

A STUDY OF SOCIO - EDUCATIONAL CORRELATES OF CREATIVITY
AMONG THE SECONDARY SCHOOL STUDENTS OF
LOWER SUBANSIRI AND WEST SIANG DISTRICTS IN
ARUNACHAL PRADESH

Dissertation Submitted

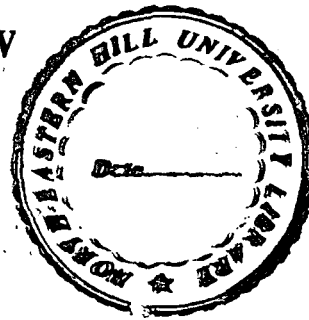
IN

Part Fulfilment of the Requirements of the
Master of Education

Session 1989 - 90

BY

MINI MATHEW



DEPARTMENT OF EDUCATION

ARUNACHAL UNIVERSITY

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D E C L A R A T I O N

I do hereby declare that the Dissertation "The Study of Socio-Educational Correlates of Creativity Among the Secondary School Students of Lower Subansiri and West Siang districts of Arunachal Pradesh" or any part thereto has not been submitted for any degree in the Arunachal University or any other University.

Place :

(MINI MATHEW)

Date :

SUPERVISORS' CERTIFICATE

This is to certify that the M.Ed
Dissertation entitled "The Study of Socio-
Educational Correlates of Creativity Among
the Secondary School Students of Lower
Subansiri and West Siang Districts of
Arunachal Pradesh" is a record of bonafide
study carried out by Mini Mathew under our
supervision and guidance.

(Rachob Taba)

(Prof. M.A. Sudhir)

A C K N O W L E D G E M E N T

With a sense of deep gratitude I acknowledge my Guides Mr. Rachob Taba and Prof, M.A. Sudhir for their valuable suggestions, infinite patience and unfailing support that saw me through in the execution of this project.

I wish to thank Dr. T. Mibang, Reader, Department of History, Arunachal University for his valuable suggestions. My sincere thanks are also due to the members of the Department of Education for their constant encouragement and enquiries during various stages of this project.

It is not possible to name everyone who has assisted me but I would like to mention especially my father for his very valuable help.

(MINI MATHEW)

C O N T E N T S

Acknowledgement

List of Tables

<u>CHAPTER</u>		<u>PAGE</u>
I	INTRODUCTION	1-33
II	REVIEW OF RELATED RESEARCH	34-82
III	METHODOLOGY	83-103
IV	ANALYSIS OF DATA	104-144
V	SUMMARY AND CONCLUSION	145-163

Bibliography

Appendices

LIST OF TABLES

<u>Table No.</u>	<u>T i t l e</u>	<u>Page</u>
1	Sample selected for the study	85
2	Correlation of item scores with total creativity scores	94
3	Correlation coefficients between various factors of creativity	97
4	Break-up of the sample on the select socio-educational variables	107
5	Sex and Creativity	108
6	Age and Creativity	110
7	Birth order and Creativity	112
8	Mean, Standard Deviation and Critical Ratio computed for Creativity Scores of the Birth Order groups	114
9	Paternal Education and Creativity	116
10	Mean, Standard Deviation and Critical Ratio computed for Creativity Scores of Secondary School Students by Paternal Education	118
11	Maternal Education and Creativity	119
12	Mean, Standard Deviation and Critical Ratio computed for Creativity Scores of Secondary School Students by Maternal Education	120
13	Parental Occupation and Creativity	122

14	Socio-economic status and creativity	124
15	Mean, Standard Deviation and Critical Ratio computed for Creativity Scores of Low and High SES groups	125
16	Family Facility and Creativity	127
17	Mean, Standard Deviation and Critical Ratio computed for Creativity Scores of Low and High Family Facility Groups	128
18	Media Exposure and Creativity	130
19	Mean, Standard Deviation and Critical Ratio computed for Creativity Scores of students belonging to Low and High Groups on Media Exposure	131
20	Literary/Social Interests and Creativity	133
21	Mean, Standard Deviation and Critical Ratio computed for Creativity Scores by Literary/social interest groups	134
22	Pastime and Creativity	136
23	Mean, Standard Deviation and Critical Ratio computed for Creativity Scores by Student Pastime	137
24	Type of School and Creativity	139
25	Mean, Standard Deviation and Critical Ratio computed for Creativity Scores of Students from Government and Central School	140
26	Summary of Results : Creativity vs. select Socio-Educational Variables	153

Creativity : Concept and Components

Need for the Study

**Arunachal Pradesh : The setting of
the Study**

Literacy and Education in Arunachal Pradesh

Statement of the Problem

Title of the Study

Objectives of the Study

Hypotheses

Terminology

Scope and Limitations

Organization of the Report

socio-educational Correlates of Creativity among the Secondary school students in Arunachal

I N T R O D U C T I O N

Education plays a significant role in the progress and welfare of society. It is a complex concept and refers both to process as well as product. Education, as a product, implies the knowledge, skills, values and attitudes attained by the people. As a process, the human resources are transformed and utilized effectively for the development of the society.

(The third world nations are committed to human resource development. The development of human resources depends mostly on the detection and fostering of the human potential as such the talent development is a necessary pre-requisite for planned progress and development. The national planners in India, therefore, have rightly emphasized the development of human resources through educational programmes. The development over the last two decades have shown that desired improvements have not been materialised because neither the resources nor the measures for restructuring were commensurate with the imaginative and purposeful thrust of the education. Till recently, the stress has been placed on the intellectual gains. Creative potential, the most precious human resource, has not

been paid much attention. Nevertheless, it has now been realised that it is not merely intelligence but also creativity which is responsible for the overall progress.)

Creativity : the Concept and Components

(Creativity is considered as an ability to produce work or thought of imagination along new or unconventional lines.) Most people believe that creativity can be judged by the product or by what a person creates. But it does not always lead to products but it must be regarded as a process by which something new either an idea or an object in a new form is produced. The functioning of mind and the nature of human genius has become the centre of attention of psychologists and educationists for centuries. But it was not until very recently when Guilford propagated his theory of human intellect, that creative aspect of mental ability became the focus of research activity. Creativity has become the central concept in educational research only very recently although creative thinking ability has been considered the highest of mental functions and creative product the peak of human achievement. Barron (1968) points out "our capacity

1 Barron, F., Creativity and Personal Freedom, NYC : Van Nostrand, 1968.

for creative thought and action may literally make all the difference in the world Human creativity may prove to be the key to success or failure in man-kinds quest for knowledge, in his journey beyond the bounds of the sure and seen in his exploration of the unknown". ² Toynbee (1964), the famous historian considered "creativity as the man's greatest asset and one of the most valued qualities"... "Creativity is a type of talent which can make history through reshaping man's world and it is a matter of life, and death for any society". ³ Patrick (1955) considers creativity as one of the most valuable human resources and is of the view that it can cope up with life's stress and strain and is a mental ability which could overwhelm even tensions and break downs of day-to-day life. ⁴ Torrance (1962) testifies this^w: "The survival and progress of any society is closely dependant upon how it can conserve and utilise the precious human resource,

2 ✓ Toynbee, A., "Is America Neglecting her Creative Minority?", in Taylor, C.W (ed) widening horizons in Creativity; New York, Joh Wiley and Sons, Inc., 1964, 3-9.

3 ✓ Patrick, C., What is Creative Thinking?, New York : Philosophical Library, Inc., 1955.

4 ✓ Torrance, E.P., Guiding Creative Talent, Eagle Wood Cliffs, N.J. : Prentice Hall, 1962.

the creative potential".) ⁵ Mackinnon (1970) described creativity as a multi-faceted phenomenon which carries several meanings like it is a simple problem solving to conceiving it as a full realization and expression of individuals unique potentials. ⁶ Mc Pherson (1960) collected twenty-six different definitions of creativity and in an interesting experiment in the fifth Utah Conference, ⁷ Mednick (1964) could get 395 different meanings in response to a stimulus word creativity. ⁸ Morgan (1953) after a review of literature published a list of twenty five definitions which maintained creativity as something new and unique. ⁹ Rhodes (1961) analysis of fifty definitions of creativity revealed four strands of creativity - person, process, press and

-
- 5 Mackinnon, Donald, D. "Creativity : A Multifaceted Phenomenon". In John D. Rosalusk (Ed) : Creativity Amsterdam, North-Holland Publishing Company, 1970.
- 6 McPherson, L.C., Definitions and Criteria of Creativity, Midland : The Dow Chemical Co., 1960 (Mimeographed).
- 7 Mednick, S.H. and Mednick, M.T., "An Associative Interpretation of the creative process", In C.W. Taylor (Ed) : Widening Horizons in Creativity, New York : John Wiley and Sons, Inc, 1964, 54-68.
- 8 Morgan, O.N., Creativity Today, Journal of Aesthetic Art and Criticism, 1953, 12, 24.
- 9 Rhodes, M., An Analysis of Creativity, Phi Del ta Kappan, 1961, 42, 305-310.

product. ¹⁰Welsh (1973) also recommended approaches to study creativity in terms of person, product, process, press and place. Emphasis of either one or a combination of these strands can be found in models developed for creativity research in recent years and evolving a comprehensive definition to the concept of creativity.

Creativity as a Person

The concept of creativity in this approach acknowledges the importance of cognitive and non-cognitive variables influencing the functioning of a creative person. ¹¹Simpson (1922) emphasized the cognitive structure of creativity and indicated the mental abilities involved in searching, combining and synthesizing as the components of creativity. Curiosity, imagination, discovery, innovation and invention are also stressed as creative potentials. ¹²Wallas (1926) observed that a number of abilities are involved in the creative problem solving such as bringing problem

10 Welsh, G.W., Perspectives in the Study of Creativity. The Journal of Creative Behaviour, 7, 4 ; 1973.

11 Simpson, R.M. Creative Imagination, American Journal of Psychology, 1922, 33, 234-243.

12 Wallas, G., The Art of Thought, New York : Harcourt Brace, 1926.

to the fore of the mind, originating and inventing an idea or concept and the realization of solutions along new and unconventional lines. In his model of the structure of intellect ¹³ Guilford (1950) emphasized creativity as an individual's ability of generation of information from given information where the emphasis is upon variety of output from the same source (innovation, originality, unusual synthesis or perspective). ¹⁴ Wilson et. al. (1954) analysed the creative thinking ability among the air cadets and student officers using Guilford's factor analytical model and isolated fluency, flexibility, originality, elaboration and redefinition as the primary factors associated with creativity. ¹⁵ Guilford's (1967) scheme for classification of human abilities consists of four fluency factors namely, associated fluency, expressional fluency, word fluency and ideational fluency, and two flexibility

13 Guilford, J.P., Creativity, American Psychologist, 1950, 14, 469-479.

14 Wilson, R.C., Guilford, J.P., Christensen, R., and Lewis, D.J., A Factor Analytic Study of Creative Thinking Abilities, Psychometrika, 1954, 19, 297-311.

15 Guilford, J.P., The Nature of Human Intelligence, New York : McGraw Hill, 1967.

7

factors, spontaneous and adaptive flexibility in addition to factors of originality, elaboration and redefinition. ¹⁶ Lowenfield (1952) recognized eight ^{Components} characteristics of creative person, viz., sensitivity, fluency, flexibility, originality, redefinition, ability to abstract, ability to synthesize and coherence of organization.)

Creativity as a Process

Creativity is considered as a process which enables the person to think in divergent directions and search many possible solutions to a problem.

¹⁷ Yamamoto (1964) defined creativity as the process of forming new ideas or hypotheses, testing these ideas and hypotheses, and communicating the results. Creativity according to ¹⁸ Taylor (1955) is a process with three underlying assumptions :

(i) as a resultant process of social transaction ;

(ii) as a novel work that is accepted ; and

✓ 16 Lowenfield, V., The Nature of Creative Activity, London, Routledge and Kegan Paul, 1952.

✓ 17 Yamamoto, K., Creative Thinking : Some Thoughts on Research, Exceptional Children, 1964, 34, 403-410.

(iii) as satisfying to a group at some point in time.)

viewed page 9

19 Vinacke (1960) defined creativity as "an integrated harmony between external world of reality and the individuals internalized needs". 20 Maslow (1962) maintained creativity as a fundamental change in the personality structure occurring in the direction of self-fulfilment. He distinguished special talent "creativity and self-actualizing creativity". The former is the result of exceptional ability in certain fields. The self-actualizing creativity is a present in everyone particularly among the fully integrated persons and is related with the mental health. The need for excellence, the need for quality and novelty, the need to achieve and willingness to take risks and commitment to deep philosophical and aesthetic meaning in one's activities are considered the creative

18 Taylor, C.W., The Identification of Creative Scientific Talent; Salt Lake City, Utah: University of Utah Press, 1955.

19 Vinacke, W.E., The Psychology of Thinking, New York, Mc Graw Hill, 1960.

20 Maslow, A.H., Towards a Psychology of Being; Princeton, N.J.D., Van Nostrand, 1962.

dimensions (²¹ Torrance, 1965; ²² Maddi, 1965 ;
²³ Mc Clelland, 1963 ; ²⁴ Barron, 1968). According
to this approach it is the motivation from the environ-
ment which drives the individual for par excellence or
perfection in a given field or area of knowledge. Defi-
nitions are formulated in terms of subjective experience
involved in creation. Maslow mentions the importance
of inspiration and the 'flash' of insight, the transcen-
dent sensation itself the issue being "the inspired
moment" rather than "the inspired product". ²⁵(Torrance
(1969) testified creative thinking as "the process of

- 21 ✓ Torrance, E. Paul, Rewarding Creative Behaviour,
Eagle Wood Cliffs, N.J. : Prentice Hall, 1965.
- 22 Maddi, S.R., Motivational Aspect of Creativity,
Journal of Personality, 33, 330-3, 1965.
- 23 Mc Clelland, D.C., The Calculated risk and aspect
of Scientific Performance. In Taylor, C.W. and
Barron, F. (eds.), Scientific Creativity. Its
recognition and development, NYC Wiley, 1963.
- 24 Barron, F., op. cit., 1968.
25. Torrance, E.P. Guiding Creative Talent, New Delhi,
Prentice Hall of India, 1969.

becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on, identifying the difficulties, searching for new solutions, making gusses or formulating hypotheses about the deficiencies testing and retesting these hypotheses and possibly modifying and retesting them and communicating the results.)²⁶ Foshay (1962) considers the product as a part of creative process. He postulates four major aspects of this process : openness to one's own experiencing, focussing of one's experiencing, the discipline of one's actions to work out the focus and closure.

²⁷ Schachtel (1959) also believes that creative experience primarily consists in the openness during the creative encounter and in the repeated and varied approaches to the object, the free and open play of attention, thought, feeling, perception, etc.

Creativity as a Product

In terms of product, creativity is defined as the ability to produce something new - an idea, a

26 Foshay, A.W., "The Creative Process Described". In Alice Miel (Ed.) : Creativity in Teaching, Belmont, California : Wadsworth Publishing Co., Inc, 1962.

27 Schachtel, E.G., Metamorphosis, New York : Basic Books, Inc., 1959.

theory, an invention, or a masterpiece to originate and to bring into existence, something new. ²⁸ Flangan (1963) believes that creativity is shown by bringing something new into being. Wertheimer considers creative thinking as productive thinking and defines creativity as the ability to actually produce, make or express something new. (According to ²⁹ Barron (1965) "creativity may be defined as the ability to bring something new into existence".) ³⁰ Stein (1953) suggested that "creativity results in a novel work that is accepted as tenable or useful by a group at some point in time") Page 12

Rhodes defines creativity as a noun naming the phenomenon in which the person communicates a new concept.

28 Flangan, J.C., "Definition of Ingenuity". In C.W. Taylor and Frank Barron (Eds.) : Scientific Creativity : Its Recognition and Development., New York, John Wiley & Sons, Inc, 1963.

29 Barron, Frank, "The Psychology of Creativity". In T.M. New Comb (Ed.), New Directions in Psychology II New York : Halt, Rinehart and Winston, Inc., 1965, PP 3-134.

30 Stein, M.J., Creativity and Culture, Journal of Psychology, 1953, 35, 311-32.

³¹ Messick (1965) suggested four criteria to judge creativity in product and they were novelty, appropriateness, transformation and condensation. ³² Parnes (1976) defined creative behaviour as that which demonstrates both uniqueness and relevance in its product. Creativity is thus a function of knowledge, imagination and evaluation. ³³ (De Haan and Havinghurst (1961) after a review of a number of definitions of creativity state that "creativity is the quality which leads to the production of something new and desirable. The new product may be new to society or merely new for the individual who creates it". ³⁴ Drendahl (1958) defined creativity as the capacity of a person to produce compositions, poems, or ideas of any sort which ^{are} essentially new or novel and previously unknown to the producer.)

31 Messick, S., "The Person, the Product and the Response. Conceptual Problems in Assessment of Creativity; Journal of Personality, Vol.33 (1965), 1-19.

32 Parnes, S.J., 'Creativity Development', In S.E. Goodman (Ed.) : Handbook on Contemporary Education; New York : A Xerox Education Company, 1976, PP 498-501.

✓ 33 De Haan, R.F. and Havinghurst, R.J., Educating Gifted Children, Chicago, V. Chicago Press, 1961.

34 Drendahl, J.E. and Cattell, R.B., Personality and Creativity in Artists and Writers; Journal of Clinical Psychology, 1958, 14, 107-111.

Creativity and Press

The interaction between the individual and his environment is taken as a basis to conceptualize creativity in this approach. It is assumed that the effect (Press) of the environment initiates the individuals for creative activities and abilities. Creative thinking process has been considered as bipolar in which there is an interaction between a person and the environment. ³⁵ Chambers (1973) considers creativity as a multi-dimensional process of interaction between the organism and its environment that results in the emergence of a new and unique product. ³⁶ Parloff (1972) assumes that creative performance is a function of a complex interaction among such factors as personality structure, environmental influences and cognitive capacities. Piaget points out that every act of thinking implies a balance between one's assimilation of the outside world to one's needs and one's accommodation of oneself to

35 Chambers, Jack, A., "College Teachers - Their Effects on Creativity of Students", Journal of Educational Psychology, Vol.65 (No.3, 1973), 326-334.

36 Parloff, M.B., "Creativity Research Programme" - A Review. In C.W. Taylor (Ed.) : Climate for Creativity, New York : Pergamon Press Inc; 1972, PP. 269-286.

demands of the outside world. ³⁷ Freudian view of Creativity (1955) hold that "sublimation of the repressed wishes of the unconscious mind determines creativity". Creative production is a form of substitute gratification and extension of child's play and ordinary man's day dreams. The neo-Freudians explained creativity stemming out of the preconscious and emphasized the role of ego in organizing the experiences with external reality.

The developmental curves of creative thinking follow a pattern which is quite different from most other aspects of human growth. Torrance from his researches in creativity stated that there is a steady growth of creative abilities from grade one through grade three. From thereon, there is a slump between the third and the fourth grade which is followed by a little recovery during grades five and six. Another slump occurs between the sixth and high school years. At grade eleven, again there is a setback in the development of creative thinking abilities. It has also been observed that even though recovery takes place during

^w
37 Freud, A.H., The Interpretation of Dreams, New York : Basic Books, 1955.



grades five and six, yet the third grade status is not again executed until grade nine (for boys) and grade ten (for girls). Torrance explains "the setbacks in the growth of creative abilities for the fourth, seventh, and eleventh grade levels as related to each of the transitional state in education".

