CHAPTER III

CHAPTER II

METHOD AND PROCEDURE

2.1.0 Design of the Study

The present investigation is a descriptive correlational study which involves socio-economic status, school climate and classroom behaviour as variates (independent variables); country and sex as controlled variables; and creative thinking as criterion variable. Therefore, there are three sets of variables in this study. The list of different sets of 34 variables in the present study and the tools used for deriving them are shown in Table 2.6. The population of the present study included all the secondary school students with age range of 13^{+} to 16^{+} years of grade IX in Baroda City (India) and Bangkok City (Thailand).

The details of the sample, tools employed, procedure of data collection and analysis of data are described in the following captions of this chapter.

2.2.0 Sample

The stratified cluster design of sampling was employed. The sample was selected from the municipal

areas of Baroda City and Bangkok City. The municipal areas of the two cities were further divided into the blocks. After having selected the "blocks", the high and higher secondary schools were listed with a view to select the institutions randomly. From grade IX level, sections (classroom as unit) were selected randomly from these institutions.

In the absence of up-to-date census data of the number of school going girls and boys of these two cities, it was not possible to fix the proportion of girls and boys in the sample according to total population. The six English medium schools in Baroda and six secondary schools in Bangkok were selected while considering the location and school standard. The school standard was considered on the basis of examination records available at the department of secondary education in both the countries. Every school in the sample was one of the topmost schools with regard to examination results.

The present study employed three different samples: (i) Student Sample, (ii) Teacher Sample - 1, and (iii) Teacher Sample - 2. The composition of the sample (school-wise) is given in Table 2.1.

TABLE 2.1 COMPOSITION OF THE SAMPLE (SCHOOL-WISE)

	Sr. No.	Name of the School.	Nature of School Boys/Girls Co-education	Location	Educational District	Medium of Instruction	Total Number of students
INDIAN	1	Baroda High School	C.S.	Urban	Baroda	English	50
	2	Vidyakunj High School	C.S.	"	"	"	50
	3	Rosary High School	B.S.	"	"	"	51
	4	Shreyas Vidyalaya	C.S.	"	"	"	47
	5	Navarachana High School	C.S.	"	"	"	45
	6	Jesus Mary High School	G.S.	"	"	"	57
THAILAND	7	Panyavorrakun School	C.S.	Urban	Bangkok	Thai	50
	8	Samsen Vidyalai School	C.S.	"	"	"	50
	9	Satrividhaya School	G.S.	"	"	"	52
	10	Watpratomkongka School	B.S.	"	"	"	47
	11	Darunvidhaya School	C.S.	"	"	"	55
	12	Bangkapi Schbol	C.S.	"	"	"	46

C.S. = Co-education School
B.S. = Boys School
G.S. = Girls School

2.2.1 Student Sample

TABLE 2.2 COMPARISON OF SAMPLE OF INDIAN STUDENTS (BARODA) AND THAI STUDENTS (BANGKOK)

COUNTRY	VAR	YEARS	NO. OF STUDENTS M	NO. OF STUDENTS F	TOTAL	PERCENT M	PERCENT F	TOTAL
INDIAN	AGE	13+	41	61	102	13.67	20.33	34.00
		14+	57	72	129	19.00	24.00	43.00
		15+	30	21	51	10.00	7.00	17.00
		16+	11	7	18	3.67	2.33	6.00
			139	161	300	46.34	53.66	100.00
THAILAND	AGE	13+	16	25	41	5.33	8.33	13.67
		14+	43	53	96	14.33	17.67	32.00
		15+	59	54	113	19.67	18.00	37.67
		16+	33	17	50	11.00	5.67	16.67
			151	149	300	50.33	49.67	100.00

M = Male F = Female

In Table 2.2, the comparison of student sample of Indian students (Baroda) and Thai students (Bangkok) with regard to sex

and age are shown. The student sample consisted of 300 Indian students (Baroda) and 300 Thai students (Bangkok) of grade IX belonging to age range 13^{+} to 16^{+} years. There were 290 male students - 139 in Baroda and 151 in Bangkok and 310 female students - 161 in Baroda and 149 in Bangkok. The student sample from two cities have represented both sexes of various age groups. The sample was drawn - randomly from six English medium schools in Baroda City and six secondary schools from Bangkok City. All twelve schools were situated in the urban areas.

TABLE 2.3 SAMPLE COMPOSITION WITH RESPECT TO SOCIO-ECONOMIC STATUS OF INDIAN STUDENTS AND THAI STUDENTS (N=600)

INDIAN						THAI					
	SOCIO-ECONOMIC STATUS				TOTAL		SOCIO-ECONOMIC STATUS				Total
	SES I	SES II	SES III	SES IV			SES I	SES II	SES III	SES IV	
No. of Cases (N)	4	95	139	62	300	No. of Cases (N)	11	125	127	37	300
Percentage	1.33	31.67	46.33	20.67	100	Percentage	3.67	41.67	42.33	12.33	100

Table 2.3 shows the comparison of the student sample with respect to socio-economic status. The maximum percentage of students in both the countries with regard to socio-economic status fall in the third class

i.e. Lower Middle Class. The first class i.e. Upper Class has the minimum percentage of students with respect to SES. The Indian students have more number in the fourth class of Upper Lower as compared to the Thai students. The whole sample lies between Upper Lower and Upper Middle Class.

