	8.48	2.39	0.31		G3 * *
Strict control	Low (1)	63	4.76	2.16	0.27	3.90*	G1
	Avg (2)	248	5.45	2.03	0.13		G2 *
	High (3)	62	5.73	2.00	0.25		G3 *
Overall TES	Low (1)	63	43.00	9.48	1.19	9.11*	G1 G2
	Avg (2)	248	46.68	11.44	0.72		
	High (3)	62	51.47	11.50	1.46		G3 * *

**** = Significant at 0.0001 level *** Significant at 0.001 level
* Significant at 0.05 level

Table 12. Mean Scores, SDs, SE_m and F-ratio of TES of subjects (SS) in relation to the level of Students' creativity

With regard to the "teacher-attention" sub-scale, the F-ratio was found to be 11.78. This is highly significant at 0.0001 level. This indicates that highly creative children perceive that their teachers do not ignore them when

[6] *Formation of creative groups: The purpose of dividing the groups to find the major differences or comparison between the groups in respect to their interests, perceptions experiences in the classroom and teacher's encouragement. The sample was classified into three groups and labelled as High Creative (HC), Average Creative (AC) and Low Creative (LC), on the basis of composite test scores on the tests of creative thinking (Mean=250 and SD=37.4)). The High Creative (HC) group (N=62) composed those scored above Mean +1 SD (250+37.4=287.4); the Low creative (LC) group (N=63) those scored below Mean-1SD (250-37.4=212.6); and the Average Creative (AC) group (N=247) those scored between Mean-1SD and Mean+1SD (212.6 to 287.4)*

they raise questions and the teachers are not anxious when they ask unexpected questions, when compared to their counterparts in average and low creative groups.

For the sub-scale "creating interest", the F-ratio was found to be 3.76, which is significant ($p<0.05$). The high mean score for the highly creative group (8.48) indicates that they perceive that their teachers give more interesting examples from different fields, that they have the opportunities to speak and that they are not discouraged from following their own interests, when compared to the average and low creative groups.

Finally, on the "strict control" scale, the F-ratio was found to be 3.90, which is significant at 0.05 level. The highly creative groups mean score (5.73) is higher than those of the average (5.45) and low creative groups (4.76). This means that low and average creative group students felt that the teachers were very strict with them and criticised them more for no good reason, when compared with the high creative group.

Conclusion and Discussion

The teacher encouragement scale was analysed, revealing that pupils' perspectives on teacher encouragement that fall into 6 main factors: teacher-pupil relations, teacher initiation, classroom organisation, teachers' attention, creating interest and strict control. Scores on pupils' perceptions of teacher encouragement were related to measure creativity, suggesting that teacher behaviour may have an effect on creativity.

The overall scores on the Teacher Encouragement Scale (TES) showed no significant difference between girls and boys. But in the sub-scale analysis of TES, it was found that the girls were happier than the boys with the teachers' classroom organisation and teacher-pupil relations. No significant differences were exhibited on the overall TES scores ($p>0.05$) between the Telugu and English medium students' assessment of their teachers encouragement. However, significant differences were found on teacher initiation ($p<0.01$), teacher attention ($P<0.01$), and strict control ($p<0.01$). English medium students were positive about teacher initiation, but unhappy with the level of teacher attention and the teachers' strict control over the students.

Wodtke (1975) concluded that pupils of highly controlling teachers exhibit less self-initiated verbal behaviour, and achieve lower gains on measures of verbal creativity than those of more permissive teachers. The present study, shows that the English medium students felt that their teachers were very strict. This could be the cause for under-achievement of English medium students compared with Telugu medium students. Providing a friendly environment, making a stand for mutual understanding and respecting the dignity and worth of the individual can promote creativity (Torrance, 1962a).

A significant difference was found between girls', boys' and co-educational school pupils in assessing their teachers on TES scale ($p<0.05$). Students from boys' schools were more favourable towards the teacher encouragement than the other two categories of school students. There exist a notable significant differences among the three type of schools students in the sub-scales teacher initiation ($p<0.0001$) and teacher attention ($p<0.001$). The differences were also found in other sub-scales 'creating interest' and 'strict control' but they were statistically significant only at 0.05 level.

The result reveals that the three groups, high, average, and low creative groups were significantly differed ($p < 0.001$) on TES. It indicates that the highly creative students had more favourable attitudes towards teacher encouragement as perceived by students than their counterparts of average and low creative groups. It indicates that level of students' creativity is proportionate to the teacher encouragement. The correlation analysis ($r=. 22, p< 0.001$) was shown a positive correlation between teacher encouragement (as measured by TES) and their students creativity. In the multiple regression analysis, teacher encouragement (TES) was found to be largely influencing the students creative thinking (Sarsani, 1999). This result reflects the arguments of Torrance and Myers (1974, p.83), Powell Jones (1972, p.24), Passi (1989, pp.8-9) and Poole (1979, p.12) that teachers' efforts in encouraging children to use their creative abilities, as well as the receptive and accepting attitude of the teachers play an important role in fostering creativity in children.

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