Need for the Study

Not much work seems to have been done in India in the field of Creativity. The studies undertaken are mainly confined to the urban and advanced regions (Raina, 1969; Mehdi, 1971; Passi, 1971). In a tribal region like Arunachal Pradesh, the studies are conspicuous by their absence. Systematic ^{empirical} explorations to understand the concept of creativity and its correlates are needed for planning educational programmes of talent development in India especially in tribal remote backward regions. This view has been upheld by the Education Commission (1964-66) 'talent has to be located early and allowed to grow in the best atmosphere and under the best teachers'. This felt need for identification and fostering of the tribal talent has prompted the investigator to undertake the present research.)

Arunachal Pradesh : The setting of the Study

Arunachal Pradesh 'the land of rising sun' is situated on the foothills of Himalayas in the extreme

North-East India. The land is comprised roughly of 83,743 sq. kms. of mostly hilly mountaneous area bordering the international boundaries of Bhutan, China (Tibet) and Burma³⁸. The land is mostly mountaneous, criss-crossed with countless roaring streams and murmuring rivulets. The beauty of the country side, the distant mountains white with snow, the nearer hills dressed in pine, oak and fir, the limped green of winding river has created in the people of Arunachal a love of beauty, a sensitive taste and a desire to make good things.)

The beginning of administration of Arunachal Pradesh may be traced back to the Government of India, Foreign and Political Department, Notification of 1914, which promulgated that the Assam Frontier Tracts Regulation of 1880 would extend to the hills inhabited by Abors, Miris, Mishmis, Singphos, Nagas, Khamtis, Bhutias, Akas and Daflas. As a result, the North-East Frontier Tract came into existence composed of the following three administrative units :

- (i) The Central and Eastern Section
- (ii) The Lakhimpur Frontier Tract
- (iii) The Western Section

In the year 1914, the first and third units were each placed under the charge of a separate political officer and the second unit under the Deputy Commissioner,

Lakhimpur District. The Political Officer of the Central and Eastern Section ^{had} Hqrs. at Sadiya. The Political Officer of the Western Section was located at Charduar.

In 1919, the Central and Eastern Sections were renamed as the Sadiya Frontier Tract and the Western Section as the Balipara Frontier Tract. The Lakhimpur Frontier Tract, however, continued to be known as such.

In 1943, a new administrative charge was created with certain areas from the Lakhimpur Frontier Tract and was named as the Tirap Frontier Tract. The Tirap Frontier Tract was placed under a separate Political Officer with Hqrs. at Margherita. In 1946, the Balipara Frontier Tract was divided, for administrative convenience, into Sela Sub-Agency and the Subansiri Area. In 1948, the remaining portion of the Sadiya Frontier Tract was bifurcated into two separate administrative charges, namely, the Abor Hills District and Mishmi Hills District.

In the year 1951, the plains portions of the Balipara Frontier Tract, Tirap Frontier Tract, Abor Hills and Mishmi Hills were transferred to the administrative jurisdiction of the Govt. of Assam vide Notification No. TAD/R/35/50/109, 23, February, 1951.

-East

The North/Frontier Tracts was renamed in 1954 as North-East Frontier Agency (NEFA). It was administered directly by the President of India through the Governor of Assam as his agent. NEFA attained the status of a Union Territory on 21st January, 1972 under the provisions of North-Eastern Area Reorganization Act, 1971 with the new name of Arunachal Pradesh³⁹. The headquarters of the Union Territory was shifted from Shillong to the Capital Complex Itanagar in Lower Subansiri District in 1974, and Arunachal Pradesh formed its own Legislative Assembly on 15th August, 1975. The Arunachal Pradesh became a state on 20th February, 1987.

The territory is divided into 11 administrative districts, namely, West Kameng, East Kameng, Upper Subansiri, Lower Subansiri, West Siang, East Siang, Lohit, Dibang Valley, Tapat, Tawang and Changlang.

39 Luthra, P.N., Constitutional and Administrative Growth of the NEFA

The indigenous people constitute the largest section of population of Arunachal Pradesh. Out of the total population of 631,839 as per the 1981 Indian Census, the tribal population is 441,167 (69% of the total population). The rural tribal population is 431,110 and the urban 10,057, the male and female break up of population being 220,046 and 221,121 respectively.

There are some twenty major tribes each having a number of sub-tribes. Some of the tribes inhabiting Arunachal are shown below :

- (1) The Apatanis, Nishis, Sulungs, Hill Miris, Tagins in Upper & Lower Subansiri Districts.
- (2) The Monpas, Mijis, Akas, Khowas, Sherduk-pens and Bangnis in West and East Kameng.
- (3) The Adis, Membas, and Khankas in West and East Siang Districts.
- (4) The Mishmis, Khantis and Singphos in Lohit and Dibang Valley districts.
- (5) The Noctes, Wanches and Tangsas in Tirap district.

(The people of Arunachal Pradesh excell in the produc-
 tion of useful and eye-catching handicrafts. Their
 nimble fingers weave excellent designs on the textiles
 and carpets and the multi-coloured masks created for
 the dancers bring the childhood fairy tales back to
 life. The intricately executed wood crafts, cane and
 fibre works and handlooms bear eloquent testimony to
 the fine artistic temperament and poetic imagination
 of these hard working tribesmen of the eastern
 Himalayas. Nature has endowed this difficult terrain
 with a beauty that can hardly be found anywhere else
 in India. The snow-capped mountains, the majestic
 jungles, the roaring streams, the singing birds and
 all the other gifts of nature have created ^{among} in the
 people a subtle sense of beauty which finds delight-
 ful expression in their ^{folk} songs, ^{folk} dances and crafts. ^{and forms}
 and even in the day to day life.

Literacy and Education in Arunachal Pradesh

(The literacy of Arunachal Pradesh is the
 lowest when compared to the rest of the country, 20.79
 percent as against 36.23 percent for the country as a whole.)

The literacy rates for rural and urban areas of Arunachal Pradesh are 18.51 percent and 53.22 percent respectively. Lohit District has the highest literacy rate 28.26 per cent and East Kameng the lowest literacy rate of 7.73 percent. (The literacy rates for the scheduled tribes population of Arunachal Pradesh is 14.014 for total, 20.79 for male and 7.31 percent for females.) Among the districts, the highest scheduled tribes literacy is 23.04 per cent in East Siang and the lowest in East Kameng with 3.83 percent. (Female literacy rates of the scheduled tribes are very low in all the districts of Arunachal Pradesh. One of the major reasons for the lowest literacy rate of Arunachal is the late start in education. Attention was paid to the development of education among the tribal people of Arunachal Pradesh only after independence.)

(Education in Arunachal has shown very slow progress. The number of primary school were only three in Arunachal when India became independent and there were no middle or high school or higher institutions of education. In 1972 when Arunachal became a Union Territory ^(NEFA) there were 463 primary schools, 41 middle schools, 16 high schools besides an Arts and Science College, the J.N. College, Pasighat.) There has been

a lot of efforts taken for providing free and compulsory education to all children upto the age of 14 yrs. As a result a number of primary schools were opened in remote areas of the state and many schools were upgraded. The Government has accorded equal importance to education and the investment in education is also receiving highest priority. (Presently, there are 1249 pre-primary schools, 1088 primary schools, 229 middle schools, 55 secondary schools, 40^{higher}/secondary schools, 4 colleges and one University. Further, there are 13 primary schools, 8 secondary schools and 5 higher secondary schools run by voluntary organizations with financial assistance from the state government.) Educational institutions such as Vivekananda Kendra Schools, Donyi Polo Mission Schools, Boum Kabir Mission Schools, R.K. Mission Schools are also functioning in Arunachal. (The schools in Arunachal follow the curriculum prescribed by the Central Board of Schools Education (CBSE) and the examinations are conducted by CBSE, New Delhi. The State Directorate of Education directs and controls the educational programmes of the state. Non-formal and adult education programmes are also paid much attention by the Government. There are

696 adult education centres and 791 central functional literacy centres functioning in the state with a view to eradicate illiteracy. The new scheme of Jana Shiksha Nilayam has also been introduced under the adult education programme. The India Gandhi National Open University (IGNOU) has also sponsored a centre at Itanagar for the benefits of students who cannot attend regular courses of studies in the colleges for higher education.)

The Arunachal University was established in 1985. Since then during the span of little more than five years, the University has grown into a premier, affiliating, teaching and research institution imparting higher education in the state of Arunachal Pradesh. The University functions from its permanent campus located atop Rono Hills near Doimukh, 25 kms. away from Itanagar, Capital of Arunachal Pradesh. The picturesque land of 302 acres is adjacent to the river Dikrong and is surrounded by perennial forests. The beautiful natural scenery and the quiet serene atmosphere afford an avenue for academic growth and excellence. The jurisdiction of the University extends to the entire state of Arunachal Pradesh. At present the University has under its jurisdiction four affiliated colleges imparting

instruction in the Faculties of Arts, Science and Commerce. During the session 1989-90, the University offered Masters Degree programmes in History, Pol. Science and Education (M.Ed and B.Ed).

Arrangements were made to establish the Departments of English and Economics and also to set up a Centre for Tribal Research.

Statement of the Problem

(The present research is designed to examine the creative thinking ability among the secondary school students in Arunachal Pradesh. The relationship between creativity and select socio-educational variables were also studied. The socio-educational correlates specifically taken up for research are sex, age, birth order, parental education, parental occupation, socio-economic status, family facility, mass media exposure, literary interests, leisure time activities and the type of school in which they study.)

Title of the Study

"The Study of Socio-Educational Correlates of Creativity among the Secondary School Students of Lower Subansiri and West Siang districts of Arunachal Pradesh".

Objectives of the Study

The study has been undertaken primarily to realise the following objectives :

- (1) Adaptation of creativity test to Arunachal Pradesh
- (2) to measure the level of creative thinking ability among the secondary school students
- (3) To find the relationship of socio-educational variables with the creative thinking ability.

Hypotheses

Statistical verification of the following

hypotheses are undertaken in the present study :

Hypothesis 1 : There is no sex difference in the creative thinking ability of the secondary school students.

Hypothesis 2 : There is no age difference in creative thinking ability of the secondary school students.

Hypothesis 3 : There is no birth order difference in the creative thinking ability of secondary school students.

Hypothesis 4 : There is no significant relation between creativity and paternal education.

Hypothesis 5 : There is no relation between creativity and maternal education.

Hypothesis 6 : There is no relation between creativity and parental occupation.

Hypothesis 6 : There is no relation between socio-economic status and creativity of secondary school students.

Hypothesis 8 : There is no relation between the family facility and the creativity of the secondary school students.

Hypothesis 9 : There is no relation between the creativity and exposure to mass media of secondary school students.

Hypothesis 10 : There is no relation between literary/social interest

Hypothesis 11 : There is no relation between creativity and pastime of students.

Hypothesis 12 : There is no relation between creativity and the type of school.

Terminology

Creativity

Creativity is taken as a divergent thinking process enabling the pupils for creative outputs (novel and useful) and measured through verbal and non-verbal creativity test on four primary traits, fluency, flexibility, originality and elaboration.

Verbal and Non-verbal Creativity

Verbal creativity is concerned with the production of novel and useful ideas relationships with the manipulation of semantic content. This is being tested in the present study with a verbal test of creativity which includes four sub-tests, namely consequences Test, unusual uses Test, seeing problems Test and similarities.

Non-verbal creativity on the other hand is intended to measure the individuals ability in dealing with figural context or symbols in a creative manner. Non-verbal creativity test provide a quick and efficient means of measuring higher order creative reasoning functions with the effect of language and cultural experience being reduced in comparison with verbal

tests involving semantic content. Three types of activity are used for the purpose of analysing creative thinking ability which are picture construction, picture completion and circle's test.

The four components of creativity, namely, fluency, flexibility, originality and elaboration were taken to study the verbal and non-verbal creativity are explained below :

(a) Fluency

Fluency is represented by the number of relevant and unrepeated ideas which the tester produces. Relevance is judged on the basis of the appropriateness of the response when considered in relation to the test problem.

(b) Flexibility

Flexibility is represented by a persons ability to produce ideas which differ in approach or thought trend. All ideas which fall under one category of approach or thought trend are treated as one for purposes of flexibility scoring. If five ideas are produced and all belong to one category of approach, or thought trend, then the score will be one, but if

all five ideas are based on five different approaches, or thought trends, then the flexibility score will be five.

(c) Originality

Originality is represented by uncommonness of given responses. Responses given by less than 5% of the group are treated as original.

(d) Elaboration

Elaboration is represented by a persons ability to add pertinent details (more ideas) to minimum and primary response to the stimulus figure. This response gives essential meaning to the picture and the response title often tells what exactly the testee is trying to make. However, responses which can be reasonably interpreted and identified should be scored.

Socio-Educational Correlates (SEC)

The socio-educational correlates designate the personal family and educational background of the high school students. The specific factors taken up for study are sex, age, birth order, socio-economic status, types of school, parental education, parental profession, exposure to media, hobbies, participation

in socio-cultural activities, family facilities and ambition in life.

Scope and Limitations

The present research is planned to identify the creative thinking abilities among the tribal students. It is to be mentioned that this is the first attempt carried out for identification and fostering of talents. The studies and educational endeavours are conspicuous by their absence in talent development in tribal societies of Arunachal Pradesh. In that way this is a pioneering attempt to unearth the rich resource of tribal talent. The people are known for their folklores, traditions and culture. The researcher has taken pains to adapt a creativity test in Arunachal. This can be used in for the studies and will also promote research insights in the field of creativity. Also the researcher has attempted to identify the socio-economic factors related with creativity. However, the researcher is not free from the limitations of survey type studies. The sample selected for the study is not exhaustive and only 2 districts were considered while drawing the sample. However, every care has been taken to make the sample as representative as possible and

the sample represented students from different types of schools and different socio-economic backgrounds. Another major limitation is the use of a survey design to an experimental one. In fact the influence of the socio-educational backgrounds on the verbal and non-verbal ability of students would have been examined in a controlled study using an experimental design. It is expected that the study would contribute within its limitations to project the creative thinking abilities in relation to socio-cultural of the tribal population of Arunachal.

Organization of the Report

The Research Report has been divided into five chapters. The introductory chapter presents the research theme along with the conceptual analysis of creativity. It also indicates the need and relevance of present research, enunciates the major ^{Objectives,} need of hypotheses and states the scope and limitations of the study.

A review of the studies conducted in India and abroad in the field of creativity in relation to variables such as age, sex, achievement, socio-economic status, locale and personality is given in chapter II.

The methodology followed in the study stating details regarding the sample, the adaptation of creativity test, preparation of the personal data sheet, the collection of data mode of analysis are described in Chapter III.

Chapter IV deals with the analysis of data to test the major hypotheses advanced in the research. The analysis is dealt with each of the socio-educational variables separately and the tenability of hypotheses is stated at the end of this Chapter.

The concluding Chapter gives the resume of the research together with the salient findings, their interpretation, educational implications and suggestions for underaking further studies in the area of creativity.

CHAPTER II : REVIEW OF RELATED RESEARCH

✓ **Creativity and Sex**

✓ **Creativity and Age**

✓ **Creativity and Socio-Economic Status**

✓ **Creativity and Locale** ✓

Creativity and Achievement

X **Creativity and Intelligence**

X **Creativity and Personality**

Conclusion

REVIEW OF RELATED RESEARCH

Creativity as a scientific field of study is of recent origin. For a long time the creative power is thought to be a divine gift and as such offered no scope for scientific research. This view has undergone a drastic change during the latter half of the present century. The credit really goes to Guilford and his colleagues in California who made creativity as the main subject of study during the last 30 years. Alex S. Osborn, the founder of creative education foundation Buffalo was also instrumental in popularising scientific research in the field of creativity. Thus the significance of creativity as a potential field of research and development has been recognized. Many eminent educationists in India also have undertaken studies focusing creativity. These studies were mainly meant to analyse the nature and concept of creativity and to examine its correlates. An attempt is made here by the investigator to review the studies conducted in creativity in India and abroad. The review of the studies has been carried out under the following headings :

Creativity and Sex

Creativity and Age

Creativity and Socio-Economic Status (SES)

Creativity and Locale

Creativity and Achievement

Creativity and Intelligence

Creativity and Personality

Creativity and Sex

Contradictory trends are observed in empirical researches related to the two variables of creativity and sex

- (1) Females are superior to males in creative thinking
- (2) Males are superior to females in creative thinking

The superiority of the fair sex over their counterparts has been observed by several investigators. Using the Torrance Tests of Creative Thinking and the Bell's Adjustment Inventory (¹Singh, 1975) found that girls were superior to boys on all dimensions of creativity and composite creativity. ²Raina (1980) studied the verbal creativity and non-verbal creative thinking ability among the secondary school students. Torrance Test of Creative Thinking (TTCT) was administered on 110 IXth grade students belonging to three higher secondary schools. The research failed to report any significant sex differences in the fluency, flexibility and originality dimensions of creativity. However, the overall differences among the three dimensions and the total scores were in favour of the girls. On the figural form again, the scores remained higher for

1 Singh, R.A., Study of Creativity among X Class students in relation to their adjustment and sex. Unpublished M. Lit. Dissertation. Punjab University, 1975.

2 Raina, T.N., Sex differences in Creativity in India : a second book. The Journal of Creative Behaviour, 1980 14, 3, P.218.

girls on the three dimensions and the total creativity score. Though the differences were statistically insignificant, the boys scores edged the girls in originality while the girls were a shade higher than the boys on flexibility. Superiority of girls over boys has been reported by ³Yamamoto (1960); ⁴Torrance (1962); ⁵Passi (1972); ⁶Bowers (1971); ⁷Bedi (1974).

On the originality dimension of creativity, ⁸Mac Gregor and Smith (1976); ⁹Singh (1978); ¹⁰Sharma (1981) have observed that females scored higher than the males in

- 3 Yamamoto, K., Further analysis of ask-and-test. Research Memorandum BER 60-11, Minneapolis, Bureau of Educational Research, Univ. of Minnesota, 1960.
- 4 Torrance, E.P., Towards the more humane education of gifted children. Gifted Child Quarterly, 1962, 7, 135-145.
- 5 Passi, B.K., An Exploratory Study of Creativity and its relationship with Intelligence and Achievement in School Subjects of Higher Secondary Stage, Ph.D Education, Punjab University, 1972.
- 6 Bowers, K.S., Sex and Susseptibility as moderator variables in the relationship of Creativity and hypnotic suggestibility, Journal of Abnormal Psychology, 1971, 78(1), 93-100.
- 7 Bedi, R.K., Experimental Attitude and Creativity : Unpublished M.Ed Dissertation, Indore University, 1974.
- 8 Mac Gregor, M. and Smith, J.L., Originality and role perception in elementary and Junior High School Children. Dissertation Abstracts, 1965, 25, 11, 6762.
- 9 Singh, R.P., Divergent thinking abilities and Personality dimensions of bright adolescent boys and girls : A Comparative Study. Indian Educational Review, Vol.13, No.4, 1978, P 82-91.
- 10 Sharma, A.K., Sex roles in verbal creative thinking abilities, Psycho-lingua 11(1), 1981, Pp.15-18.

originality aspect of verbal creativity. The significant superiority of females over males in verbal originality has also been reported by ¹¹Hussain (1974). In yet another study on high school students, girls scored significantly higher than boys in verbal fluency (¹²Dhir 1973). The same result was observed in a study of tribal boys and girls (¹⁴Krishnakumari 1986). The tribal girls scored high on fluency and also excelled in verbal originality and elaboration. ¹⁵Pandit (1976) also pointed out that females were significantly superior to males on fluency and flexibility dimensions of creativity. ¹⁶Passi (1970); ¹⁷Singh (1975);

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- 11 Hussain, M.G., Creativity and Sex differences, Psychological Studies, Vol.19, No.2, 1974, P 127-129.
- 12 Dhir, S., Performance of High School Students on verbal and figural tests of creative thinking. Master's Dissertation, Punjab University, 1973.
- 14 Krishnakumari, P., Study of creative abilities of tribal children in relation to their sex and socio-economic status : Journal of the Institute of Educational Research, Vol.9, No.4, March 1986, P 1-4.
- 15 Pandit, R.A., Study of creativity in relation to adjustment, socio-economic status, and scholastic achievement of the students, Unpublished M.Ed Dissertation, Indore University, 1972.
- 16 Passi, B.K., An Exploratory Study of Creativity and its relationship with Intelligence and Achievement in Subjects at Higher Secondary Stage, Ph.D Education, Punjab Univ., 1972.
- 17 Singh, R.A., Study of Creativity among X Class Students in relation to their adjustment and Sex. Unpublished M.Litt. Psychological Review, Vol.4, No.2, 1977, P 51-53.