2.2.2 Teacher Sample - 1

TABLE 2.4 FREQUENCY DISTRIBUTION OF TEACHERS ACCORDING TO THEIR AGE, SEX AND COUNTRIES (N=200)

Age Class Intervals	Baroda (India)			Bangkok (Thailand)		
	M	F	Total	M	F	Total
51 - 55	1	0	1	2	0	2
46 - 50	1	1	2	3	1	4
41 - 45	5	1	6	8	1	9
36 - 40	9	3	12	14	3	17
31 - 35	18	17	35	11	10	21
26 - 30	15	13	28	12	7	19
21 - 25	6	10	16	17	11	28
N	55	45	100	67	33	100
%	55.00	45.00	100	67.00	33.00	100

In Table 2.4, frequency distribution of teachers according to their age, sex and countries is shown. There were 122 male teachers - 55 in Baroda and 67 in

Bangkok - and 78 female teachers - 45 in Baroda and 33 in Bangkok. Ages of teachers in both countries are clustering around 21-35 years.

2.2.3 Teacher Sample - 2

TABLE 2.5 FREQUENCY DISTRIBUTION OF TEACHING SITUATIONS (N=72) OBSERVED IN BARODA CITY (INDIA) AND BANGKOK CITY (THAILAND)

Class Intervals strength of the class	Frequency of Teaching Situations		
	Baroda	Bangkok	Total
45 - 49	3	4	7
40 - 44	4	7	11
35 - 39	10	13	23
30 - 34	12	8	20
25 - 29	5	2	7
20 - 24	2	2	4
N	36	36	72
%	50	50	100

In Table 2.5, the frequency distribution of teaching situations in Baroda City (India) and Bangkok City (Thailand) is shown. The number of students in the teaching situations varied from 20-49. The strength of the classes observed in both the countries were clustering in the class interval of 30-44.

2.3.0 Tools Used

The following research tools were used for this investigation :

(i) The Passi Tests of Creativity (Verbal Form)

(ii) The Torrance Tests of Creative thinking (Figural Version Form A and Verbal Version Form B)

(iii) The Kuppuswamy's Socio-Economic Status Scale (Form B)

(iv) The Organizational Climate Descriptive Questionnaire (Based on eight dimensions of Haplin and Croft's Organizational Climate Descriptive Questionnaire)

(v) The Flanders' Interaction Analysis Categories System (A ten Category System)

The details regarding the selection of tools and description of tools are given as follows :

2.3.1 Selection of Tools

The Passi Tests of Creativity (PTC - Verbal Form) was the tool used for measuring criterion variables in the present study. This tool has been tried out to the Thai students (Vullope, 1976). He has reported the satisfactory results in the -

application of the PTC to the Thai culture. Moreover, the PTC was the open - ended type which provided the common objects or situations to respondent, for - example, the test of Seeing Problems included the objects of shoes, Pen, Chair and Post - card. The respondents are expected to write the defects and problems in using each of these subjects. In the case of the Unusual Uses Test, the two common objects 'piece of cloth and bottle' were given to respondents to list as many uses as possible, which are unusual for each of the two objects. These objects and situations provided in the PTC seemed to be in common as far as Indian and Thai culture are concerned. The responses of the respondents may differ from culture to culture but researcher can prepare the particular list of the responses which do not affect to the scoring procedure. A separate system of scoring might be devised with the help of a panel of judges in each culture. A researcher can ask them to give opinions about the relevance and categorization of responses to different tests or items wherever and whenever necessary. Besides this, the researcher himself may analyse the relevance and categorization of responses, and, in case of conflicts, discussion with the judges may be held in order to take a final decision. The later procedure has been adopted in this study.

For example, in the case of Unusual Uses Test, the responses of 'Dakshina to Brahmin' (Indian culture) and 'Mon Sorn Pha' (Thai culture) towards the item 'piece of cloth' may not be relevant to each other but the scoring is remained the same.

The Torrance Tests of Creative Thinking (Figural Version Form A and Verbal Version Form B) was the second standardised tool used in the study. The TTCT were also employed to assess the various dimensions of creative thinking. The tasks of the TTCT are also kept open-ended so that respondents be able to respond in terms of their experience whatever they might have been. This is the true nature of divergent production. And it has been responsible for fairly consistent finding that the TTCT has little or no racial, ethnic, or socio-economic status bias (Torrance, 1971 b), and that it exhibits a significant degree of validity in countries other than U.S.A. (Ogletree, 1971). Even in India, it has been widely and fruitfully used as can be seen from the reviews by Raina (1971, 1972 a, 1972 b). So far no research study at any level in Thailand has been reported in which the TTCT has been used to assess creative thinking.

The Kuppuswamy's Socio-Economic Status Scale (Form B) was the third standardised tool used in the study. Though, the Kuppuswamy's Socio-Economic

Status Scale was constructed and standardised through Indian sample, it could be used to the Thai culture as well. Because the socio-economic status in the urban areas of Thailand is attached to the three important variables of education, occupation and income as indicated in this tool. Considering to the categorization of education and occupation, the highly qualified persons, the doctors and engineers were considered to have high status in India as well as Thailand. Referring to income, the categories provided in this item were broad and were covering the probable incomes per month of Thailand. Therefore, this tool was also reasonable to the Thai condition.

The organizational climate Descriptive Questionnaire was used to measure the school climate of the teachers in the schools which the student sample was drawn. The tool was based on the eight dimensions of the Haplin and Croft's Organizational Climate Descriptive Questionnaire. The original tool has been adopted to Indian and Thai conditions (Desai, D.M. and Samrong, 1975) by adding the four dimensions of organization structure, communication, human relation, and freedom and democratization.