¹⁸Jarial (1981) found female students significantly superior to their male counterparts while ¹⁹Bedi (1974) and ²⁰Jarial (1981) noted girls to score higher than boys on non-verbal creativity. These findings were further supported by ²¹Dutta (1982) whose study of sex difference in creativity among the Khasi tribes of Meghalaya demonstrated the female superiority in non-verbal creativity. The girls were found better in creativity when compared to boys in a number of other researches (²²Yamamoto 1960; ²³Mac Gregor and Smith 1965; ²⁴Solomon 1968; ²⁵Ogletree 1968; ²⁶Walker 1969;

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- 18 Jarial, G.S., Creativity, Intelligence and Academic Achievement their relationship and differences with reference to sex and academic subjects. *Journal of Education and Psychology*, Vol.39, No.2, 1981.
- 19 Bedi, R.K., *op.cit.*, 1974.
- 20 Jarial, G.S., *op.cit.*, 1981.
- 21 Dutta, G., Sex differences in creativity among the tribes of Meghalaya, *Journal of the Institute of Educational Research*, Vol.6, No.2, May 1982, P 23-26.
- 22 Yamamoto, K., The role of Creative Thinking and Intelligence in Higher School Achievement Research Memorandum BER 60-10 Bureau of Educational Research, College of Education, Univ. of Minnesota, July, 1960, Pp 1-25.
- 23 Mac Gregor and Smith, J.L., "Originality and Role Perception in Elementary and Junior High School Children". *Dissertation Abstract*, Wool.25, No.11, 1965, 6762.
- 24 Solomon, A.G., "A Comparative Analysis of Creative and Intelligent Behaviour of Elementary School Children with different Socio-Economic Backgrounds". *Dissertation Abstracts*, Vol.29 (No.5, 1968), 1457-A.
- 25 Ogletree, E.J. "A Cross-cultural Exploratory Study of the Creativeness of Steiner and State School pupils in England, Scotland and Germany". *Dissertation Abstracts*, Vol.29 (No.2, 1968), 516-A.
- 26 Walker, P.C., A Study of Creativity Among Mexican School Children, *Doctoral Dissertation*, Univ. of Georgia, 1969.

²⁷Cacha 1971). ²⁸Burgess (1971) & ²⁹Yamamoto (1960) quoting Torrance reports there was a consistent tendency among the groups for girls to excel boys on creativity scores through grade IV to VI even when the mean IQs were almost equal. Girls performed better than boys on verbal test of creative thinking.

After reviewing a large number of studies, ³⁰Maccoby and Jacklin (1974) concluded that no sex differences are found on verbal tests of creativity in pre-school years but girls gained an advantage about age of seven. No sex difference in creativity was found by (³¹Phatak 1962; ³²Jackson 1968;

- 27 Cacha, F.B., "A Study of Creative Thinking Abilities of Personality Factors and Peer Nominations of Fifth Grade Children". Dissertation Abstracts International, Vol.32 (No.3, 1971), 1329-A.
- 28 Burgess, W.V., "The Analysis of Teacher Creativity Pupil, Age and Pupil Sex as sources of Variation Among Elementary Pupil's Performance on Pre and Post-Tests of Creative Thinking. Dissertation Abstracts International, Vol.32 (No.2, 1971), 747.
- 29 Yamamoto, K., "The Role of Creative Thinking and Intelligence in High School Achievement". Research Memorandum, BER 60-10. Bureau of Educational Research, College of Education, Univ. of Minnesota, July 1960, PP 1-25.
- 30 Maccoby, E.E., and Jacklin, C.N., The Psychology of Sex Differences, Vol.I/Text, Standford California, Standford Univ.Press, 1974.
- 31 Phatak, "Experimental Study of Creativity and Intelligence and School Achievement", Psychological Studies, Vol.7 (1962) 1-9.
- 32 Jackson, R.L., "An Investigation of the Creative Growth curves of University Students", Dissertation Abstracts, Vol.28 (No.9, 1968), 3508-A.

³³Simpkins and Ensenman 1968; ³⁴Burns 1969; ³⁵Phillps and Torrance 1971; ³⁶Kloss 1972); ³⁷Kaltsouni (1971); ³⁸Mc Elvain, et. al (1963) and ³⁹Yoralski (1964) failed to find any significant difference in creativity of male and female teachers.

The male superiority in creativity finds its origin in the findings of surveys which indicated very lone contribution of women towards creative act as compared to men

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- 33 Simpkins & Eisenman, R., "Sex Differences in Creativity". Psychological Reports, Vol.22(No.3, Part I, 1968), 996.
- 34 Burns, M.J., "Selected Characteristics of Childrens' Individual Tests of Creativity". Dissertation Abstracts International Volume, 30 (No.5, 1969) 1859-A.
- 35 Phillips, V.K., and Torrance, E.P., "Divergent Thinking Remote Association and Concept Attainment Strategies". Journal of Psychology, Vol.77 (1971), 221-228.
- 36 Kloss, M.G., "The Relation Between Adolescent Creativity and Selected Variables, Sex, Adjustment, Art-Science Performance, Complexity, Simplicity and Type of School". Dissertation Abstracts International, Vol.83, (No.5, 1972) 2324-B.
- 37 Kaltsouni, B., "Differences in Creative Thinking of Black and White Deaf Children". Perceptual and Motor Skills, Vol.32 (1971), 243-248.
- 38 Mc Elvain, J.L., Fretwell, L.N., and Lewis, R.B., "Relationship Between Creativity and Teacher Variability". Psychological Reports, Vol.13 (1963), 186.
- 39 Moralski, P.S., "Creativity : Student Teachers Perception of Approaches to Classroom Teaching, Dissertation Abstracts, Vol.25 (No.5, 1969), 2851.

⁴⁰Cattell(1903); ⁴¹Frilllis (1904); ⁴²Castle (1913) listed only 32 women out of 1000 prominent persons. Similarly, Frilllis (1904) could locate just 55 genius women among 1030 persons in his study of British Genius, and Castle (1913) identified only 868 outstanding women down through the ages.

In a comparative study in creativity among boys and girls ⁴³Prakash (1966) found boys of Class IV were significantly higher in creativity than girls. Similar findings were reported by ⁴⁴Raina (1968) and ⁴⁵Gangneja (1972) in

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- 40 Cattell, J. Mck., "A Statistical Study of Emminent Men". Popular Science Monograph, Vol.62 (1903), 359-377.
- 41 Ellis, H.A., A Study of British Genius. London Hurst, 1904.
- 42 Castle, C.S., "A Statistical Study of Emminent Women". American Psychologist, Vol.27, 1913.
- 43 Prakash, A.O., Understanding the Fourth grade Slump : A Study of Creative Thinking Abilities of Indian Children. Master's Dissertation, Univ. of Minnesota (1966).
- 44 Raina, M.K., A Study of Some Correlates of Creativity in Indian Students. Doctoral Thesis, University of Rajasthan, 1968a.
- 45 Gangneja, S.L., A Study of Creativity in Ninth Class Students in Relation to Sex. Residential Background, Academic Achievement and Parental Occupation. Master's Dissertation, Punjab University, 1972.

their study of Secondary School Indian Students. Several other researches have also showed superiority of male over female in creative thinking ability in studies conducted abroad. Empirical researches conducted on school students (⁴⁶Kelly 1965) and college students(⁴⁷ Middents 1968) revealed that male students had scored higher than females on non-verbal creativity. Male superiority in creative thinking ability was also observed by ⁴⁸Mar'I in a study of Arab and American eight graders. The boys performed better on 9 out of 13 schools on Torrance Test of Creative Thinking (TTCT); ⁴⁹Hutchinson (1967) and ⁵⁰Strans and Strans (1968) also reported similar findings from creativity research both in Indian and American cultures. These studies also indicated that the sex difference in creativity

- 46 Kelly, G.R., "Creativity, School Attitude and Intelligence Relationships in Grades four, six and eight", Dissertation Abstracts, Vol.25 (No.11, 1965), 6300.
- 47 Middents, G.J., "The Relationship of Creativity and Anxiety". Dissertation Abstracts, Vol.28 (No.7, 1968) 2562-A.
- 48 Mar'I, S.K., "Creativity of American and Arab Rural Youth : A Close Cultural Study". Dissertation Abstracts International, Vol.31 (No.12, 1971), 640 Y-A.
- 49 Hutchinson, "Creative and Productive Thinking in Classroom", Journal of Creative Behaviour, Vol.I (No.4, 1967), 419-427.
- 50 Strans and Strans, M.A., "Family Roles and Sex Differences in Creativity of Children in Bombay and Minneapolis". Journal of Marriage and Family, Vol.30 (No.1, 1968), 46-53.

were more prominent in India. ⁵¹Torrance (1973) further feed these results in a cross-cultural study of creative development in seven selected societies including India. The research reflected the superiority of Indian boys over girls in verbal creativity ⁵²Dharmangandan (1981) also demonstrated the male superiority over female in verbal and figural creativity in a study conducted in Kerala by administering the Torrance Test of Creative Thinking. Significant superiority of male over female on verbal creativity was further reported by ⁵³Rawat and Agarwal (1977); ⁵⁴Satya Narayanan (1979) among the high school students in India.

Contradictory to the above findings ⁵⁵Datta (1982) obtained no significant difference in verbal creativity among the boys and girls of Khasis in Meghalaya on the other hand, ⁵⁶Passi (1972) observed the male superiority in both verbal and non-verbal creativity.

- 51 Torrance, J. Pansy, Is Creativity Teachable? Text Book No.20, Bloomington Indiana Phil Delta Kappa, 1973.
- 52 Dharmangadan, B., Creativity in Relation to Sex, Age and Local. Psychological Studies, Vol.26, No.1 (1981), 28-33.
- 53 Rawat and Agarwal, A Study of Creative Thinking (with reference to intelligence, age, sex, communities, and income groups), Indian Psychological Review, Vol.14, No.2 (1977), 36-40.
- 54 Satya Narayanan, S.B., Correlates of Creative Thinking of High School Students, Creativity Newsletter, Vol.7 and 8, No.2 and 1 (1979).
- 55 Datta, G., op. cit., 1982.
- 56 Passi, B.K., op. cit, 1972.

Analysing the components of creativity ⁵⁷Raina (1971) claimed that male students were significantly higher in originality than female. Boys were found superior in elaboration (⁵⁸Singh 1978) and scored higher than girls on fluency and originality (⁵⁹Awasthy 1979 and ⁶⁰Jarial and Sharma (1981).

⁶¹Ogletree (1968) in a cross-cultural study of 1165 students of third to sixth grades in England, Scotland and Germany observed that girls excelled boys on all creativity measures except in Scotland where boys obtained higher non-significant figural creativity scores than girls. ⁶²Razik (1964) reported from researches on college students of agriculture, education, engineering and applied arts that the females outscored the males in creative thinking abilities on 4 out of 6 in tests of creativity.

- 57 Raina, M.K., Verbal and Non-Verbal Creative Thinking Ability : A Study in Sex differences. Journal of Education and Psychology, 1971, 29(3), 175-179.
- 58 Singh, R.P., Divergent Thinking Abilities and Personality Dimensions of bright adolescent boys and girls : A Comparative Study.
- 59 Awasthy, M.A., Study of Creativity Intelligence, Scholastic achievement and factors of socio-economic status. Unpublished M.Ed Dissertation, Indore Univ., 1979.
- 60 Jarial, G.S. and Sharma, A.K., op. cit., 1981.
- 61 Ogletree, E.J., "A Cross-cultural explanatory study of the creativeness of Steiner and state pupils in England, Scotland and Germany". Dissertation Abstracts, Vol.29 (No.2, 1968), 516-A.
- 62 Razik, T.M.A., "An Investigation of Creative Thinking Among College Students. Dissertation Abstracts, Vol.24 (No.7, 1964), 2775.

⁶³Maccoby and Jacklin (1974) after reviewing a large number of studies maintained that no significant sex differences are evidenced on verbal test of creativity in pre-school and early childhood ages while girls superseded boys from the age of seven onwards. On non-verbal creativity the review did not yield any concrete results. They commented, "In general it may be said that test of creativity reflect the already documented difference between the sexes in verbal skills, clearly atleast girls and women are as able as boys and men to generate a variety of hypotheses, and produce unusual ideas" ⁶⁴Oltoa, et. al (1969); ⁶⁵Goyal (1973) and ⁶⁶Panucci (1978) also substantiated the above findings from their empirical researches on creativity.

- 63 Maccoby, E.E. and Jacklin, C.N., The Psychology of Sex Differences, Vol.I/Text, Standford, California, Standford University Press, 1974.
- 64 Oltoa, R.M. and others, "The Development of Productive Thinking Skills in Fifth Grade Children". Research in Education (ERIC), Vol.4 (No.1 Jan. 1969) E.D 021 312.
- 65 Goyal, R.P., A Study of some personality correlates of creativity in Secondary School Teachers under Training Doctoral Dissertation, Punjab Univ. Patiala, 1973.
- 66 Panucci, Mary, R. "The Relationship of Sex and Ethnicity to Anxiety, Self Concept and Creativity Among Continuation High School Students". Dissertation Abstracts International, Vol.38, No.7 (Jan. 1978), 4056.

⁶⁷Mackler (1962) and ⁶⁸Goralski (1964) also failed to find significant difference in the creative thinking ability of the male and female teachers. ⁶⁹Raina's study (1971) also indicated that the differences of measures of creativity on male and female teachers were not significant except on originality factor. Another study ⁷⁰Vohra (1975) showed that male and female students of primary class did not differ significantly on non-verbal creativity. Studies conducted by ⁷¹Pathak (1962); ⁷²Jackson (1968); ⁷³Castle (1965) ;

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- 67 Mackler, B., Creativity and Life Style. Doctoral Dissertation, University of Kansas, 1962.
- 68 Goralski, P.S., "Creativity : Student Teacher's Perception of Approaches to Classroom Teaching", Dissertation Abstracts, Vol.25 (No.5, 1964), 2851.
- 69 Raina, M.K., "Verbal and Non-verbal Creative Thinking Ability : A Study in Sex Differences". Journal of Education and Psychology, Vol.29 (No.3, 1971), 175-179.
- 70 Vohra, I.N., A Study of non-verbal Creativity in relation to socio-economic status, age, sex, medium of instruction and Personality Characteristics amongst the Pupils of English and Gujarati medium of 'Bazm-E-Hidayat' Primary School from Baroda City, Unpublished M.Ed Dissertation, M.S. University, 1975.
- 71 Pathak, P., Experimental Study of Creativity, Intelligence and School Achievement. Psychological Studies, 1962, 7, 1-9.
- 72 Karsten, M.O.K., The Relationship of Tested Creative Abilities and Selected Factors of Academic Achievement, Intelligence, Sex, Socio-Economic Status, and pupils attitudes. Dissertation Abstracts, 1968, 28, 7, 2557-A.
- 73 Castle, A.D., A Comparison of Creativity of Urban and Rural Students in Oklahoma. Dissertation Abstracts, 1965, 26,3, 1420.

⁷⁴Mayhon (1966); ⁷⁵Jackson (1968); ⁷⁶Burns (1969); ⁷⁷Philips and Torrance (1971); ⁷⁸Kloss (1972); and ⁷⁹Ward and Cox (1974) also failed to find significant sex differences in creative thinking ability.

The above review of research on sex differences in creativity and its components indicates varied and diversified results. The results are contradictory, inconsistent and inconclusive to draw any concrete conclusions. There can be

- ⁷⁴ Mayhon, W.G., The Relationship of Creativity to Achievement and other Student Variables. Dissertation Abstracts, 1966, 27, 6, 1713-A.
- ⁷⁵ Jackson, R.L., An Investigation of the Creative Growth curves of University Students. Dissertation Abstracts, 1968, 28, 9, 3508-A.
- ⁷⁶ Burns, M.J., Selected Characteristics of Children's Individual tests of creativity. Dissertation Abstracts International, 1969, 30, 5, 1859-A.
- ⁷⁷ Philips, V.K. and Torrance, E.P., Divergent thinking, remote associations and concept attainment strategies, Journal of Psychology, 1971, 77, 22-228.
- ⁷⁸ Kloss, M.G., The Relation between adolescent creativity and Selected Variables : Sex, adjustment, art - Science preference complexity - simplicity, and type of school. Dissertation Abstracts International, 1972, 33(5), 2324-B.
- ⁷⁹ Ward, W.C. and Cox, P.W., A Field Study of non-verbal creativity. Journal of Personality, 1974, 42(2), 202-219.

a number of reasons for variation and contradiction of research findings. Cultural and environmental factors may form the basis for these findings. The social role played by the different sexes, and the status and treatment of children in many cultures and sub-cultures, and the child-rearing practises may determine the development of creativity among the boys and girls. The educational preferences and priorities shown by the parents may also be a conspicuous condition for stimulating the creative potential. However, there is a scope for speculation and need for further probing especially in the context of the tribal culture of Arunachal where no studies have undertaken on creativity.

Various reasons have been put forth to explain the decrease of creativity in children. Lack of recognition, destructive criticism, under-valuing their ability physiological changes, let-down in motivation following high achievement, stereo-typing of norms and family pressures are some of them. It will be quite interesting to analyse the creativity development among the tribal children in Arunachal where no attempts have been undertaken to investigate the two variables.

Creativity and Age

Observation regarding the development of creativity in relation to chronological age have been made by a number of researchers. Though a difficult task, particular care has been taken by researchers to investigate the nature of development of creativity from infancy to adulthood. The studies on the whole have provided consistent findings. One of the earliest researches relating to age and creativity was conducted by ⁸⁰Ribat (1906) by exploring imagination and reason from childhood to adulthood. Ribat revealed that imagination works during youth after which only reason exists. ⁸¹Andrews (1930) analysing the development of imagination in the pre-school child stated that the power of imagination develops in infancy and drops at the age of five. ⁸²Ligon (1957) in an attempt to establish age level of characteristics of children for the development of imagination from birth to 15 years describes the stages of creative growth as follows :

Scribbling stage	: 2-4 years
Pre-schematic stage	: 4-7 years
Schematic stage	: 7-9 years
Stage of dawning realism	: 9-11 years
Pseudo-Naturalistic stage	: 11-13-years
Crisis of Adolescence	: 13-17 years

80 Ribat, T., Essay on the Creative Imagination, London, Kegan Paul and Co., 1906.

81 Andrews, E.G., The Development of Imagination in the Pre-School child. University of Lower Studies in Character, 1930 3(4).

82 Ligon, E.M., The Growth and Development of Christian Personality. Schenectady, New York : The Union College Character, Research Project, 1957.

These stages however present only an outline of the regression of creative expression ⁸³(Lowenfeld and Brittain, 1966).

⁸⁴Simpson (1922) stated that there is a subtle increase in the power of imagination at the III grade and declined in the IV grade and an increase was again noted in the next two classes, attaining the peak in Class VI which again declined in next two grades. ⁸⁵Barkan (1960) also observed spurts in creativity at different age levels. Kule citing the example of eminent individuals claimed adolescence as an important stage of creativity development. To analyse the growth of creativity among the children of fifteen years of age and older, ⁸⁶Trembly (1964) tested thousands of individuals on consequences test. The study acknowledged that there is a rapid rise in the development of creative imagination from the age of 15 reaching maximum of 30 years in the case of men and 28 for women. The research findings are significant as they are in view with the results of other studies relating to the most productive age of outstanding creativity. Rosman also found, out of seven hundred and ten inventors, sixty one per cent made their first invention before the age of twenty five. In a study that used the Rorschach tests,

83 Lowenfeld, V. and Brittain, W.L., Creative and Mental Growth, London, Collier - McMillan Ltd., 1966

84 Simpson, R.M., 'Creative Imagination', American Journal of Psychology, Vol.33 (1922), 234-243.

85 Barkan, M., Through art to creativity, Boston, Massachusetts : Allyn and Bacon, Inc., 1960.

86 Trembly, D., "Age and Sex Differences in Creative Thinking Potential", American Psychologist, Vol.19 (1964), 516 (Abstract).

⁸⁷Lalitha (1957) studied the development of imagination among Indian children between the age 8 to 11 years and no significant relation was observed between age and creativity. Similar results were reported by ⁸⁸Bhargave (1979), ⁸⁹Passi (1971), ⁹⁰Thamma Prateep (1976) from their studies of Indian school students. However, positive and significant relationship between creativity and chronological age have been observed in a number of researches. ⁹²Raina (1970) found that the total creativity and the originality and elaboration dimensions of creativity were positively and significantly related to age while fluency was found negative related and flexibility did not found related to age. Khire and Badrinath and Satyanarayanan in their studies found an increase in creativity upto the age of 13 years. ⁹³Joshi and Gakhar (1975) acknowledged an increase of creativity upto the age of 15 years. ⁹⁴Gakhar (1974) in yet another study observed that the fluency and flexibility score of students showed an upward trend from

87 Lalitha, M.S., A Study of the Development of Imagination in Children. Journal of Psychological Researches, 1957, 2, 39-48.

88 Bhargave, M., Personal Variables and Second Order Personality Correlates of Creativity. Indian Psychological Review, Vol.17, No.3-4, 1979, P 63-87.

89 Passi, B.K., op-cit., 1971.

90 Thamma Prateep, op. cit., 1976.

92 Raina, M.K., A Study of Creativity in teachers. Psychological Studies, Vol.15, No.1 and 2, 1970, P.

93 Joshi, R.K., A Study of Creativity and some Personality traits of the intellectually gifted high school students. Ph.D Education, M.S. University, 1974.

94 Gakhar, S., op. cit., 1974.

IX to X grades which was followed by a decline from X to XI classes. It was also observed that the growth of creativity was possible until the X class for girls and in case of boys creativity reached its maximum at XI Class. Torrance in a cross-cultural study of creativity compared the development of elementary school students in Australia, Germany, India, Lamora and Negro children in America. The German and Australian girls on creative development were found similar but levelled off earlier in USA Indian and American patterns were observed although the level was lower in India. The Somonan and the American negro children showed the continuity of growth in creativity and did not figure a fourth grade slump as indicated by Simson and others. The fourth grade slump in creativity has been observed in studies conducted by ⁹⁵Weideman (1961), ⁹⁶Sullivan (1953). Torrance suggested that these slumps may be related to cultural continuities and discontinuities of culture. Torrance opinion was supported by later findings. Torrance observed that longitudinal studies indicate that while most children face this discrimination some maintain steady creative growth. Children who experience the slump or drop never require their creative potential but average students show general recovery and continued growth. ⁹⁷Sullivan (1953) explains the phenomenon that the slump in creativity which usually occurs between III or IV grade may be due to segregation in group, austracisin,

95 Weideman Ruth, A., An Experiment with Grade Children in making creative songs with varied stimuli. M.A. Research Paper, Minneapolis, Minnesota : Univ. of Minnesota, 1961.

discouragement, stereo-typing, competition and compromise. In this transitional stage there are new demands which increase feelings of inadequacy and insecurity. The recertain anxiety restrict awareness and produces uncertainty, making productive thinking difficult. The reason for the slump given by ⁹⁸Wilt (1959) are peer pressure from conformity to social norms and increase awareness of sex role of the age of 9 years. ⁹⁹Torrance (1962a) even suggest some relationship between physiological changes and slumps in creative growth although he attributes it mainly social and cultural causes. ¹⁰⁰Lowenfeld and Brittain (1966) is of the view that it might be due to dawning of realism which instigate the child to discard fantasy and tried to stick to reality at this age. Lowry mentioned that the 9 years old have worst possible visual organisation and this may be due to physical limitation to the growth of creativity. Many studies have showed the same trend in creative development in VII grade. This might be because of the conflicts arising out of the physiological changes of puberty.

98 Wilt, Miriam, E., Creativity in the Elementary School, New York, Appleton Century Crafts, Inc., 1959.

99 Torrance, E. Paul, Guiding Creative Talent, Prentice Hall, 1962a (Indian Reprint 1969).

100 Lowenfeld, V and Brittain, W.L., Creative and Mental Growth, London : Collier, MacMillan Ltd. (Indian Edition) 1966.

Creativity and Socio-Economic Status

The socio-economic status as a factor influencing the development of creativity has been analysed in a number of studies conducted in India and abroad. The results of this research did not yield any consistent results but are significant in the context of evolving strategies for talent development. A number of studies have shown that highly creative individual normally hails from high socio-economic background researches conducted by ¹⁰¹Rossman (1931); ¹⁰²Pareek (1966); ¹⁰³Solomon (1968); ¹⁰⁴Raina (1969); ¹⁰⁵Singh (1977); ¹⁰⁶Thorat (1977)

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- 101 Rossman, J., The Psychology of the Inventor, Washington DC Inventors Pub. Co., 1931.
- 102 Pareek, S.S., In investigation into the creative thinking of students at different levels and the relationship between creative thinking and other related factors, Unpublished M.A Dissertation, Rajasthan Univ., 1966.
- 103 Solomon, A.D., A Comparative analysis of creative and intelligent behaviour of elementary school children with different socio-economic backgrounds. Dissertation Abstracts, 1968, 29, 5, 1457-A.
- 104 Raina, M.K., Creativity Research in India : An Analysis. The Journal of Creative Behaviour, 1969, 3, 200-210.
- 105 Singh, A., A Study of creativity of populars, isolates and rejectees in relation to their socio-economic status and scholastic achievement. Unpublished M.Ed Dissertation. Indore University, 1977.
- 106 Thorat, N., Study of Creativity of student players in relation to their scholastic achievement and socio-economic status. Unpublished M.Ed Dissertation, Indore University, 1977.

¹⁰⁷Sharma (1979) have confirmed these results. In yet other Indian studies ¹⁰⁸Pandey and Rai (1986) obtained a positive but non-significant relationship between creativity and socio-economic status ¹⁰⁹Sharma and Jarial (1980) on the other hand reported that students from high socio-economic status family score significantly higher than those from low SES influencing whereas students of high and low SES did not differ significantly in verbal creativity, originality and overall creative thinking ability. ¹¹⁰Awasthy (1979) also acknowledged that the students of very high socio-economic status were superior to the students from high average and low strata of SES in flexibility, originality and oral creativity. A similar result was stated by ¹¹¹Srivastava (1978). The study stated that students from families of high income group were found significantly high on creativity test in comparison to the middle and low income group. The study also recognised that the education of the parents significantly influenced the creativity

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- 107 Sharma, K.N., Multi-trait, multi-dimensional approach to creativity. Creativity Newsletter, Vol. 7 & 8, No.221, 1979
- 108 Pandey, R.C., R.N. and Rai, R.N., A Study of Creativity in relation to socio-economic status of high school students. The Journal of Institute of Educational Research, Vol.10, No.1, 1986, 9-12.
- 109 Sharma, A.K. and Jarial, G.S., Factorial Study of the effect of SES, Grade levels, and their interaction upon creativity and its components. Trends in Education, Vol. 7, No.1 and 2, 1980, P. 37-42.
- 110 Awasthy, M, A Study of Creativity, Intelligence, Scholastic Achievement, and the factors of socio-economic status, Unpublished M.Ed Dissertation, Indore Univ., 1979
- 111 Srivastava, R., op. cit., 1978.

of the children. The degree to which the father became professionally autonomous was very significantly related with child's creative (¹¹²Seisburg and Springer, 1969). The size of the family was also found to be a correlate of creativity. ¹¹³Kenneth (1974) studied class VII children and claimed that the larger family environment fostering both convergent and divergent thinking abilities in children. In yet another Indian study ¹¹⁴Jarial (1981) compared the creativity scores of students from small average and large families. The study conclusively proved that students of small families were superior to students of large families. in fluency, flexibility and composite creativity and did not much differ to originality component of creativity. ¹¹⁵Ahmed and Joshi (1984) also acknowledged that the verbal originality is very much affected by the enriched home background. However in yet another study by the same authors ¹¹⁶ (Ahmed & Joshi, 1977) found that home background played a relatively insignificant role in influencing the non-verbal creative

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- 112 Weisburg, P.S. and Springer, K.J., Environmental factors influencing creative function in gifted children, Cincinnati, Deptt. of Psychiatry, 1961.
- 113 Kennett, K.F., Creativity, family size and socio-economic status. The paper presented at the XV inter-American Congress of Psychology in Bogota, Columbia, 1974.
- 114 Jarial, G.S., Creativity and family size. Journal of Education and Psychology, 1981.
- 115 Ahmed, S. and Joshi, R.K., Effect of socio-cultural disadvantage on verbal originality, fluency and flexibility. Journal of Institute of Educational Research, May 1984, Vol.8, No.2, 16-23.
- 116 Ahmed S., and Joshi, R.K., Effect of socio-cultural disadvantage on non-verbal creative thinking ability among school-going children. Indian Journal of Psychology, Vol.52, Part 4, 1977, 342-349.

thinking ability. Raina's comparative study of Indian students belonging to middle and lower class revealed that the middle class students were advantageous on the creativity scores.

¹¹⁷Ford (1968) also found that children from upper-middle and lower-middle classes seem to be more creative than youngsters from working class. Contradictory to these findings ¹¹⁸Smith (1966), ¹¹⁹Singh (1980) and ¹²⁰Torrance (1980) reported the superiority of subjects from low SES background on creativity over those from high and average SES. On the other hand there are a number of studies which did not find any significant relationship between the variables of creativity and socio-economic status (¹²¹Kartsen, 1974; ¹²²MacDaniel 1974;

- 117 Ford, E.D., The relationship of certain socio-cultural factors among junior or high school students to creativity in Art, Dissertation Abstracts, 28 (9-A), 3502, 1968
- 118 Smith, J.A., Setting conditions for creative teaching. Boston Allyn and Bacon, 1966.
- 119 Singh, A.K., To study the incidence of creativity among the socio-economic disadvantaged children with reference to central, Unpublished Ph.D thesis, Rohlkhand Univ., Bareilly, 1980.
- 120 Torrance, E.P., Georgia studies of creative behaviour : A brief summary of activities and results in M.K. Raina (Ed) Creativity Research : International Perspective, New Delhi : National Council of Educational Research and Training, 1980.
- 121 Kartsen, M.O., The relationship of tested creative abilities and selected factors of academic achievement, intelligence, sex, socio-economic status and pupil attitudes : Dissertation Abstracts International, 38(8), 4732, 1968, 1977-78.
- 122 MacDaniel, E.R., In investigation of the relationship between creativity and socio-economic status, race and sex of VII grade pupils, Dissertation Abstracts International, 34, 7A, 3997-98, 1974.

¹²³Badrinath and Satyanarayanan (1979) and ¹²⁴Dutt (1988) examined the relationship between socio-economic status and creativity in a study conducted on 150 X grade students from 5 schools of Haryana. Total verbal creativity was not found related significantly to SES in this study. ¹²⁵Doutriaux (1980) also demonstrated that creativity is not related to parental occupation. The research reviewed above did not lead to any substantial relationship of socio-economic status with creativity. While some studies recognized a positive relationship between the two. There are other studies who have reflected either negative or non-significant relationship between the two variables. The above studies gives us scope for further research connecting the two variables and such a study is all the more significant in Arunachal Pradesh.

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- 123 Badrinath, S and Satyanarayanan, S.B., Correlates of Creative Thinking of High School Students. Creativity Newsletter, Vol.7 & 8, No.221, 1979.
- 124 Dutt, Sunil, "Relationship of Creativity with Achievement in Science and Socio-Economic Status of X Grade Students ; Journal of Educational Research and Extension, Vol.25, No.2, Oct. 1985, PP.106-111.
- 125 Doutriaux, F., "The relationship between creativity, intelligence, school achievement and socio-cultural level in children, Psychological Abstracts, Vol.67, No.1-3.

Creativity and Locale

There are very few studies conducted to explore the relationship between locale and creativity. The difference in creativity among the rural and urban students was analysed by Aaron Marihal and ¹²⁶Maltesha (1972). The research did not recognise very significant locale differences among the high school students. Sehgal's study also supported the above findings. However, there are a number of studies where the superiority of urban students over rural students having recognised (¹²⁷Passi 1972; ¹²⁸Singh 1977; ¹²⁹Srivastava 1977; & ¹³⁰Singh 1979). In yet another study the superiority of urban groups over the semi-urban groups in scientific creativity was noted by ¹³¹Singh (1981). On the contrary studies conducted by ¹³²Sharma (1972, 1974) stated

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- 126 Aaron, P.G., Marihal and Maltesha, R.N., Fluency and Flexibility and Motivation. Journal of Education and Psychology, Vol.30, No.1, 1972, 7-10.
- 127 Passi, B.K., op.cit., 1972.
- 128 Singh, R.J., op.cit., 1977.
- 129 Srivastava, S.S., Study of Creativity in relation to neuroticism and extroversion in high school students, Ph.D Education, Patna University, 1977.
- 130 Singh, R.J., Teacher creativity in relation to rural-urban background, Anagahana, Vol.3, No.1, 1979.
- 131 Singh, D., Scientific creativity and Personality, Agra National Psychological Corporation, 1981.
- 132 Sharma, K.N., Creativity as a function of Intelligence, Fine arts interests and culture, Indian Journal of Psychology, Vol.42, No.4, 1974, P.313-319.

that rural students were significantly more creative than their urban counterparts. ¹³³ Hussain and Sahay (1975) observed that tribal students were equally creative as, and superior in certain dimensions of creativity to the students in urban areas.

The studies reviewed have not shown any significant difference between the relationship between rural and urban. The paucity and insufficiency of studies make it impossible to derive any definite conclusions and also stress the need to undertake further research relating to locale and creativity.

133 Sahay, M., Cultural impact on the development of creative potential in M.G. Hussain and Q. Hussains cultural roles, sex differences and creativity. Educational Trends, 1975, 10, 2, 141-145.

Creativity and Academic Achievement

Creativity as a factor related to the scholastic achievement has been the theme of research in a number of studies. Achievement is a learned motive which serve as a source of strong motivation in creative endeavour. Achievement calls for greater attention power, memory power, fertility of ideas, self-confidence, will power, all these form the basis of creative thinking ability. ¹³⁴Getzels and Jackson (1962) found that since creative students tend to be non-conformed and disruptive of classroom activity, it seems reasonable to anticipate a negative relationship between creativity and academic performance. A study conducted by ¹³⁵Joseph (1966) indicated that creative test scores correlated significantly with divergent thinking and evaluative abilities, however, no correlation was found between creativity and cognitive and memory scores. The relationship between creativity and various measures of scholastic achievement was analysed by ^{135a}Woodcome (1966) with a sample of 264 IX grade students selected at random from 8 schools. The main findings of the study were the following :

1. The relationship between creativity and intelligence is slight but significant for the total sample.

134 Getzels, J.W. and Jackson, P.W., Creativity and Intelligence Explorations with Gifted Students, New York : Wiley, 1962.

135 Joseph, C.B., Creativity and Academic Achievement, Journal of Educational Research, 1966, 59(6), 269-272.

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- (2) The relationship between creativity scores and achievement scores is low but significant. ✓
- (3) Generally negligible correlation were found between creativity and grade point average.
- (4) No significant difference was found between the grade point means of high creative students and high IQ students. ¹³⁶Sandhu (1979) observed no significant relationship between creativity and achievement when the effect of intelligence was controlled. Likewise ¹³⁷Badrinath and Satyanarayanan (1978) studies also failed to yield any significant difference in the academic performance of students belonging to high and low groups on creativity. ¹³⁸William and Rutherford (1972) investigated the relationship among measure of academic achievement, creativity and teacher judgement. The measures were obtained from V grade pupils correlation between creativity and achievement was statistically significant, but very low. A slight positive relationship was noted both for creativity and achievement measure ¹³⁹Parmesh (1973) studied 155 high school students of Madras city and stated that there was no relationship between creativity and

- 136 Sandhu, T.S., Relationship of Creativity with academic achievement in science subjects, Creativity Newsletter, 1979, 8(1), 1-10.
- 137 Badrinath, S. and Satyanarayanan, S.B., Correlates of creative thinking in high school students. Department of Education, Bangalore University, 1978.
- 138 William, R. and Rutherford, R., Differential teacher regard for creative students and achieving students, Journal of Educational Research, 1972, 23(2), 83-90.
- 139 Parmesh, C.R., Creativity, Intelligence and academic achievement, Educational Trends, 1973, 18, 1-4.

academic achievement. ¹⁴⁰Passi (1972) obtained a low relationship between creativity and achievement. ¹⁴¹Goyal (1979) aimed no relationship between creativity and achievement. ¹⁴³Passi (1972) also projected similar results when he divided his sample on the lines of Crepley study, although the relationship between creativity and achievement was found low. The double talented, single and non-talented groups were found to have significantly different mean achievement scores. But in several of the recent investigations where creativity was a criterion variable and creativity training was a treatment variable, gains in creativity are found coupled with gains in scholastic achievement. ¹⁴⁴Getzels Jackson studied the high creative high intelligent students to probe the relationship between creativity and school achievement. The study showed that creativity can compensate for a relative lack of skills in areas sampled by conventional intelligence test. The study has been criticised for the selection and use of creativity test without establishing its validity and

140 Passi, B.K., Instructions and Scoring Procedure. Unpublished Materials, 1972.

141 Goyal, R.P., a Study of Some Personality Correlates of Creativity in Secondary School teachers under training, Unpublished Doctoral Dissertation, Panjab Univ., 1973.