The Flanders Interaction Analysis Category System (A ten Categories System) was the tool used to observe verbal behaviour of teachers in the classroom.

Classroom observational instruments exist in abundance. More than one hundred category systems (and sign systems) can be identified easily. The anthology, Mirrors for Behaviour (Simon and Boyer, 1967, 1970 a, 1970 b), contains 92 observational systems. Of these, 76 have been used for observation of instruction in schools or school like settings (Rosenshine and Furst, 1973). Classroom interaction analysis can be performed by means of any suitable tool of observation, developed for the specific purpose. There are several systems of coding spontaneous verbal communication occurring in a classroom as also that take into account the nonverbal occurrences. Some of the tools described by Simon and Boyer (1967) have subsequently undergone modifications so much so that they have become improved tools to observe classroom interaction to discover subtler relationships. A point in instance is the "subscripting" done by Flanders (1970). Largely, it is the purpose on hand that should decide the choice of the tool for observation since different tools aim at studying the classroom interaction for different objectives.

Of the several observational tools available the systems developed by Flanders are found suitable for use in India as well as Thailand where it is difficult to afford costly electrical and electronic

gadgets for use in the process of observation and subsequent analysis, which are essential in respect of some other tools of observation.

2.3.2 Description of Tools

(i) The Passi Tests of Creativity (PTC - Verbal Form) :

This battery of tests was constructed by Passi (1967) and standardized by employing school population. It consists of both verbal and non-verbal tests of creativity, and is available both in English and in Hindi. It includes six subtests, namely, (i) the Seeing Problems Test, (ii) the Unusual Uses Test, (iii) the Consequences Test, (iv) the Test of Inquisitiveness, (v) the Square Puzzle Test and (vi) the Blocks Test of Creativity. These tests are classified on the lines of Torrance (1962) as follows :

(a) Tests consisting of verbal tasks, namely, the Seeing Problems Test, the Unusual Uses Test and the Consequences Test; (b) Test with verbal tasks using mostly non-verbal stimuli namely, the Test of - Inquisitiveness; (c) Tests consisting of non-verbal tasks comprising the Square Puzzle Test and the Blocks Test of Creativity. The first four can be administered to a group of 30 students at a time or individually and the fifth test namely, the Square

Puzzle Test can be administered either individually or to a group of not more than six students. The sixth test can be administered individually only. In the present study only the three verbal tests (Seeing Problems, Unusual Uses and Consequences) were used.

The nature of the tests permit freedom of response both qualitative and quantitative within specified time limits, thus entering suitability of the tools for measuring divergent thinking. Instructions and practice items are given before the actual commencement of the administration of the different tests. The subject are supposed to write their responses in the specific responses sheet provided for the purpose. Responses are acceptable in any of the languages - English, Hindi or any other Mother-tongue. A brief and specific outline of the three tests which have been employed in the study is given in the following captions :

(i) The Seeing Problems Test : It is a verbal and an individual and group administered test. The Seeing Problems Test was developed by adopting the pattern of Guilford, et al (1952). It is designed to measure a factor of sensitivity to problems which is a component dimension of creativity as described by Guilford (1951, 1952). The test is proposed to

measure the ability to comprehend problems concerning the working of simple and handy articles of common use. The test of Seeing Problems includes four items, namely, Shoes, Pen, Chair and Post card. The maximum time limit for the test is kept eight minutes so that two minutes could be devoted to each of the items. Instructions to this effect are specifically mentioned in the test booklet.

(ii) The Unusual Uses Test : It is a verbal and an individual and group administered test. This is designed on the lines of the Brick Uses Test by Guilford, et al (1952) and Torrance's (1962) the Unusual Uses Test, this test includes the names of things which could be used for numerous purposes. It includes only those item which have proximity with the psychological and physical environment of the subjects. The test of Unusual Uses includes two items, namely, Piece of Cloth and Bottle. The subjects are expected to write down as many interesting and unusual responses to each stimulus article (item) as they can. The maximum time limit for the test is kept eight minutes so that four minutes could be devoted to each of the items. Instructions to this effect are specifically mentioned in the test booklet.

(iii) The Consequences Test : It is a verbal and an individually and group administered test. The pattern

of the test is based on the tests of Guilford et al (1952) and Torrance (1962). The test measures the dimensions of fluency, originality and creativity (creativity score is the sum of the scores of fluency and originality). The Consequences Test includes four items, namely, "If human beings start flying like birds"; "If all houses start flying"; "If all people become mad"; and "If all females become males." The maximum time limit for the test is kept eight minutes so that two minutes could be devoted to each of the items. Instructions to this effect are specifically mentioned in the test booklet.

Reliability and Validity of PTC

As already mentioned that the above three sub-tests of the battery of 'The Passi Tests of Creativity' are developed somewhat on the lines followed by Guilford (1952) and Torrance (1962). The parental population used for the standardization of these tests, consisted of higher secondary students of the States of the Punjab, Haryana and Union Territory of Chandigarh. For developing the Tests, samples were drawn from it, at different stages depending on the purpose. The techniques of sampling were random, random clustered or multistage random clustered depending on the size and purpose of the sample.