143 Passi, B.K., op.cit, 1972.

144 Getzels, J.W. and Jackson, P.W., op.cit, 1972.

reliability. ¹⁴⁵Hudson (1966) investigated the relationship between school achievement and intellectual style in a series of studies stretched over several years. He showed that success in a particular subject area is closely related to an individual's intellectual style. The divergent thinkers preferred Humanities subjects and convergent thinkers strongly preferred Science subjects. ¹⁴⁶Torrance (1960) tried to overcome the inadequacies of Getzels-Jackson studies and with more representative samples did not find significant difference in the academic achievement of highly creative and highly intelligent students. ¹⁴⁷Chadha and Mehta (1982) conducted a study on 101 students of XII grade under 10+2+3 system. For collecting the creativity score, Torrance Tests of Creative Thinking were employed and scholastic Achievement was taken from annual marks. The study signified a positive significant correlation between creativity and scholastic achievement. ¹⁴⁸Dhaliwal and Saini's (1976) demonstrated a positive significant relationship between creativity and achievement

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- 145 Hudson, L., Contrary Imaginations : A Psychological Study of the English school boy, London, Methuen, 1966.
- 146 Torrance, E. Paul, Educational Achievement of the Highly Intelligent and Highly Creative : Eight Partial Publications of Getzels-Jackson Study, Minneapolis, Bureau of Educational Research, University of Minnesota, 1960.
- 147 Chada, N.K. and Mehta, V.K., Creativity, Intelligence and Scholastic Achievement : A Residual Study, University Psychology Research Journal (In Press), 1982.
- 148 Dhaliwal, A.S. and Saini, B.S., Relationship of Creativity with over and under academic achievement, Psychological Studies, Vol.21, No.2, 1976, P.30-40.

in History and Geography. However, no significant relationship was observed between creativity and achievement in mathematics. A positive and significant relationship between creativity and achievement in English was noticed by ¹⁴⁹Joshi (1974). ¹⁵⁰Passi (1972) reported significant positive relationship between the academic achievement and the fluency and originality components of creativity. The high creative individuals were found to be more achievement oriented than the low creative. Study conducted by ¹⁵¹Kumar (1978), ¹⁵²Awasthy (1979) also acknowledged significant relationship in scholastic achievement and different areas of creativity. ¹⁵³Asha (1980) also observed positive and significant relationship between

- 149 Joshi, R.J., A Study of Creativity and some Personal Traits of the Intellectually Gifted High School Students, Ph.D Education, M.S. University, 1974.
- 150 Passi, B.K., An exploratory study of creativity and its relationship with Intelligence and Achievement in School Subjects at Higher Secondary Stage, Ph.D Education, Panjab University, 1972.
- 151 Kumar, G., Creative functioning in relation to personality, value-orientation and achievement motivation, Indian Educational Review, Vol.13, No.2, 1978, P.110-114.
- 152 Awasthy, M., op.cit., 1979.
- 153 Asha, C.B., Creativity and Academic Achievement among Secondary School Children. Asian Journal of Psychology and Education, Vol.6, No.1, 1980.

creativity and academic achievement of Secondary School students of Kerala. ¹⁵⁴Jarial's (1981) study indicated a positive and significant relationship between the academic performance and the verbal and non-verbal creativity. Studies done by ¹⁵⁵Gupta (1979) and Sophia also acknowledged the association of the relationship between achievement and creative thinking ability. In yet another study by ¹⁵⁶Joshi (1982) a significant positive correlation was found between the achievement score and creativity was found for urban sample.

The studies seem to indicate that creativity and achievement in school subjects are lowly but positively related creative teaching definitely improves the scholastic performance along with enhanced creativity.

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- 154 Jarial, G.S., Creativity, Intelligence and Academic Achievement - their relationship and differences with reference to sex and academic subjects, Journal of Education and Psychology, Vol.39, No.2, 1981.
- 155 Gupta, K.K., Creativity, Intelligence and Achievement. The Educational Review, Vol.85, No.11, 1979, P.208-212.
- 156 Joshi, S.P., A Study of verbal creativity in Marathi language in relation to achievement in Marathi and environmental factors of the students as well as teaching in High Schools, Ph.D Education, Bombay University, 1982.

Creativity and Intelligence

The relationship between Intelligence and Creativity have been analysed in a number of studies. These researchers were mainly meant to examine the nature, extend and trend of relationship between the two variables. It was Guilford, who protested against the practice of psychologist considering creativity as a demain of intelligence. In 1956 Guilford and his associates acknowledged two distinct type of mental abilities. The convergent thinking induces facts from known information and was assigned synonymous with intelligence on the other hand the divergent thinking ability generates new thought trends, ideas and knowledge from a known fact or information. The studies conducted analysing the mental abilities, however, failed to establish the exact nature of relationship between creativity and other mental abilities.

Research relating to relationship between Intelligence and components of creativity have also yielded contradictory results. ¹⁵⁷ Safaya (1981) studied the fluency, flexibility and originality components of verbal creativity and stated that they were positively and significantly related to each other. The study further revealed that the

157 Safaya, R., Academic Achievement of B.Ed trainees as related to intelligence, creativity and adjustment, Trends in Education, Vol.8, No.1 and 2, 1981, 18-25.

fluency and originality dimension of non-verbal creativity are also positively related to intelligence. But the flexibility and elaboration dimensions of non-verbal creativity was found negatively related. Studies conducted by ¹⁵⁸Sandhu (1979), ¹⁵⁹Khire (1971), ¹⁶⁰Lalithamma (1973), ¹⁶¹Rawat and Agarwal (1973) did not reveal any relationship between creativity and intelligence. Contradictory findings were mentioned by ¹⁶²Medhi (1977) in a study of creativity and intelligence among the secondary school in India. It was seen that while they had a positive relationship between creativity and intelligence among students from rural region the relationship was negative among the urban students.

¹⁶³Shinagawa (1960) in a study classified 3000 cases into 12 categories, according to the personality pattern of children and the discrepancy graphs on WI SC

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- 158 Sandhu, T.S., Relationship of creativity with academic achievement in science subjects; Creativity Newsletter, 1979, 8 (1), 1-10.
- 159 Khire, V.S., op. cit., 1971.
- 160 Lalithamma, M.S., Self Concept and Creativity over, normal and under-achievers amongst grade X students of Baroda City, Unpublished M.Ed Dissertation, M.S. University, 1973.
- 161 Rawat, M.S. and Agarwal, op. cit., 1973.
- 162 Medhi, B., Creativity, Intelligence and Achievement : A Correlational Study; Psychological Studies, Vol.22, No.1, 1977, P.56-62.
- 163 Shinagawa, F., A Statistical Study of Discrepancy between verbal IQ and performance IQ on WISC. Japanese Journal of Child Psychiatry, 1960, 403-411.

were analysed with clumsy children, physically weak children, neurotic children, only children, over protected children, and restless children. Verbal IQ was found to be higher than performance IQ. Opposite tendency was found with delinquents and mentally retarded, emotionally unstable and withdrawn children. ¹⁶⁴Miezitus (1966) reviewed the theory regarding creativity and correlation between divergent thinking and intelligence range from .1 to -0.7. The dichotomy of intelligence and creativity is not warranted. ¹⁶⁵Iwata (1968) study 104 first year senior high school students revealed that in the upper half of an intelligence test but in the lower half on creativity test were independent, introverted and dominant but less sociable than those in the lower half on the intelligence but upper half in creativity. However, later group was found superior academically, when IQ was controlled, those high on the creativity test were relatively more extroverted and less neurotic. Verbal and non-verbal tests from the Minnesota Tests of creative thinking were administered to fourth grade students by Rittmayer (1968). On the basis of test scores, three groups of children were identified (a) children who score the upper one-third of the group in both VC

164 Miezitus, S.A., Divergent Production : Creativity or Intelligence, *Child Study*, 1966, 29(2), 12-21.

165 Iwata, O., Some relationships of creativity with intelligence and personality variables - *Psychologia : an International Journal of Psychology in the Orient*, 1968, 11 (3-4), 211-220.

and NVC; (2) children whose scores were in the upper one-third of the group in VC and the lower one-third of the group in NVC; (3) children whose scores were in the one-third of the group in NVC and the lower one-third of the group in VC. ¹⁶⁶Dewing (1970) correlated scores on selected tests of divergent thinking, (c) Intelligence, academic achievement and SES in 394 grade 7 West Australian children from 10 metropolitan schools. The relationship verbal creativity with intelligence were small, positive and significant and greater for the NVC. ¹⁶⁷Torrance (1967) review of research involving 114 correlations with the figural and 88 with 'VC' and intelligence is quite interesting. The median correlation for the figural measures and intelligence was .06 and for VC .21. ¹⁶⁸Burt (1962), ¹⁶⁹McNemar (1964) and ¹⁷⁰Marsh (1964) attributed creative

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- 166 Dewing, K., Some Correlates of creativity and test performance in 7th grade children, Australian Journal of Psychology, 1970, 22(3), 269-276.
- 167 Torrance, E. Paul, "The Minnesota Studies of Creative Behaviour - National and International Extensions; Journal of Creative Behaviour, Vol.1 (N.2, 1967a), 137-154.
- 168 Burt, C. "The Psychology of Creative Ability", British Journal of Educational Psychology, Vol.32 (1962), 292-298.
- 169 McNemar, G., "Lost : Our Intelligence ? Why". Amer. Psychologist, 19-871, 82, 1964.
- 170 Marsh, R.W., "A Statistical Analysis of Getzels and Jacksons Data", British Journal of Educational Psychology, Vol.34 (1964), 91-93.

production mainly to the operation of general ability rather than a distinct skill labelled as creativity. They suggested that conventional intelligence tests can be used effectively for measuring creativity by adding some divergent thinking sub tests to them. ¹⁷¹Guilford (1967a) reports that creativity and intelligence have relationship to each other, leading to a triangular scatter-plot indicating the high creatives rarely have low IQ. While high IQ is often associated with low creativity. It is postulated that minimum level of intellectual ability is necessary for creativity but creativity and intelligence become independent on exceeding the critical level of intelligence (¹⁷²Taylor, 1964; ¹⁷³Vernon, 1964; ¹⁷⁴Barron, 1969).

Studies have also been carried out researchers like ¹⁷⁵Cohrin and Meyer (1906; ¹⁷⁶Chassell (1916);

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- 171 Guilford, J.P., "Nature of Human Intelligence", New York : McGraw Hill Book Company, 1967 a.
- 172 Taylor, C.W. and Ellison, R.L., "Predicating Creative Performances from Multiple Measures", In C.W. Taylor, (Ed.), Widening Horizons in creativity, New York, John Wiley & Sons, Inc., 1964, PP 227-260.
173. Vernon, P.E., "Creativity and Intelligence", Educational Research, Vol.6 (1964), 163-196.
- 174 Barron, Frank, Creative Person and Creative Process, New York, Holt, Rinehart and Winston, Inc. 1969.
- 175 Cohrin, S.S. and Meyer, I.F., Imaginative Elements in the written works of School children, Pedagogical Seminary, 1906, 13, 84-93.
- 176 Chassell, L.M., Tests for Originality, Journal of Educational Psychology, 1916, 7, 317-328.

¹⁷⁷Andrews (1930); ¹⁷⁸McCloy and Meier (1939); ¹⁷⁹Weleh (1946); and ¹⁸⁰Thurston (1950) to examine the relationship between the two variables. But the researchers did not recognize the exact nature of relationship between creativity and intelligence. The first systematic study aimed at laying a clear-cut distinction between intelligence and creativity was conducted by ¹⁸¹Getzels and Jackson (1962). The result revealed that the two distinct and separate ways of thinking. These research findings were further supported by ¹⁸²Taylor (1962) and ¹⁸³Guilford (1962). Studies conducted in India on measures of creativity and intelligence also projected a positive significant relationship between the two variables.

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- 177 Andrews, E.G., The development of imagination in the Pre-school child, University of Iowa studies in character, 1930, 3(4).
- 178 Mc Cloy, W and Meier, N.C., Re-creative Imagination, Psychological Monograph, 1939, 51, 5, 108-116.
- 179 Weleh, L., Recombination of ideas in creative thinking, Journal of Applied Psychology, 1946, 30, 638-643.
- 180 Thurston, L.L., Creative Talent - Report of Psychometric Lab., Univ. of Chicago, 1950, 61.
- 181 Getzels, J.W. and Jackson, P.W., Creativity and Intelligence, New York, John Wiley and Sons, 1962.
- 182 Taylor, C.W., Who are exceptionally creative ? Exceptional Children, April, 1962, 28, 421-429.
- 183 Guilford, J.P., Potentiality to Creativity, Gifted Child Quarterly, 1962, (1), 6, 87-90.

Creativity and Personality

One of the most systematic approach in the study of creativity is through personality traits. Researches adopting psychometric evaluation (Roe, 1946; Mackinson, 1965) observed that the tests of personality can no doubt be applied to detect some of the subtle characteristics of the creative person. Dellas and Gaier (1970) after a review of researches report ".....this evidence points up a common pattern of personality traits among creative persons and also that these personality factors may have some bearing on creative in the abstract regardless of field". Summarizing a series of studies, the authors concluded that the creative person is characterized by the following personality traits :

- (1) independence in attitude and social behaviour
- (2) dominance
- (3) introversion
- (4) openness to stimuli
- (5) wide interests
- (6) self-acceptance
- (7) intuitiveness
- (8) flexibility
- (9) social presence and poise
- (10) asocial attitude
- (11) unconcern for social norms

Radicalism and rejection of external constraints are two other traits related to creative behaviour.

The personality approach in creativity analyses the qualities of persons which help in the identification of a creative individual. The creative person then appears to have certain personality characteristics, and these traits can be recognized in individuals before the adult accomplishments are demonstrated.

The empirical research relating to creativity and personality has accumulated an exhaustive amount of research data. Studies examining the relationship between the two variables have been undertaken in almost all cultures in India and abroad. It was ¹⁸⁴Galton (1869) who was the first to initiate empirical research in creativity-personality relationship. Galton's biographical study of men of genius and scientists through questionnaire method indicated that the genius and eminent can be distinguished on the originality dimension of creativity. ¹⁸⁵Terman (1954) observed emotional stability and social adjustment among the men rated highest for success in life. They were also found to excel on prudence, self-confidence and

184 Galton, F., Hereditary genius ; an inquiry into its laws and consequences, New York, McMillan, 1869.

185 Terman, L.M., Scientists and non-Scientists in a group of 800 gifted men, Psychological Monograph, 68, 1954.

perseverance. ¹⁸⁶Cattell (1903) also got similar results on the study of men of eminence. ¹⁸⁷Barron (1958) found highly creative people as "more original, less suggestible and more tolerant of structural disorderliness". The portrait depicted by ¹⁸⁸Taylor (1982) of the creative individuals was unconditional and resisting the drive towards conformity. ¹⁸⁹Reid, King and Wickwire (1959) noted that the creative children were more sociable, more warm hearted and less anxious. ¹⁹⁰Torrance (1962) suggested three personality characteristics stand out differentiating the highly creative children from less creative. Firstly, the high creative children have a reputation for wild silly ideas. Secondly, their work is characterised by the

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- 186 Cattell, J. Mck, A Statistical Study of eminent men. Popular Science Monograph, 62, 1903, 359-377.
- 187 Barron, F., The Psychology of Imagination, Scientific American; September, 1958, 199, P.150-166.
- 188 Taylor, C.W., Who are exceptionally creative? Exceptional children, April, 1962, 28, 421-429.
- 189 Reid, J.B., King, F.J., and Wickwire, P., Cognitive and other Personality characteristics of Gifted children. Psychological Reports, 1959, 5, P.529-537.
- 190 Torrance, E.P., Guiding Creative Talent, Englewood Cliffs, N.J.; Prentice Hall, 1962.

production of ideas of the beaten track, outside this world. Thirdly, their work is characterised by humour, playfulness, relative lack of rigidity and relaxation. Getzel and ¹⁹¹Jackson (1962) also observed that the highly creative adolescent displayed humour and creativeness, enjoyed taking risks, preferred to be independence and liked unconventional occupation such as adventourous, inventor, writer and artists. ¹⁹²Vanzeist and Kerr (1954) found the creative as imaginative, subjective, furious, impulsive, enthusiastic, original, confident, unconventional, less worrrying, less inhibited and less contended. In an Indian study of artistic persons including musicians, ¹⁹³Raychaudhary (1965) revealed that the creative have (1) strong feelings of depression in their childhood; (2) basically dependent and submissive; (3) strong Oedipal attachment; (4) High of sensitivity; (5) day-dreaming and fantasy; (6) the capacity to channalise their aggression into creative actions. ¹⁹⁴Raina (1968) reported that greater achievements, endurance and independence

191 Jackson, P.W., Creativity and Intelligence : Explorations with Gifted Students : New York, Wiley & Sons, 1962.

192 Vanzeist, R.H. and Kerr, W.A., Personality Self-Assessment of Scientific and Technical Personnel; Journal of Applied Psychology, 1954, 38, 145-147.

193 Raychaudhary, M., Personality Correlates of Creativity, Samiakash, XXI, No.3, 1965.

194 Raina, M.K., A Study of Some Correlates of Creativity in Indian Studets : Doctoral Dissertation, University of Rajasthan, 1968.

characterise the high creatives. ¹⁹⁵Nair (1976) noted high self reliance, sense of personal worth, personal freedom, freedom from withdrawal, nervousness sense of belongingness, anti-social tendency among the creatives. Creative science students were observed to be more reserved emotionally stable, assertive, sober, expediant, venture-some, suspicious, imaginative, shrewd, experimentatative, self-sufficient and relaxed (¹⁹⁶Gopal, 1974; ¹⁹⁷Goyal, 1974). ¹⁹⁸Singh's study (1978) showed creative males to be adventurous, self-assured, confident, shy, timid, restraining and sensitive to threats. In a comparative study of the creative and non-creative ¹⁹⁹Pandey (1980) found the creative male as good natured co-operative, easy-going and imaginative, the creative females on the other hand were found to be high intelligent, independent, fault-finders, socially bold and self-assured. ²⁰⁰Joytsna (1980) and

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- 195 Nair, M., Personality Characteristics of Creative High School Pupils; M.Ed Dissertation, Kerala Univ., 1976.
- 196 Gopal, A.K., Certain differentiating personality variables of creative and non-creative science and engineering students, Ph.D Education, Kurukshetra University, 1974.
- 197 Goyal, R.P., A Study of Some Personality Correlates of Creativity in Secondary School Teachers under training, Ph.D Education, Panjab University, 1974.
- 198 Singh, R.J., The psychological make up and sociological background of creative and non-creative student teachers. Indian Educational Review, Vol.13, No.4, 1978, p. 119-123.
- 199 Pandey, K.A., Comparative Study of the personality characteristics and value of creative and non-creative pupil-teachers, Unpublished M.Ed Dissertation, Allahabad University, 1980.

²⁰¹Singh (1978) observed creative students to be reserved critical, more intelligent, self-reliant and having high self-concept and super ego strength.

²⁰²Galton (1874) found that the scientists were characterised by great energy, greater circumference of their heads, excellent health, steady, perseverance, practical business habits, high degree of memory, spirit of independence and innate taste for science. They have a sober will and were found mentally well-developed.

²⁰³Kretschmer (1931) reported that the scientists are not associated with any kind of abnormality. They have often shown lively originality and vibrated with sensibility and inward tension. ²⁰⁴Terman (1925, 1930, 1947) in his monumental genetic study of the geni, for forty years found the general pattern of personality traits of the highly

- 200 Jyotsna, A Study of Personality Correlates of high and low creative students - A cross-cultural study of western U.P., Ph.D Psychology, Rohilkhand University, Bareilly, 1980.
- 201 Singh, A., A Study of creativity in school teachers as measured by Mehdi's Test in relation to their self-concept, attitude towards teaching and classroom verbal interaction, Unpublished Ph.D thesis in Education, Meerut University, 1978.
- 202 Galton, R., Englishmen of Science : Their Nature and Nurture, London, McMillan, 1874.
- 203 Kretschmer, E., The Psychology of men of genius, London, Kegan Paul, 1931.
- 204 Terman, L.M, et.al (1926-59), Genetic Studies of Genius, 5 Vols., Stanford University Press.

talented, including scientifically talents. He found them to be more or less associated with stability and absence of disturbed conflicts, all-round special adjustment, well balanced temperament, freedom from excessive frustration and strength of character and moral judgement. Taylor and ²⁰⁵Barron (1963) present summary of collection of papers originally presented at the three Utah Conference on Scientific creativity which reveal comprehensive results as reported by sub-groups studying environmental conditions, motivation and personality traits. ²⁰⁶Vaidya (1964) investigated the problem solving ability in science among certain groups of adolescent pupils. The major findings bearing on personality was that poor problem solver appears to stick to one idea at a time, stubbornly and later on ceases to think in disgust. Pearce (1968) compared the profiles of General Elective Research Fellows and NSF College Science students. Kotarbinski (1968) highlighted the significance of psychological, sociological and economic factors of development creativity.

It is observed from the above studies that the creative personality emerging through the empirical group is autonomous, independent, self-expressive, effeminate,

205 Barron, F., "Creativity and Psychological Health", New York, Van Nostrand, 1963.

206 Vaidya, N., Problem Solving in Science; Unpublished MA (Education) Thesis, London University, 1964.

emotionally more reactive and expensive, sensitive, imaginative and aesthetic.

Conclusion

The research review reflects that creativity research has received recognition only very recently. Although a number of studies have been carried out in western countries with efforts from eminent psychologists as Guilford, Torrance, Taylor, Getzels and Jackson, very few attempts have been made in India. The studies conducted in India are mostly confined to urban and well developed regions. The tribal regions of India are totally neglected in this aspect of research. Khiangte's study of creativity among the secondary school students in Mizoram stands out as an exception. The researcher has taken pains to develop a creativity test which can be adopted to other north-eastern tribal cultures. The study analysed the sex and locale differences in personality characteristics of high creative secondary school students. The sample of the study consisted of 700 students (335 boys and 365 girls) selected randomly from classes IX and X in 10 secondary schools in Mizoram. The three way classification of Anova with 2x2x2 Factorial Design was employed to test the effects of creativity, sex and locale on personality traits. The high creative tribal students were found to be assertive, effected by feelings, tenderminded, placid, venturesome and outgoing. The other significant correlates of creativity

were intelligence, independence, spontaneity and sensitivity. The results of this research corroborate with the findings of a number of other studies on creativity and personality (Taylor, 1957; Torrance, 1965; Raychaudhary, 1965; Raina, 1980). The study also highlighted the influence of sex and locale as factors relating to creativity among tribal children. But this results have to be verified and tested in other tribal cultures to arrive at definite conclusions. As such there is a need for research in creativity to identify the talents. Further, the review also indicates that there is not even a single study on talent development conducted in Arunachal Pradesh. As such the present study assume significance as a pioneering attempt to study the creativity and examine its correlates in a culturally diversified and remote tribal region in India.

The Sample

Creativity Test

Khiangte's Creativity Test

Validity

Reliability

Administration and Scoring

Personal Data Sheet

Data Collection

Statistical Techniques

METHODOLOGY

The major purpose of the study is to analyse the verbal and non-verbal creativity among the secondary school students. The relationship between creativity and select socio-educational factors has also been examined. The selection of method for the research work depends upon the nature of the problem selected and the kind of data required for the solution of the problem. According to ¹Mouly (1963) "scientific problem can be solved only on the basis of data, and the major responsibility of the scientist is to set up a research design capable of providing the data necessary to the solution of a problem". A careful selection of a method is an essential pre-requisite for an investigation. "The machinery of methodology", according to ²Barr (1960), "occupies a very important position in any kind of research. The research cannot perform its function without it, since it is methodology which lays out the way that formal research is to be carried out and outlines the detailed description of the research procedure". In educational research, three major categories of methods - the historical, descriptive and experimental have been identified. In view of the objectives of the study, the investigator has adopted the descriptive method with a correlational status survey design.

1 George J. Mouly, The Science of Educational Research, New Delhi : Eurasia Publishing House (Pvt) Ltd., 1963, p.95.

2 Arvil S. Barr, Research Methods in Chester W. Harris (ed), Encyclopedia of Educational Research, New York, McMillan, 1960, p.1160.

The methodology followed in the present research is detailed in this chapter. The chapter has been divided into the following parts :

- (1) The Sample
- (2) The Tools Used
- (3) Administration and Scoring of Creativity Test
- (4) Collection of data
- (5) Statistical techniques for Analysis of Data

(1) The Sample

The universe of the study constituted the students on the roles on the secondary schools of state of Arunachal Pradesh. A stratified random sample of 200 students were selected from three schools of two districts of Arunachal. Cluster sampling technique using class as a unit was employed for the selection of the sample. The design of multi-stage cluster sampling was followed for the selection of sample. For this two districts were identified out of eleven districts of the state. The Lower Subansiri district covering the Sagalee, Doimukh, Naharlagun and Itanagar, the capital, was chosen for the study. The district is inhabited by the people from different tribes of Arunachal. The second district selected was West Siang which has the dominance of Adi tribes. The sample for the study was drawn from three schools, two from Lower Subansiri and one from West Siang district. The Govt. Higher Secondary School, Basar was selected from West Siang while the Govt. Secondary

School, Naharlagun and Central School, Naharlagun were selected for the study of the three schools thus selected two were government schools and one was Central School. The students of Class VII-Class X were chosen for the sample. The actual sample chosen for the study consisted of 200 students (110 boys and 90 girls). The details of the final sample selected for the study are given in Table I.

TABLE 1

Samples Selected for the Study

Name of the school	Govt./ Central	Boys	Girls	Total
1. Govt. Secondary School	Govt.	37	28	65
2. Central School	Central	37	40	77
3. Govt. H.S. School	Govt.	36	22	58

(2) Tools Used

The following tools were employed to collect data in the present investigation :

- (1) Creativity test developed in the department of education, North-Eastern Hill University, Aizal (1987), adapted to Arunachal Pradesh.

- (2) Personal data sheet specially devised for the study.
- (3) The socio-economic Status Index (SESI).
- (4) Index for Media Exposure (IME).

Creativity Testing

Several tests have been developed in India (³Mehdi, 1973); (⁴Passi, 1971) and abroad (⁵Torrance, 1966); (⁶Guilford, 1967); (⁷Wallach and Kegan, 1965) for the measurement of creativity.

These standardised tests have been extensively used all over the world in research as such, or with

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- 3 Mehdi B., Verbal and Non-verbal tests of creative thinking, Agra : National Psychological Corporation, 1973.
 - 4 Passi, B.K., Passi Tests of Creativity (Verbal and non-verbal), Agra National Psychological Corporation, 1979.
 - 5 Torrance, E.P., Torrance Tests of Creative Thinking ; Norms - Technical Manual (Research Edition), Princeton, N.J. : Personal Press, 1966.
 - 6 Guilford, J.E., et.al. A Factor Analysis Study of Creative Thinking II; Administration of Tests and Analysis of Results, Reports from Psychological Laboratory, No.24, Los Angeles, University of South, California, 1967.
 - 7 Wallach, M.A. and Kegan, Modes of Thinking in Young children; a study of creativity - intelligence distinction; New York, Holt, Rinehart and Winston, 1965.

necessary adaptations. However, the psychological tests are not wholly applicable to a different culture and the tribal cultures of India with their unique characteristic need tests specifically relevant to their cultural fabrics.

Khiangte's Creativity Test

This test has been developed and standardized on a sample of Class IX and X Secondary School students from the neighbouring tribal culture of Mizoram (⁸Khiangte, 1987). The test was found quite feasible for the study. Necessary modifications have been made and several test items were changed while adapting the test to Arunachal culture. The creativity of the secondary school students were measured in present investigation using Khiangte's creativity test.

Khiangte's creativity test measures the four primary components of creativity namely the Fluency, Flexibility, Originality and Elaboration. Both the verbal and non-verbal tests were employed. The test battery included seeing problems test, unusual uses test, consequences test, making things more interesting and similarities tests on the verbal creativity and picture construction, picture

⁸ Khiangte Varparhi, Non-Cognitive Correlates of Creativity among secondary school students, Unpublished Ph.D thesis North-Eastern Hill University, Aizawl, 1987.

completion, and circle tests on the non-verbal creativity. The test items are developed on the model of Guilford Divergent Production Tests (1967), Torrance Tests of Creativity Thinking (1966) and Wallach and Kogan's Test of Creativity (1965). The two Pioneering Indian Tests of Creativity, the Verbal and Non-verbal Tests of Creative Thinking (Mehdi, 1973) and Passi Test of Creativity (1979) were also consulted. The test was modified, for the requirements of the socio-cultural life of Arunachal Pradesh. The item 'making things interesting' was dropped from the test as it was not found applicable to the students of Arunachal. Certain items were changed and some were dropped on the sub-tests. The details of which are stated below :

(1) Seeing Problems Test

This test has been developed by adopting Guilford (1962) pattern and it designed to measure the degree of sensitivity to problem which was considered a component dimension of creativity. The test included six items namely television, jeep, shoes, gun, thatched house and bicycle. The duration for this test is 12 minutes, 2 minutes for each item. Items like jeep, shoes, bicycle were rejected. and only items such as television, gun, thatched house were retained for the present research and as such the time-limit was reduced to 6 minutes instead of 12.

(2) Unusual Uses Test

It was designed on the model of the Brick Uses Test (Guilford, 1952) and Torrance's Unusual Uses Test (1962). The test consisted of 6 items within the psychological and physical proximity of the students. The students were requested to reflect as many interesting and unusual responses as possible. The time-limit on each items of the test is four minutes. The test was given as it is and there was no modification made in the items.

(3) The Consequences Test

The test was developed on the lines of Guilford (1952) and Torrance (1962). Items such as "If everybody started dancing", "If we cut down all plants", "If man had wings", "If we had no fire", are included on the consequences test and two minutes are given for the completion of each item. The items "If we cut down all plants", "If we had no fire", "If man had wings" were rejected for the present study and one extra interesting item was included with the other items and it was "If it did not rain at all".

(4) Similarities Test

The qualities of two objects were to be compared in this sub-test. There were 8 items - (1) Sun and the Moon, Y.M.A. (Young Mizo Association), K.T.P. (Christian Youth Fellowship), Radio and Newspaper, Fish and Frog, A young

lady and a puppy, A flower and tree, A ladder and A table, cigarette and pencil in the original test. The items applied were similarities between Fish and Frog, Flower and Tree. The test battery included 3 non-verbal tests also and they are given below.

(5) Picture Construction Test

The test presented the students with three figures : a triangle, a semi-circle, and a spiral. The item spiral was excluded . The subject were required to use this figure as an integral part while elaborating into a complete form. The pictures were scored for originality and elaboration. Originality is concerned so as to make the students produce a novel figure. The title is also scored for the verbal elaboration and originality. The time-limit was 15 minutes, 5 minutes for each item and the students were informed after every 5 minutes.

(6) Picture Completion Test

The activity consists of four line drawings, and these are to be made into meaningful pictures of different objects. The students had to complete the drawings and to give suitable and interesting titles to each picture. The time limit of 12 minutes for the test were given, 3 minutes each for the completion of each item. They were scored for verbal elaboration and originality.

(7) Circles Test

In this non-verbal test, 20 circles were given and the subjects were asked to draw as many pictures as they can. They can add to circle inside, outside or both with the help of a pencil. The time-limit was 5 minutes and the students were asked to draw unusual figures which their friends may not have thought of. They were asked to give titles in case the figure was not clear. The test item was scored for originality and elaboration. The adapted version of the creativity test used in the present study is given as Appendix I.

Validity of the Test

The scores on each item thus related were taken separately. The raw scores for each item for fluency, flexibility and originality on the first five verbal tests, and elaboration and originality on the first three non-verbal tests were converted into T scores with the mean of 50 and SD 10, and were added upto get the item score. The item scores were then correlated with the total creativity scores and again each of the total activity scores were correlated with the grand total.

Correlation-coefficient between various factors of creativity scores have taken separately, and total creativity score was calculated to determine the item validity. Details are given in Table 2 and 3.

TABLE 2

Correlation of Item Scores with the Activity Score with
the total Creativity Score (N=100)

Activity	Item	Correlation with Activity total	Correlation with Grand Total
I	1	.601	.530
	2	.593	.482
	3	.744	.525
Activity I Scores vs. Total Score			
II	4	.791	.630
	5	.704	.661
	6	.669	.601
Activity II Scores vs. Total Score			
III	7	.841	.699
	8	.793	.702
	9	.735	.680
Activity III Scores vs. Total Score			
IV	10	.882	.704
	11	.760	.458
Activity IV Scores vs. Total Score			.452
V	12	.544	
	13	.482	
VI	14	.499	
	15	.473	
VII	16	1.00	

Reliability

The reliability of the test of creativity was determined by the test-retest method. The test was administered to the same 100 students from two schools for the second time after a gap of 15 days. The sample size was considered adequate as supported by other researches in determining the reliability of creativity test, the Minnesota Tests of Creative Thinking on a sample of 56 students (Moss and Duenk, 1967)⁹, Passi Tests of Creativity on a sample of 60 students (Pass, 1979)¹⁰ and verbal and non-verbal tests of creativity thinking on a sample of 31 students (Mehdi, 1973)¹¹.

Test-retest reliability coefficients for the creativity test and the various sub-tests were computed by correlating the scores of subjects on first and second administration. The reliability of the test was found to be quite satisfactory. The value of coefficient of correlations were .802 for the whole test, .819 for the verbal test, .725 for

9 Moss, J. and Duenk, I.G., Estimating the Concurrent Validity of Minnesota Tests of Creative Thinking, American Educational Research Journal, 4(4), 1967, 389-396.

10 Passi B.K., Passi Tests of Creativity, Agra : National Psychological Corporation, 1979.

11. Mehdi, B., Verbal and Non-verbal Tests of Creativity, Agra : National Psychological Corporation, 1973.

the non-verbal tests, .61 seeing problems test, .86 unusual uses test, .73 consequences test, .83 making things interesting, .64 similarities, .70 picture construction, .66 picture completion and .84 circles test, all significant at .01 level. This gives credence to accept creativity test used in the present investigation as a reliable tool. Further, test-retest reliabilities on the factor scores (fluency .642; flexibility .589; originality .605; elaboration .552) were also found to be highly significant to accept the reliability of the creativity test. Test constructors in creativity has accepted reliability coefficients between .28 and .78 for verbal tests (Wodtke, 1964)¹²; .80 with stability coefficients of the part scores between .65 and .70 for the Minnesota Tests of Creative Thinking (Torrance, 1972)¹³, and coefficients ranging between .068 and 0.97 for the Passi Test of Creativity (Passi, 1979)¹⁴.

12 Wodtke, K.H., Some Data on Reliability and Validity of Creativity Tests at Elementary School Level. Educational and Psychological Measurement, 24, 1964, 399-408.

13 Torrance, E.P., Some Validity Studies of two brief screening devices for studying the creative personality. Journal of Creative Behaviour, 5, 1972, 94-103.

14 Passi, B.K., op. cit., 1979.

TABLE 3

Correlation Co-efficients between various factors of Creativity and the total Creativity Score (N = 100)

Factor	Fluency	Flexibility	Originality	Elaboration
Fluency	...	...	...	...
Flexibility	.822	...	...	...
Originality	.690	.771	...	...
Elaboration	.725	.433	.505	...
Creativity	.837	.786	.601	.664

Administration and Scoring

The creativity test adopted and used for the study consisted of four verbal tests and three non-verbal tests. These tests can be administered individually as well as in convenient groups of thirty to fifty students. For the present study the test was administered to entire class in each school. Before administering the test the students were properly motivated and necessary instructions were given. A pencil and a pen were made available to the students along with the test book-lets. A stop watch was used to keep the time for each activity. The investigator made

sure that students followed the instructions and studied the practice items before answering the test items.

Scoring Scheme

The test items were scored in a systematic manner for the 4 components of creativity both verbal and non-verbal tests. The first four verbal tests are scored for fluency, flexibility and originality while the 3 non-verbal tests are scored for originality and elaboration. The scoring schemes developed are given below :

Scoring for fluency

In the scoring for fluency, the responses to the items on the verbal tests should be marked carefully and the irrelevant responses and repetitions should be avoided. The rest should be entered as the fluency score for the item in the appropriate box in the answer sheet.

Scoring for flexibility

The responses which differ in approach and thought are identified. All responses belonging to the same approach or trends are considered as one category for flexibility scoring. The number of categories based on the different approaches or thought trends are noted down and taken as the flexibility score. The flexibility scoring can be done through assigning an alphabet against each response indicating the category of approach or thought trend.

Scoring of Originality

Uncommonness in responses, i.e., the responses given by less than 5% of the students are scored for originality. Responses given by 5% or more of students are given no score. The relative weightage for originality scoring is given in the following scheme :

<u>P.C. of Response</u>	<u>Originality weightage</u>
0.1% to 0.99%	5
1% to 1.99 %	4
2% to 2.99%	3
3% to 3.99%	2
4% to 4.99%	1
5% and above	0

Scoring of elaboration

The non-verbal tests are considered for scores on the creativity factor, elaboration. The ability to add relevant details to the minimum and essential response to the figural stimulus which gives meaning to the picture is marked. If the figure is not relevant and meaningful, it should be ignored. The total elaboration score will consist of a score of one for the primary and minimum responses plus one score each for all additional details.

Scoring of the Title

The titles of the non-verbal tests are scored for

originality and elaboration. In scoring the title for elaboration, the primary and essential response has to be identified as all additional ideas are taken as elaboration. The essential response should be taken as elaborations. The essential response should be given a score of one, and one score for each of the additional ideas. For instance. For instance, 'an Arunachal youth returning home from community work'. The elaboration score for this title will be the no. of ideas included in the title - one for Arunachal youth, plus one for returning home and one for community work.

Score Summary

The scores for fluency, flexibility and elaboration on different activities obtained by the students were entered in a summary sheet. Specifically devised for the purpose and added upto obtain the total scores on the four components of creativity. The component creativity score was calculated by converting the raw component scores into standard scores.

The scores on the creativity test were taken as criterion for classifying the students into high and low creative groups. The students having the highest twenty percent scores constitute the 'high creative group' and the pupils possessing the lowest twenty percent of scores from the 'low creative group'.

Personal Data Sheet (PDS)

The investigator specially devised a data sheet to obtain the information of the students relating to personal and socio-economic background. The students are requested to give appropriate and accurate information on a number of items such as the birth order, education and occupation of the parents, the facilities available at home, the members of siblings, etc - hobbies, aspirations, etc. A copy of the Personal Data Sheet (PDS) is attached as Appendix II.

Information pertained to the components of socio-economic status such as family facility, family income, etc. are also sought through the data sheet. The Socio-Economic Status Index (SESI) is derived as a composite score obtained from the students family background such as parental education, parental profession, family facilities and education (Lalrinkimi, 1988). The students exposure to the media such as T.V., Radio and Newspaper are taken as the basis to develop the Index for Media Exposure (Lalrinkimi, 1988). Information regarding the media exposure are also obtained through the Personal Data Sheet.