A sample of 50 students was drawn for selection

of the type of test items; 30 for 'pooling source material' for items for the Tests; 100 for item analysis; 60 to establish reliability and validity; and 600 for norm establishing. The test - retest reliability coefficient for all the tests in the battery with a time gap of a fortnight between two administrations, ranged from 0.68 to 0.97 with a median value of 0.83. The split - half reliability coefficients for the Tests - the Seeing Problems Test, the Unsuaul Uses Test and the Consequences Test are respectively equal to 0.83, 0.51, and 0.80. The Tests were validated against an external criterion namely, 'the Things-Done-On-Your-Own-Checklist.' This battery of Tests has higher convergent validity coefficients. Against the criterion measures of the checklist, they ranged from 0.43 to 0.95 with a median value of 0.60. The coefficient of discriminant validity against the criteria of non-verbal intelligence, verbal intelligence and scholastic achievement, ranged from 0.05 to 0.81. Factorial validity for the verbal tests represented by factor loadings of the tests ranged from 0.305 to 0.747.

Scoring

The scoring system of the PTC was adopted in accordance with the nature of responses given by the sampled subjects from the city of Baroda and Bangkok

respectively. Details about the scoring of the three tests are given below :

(a) The Seeing Problems Test : Each accepted response is given a credit of one score representing seeing problem.

(b) The Unusual Uses Test : With this test, the dimensions of fluency, flexibility and originality are measured. The fluency score is obtained by counting the total number of acceptable response. Flexibility is represented by the number of different categories of responses for which a five point scale from zero to four was developed in order to assign weightage to a response according to its level of commonners. The greater the fluency of occurance of a particular response in group, the more is the commonners and the lower is its scores of originality and vice-versa.

(c) The Consequences Test : This test is designed to measure the dimension of fluency and originality. Fluency is represented by the sum total of accepted responses on the test. The score of originality is represented by the total number or indirect and remote responses. The summated scores of fluency and originality represent a score of creativity as measured by the Consequences Test. The Creativity Total (CY) is obtained by adding all on three subtests

i.e. SP+UC+CC.

(ii) The Torrance Tests of Creative Thinking (TTCT) :

These tests are very popular in this field and consisted of four batteries of test activities - two verbal and two figural. These were developed after a lot of research efforts. These tests included Verbal Form A, Verbal Form B (an equivalent alternate form to verbal A), Figural Form A, and Figural Form B (an equivalent alternate form to Figural A). An attempt is made, however, to assess the products that result from the administration of these test activities in terms of divergent thinking factors like fluency, flexibility, originality and elaboration.

In this study, the Torrance Tests of Creative Thinking (Figural Form A and Verbal Form B) were used. The Figural Form A of the Torrance Tests of Creative Thinking (Torrance, 1966 b) consists of the following three 10 minutes tasks or activities : Picture construction, Picture Completion, and Repeated Figures (Parallel Lines). The verbal Form B (an equivalent alternate form to Verbal A) consists of the following seven tasks or activities : Asking Question, Guessing Causes, Guessing Consequences, Product Improvement, Unusual Uses of Tin Cans, Unusual Questions and Just Suppose.

These tests have been used with different cultures with satisfactory results. The tests were translated into Gujarati and Thai. The test developed at the Bureau of Educational Research has been guided by definition of creativity presented by Torrance as a process functionally a special kind of problem-solving (quoted earlier), considered it as a multivariate phenomenon. The tasks were devised so that they reflected different aspects of creative behaviour. Torrance has described how it was accomplished and what criteria were applied for the selection of the tasks in the Norms - Technical Manual (1974) as well as elsewhere (Torrance, 1975). However, an attempt is made to assess the products that result from the administration of these test activities in terms of divergent thinking factors such as, fluency, flexibility, originality and elaboration.

Administration of the Test

TTCT manuals (1963) made it clear in the instructions for administration that the test anxiety or pressure of evaluation be removed from the atmosphere by establishing good and friendly rapport with the subjects and refering to the test tasks as play activities for fun. The Figural Tests include three activities with an over-all administration time of 30 minutes. The verbal tests consist of seven parallel

tasks, each requiring a total of 45 minutes in addition to the time necessary for providing an orientation, handing out booklets, and giving instructions. Barron (1969) strongly objects to the procedure of the creativity tests in general, saying "The short and closely timed tests do violence to the very essence of creative process, which goes at its own pace, will not be hurried, is behaviorally silent for long periods of time, and is easily aborted if someone is always blowing a whistle on it." Wallach and Kogan (1965), too, have insisted on game - like test context free from the pressure of time and evaluation.

Reliability

(a) Inter - Scorer reliability :

An experiment was conducted during 1965-1966 to determine the extent to which unselected classroom teachers can reliably score Verbal and Figural Form A and B of the Torrance Tests of Creative Thinking without any training other than individual study of scoring guides. The data summarized in the N - T Manual comparing the experienced, short - trained and inexperienced scorers are quite impressive : almost all the coefficients of correlation being above .90.

(b) Alternate Forms : The coefficients of -

correlation between Form A and Form B in the two studies quoted in the manual range from 0.71 to 0.93 and from 0.60 to 0.80.

(c) Test - Retest : A number of Test-Retest reliability studies were conducted with Verbal and Figural Forms A and B of the TTCT with the same or alternate forms with intervals from one week to six months, are quoted in the N - T Manual yielding coefficients ranging from 0.47 to 0.89 mostly around 0.75. As will be noted, the test-retest reliability coefficients are generally higher than for the figural tests and for fluency and flexibility than for originality and elaboration.

Studies, also quoted in the N - T Manual, using more or less the whole battery are summarized below :

Investigator & Date.	Subjects.	Period between Test & Retest.	Coefficient
Sommers (1961)	College students	10 weeks	0.97 and 0.80
Goralski (1964)	Student teachers	10 weeks	0.83
Wodtke (1963)	Students Gr. 2-5	3 months	Range 0.34-0.79
Eherts (1961)	Students Gr. 5	7 months	0.88
Dalbec (1966)	College students	3 years	0.35-0.73

The fluctuations are visible. Eherts' (1961) study is closer to the present one in regard of subjects and period. His coefficient (0.88) alongwith - Torrance's (1974) assurance, that "The simple practice effects at taking the tests do not seem to have a great deal of effect on performance," shows that the scores could be relied upon.

Validity

(a) Content Validity :

To ensure content validity, a consistent and deliberate effort has been made to base the test stimuli, the test tasks, instructions, and scoring procedures on the test theory and research results available. Analyses of the lives of indisputably eminent creative people, research concerning the personalities of creative people, the nature of performances regarded as creative, research and theory concerning the functioning of the human mind, and the like have been considered in making decisions regarding the selection of test tasks. A deliberate and consistent effort has also been made to keep the test tasks free of bias from technical or subject matter content. One special advantage of the test tasks that constitute Figural and Verbal Forms A and B is that they can be administered at all educational levels. This features makes it possible to determine whether or not children and young people

identified as "creative" behave in ways similar to the ways in which eminent creative people of the past behaved when they were children and young people. It also enables us to determine whether or not adults identified today as relatively creative on the basis of outside criteria behave in ways that can be called creative on the basis of test scores. Such matters as these will be dealt with under "concurrent validity," but it is this content - free characteristic of the test tasks that makes possible the above approach to concurrent validity and gives it greater meaning than generally inherent in indications of concurrent - validity.

(b) Construct Validity :

A large number of studies employing the Torrance Tests of Creative Thinking have been conducted to - increase understanding of the qualities being measured by the tests. Torrance (1974) reported various - studies which used the TTCT alongwith various personality assessment instruments and using contrasted groups designs, found positive, and most of the times, significant correlations between the attributes, needs - aspirations, interests, preferences, etc. that are found to go with the creative personality (Crosby, 1968) and high scores on the TTCT.

The personality variables and the problem -

solving traits, earlier not specified but supposed to be assessed, are perhaps "impulse to closure" in "Incomplete Figures" and "Parallel Lines", "disruption of structure" in "Circles", "tolerating and playing with the improbable" in "Just Suppose", and 'tendencies of elaboration' or 'perfectionism' in all the figural activities. Of course, these traits are not distinctly measured, but they can be inferred from the responses.

Some of the reported studies found significant correlations between TTCT scores and the originality of the "products" like drawings, imaginative stories, divergent questions asked in classroom etc., produced by the same subjects.

Still other studies found positive correlations between the TTCT scores and the "press" or environmental conditions said to be conducive for creativity, such as, family background, child-rearing practices, and experimental intervention.

These validity studies are criticized for their gross statistical deficiencies and weak designs, e.g. extreme group comparisons without any information about the excluded middle, 'creative' versus 'unselected' sample, and simple matching of controls and "creatives" (Holland, 1968). But the same critic agrees, "yet most of the evidence seems internally consistent and generally consistent with the literature of creative

behaviour."

(c) Concurrent Validity :

Although Torrance and his associates have been able to find no generally acceptable criteria of concurrent validity, a number of the ones that have been used deserve mention. There are some measures of concurrent validity which are regarded by Torrance as inappropriate.

Scoring :

The tests being open-ended, their scoring is inevitably time - consuming. The following four scores are derived, the first three of which are common for both the verabal and the figural tasks and the last one expected for the figural tasks but optional for the verbal ones.

(a) Fluency : the number of relevant responses. This score is expected to reflect the subjects's "ability to produce a large number of ideas."

(b) Flexibility : the number of pre-determined categories to which the responses belong. This score is supposed to represent the subject's "ability to produce a variety of kinds of ideas, to shift from one approach to another, or to use a variety of strategies."

(c) Originality : the weighted infrequency of each response with reference to the pool of responses given

by the normative sample. This score is supposed to represent the subject's "ability to produce ideas that are away from the obvious, commonplace, banal or established."

(d) Elaboration : The number of significant details add to the basic idea. This score is expected to reflect the subject's "ability to develop, embroider, embellish, carry out, or otherwise elaborate ideas."

Scoring manual (1965) are fairly unambiguous and ensure objective scoring except at some places where the scorer has to exercise his judgment while deciding relevance, category or creative strength of a response. If the manuals are followed strictly, impressive inter-scorer consistency is achieved.

In addition to the three dimensions of the Verbal Form B (fluency, flexibility and originality) and four dimensions of Figural Form A (fluency, flexibility, originality, and elaboration) the investigator has added each dimension of Verbal Form B and Figural Form A to get composite total verbal and/or figural score. The two adding dimensions were labelled as Verbal Creativity (VC) and Figural Creativity (FC) respectively. Though, such a practice was not recommended. Torrance (1974) stated that "such a score does seem to give a rather stable index of the total amount of creative energy a person has available or is willing to use."