Data Collection

The collection of data spread over almost one month. The investigator personally visited the schools

9 Lalrinkimi, "A Study of the Impact of Education on All Social Attitudes of People in Mizoram, Unpublished Ph.D thesis, NEHU, Aizawl, 1988.

selected for the teachers who were given instruction about the procedures to be adopted during the administration of a test. The Personal Data Sheet was given to each student. The creativity tests were given after the Personal Data Sheet was filled in and returned by the students. The students were requested to do the practice items of each sub-test and to follow the instructions carefully while taking the test.

Statistical Techniques

The following statistical techniques were used for the analysis of data :

(1) Descriptive Statistics

Measures of central tendency, dispersion, skewness, and curtosis were employed to know the nature of score distribution on creativity test.

(2) Chi-square Test and Coefficient of Contingency

In order to test the existence of relationship between variables, creativity and select socio-educational factors, chi-square test was applied after arranging the data into appropriate contingency tables. For every obtained cell frequency (O_{ij}) the expected frequency (E_{ij}) was found by multiplying the two marginal totals common to the particular cell,

and then dividing the product by the total number of cases, N. Then, the following formula recommended by Siegel (1956) was employed to determine the chi-square value and the degrees of freedom :

$$\text{Chi-square } (\chi^2) = \sum_{i=1}^r \sum_{j=1}^k \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

where,

O_{ij} = Observed number of cases categorized in i^{th} row of j^{th} column.

E_{ij} = Number of cases expected in i^{th} row of j^{th} column

$\sum_{i=1}^r \sum_{j=1}^k$ = directs to sum overall r (rows) and all (k) columns, i.e. to sum over all cells.

$$\text{Progress of freedom (df)} = (r - 1) (k - 1)$$

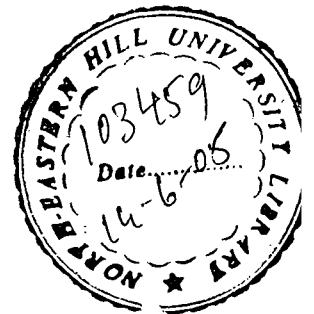
The sample value of chi-square computed with the help of the above formula was compared with the theoretical values in chi-square Table for the given degrees of freedom to decide the level of significance. The present investigation accepted value significant at 0.05 and 0.01 levels.

When the computed chi-square value was found to be greater than the table value, the null hypothesis

was rejected with the conclusion that the categories of classification were not independent and vice-versa. In other words, the existence of a relationship between the rows and columns representing the two variables was accepted depending on whether the chi-square value was significant or not.

The degree or extent of association between the two variables was measured by computing the coefficient of contingency. The formula proposed by Karl Pearson was employed for this.¹⁷

$$C = \sqrt{\frac{2}{N - 2}}$$



From this, the corrected C was worked out by dividing the obtained value of C by the upper limit of C for the concerned contingency table (Upper limit being .707 for a 2x2 table).

(3) Test of Significance for Mean Difference

Difference between the mean creativity scores of the sub-groups formed on select socio-educational

16 Sidney Siegel, Nonparametric Statistics for the Behavioural Sciences (Tokyo : Mc Graw Hill Kogakusha Ltd., 1956), pp.175-179.

17 Helen M. Walker and Joseph Lev, Statistical Inference (New York : Holt, Rinehart & Winston, 1955), pp.286-287.

variables was tested for significance using one-tailed test of significance for large independent samples suggested by Garret¹⁸. Standard error of difference between the means was calculated using the formula,

$$D = \sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}$$

where, σ_1 and σ_2 are the standard deviations of the two samples and N_1 and N_2 are the size of the samples. Critical Ratio (C.R.) was found by dividing the difference between the sample means by its standard error. The significance of the mean difference was determined by finding out whether the obtained ^{t' value} Critical Ratio exceeded 1.96^b or 2.58 for significance at 0.05 and 0.01 levels respectively.

18 Henry E. Garrett, Statistics in Psychology and Education (Bombay : Vakils, Foffer and Simons Pvt. Ltd., 197), pp.217-219.

Relationship between Creativity and
the Select Socio-Educational Variables

Creativity and Sex

Creativity and Age

Creativity and Birth Order

Creativity and Parental Education (Father)

Creativity and Parental Education (Mother)

Creativity and Parental Occupation

Creativity and Socio-Economic Status

Creativity and Family Facility

Creativity and Media Exposure

Creativity and Literary/Social Interest

Creativity and Pastime

Creativity and Type of School

Results of Research by Hypotheses

ANALYSIS OF DATA

The details of the analysis of the data obtained on creativity and other socio-educational variables are presented in this chapter. The sample for the study consisted of 200 secondary school students selected at random from three schools of Lower Subansiri and East Siang districts of Arunachal Pradesh. The responses on the creativity test were scored following the scoring scheme mentioned in Chapter IV. The normality of score distribution on the creativity test were examined by applying the descriptive statistics. The measures of central tendency, standard deviation, skewness and kurtosis were calculated and judged by the following criteria :

- (i) closeness of measures of central tendency ;
- (ii) low value of skewness (sk) ; and
- (iii) value of kurtosis (ku) being close to that of Normal Probability Curve (NPC), ku for the NPC is 0.263.

The relevant statistics calculated for the

creativity Scores are stated below :

Mean = 53.386 Median = 51.038 Mode = 50.162
SD = 6.925 SK = .014 Ku = .226

The closeness of the measures of the central tendency, the negligible low value of skewness and the nearness of kurtosis to that of NPC indicate that the score distribution approximates normality to a great extent on creativity test. This helped to establish the conditions and gave ample justification for the use of the two tailed test of significance for mean difference in the study. The scores on the creativity test were taken as criterion for classifying the students into high and low creative groups. The students obtaining the mean score on creativity test and above constituted the 'high creative group' (N=88) and those possessing less than the mean score formed the 'low creative group' (N = 112). Groups were also formed on variables such as socio-economic status (SES), Family Facility (FF), Media Exposure (ME) following the same procedure after obtaining scores as per the scoring schemes suggested in the Methodology Chapter. Data on other personal socio-educational variables were classified following arbitrary method. The break-up of the

sample on the select socio-educational variables are given in Table-4.

Relation between Creativity and the Select Socio-Educational Variables

In order to find the relation between the select variables under research the creativity and socio-educational variables, such as sex, age, birth order, type of school, parental education (father), parental education (mother), parental occupation, family facility (FF), socio-economic status (SES), media exposure, interests and pass times, the data were arranged in appropriate contingency tables. The rows and columns of the contingency tables contained the frequency distribution on select socio-educational variables and creativity respectively. Chi square test was applied and the coefficient of contingencies (C) was calculated. Details of analysis are as follows :

Creativity and Sex

The sample for the present study included 110 boys and 90 girls. Cross tabulation of the frequency data and the statistics worked out on variables sex and creativity are shown in Table-5.

TABLE-4

Break-up of the Sample on the Select Socio-Educational
Variables (N = 200)

					6
Sl. No.	Variable	Sub-groups with variables			Total
1.	Sex	Male 110	Female 90		200
2.	Age	Low (below 15 yrs)	High (15 yrs & above)		200
		140	60		
3.	Birth Order	First born 67	Middle born 70	Last born 52	Single child 11 200
4.	Type of school	Government 123		Central 77	200
5.	Parental Education (Father)	Illiterate 139		Educated 61	200
6.	Parental Education (Mother)	Illiterate 157		Educated 43	200
7.	Family Facility	Low 118	High 82		200
8.	Socio-economic Status	Low 116	High 84		200
9.	Parental occupation	Professional 38	Cultivators 89	Unskilled 73	200
10.	Media Exposure	Low 126	High 74		200
11.	Literary/Social Interests	Literary 92		Social 108	200
12.	Pass times	Infor- mative 40	Socio- cultural 78	Recrea- tional 82	200

TABLE-5

2 x 2 Contingency Table to verify relationship between Creativity and Sex among the Secondary school students

Sex	Creativity		Total
	Low	High	
Male	58	52	110
Female	54	36	90
Total	112	88	200

$\chi^2 = 1.0625$
 df = 1
 P = Not Significant
 C = .072

The obtained chi-square value 1.0625 which for 1 degree of freedom was not found significant at any level of confidence (Table value of χ^2 for .05 = 3.84 ; .01 = 6.63). A correlation of the data from the grouping was made by computing the coefficient of contingency. The computed coefficient of .072 is very low and negligible suggesting the relatively poor, insignificant relationship between the variables of sex and creativity. Hence, the

null hypothesis cannot be rejected within the confidence limits prescribed for the present research. The results reveal that the male and female do not differentiate significantly in creativity scores. This is contradictory to the findings of many researches conducted in India and abroad where superiority of either male or female has been reported (Yamamoto, 1960; Torrance, 1962; Raina, 1971; Passi, 1972) but, however, agrees with the findings of certain studies conducted in tribal population of North-East India (Dutta, 1982; Thaching, 1985; Khiangte, 1987).

Creativity and Age

The sample was divided into two groups on the basis of chronological age of the students. There were 140 students below the age of 15 years and 60 students with 15 years of age and above forming the low and high age groups respectively. A 2 x 2 contingency table was then formed feeding the frequencies on age and creativity. Details of analysis are given in Table-6.

TABLE-6

2 x 2 Contingency table testing relationship
between variables of age and creativity

Age	Creativity		Total
	Low	High	
Low (below 15 yrs of age)	80	60	140
High (15 years and above)	32	28	60
Total	112	88	200

$$\begin{aligned} \chi^2 &= 0.247 \\ df &= 1 \\ p &= \text{NS} \\ c &= .035 \end{aligned}$$

According to the results of analysis from Table-6, creativity is not found significantly related to age. The chi-square value of 0.247 and the low coefficient correlation .035 were not found statistically significant at any level of confidence. This indicates that the two age groups failed to differentiate in creativity and hence the null hypothesis cannot be rejected. Many studies conducted in India

have reported that there is a significant relationship between age and creativity (Ahmed, 1977; Singh, 1979; Dharmagadan, 1981). The present research, however, failed to lend support to the findings of previous studies. Further, investigation is, therefore, required to arrive at any concrete conclusions on the two variables of research.

Birth Order and Creativity

The analysis was directed to identify the influence of the order of birth on the creative thinking ability of children. The birth order position of the students is taken as the criterion for classifying the sample into 3 groups. The first born figured 67, middle born 70 and last born 52 in the sample while 11 students reported to be single (only) child of their parents. The data was subjected to statistical treatment after cross-tabulating with the observed frequency on level of creativity. Details are given in Table-7.

TABLE 7

3 x 2 Contingency table testing relation between birth order and creativity

Birth Order	Creativity		Total
	Low	High	
First born	(37.23) 48	(28.14) 39	67
Middle born	(36.75) 21	(29.40) 34	70
Last born	(27.30) 21	(21.84) 31	52
Total	105	84	189

11 cases reported 'single child' dropped from computation.

Expected frequencies are given in parentheses.

$$\chi^2 = 13.334$$

$$df = 2$$

$$p = .01$$

$$c = 0.250$$

The data presented in Table 7 revealed a statistically significant chi-square value of 13.334 which was significant at .01 level, the table value being 9.21 with 2 degrees of freedom. The contingency coefficient of .25 statistically significant at .01 level indicates that there is a moderate significant relationship between the variables of birth order and creativity. The percentage distribution of the high creative (59.61%) appeared to be significantly higher among the last born group. The high creative percentage turned out to be low among the first born (28.14%) while the middle born did not differentiate much in the percentage distribution of high (51%) and low (49%) creative students. According to the above findings, it can be concluded that birth order is significantly associated with creativity. Further analysis of the data was carried out to test the significant difference in the creativity scores of the first, middle and last born students. Mean and standard deviation for the three groups on birth order were calculated. Two-tailed test of significance for mean difference of large independent samples was applied to find out whether the groups differed significantly

with regard to their creativity scores. Details regarding the analysis are given in Table 8.

TABLE 8

Mean, Standard Deviation and Critical ratio computed for the Creativity scores of the birth order group

Birth order	N	M	J	JD	MD	CR	P
				A + B			
A. First born	67	50.72	6.04	1.268	3.21	2.531	.05
				B + C			
B. Middle born	70	53.93	7.12	1.687	2.18	0.353	NS
				A + C			
C. Last born	52	56.11	7.08	1.507	5.39	3.576	.01

Comparison of creativity scores of the three birth order groups indicated that last born maintained the highest mean score (56.11) and the first born obtained the lowest score of 50.72. The test of significance for mean difference in paired comparison returned statistically significant critical ratios in the case of first born and middle born (CR = 1.531) at .05 level and first born and last born (CR = 3.576) at .01 level. However, the analysis failed to yield

statistically significant difference in mean creativity scores of the middle born and the last born. The results reveal that the last born are superior in creative dispositions when compared to the first and middle born children.

Parental Education and Creativity

Parental education, an early socialization variable is found to affect educational, vocational aspirations (Swell, Haller and Portes, 1969) and attitudes and values of children (Lalrinkimi, 1988 Sudhir and Lalrinkimi, 1985). However, there are not many studies conducted to test the association between parental education and creativity. In the present study, therefore, an attempt is made to examine the effect of paternal and maternal education on the creative thinking ability of their children. For this, the students were separated into two groups as illiterate and educated based on the education of the father. The frequency on paternal education figured 139 for the illiterate and 61 for the educated. Students belonging to the above groups were again subdivided on the basis of their creativity forming a

2 x 2 contingency table. Table 9 presents the details of analysis and the chi-square value obtained for the data.

TABLE 9

2 x 2 Contingency table testing association between parentaleducation and the creativity

Parental Education (Father)	Creativity		Total
	Low	High	
Illiterate	88	51	139
Educated	24	37	61
Total	112	88	200

$$\chi^2 = 9.881$$

$$df = 1$$

$$p = .01$$

$$c = 0.216$$

Correlated value of c
for grouping

$$= 0.305$$

The analysis acknowledges the significance of the paternal education for fostering creativity among children. The chi-square value of 9.881 obtained for the data was found statistically significant beyond the limit of .01 level, the table value being 6.635 for 1 degree of freedom. This indicates that the sub-groups formed on the paternal education and creativity differed significantly. The coefficient of contingency ($c = 0.216$) computed for the data showed statistically significant, positive correlation between the two variables under research. The upper limit of C for a 2×2 contingency table being .707, the obtained value of coefficient corrected for group .305 can be considered moderately high. The analysis permits us to predict the association between the two variables and thereby reject the null hypothesis that there is no relationship between paternal education and creativity.

The analysis was extended to test the mean difference in creativity scores of the two parental education (father) groups under investigation. The values of mean, standard deviation and critical ratio computed for the analysis are given in Table 10.

TABLE 10

Mean, standard Deviation and Critical ratio
computed for creativity scores of secondary
school students by Parental Education (Father)

Paternal Education	N	M	SD	E	MD	CR	P
Illiterate	139	49.601	7.815	1.182	12.406	10.495	.01
Educated	61	62.007	6.731				

As seen from Table 10, the mean creativity scores of the students differed significantly for the illiterate and educated sub-groups. The critical ratio was found statistically significant at .01 level with the mean score favouring the educated parental group. The study therefore indicates that there is a positive, significant relationship between paternal education and creativity.

Parental Education (Mother) and Creativity

Effect of education of mother on the creativity of children were studied. For this, the students were separated into two groups of illiterate (N=157)

and educated (N=43) parental groups. A 2x2 contingency table was formed feeding frequencies on maternal education and creativity. Chi-square and the contingency coefficient were calculated for the data and the details are stated in Table 11.

TABLE 11

2 x 2 Contingency table to test association between maternal education and creativity

Maternal Education	Creativity		Total
	Low	High	
Illiterate	96	61	157
Educated	16	27	43
Total	112	88	200

$\chi^2 = 7.849$
 $df = 1$
 $p = .01$
 $c = .194$
 Corrected C = .274

Table 11 indicates that the group differed significantly as the Chi-square value of 7.849 was found statistically beyond .01 level. The contingency coefficient of 0.194 points out the positive significant relationship between the two variables which can be considered moderate (the corrected value of C being .244) as the upper limit is .707 for 2x2 table. The results reject the hypothesis (Ho) that there is no relationship between maternal education and creativity. Creativity scores of students of illiterate and educated mothers were compared and tested for significance in mean scores. The results are presented in Table 12.

TABLE 12

Mean, standard Deviation and Critical ratio computed for the creativity scores of secondary school students by maternal education

Maternal Education	N	M	E	MD	CR	P
Illiterate	147	51.607	8.466	1.041	8.269	7.943 .01
Educated	43	59.876	5.014			

The comparison of creativity scores of students with illiterate and educated mothers showed statistically significant difference in the mean scores. The students with educated mothers showed a significantly higher mean creativity score ($CR = 7.943$ $p = .01$) reflecting the influence of the education of the mother on the creative thinking ability of their children. Thus, this study indicates that both paternal and maternal education are contributory factors fostering creativity among children.

Parental Occupation and Creativity

The occupation of the parents was analysed to find out any relationship with the creativity of the children. The students were classified into 3 groups depending on the occupation of father (professional, cultivators and unskilled workers). There were 38 with professional group, 89 cultivators and 73 in unskilled workers groups. Sub-groups were again formed on two level of creativity high and low and a 3×2 contingency table emerged. The obtained frequency distribution of the table and the chi-square value computed for the data are given in Table 13.

TABLE 13

2 x 3 Contingency table testing association
between creativity and parental occupation

Parental occupation	Low	High	Total
Professional	(22.40) 17	(17.60) 21	38
Cultivators	(43.68) 47	(34.32) 42	89
Unskilled Workers	(45.92) 48	(36.08) 25	73
Total	112	88	200

$$\chi^2 = 1.644$$

$$df = 2$$

$$p = \cancel{.05} \text{ N.S.}$$

$$c = 0.090$$

The data summarised in Table 13 reveal that the Chi-square value is not significant at any level of confidence. The groups did not differentiate in

their frequency distribution and the very low, insignificant contingency coefficient failed to establish any relation between the variable of parental occupation and creativity. The research did not provide statistical evidence to support the rejection of the null hypothesis advanced for research.

Socio-Economic Status (SES) and Creativity

The effect of socio-economic on creativity is subjected to research. Socio-economic was treated to be a key variable in creativity research because it serves as a esteem variable of considerable importance and is a facilitator of attainments in educational, social and intellectual spheres. The measures of socio-economic status used were family income, father's/ mother's education (whichever is higher), father's occupation and the family facility and the sample was divided in the quarters on a socio-economic status index (Lalrinkimi, 1988). There were 84 students in the high socio-economic status category while 116 were low socio-economic status. Students belonging to the 2 SES groups were again divided on the basis of their level of creativity. The observed frequencies were entered in the cells of a 2 x 2 contingency table.

The chi-square test was applied and results are shown in Table 14.

TABLE 14

2 x 2 Contingency table testing association
between socio-economic status (SES) and
Creativity

Socio-economic Status (SES)	Creativity		Total
	Low	High	
Low	74	42	116
High	38	46	84
Total	112	88	200

$$\chi^2 = 6.807$$

$$df = 1$$

$$P = .01$$

$$C = 0.181$$

$$\text{Corrected } C = 0.256$$

Table 14 indicates that Chi-square value is significant at .01 level. A coefficient of contingency calculated for the above revealed a value of 0.181 which were correct for grouping swelled to 0.256 with a maximum limit of .707 for 2 x 2 table. The results indicate a moderately high positive linear relationship between the socio-economic status and creativity. To further clarify the results related to the above variables under research, the creativity scores of students belonging to high and low SES groups were compared. Mean, standard deviation and critical ratios were compared and the results are given in Table 15.