(iii) The Kuppuswamy's Socio-Economic Status Scale (Form B) :

Kuppuswamy (1962) developed a socio-economic status scale (SES), consisted of two forms, namely, Form A and Form B. Form A is meant for adults who are either earning or who are out of employment. It may be used as a schedule to be completed by the investigator by asking questions, specially, when the persons are illiterate. Form B is meant only for students. In the present study the investigator used Form B to obtain socio-economic status score of the students. The Kuppuswamy's Socio-Economic Status Scale (Form B) was given to students in order to hand over their parents. The students were asked to return the forms after they have been filled in by the parents. This scale was translated into Thai as well as Gujarati.

This scale contains 7 items related to three variables, such as, education, occupation, and income. The variables of education includes the following items (i) Professional degree or Hons., M.A., and above, (ii) B.A., or B.Sc. degree, (iii) intermediate or post high school diplomas, (iv) high school certificates, (v) middle school completion certificates, (vi) primary school or literacy certificates and (vii) illiterate. The variable of occupation includes (i) profession, (ii) semi-profession, (iii) clerical, shop owners,

farm owners, etc., (iv) skilled worker, and (v) semi-skilled workers, (vi) unskilled labourers and (vii) unemployed. The variable of income includes (i) above 1,000 per month, (ii) between Rs.750 and 999, (iii) between Rs.500 and 749, (iv) between Rs.300 and 499, (v) between Rs.101 and 299, (vi) between Rs.51 and Rs.100 and (vii) below Rs.50. The scale can be used by collecting information about an individual's socio-economic background in a specially devised Information Inventory. Then the score card can be completed and the status score of the individual can be worked out. The scale on the basis of the total score is as follow :

26 - 29	I	Upper
16 - 25	II	Upper Middle
11 - 15	III	Lower Middle
5 - 10	IV	Upper Lower
Below 4	V	Lower

It is assumed that the difference between categories is more significant than differences within each category. It is further assumed that the weighted scorers of the three variables could be added in order to get the final score for socio-economic status. It is also assumed that education, occupation and the income are the three essential variables which determine the socio-economic status in a modern city. Social prestige is now defined in an operational -

manner and the variables selected are capable of being objectively ascertained. Depending on circumstances there may be an over or an under - estimation. However, since the income groups are broad, error in estimation may not affect considerably the income score itself and hardly the total scores. This is one of the merits of the scale proposed. The validity of the scale was established by using "matching against outside criterion", "distribution patterns", and "comparison of dichotomous groups" methods.

(iv) The Organizational Climate Descriptive Questionnaire (Based on eight dimensions of Haplin and Croft's Organizational Climate Descriptive Questionnaire) :

Halpin and Croft's OCDQ (Organizational Climate Descriptive Questionnaire Tool) has been the fountain head of the researches done in this field from 1963 to the present date - most of the studies on organizational climate done in the U.S.A., Canada, Australia, and to some extent in Korea, Philippines and India have used the OCDQ Tool and followed the techniques developed by them to identify, classify and interpret the organizational climates. This tool was constructed by Halpin and his colleague Don B. Croft to describe the climate of elementary schools. It was decided to use a set of Likert - Type items. The OCDQ was originally composed of items which teachers and principals can use to

describe the climate of their school. A sample of 71 elementary schools was chosen from six different regions of the United States. The tool was administered to 1,151 teacher respondents. The scale against which the respondent indicated the extent to which each statement characterized his school was defined by four categories : (i) rarely occurs, (ii) sometimes occurs, (iii) often occurs and (iv) very frequently occurs. The numberical values given to these responses were respectively 1, 2, 3 and 4. The results of the response to these items were subjected to factor analysis. As a result of this exercise, the eight dimensions of the organizational climate i.e. Disengagement, Hindrance, Esprit, Intimacy, Aloofness, production Emphasis, Thrust, and consideration were identified.

This is, thus, the research of Halpin and Croft which uses the OCDQ to get the responses of the teachers about their principal's and colleagues behaviour in the school which portray the climate in the school.

The original tool has been adapted by Desai, D.M. and Samrong (1975) by adding the four dimensions of Organization structure, communication, human relation and freedom and democratization. This has been done to make the tool more suitable to different schools of different cultures in India as well as Thailand.

They adopted the following procedure :

(a) They held conferences with the staff members as well as the research workers of the M.S. University of Baroda who have done research studies in the area of organizational climate. These series of discussion yielded four additional dimensions for identification of climate (quoted earlier).

(b) The second step was to hold discussion with the 30 post-graduate Thai students studying in the campus of Faculty of Education and Psychology, Baroda, to build up a new framework and contents for construction of items based upon each of the dimensions or factor.

(c) The third step was the construction of the items dimensionwise or factorwise for the tool.

(d) The fourth step was the detailed discussion of each item at a work conference which consisted of the same persons as in the first step.

(e) Preparation of the experimental draft form of the tool.

(f) After finalising the experimental draft of the tool, they have tried out administration of the first draft. In this try-out 50 secondary school teachers in Baroda City and the same number in the central provinces of Thailand co-operated.

(g) The final choice of items in the tool was based on technique of internal consistency. The items that showed coefficient of correlation of .50 or above were retained for the final draft of the Organizational Climate Descriptive Questionnaire.

The final draft of OCDQ consisted of 120 items. Alongwith English version, the OCDQ was translated into Thai before administered to the Teacher Sample - 1 (Vide Caption 2.2.2). Each item of the OCDQ was used for response a four - point scale which has already mentioned. These four categories of responses will be scored by simply assigning to the respective categories the four successive integers, viz., 1, 2, 3 and 4, respectively. Negative item will be scored using a reverse scale. An 'openness' score can be obtained combining certain subtest scores. The higher the score, the more open the climate of the school.

(v) The Flanders' Interaction Analysis Categories System (A ten Category System) :

The interaction analysis technique developed by Flanders (1960, 1970) was used in the investigation. It is an observational technique designed to observe and code classroom verbal behaviour of the teacher every three seconds, using a ten - category system. The system is made up chiefly of three major components

teacher talk; student talk and silence and/or confusion. The tool has face validity. Buch and Santhanam (1970) reported that this category system of classroom observation can be used with facility in Indian conditions. The various categories and their description is given in Appendix xi .

The influence which the teachers uses in the classroom is of two types - "direct" and "indirect". The student talk is divided into "responsive" and "self - initiated" parts. Of the 7 categories dealing with teacher behaviour, the first 4 deal with indirect influence pattern, which is characterised by leaving more freedom of action for the student through accepting his feelings, facilitating his participation by praising and encouraging him, accepting his ideas, and stimulating him to talk by raising questions. Categories 5, 6 and 7 deal with direct influence pattern, in which there is little or no freedom of action to the students. When the teacher lectures continuously, or gives definite directions, and justifies his authority, or reprimands the students, he is using direct influence.

In this system each verbal act of behaviour is categorised and coded only once. Whenever a statement can be classified under two categories, the category which has occured less number of time is preferred.

Methods of Observation :

The observer sits in the classroom and observes teacher when he is teaching. He writes down the category number which best represents the communication even justed completed. For instance, when the teacher is lecturing the observer puts 5 ; when he asks questions he puts 4; when the student replies he puts 8; when the teacher praises he puts 2; and when again the teacher starts lecturing he puts 5. In the end, a long series of number is obtained. The procedure of recording the events goes a rate of 20 to 25 observations per minute.

In the present study for each observation a separate 10 X 10 matrix was prepared. In this way, there were 36 different matrices in Indian sample and the same number in Thailand (N = 72). By mean of the 36 matrices for each of the two sets of Teacher Sample - 2 (Vide caption 2.2.3) the percentages and interaction ratios have been worked out. The frequency distributions for each of the interaction ratios have been drawn for both Indian teachers and Thai teachers.

The details of various tools used in the present study are given in Appendices I to XI.

2.4.0 Procedure of Data Collection

First, the Passi Tests of Creativity were administered to the students under the supervision of classroom teacher and the investigator. The administration of the PTC has taken in group of 20 - 40 students at a time. The procedure and detailed instructions for administration of the tests was done according to the tests' technical manuals (Passi, 1971). With the gap of one week, the Torrance of Creative - Thinking were given to the students. Again the Figural Version Form A of the TTCT and Verbal Version Form B of the TTCT were performed on the two different time with the interval of three days. The administration of the TTCT was according to Torrance (1965).

The Kuppuswamy's Socio-Economic Status Scale (Form B) was given to students in order to hand over their parents. The students were asked to return the forms after they have been filled in by the parents. In the case of the parents of particular students are illiterate, the students were requested to fill the forms by themselves.

All teachers from the same six schools in India and Thailand were administered the Organizational Climate Descriptive Questionnaire (Desai, D.M. and Samrong, 1975). Finally, the three teachers in each of the six schools in India and Thailand has been observed during the

classroom teachings by means of the Flanders' ten category system (A ten categories system). Each teacher was observed for 2 half-hour periods distributed over one or two days from different sections of class IX. The teachers which have been selected in both countries taught various subjects in the grade IX. The school teachers were found to be very co-operative. The collection of data was completed first in Thailand during the months of December, 1975, to March, 1976. Later, the data collection has been performed in India from June - September, 1976. This data was analysed to test the hypotheses. The techniques used for this purpose are given in the following caption.

2.5.0 Analysis of Data

Because of the complexity of the higher order statistical procedures involved in the computation and for the accuracy of the findings, the analysis of data and statistical computations were done in IBM 360 in the Computer Centre, Physical Research Laboratory, Ahmedabad.

Five types of statistical techniques were used to fulfill the objectives of the study and to test the hypotheses.

2.5.1 Descriptive Statistics

The frequencies distributions were drawn for all the 32 important variables (Vide Table 2.6). Means, SD_S, SE_M and SE_{SD} were also calculated. The overlapping percentage frequency polygons for all the 18 criterion variables of creative thinking were also given.

2.5.2 The t-test Approach

The t-test technique was employed to find out the significance of difference between means, for all 18 criterion variables of creative thinking by grouping done according to four controlled variables (independent variables) namely country, socio-economic status, school climate and classroom behaviour for total cases (N = 600) and each of the two sets (Thai and India) separately (N_1 = 300, N_2 = 300).

2.5.3 Correlational Approach

In order to see the relationship of each sub-test with the others as measured by the Passi Tests of Creativity (Verbal Form) and the Torrance Tests of Creative Thinking (Figural Version Form A and Verbal Version Form B), the inter-correlation matrix was worked out for each of the two sets (Thai and India).

2.5.4 Factor Analysis

The correlational matrix was subject to principal component analysis leading to factor matrix. The factor matrix was rotated with the help of varimax rotation method. The original and rotated factors were named.

2.5.5 Analysis of Variance (ANOVA)

ANOVA was used to determine the relationship of country, socio-economic status and school climate in one set and country, socio-economic status and classroom behaviour in another on the 18 criterion variables of creative thinking and its sub-tests. The scores on 18 criterion variables of creative thinking were analysed using 2 x 2 x 2 factorial design. The independent variables were country, socio-economic status, school climate and classroom behaviour and dependent variable was creative thinking and its sub-tests. The design consisted of 8 cells; fifteen students were drawn randomly for each cell entry for each of the two sets. Therefore, there were in all 36 tables of summary of Analysis of Variance.

2.6.0 Variables

In the present study there are three sets of variables.

2.6.1 Independent Variables

The set of independent variables include socio-economic status (SES), school climate (OCDQ) and the dimensions of classroom behaviour which are Teacher Talk (TT), Pupil Talk (PT), indirect/direct ratio (i/d), Indirect/Direct ratio (ID), Teacher Response Ratio (TRR), Teacher Question Ratio (TQR), Instantaneous Teacher Response Ratio (TRR 89), Instantaneous Teacher Question Ratio (TQR 89), Pupil Initiation Ratio (PIR), Content Cross Ratio (TQR 89), Steady State Ratio (SSR), and Pupil Steady State Ratio (PSSR).

2.6.2 Controlled Variables

The demographic variables of country and sex are labelled as controlled or independent variables.

2.6.3 Criterion Variables

The criterion variables are the dimensions of creative thinking which consist of Seeing Problems (SP), Unusual Uses Fluency (UF), Unusual Uses Flexibility (UX), Unusual Uses Originality (UO), Unusual Uses Creativity (UC), Consequences Fluency (CF), Consequences Originality (CO), Consequences Creativity (CC), Creativity Total (CY), Figural Fluency (FF), Figural Flexibility (FX), Figural Originality (FO), Figural Elaboration (FE), Figural Creativity (FC), Verbal Fluency (VF), Verbal Flexibility (VX), Verbal Originality (VO) and Verbal Creativity (VC).

The symbols used for the variables measured alongwith the tools have been given in Table 2.6 below :

TABLE 2.6 TOOLS USED FOR THE DIFFERENT VARIABLES EMPLOYED IN THIS STUDY

Sr. No.	Variable	Symbol used	Name of the tool used
1	Country	CON	Personal Information Proforma.
2	Sex	SEX	"
3	Seeing Problems	SP	The Passi Tests of Creativity (PTC - Verbal Form)
4	Unusual Uses Fluency	UF	"
5	Unusual Uses Flexibility	UX	"
6	Unusual Uses Originality	UO	"
7	Unusual Uses Creativity	UC	"
8	Consequences Fluency	CF	"
9	Consequences Originality	CO	"
10	Consequences Creativity	CC	"
11	Creativity Total	CY	"
12	Figural Fluency	FF	The Torrance Tests of Creative Thinking (TTCT - Figural - Form A)
13	Figural Flexibility	FX	"
14	Figural Originality	FO	"
15	Figural Elaboration	FE	"
16	Figural Creativity	FC	"

Sr. No.	Variable	Symbol used	Name of the tool used
17	Verbal Fluency	VF	The Torrance Tests of Creative Thinking (TTCT - Verbal Form B)
18	Verbal Flexibility	VX	"
19	Verbal Originality	VO	"
20	Verbal Creativity	VC	"
21	Teacher Talk	TT	FIACS - 10 categories
22	Pupil Talk	PT	"
23	indirect/direct ratio	i/d	"
24	Indirect/Direct ratio	I/D	"
25	Teacher Response Ratio	TRR	"
26	Teacher Question Ratio	TQR	"
27	Instantaneous Teacher Response Ratio	TRR 89	"
28	Instantaneous Teacher Question Ratio	TQR 89	"
29	Pupil Initiation Ratio	PIR	"
30	Content Cross Ratio	CCR	"
31	Steady State Ratio	SSR	"
32	Pupil Steady State Ratio	PSSR	"
33	Socio-Economic Status	SES	The Kuppuswamy's Socio-Economic Status Scale (Form B)
34	School Climate	OCDQ	The Organizational climate Descriptive Questionnaire (Based on eight dimensions of Haplin and Croft's Organizational Climate Descriptive Questionnaire).

A schematic relationship between objectives of the study, the collected samples for the fulfilment of each objective and the corresponding tools employed is given in Table 2.7.

TABLE 2.7 OBJECTIVES, THE SAMPLES TAKEN ANDTHE TOOLS EMPLOYED TO FULFIL THE OBJECTIVES

Sr.No.	Objectives	Sample	Tools
1.	To compare creative thinking of Indian students (Baroda) and Thai Students (Bangkok)	High School students Grade(IX)	The PTC (Verbal Form) The TTCT (Figural Form A and Verbal Form B)
2.	To study the relationship of creative thinking of high school students of Baroda City (India) and Bangkok City (Thailand) in accordance with their socio-economic status, school climate and classroom behaviour	High School students (Grade IX) Teacher Sample-1 Teacher Sample-2 (teaching situation)	The PTC (Verbal Form) The TTCT (Figural Form A and Verbal Form B) The Kuppuswamy's SES Scale (Form B) The OCDQ The FIAC-10 Categories
3.	To study the interaction effect of country, socio-economic status, school climate and classroom behaviour upon creative thinking	..do..	..do..
4.	To compare the factor structure of the space due to variablesrelating to creative thinking of Indian (Baroda) and Thai (Bangkok) students	High School Students (Grade IX)	The PTC (Verbal Form) The TTCT (Figural Form A and Verbal Form B)