TABLE 15

Mean, standard deviation and critical ratio computed for creativity scores of low and high socio-economic groups

SES Groups	N	M	SD	MD	CR	P
Low	116	57.709	7.002	3.99	4.394	.01
High	84	55.699	6.385			

The critical ratio computed for the mean difference of the creativity scores of high and low SES groups was found statistically significant at .01 level. The mean creativity score of high SES group showed a definite advantage over the low SES group. The results reveal that student from high socio-economic group are definitely superior in creativity to those from lower strata. The positive relation between the SES and creativity is thus confirmed with the value of being significant at .01 level and the mean creativity score showing a definite higher score with CR value statistically significant at .01 level. The results of the present study corroborates the findings of a number of researches conducted abroad and in India including the tribal regions (Ogletree, 1971; Pareek, 1966; Raina, 1969; Sharma, 1979; Dutta, 1981; Thanchingi, 1982) substantiating a positive linear relationship between creativity and socio-economic status.

Family Facility and Creativity

Family facility, a component of socio-economic status was further examined to find its influence on

the creative thinking ability of students. Students were classified into two groups based on their scores on family facility. The frequencies being 118 and 82 in high and low groups respectively. A 2x2 contingency table was formed feeding the observed frequencies of the two family facility groups with categories on low and high creativity. The chi-square was computed for the data and is presented in Table 16.

TABLE 16

A 2 x 2 Contingency table testing relationship between family facility and creativity

Family Facility	Creativity		Total
	Low	High	
Low	74	44	118
High	38	44	82
Total	112	88	200

$$T^2 = 5.261$$

$$df = 1$$

$$p = .05$$

$$C = 0.460$$

$$\text{Corrected } C = 0.226$$

It is revealed that there is a significant difference in the observed and expected frequencies as the chi-square value computed for the distribution was found significant at .05 level. The contingency coefficient computed for the data revealed a value of 0.160 (Correct for grouping $C = 0.226$) which can be interpreted as not indicating a very high linear relationship between the variables of family facility and creativity. Although the above statistical evidence gives us room to reject the null hypothesis (H_0) of no difference between the two variables under research, the analysis was extended to test the mean difference in creativity scores of students belonging to the two groups on family facility. C.R were computed to test the mean difference and the details are stated in Table 17.

TABLE 17

Mean, Standard Deviation and Critical Ratio computed for creativity scores for high and low groups of family facility

Family Facility	Creativity Scores				CR	P
	N	M	SD	MD		
Low	118	52.508	6.952	2.139	2.234	.05
High	82	54.647	6.703			

The results reveal that students belonging to high group in family facility index held a statistically significant higher mean creativity score than those in low group. The level of significance was .05, the higher family facility group securing higher mean creativity score. The results signifies a moderately positive linear relationship between the two variables and confirms that family facility is a positive contributory factor fostering creativity among children.

Media Exposure and Creativity

Exposure to mass media such as newspaper, television and radio was taken as a variable for study. Students were divided into two groups - low and high depending upon their media exposure scores. The obtained frequencies in the above groups were 126 (low) and 74 (high) respectively. To test the association between the two variables, the students were further classified on the level of creativity. A 2 x 2 contingency table was thus constituted and the chi-square was calculated. The results are reported in Table 13.

TABLE 18

2 x 2 Contingency table to test association
between media exposure and creativity

Media exposure	Creativity		Total
	Low	High	
Low	66	40	106
High	46	48	94
Total	112	88	200

$$\chi^2 = 3.838$$

$$df = 1$$

$$p = .05$$

$$C = 0.137$$

$$\text{Corrected } C = 0.193$$

The computed chi-square value of 3.838 was found statistically significant at .05 level and recognizes the evidence that the table entries really vary from the expectation that there is a true difference in creativity of the two media groups. The contingency coefficient computed for the data turned out to 0.193 corrected for grouping with maximum limits being .707 for 2x2 table. This low but positive

significant value of C indicates the relation between the two variables, thereby rejecting the H_0 there is no effect of exposure to mass media on the creativity. This was further tested by comparing the creativity scores of the low and high groups on media exposure by applying the two-tailed test of significance for large independent samples. Mean, standard deviation and critical ratios were calculated and the results are shown in Table 19.

TABLE 19

Mean, Standard Deviation and Critical Ratio computed for creativity scores of students belonging to low and high groups on media exposure

Media Exposure Groups	N	M	SD	MD	CR	P
Low	106	52.184	7.282	2.555	2.53	.05
High	94	54.739	6.903			

It is revealed from Table 19 that the mean creativity score of the high exposed group was slightly higher than the low exposed group on mass media. The mean difference of 2.555 was found statistically

significant at .05 level. The results of the study recognizes that students exposure to media has a positive and significant effect on the creative thinking ability of the children. The high exposed students were found superior to their low exposed counterparts in creativity.

Literary and Social Interests

The literary and social interests of students were studied separately. Out of the 200 students, 92 mentioned their interest in literary activities such as reading books, novels, writing poems, stories, participating in debate, poetry recitation, essay competitions, etc. The other 108 acknowledged their interest in social and cultural activities like singing, dancing, etc. They were again classified on the basis of creativity. Thus, a 2x2 contingency table emerged with the frequency distribution of the sample. Chi-square value was computed for the data and the resultant statistics are shown in Table 20.

TABLE 20

2 x 2 Contingency table testing association
between literary/social interests and creativity

Literary/ Social interests	Creativity		Total
	Low	High	
Literary	42	50	92
Social	70	38	108
Total	112	88	200

$$\chi^2 = 7.403$$

$$df = 1$$

$$p = .01$$

$$C = 0.188$$

$$\text{Corrected } C = 0.265$$

The significant difference in creativity of students with literary and social interests was observed from the analysis. Table 20 indicates a chi-square value significant at .01. The Contingency coefficient calculated for the data was 0.188 which on correction for grouping became 0.265. On the

basis of the above results, the hypothesis that there is no significant relation between the creativity and literary/social interest of students is rejected with a confidence limit of .01.

The mean difference in the creativity scores of students interested in literary and social activities were compared. Mean, Standard Deviation and critical ratio were computed and the results are reported in Table 21.

TABLE 21

Mean, Standard Deviation and Critical Ratio computed for creativity scores by literary/social interest groups

Literary/ Social Interest groups	N	Creativity Score			CR	P
		M	SD	MD		
Literary	92	56.028	7.015	4.895	5.479	.01
Social	108	51.133	6.224			

It is evident from Table 21 that students reporting interest in literary activities differed

significantly in their creativity from those showing social/cultural interests. The C.R. value of 5.479 significant at .01 level is a testimony for this difference. Again, the data projected the superiority of the literary group in creativity to the social/cultural group as the mean score was comparatively higher for the first group. This seems to be a highly significant and interesting result of the study which throws ample insight into the interest dimensions of the creative thinking ability among children.

Student Pastime and Creativity

The leisure time activities of the students were elicited through personal data sheet. Student responses showed a variety of pastimes which were categorized into 3 - recreational, informative and socio-cultural with frequencies 82, 40 and 78 respectively. Sub-groups were formed corss-tabulating the frequencies with level of creative. A 3 x 2 contingency table was formed, the chi-square and the coefficient of contingency were calculated. The details are given in Table 22.

TABLE 22

3 x 2 contingency table testing association
between student pastime and creativity

Pastime	Creativity		Total
	Low	High	
Recreational	(40.88) 55	(32.12) 18	73
Informative	(21.28) 17	(16.72) 21	38
Socio-cultural	(49.84) 40	(39.16) 49	89
Total	112	88	200

$$\chi^2 = 17.453$$

$$df = 2$$

$$p = .01$$

$$C = 0.283$$

Table 22 shows a statistically significant chi-square value of 17.4 with a confidence value of

.01 level. The results reveal that the low creative and high creative students differed significantly in their pastimes. The statistically significant value of $C .283$ also reveals a low to moderate correlation between the two variables. The statistical analysis of the data gives ample evidence to reject the hypothesis advanced in the study (H_0) that there is no significant difference in leisure time activities (pastime) of low and high creative students.

Comparison of the creative scores obtained by the students having different pastimes was made after computing the mean, standard deviation for each group. The critical ratios of the paired comparisons are cited in Table 23.

TABLE 23

Mean, Standard Deviation and Critical Ratios
computed for creativity scores by student pas-
times

Pastime	Creative Score			MD	CR	P
	N	M	SD			
A. Recreational	73	51.916	6.980	6.098	3.486	.01
B. Informative	38	58.014	6.411	5.401	3.394	.01
C. Socio-cultural	189	52.613	6.734	0.697	0.592	NS

Critical ratios computed for the mean difference in creativity scores of students with recreational and informative (CR = 6.098); informative and socio-cultural pastimes (5.401) yielded values statistically significant at .01 level. However, the comparison of creativity mean scores of recreational and socio-cultural groups failed to yield any statistically significant difference. The mean values given in Table 23 showed the informative group securing the highest mean score of 58.014 followed by socio-cultural group with 52.613 and recreational group 51.916. The results reveal that students seeking informative pastimes are bound to achieve higher level of creativity when compared to others. The study acknowledges the curiosity and inquisitiveness of the creative children which may even be reflected in their leisure time activities or hobbies.

Type of School and Creativity

Students belonging to two types of schools, Government and Central schools were considered separately for the purpose of analysis. A 2 x 2 table was

constituted entering the observed frequencies on creativity and the type of school. The results of the statistical analysis are reported in Table 24.

TABLE 24

2 x 2 Contingency table testing association between creativity and type of school

Type of School	Creativity		Total
	Low	High	
Government	61	62	123
Central	51	26	77
Total	112	88	200

$$\chi^2 = 5.316$$

$$df = 1$$

$$p = .05$$

$$C = 0.1609$$

$$\text{Corrected } C = 0.227$$

The analysis revealed chi-square value of 5.316 statistically significant at .05 level thereby

recognizing a difference in between the expected and observed frequencies. This indicates that creativity of students belonging to two types of school may be significantly different. The coefficient of contingency computed for the data was 0.1609 which when corrected for grouping turning out to 0.227. The correlation may be considered rather low with a maximum limit of .707 for a 2x2 table. The results enable us to refute the null hypothesis stating no relation between creativity and type of school.

The creativity scores of the students of Government and Central were compared and the results are presented in Table 25.

TABLE 25

Mean, Standard Deviation and Critical Ratio computed for creativity scores of students from Government and Central Schools

Type of school	N	M	SD	MD	CR	P
Government	123	54.098	7.002	1.852	1.976	.05
Central	77	52.246	6.438			

As per the results shown in Table 25 there is a statistically significant difference in creativity scores of students belonging to government and central schools. The mean difference was found in favour of the government school students and the level of significance proved to be exactly at .05. The results of the research reflects that creative thinking ability among the students are better fostered by the government schools when compared to central schools in Arunachal.

Results of Research by Hypotheses

Hypothesis 1 stated there is no sex difference in the creative thinking ability of the secondary school students. The analysis by way of chi-square test ($\chi^2 = 1.0625$; $df = 1$; $C = 0.072$) failed to yield statistically significant results even at .05 level, thereby, did not lend support to reject the above null hypothesis.

Hypothesis 2 stated that there is no age difference in creative thinking ability of the secondary school students. The hypothesis could not be rejected as the chi-square test ($\chi^2 = 0.247$; $df = 1$; $C = 0.035$)

did not yield statistically significant results at .05 level.

Hypothesis 3 in full form stated no birth order difference in the creative thinking ability of secondary school students. As the derived chi-square value of 13.334; df 2; $C = 0.250$) significant at .01 level gave ample statistical evidence to reject the null hypothesis.

Hypothesis 4 stated that there shall be no significant relation between creativity and paternal education. The hypothesis was rejected with a confidence level of .01 as the χ^2 value of 9.881; df : 1; $C = 0.305$ being statistically significant beyond .01 level.

Hypothesis 5 stated that there shall be no relation between creativity and maternal education. The analysis returned statistically significant χ^2 value of 7.849; df 1 ; $C = 0.274$ all significant beyond .01 level to reject the non-directive hypothesis.

Hypothesis 6 stated there shall be no relation between creativity and parental occupation. The chi-square test 1.644; df 2 and the Contingency Co-

efficient, 0.090 computed for the data failed to prove statistical evidence for the rejection of the assumption.

Hypothesis 7 stated there shall be no relation between socio-economic status and creativity of secondary school students. This hypothesis was rejected as the chi-square test 6.807; $df = 1$; $C = 0.256$ were found statistically significant at .01 level.

Hypothesis 8 stated that there shall be no relation between the family facility and the creativity of the secondary school students. This was also rejected as the test of chi-square ($\chi^2 = 5.261$; $df = 1$; $C = 0.226$) yield values beyond .05 level.

Hypothesis 9 stated there shall be no relation between the creativity and exposure to mass media of secondary school students. The statistical proof by way of chi-square test ($\chi^2 = 3.838$; $df = 1$; $C = 0.193$) projected values beyond .05 level to reject the hypothesis in the null format.

Hypothesis 10 stated that there shall no relation between literary/social interest and

creativity of students also failed to find acceptance with the chi-square test ($\chi^2 = 17.493$; $df = 2$; $C = 0.265$) were significant beyond .01 level.

Hypothesis 11 stated that there shall be no relation between creativity and pastime of students. This hypothesis was rejected at .01 level of confidence as the chi-square test ($\chi^2 = 17.453$; $df = 2$; $C = 0.283$) returned statistically significant values beyond .01 level.

Hypothesis 12 stated that there shall be no relation between creativity and the type of school. The analysis observed ample statistical evidence to reject the assumption at .05 level as the chi-square test ($\chi^2 = 5.316$; $df = 1$; $C = 0.227$) and was found significant at .05 confidence level.

Statement of the Problem

Objectives of the Study

Hypotheses

Terminology

Data Collection

Treatment of Data

Findings

Interpretation of Results and Educational
Implications

Suggestions of Further Research

SUMMARY AND CONCLUSION

The third world nations are committed to human resource development. The development of human resources depends mostly on the detection and fostering of the human potential as such the talent development is a necessary pre-requisite for planned progress and development. The national planners in India, therefore, have rightly emphasized the development of human resources through educational programmes. The development over the last two decades have shown that desired improvements have not been materialised because neither the resources nor the measures for restructuring were commensurate with the imaginative and purposeful thrust of the education. Till recently, the stress has been placed on the intellectual gains. Creative potential, the most precious human resource, has not been paid much attention. Nevertheless, it has now been realized that it is not merely intelligence but also creativity which is responsible for the overall progress.

Creativity is considered as an ability to produce work or thought of imagination along new or unconventional lines. Barron (1968) points out

"our capacity for creative thought and action may literally make all the difference in the world Human creativity may prove to be the key to success or failure in mankind's quest for knowledge, in his journey beyond the bounds of the sure and seen in his exploration of the unknown". Toynbee (1964), the famous historian considered "creativity as the man's greatest asset and one of the most valued qualities". . . .

"Creativity is a type of talent which can make history through reshaping man's world and it is a matter of life, and death for any society". Patrick (1955) considers creativity as one of the most valuable human resources and is of the view that it can cope up with life's stress and strain and is a mental ability which could overwhelm even tensions and break downs of day-to-day life. Terrance (1962) testifies this "The survival and progress of any society is closely dependent upon how it can conserve and utilise the precious human resource, the creative potential".

Statement of the Problem

The present research is designed to examine the creative thinking ability among the secondary

school students in Arunachal Pradesh. The relationship between creativity and socio-educational variables were also studied. The socio-educational correlates specifically considered for research are (i) sex; (ii) age; (iii) birth order; (iv) father's education; (v) mother's education; (vi) parental occupation; (vii) socio-economic ^{status} studies (SES); (viii) family facility; (ix) mass media exposure; (x) literary/social interest; (xi) pastime; and (xii) type of school.) Based on the nature of variables and the scope, the study was entitled "The Study of Socio-educational correlates of creativity among the secondary school students of Lower Subansiri and West Siang districts of Arunachal Pradesh".

Objectives of the Study

The study has been undertaken primarily to realise the following objectives :

- (1) Adaptation of creativity test to Arunachal Pradesh
- (2) To measure the level of creative thinking ability among the secondary school students

- + (3) To find the relationship of socio-educational variables with the creative thinking ability.

Hypotheses

Statistical verification of the following hypotheses are undertaken in the present study :

- Hypothesis 1 : There is no sex difference in the creative thinking ability of the secondary school students.
- Hypothesis 2 : There is no age difference in creative thinking ability of the secondary school students.
- Hypothesis 3 : There is no birth order difference in the creative thinking ability of secondary school students.
- Hypothesis 4 : There is no significant relation between creativity and paternal education.
- Hypothesis 5 : There is no relation between creativity and maternal education.

- Hypothesis 6 : There is no relation between creativity and parental occupation.
- Hypothesis 7 : There is no relation between socio-economic status and creativity of secondary school students.
- Hypothesis 8 : There is no relation between the family facility and the creativity of the secondary school students.
- Hypothesis 9 : There is no relation between the creativity and exposure to mass media of secondary school students.
- Hypothesis 10 : There is no relation between literary/ social interest and
- Hypothesis 11 : There is no relation between creativity and pastime of students.
- Hypothesis 12 : There is no relation between creativity and the type of school.

TERMINOLOGY

Creativity

Creativity is taken as a divergent thinking process enabling the pupils for creative outputs

(novel and useful) and measured through verbal and non-verbal creativity test on four primary traits; fluency, flexibility, originality and elaboration.

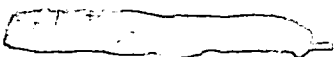
Socio-educational Correlates (SEC)

The socio-educational correlates designate the personal family and educational background of the secondary school students. The specific factors taken up for study are sex, age, birth order, father's education, mother's education, parental occupation, socio-economic status, family facility, media exposure, literary and social interests, leisure time activities and the type of school in which they study.

The Sample

✓ The sample for the study consisted of 200 secondary school students selected at random from ~~two~~ Government High Schools and one Central School of Lower Subansiri and ~~East~~ Siang Districts of Arunachal Pradesh.

Tools used

✓ The following tools were employed to collect data in the present investigation: 

- (1) Creativity test developed in the Department of Education, North-Eastern Hill University, Aizawl (1987), ^aadopted to Arunachal Pradesh ;
- (2) Personal data sheet specially devised for the study ;
- (3) The Socio-Economic Status Index SESI (Lalrinkimi, 1988) ; and
- (4) Index for Media Exposure IME (Lalrinkimi, 1988).

Data Collection

The collection of data spread over almost one month. The investigator personally visited the schools selected for the study. The investigator took the help of the teachers who were given instruction about the procedures to be adopted during the administration of ^{the} a test. The personal data sheet was given to ~~each~~ ^{every} student. ^{first} The creativity tests were given after the personal data sheet was filled-in and returned by the students. The students were requested to do the practice items on each of the sub-tests ^{on creativity} and to follow the instructions carefully while taking the test.)

Treatment of Data ✓

The scores on the creativity test were taken as criteria for classifying the students into high and low creative groups. The students obtaining the mean score on creativity test and above constituted the 'high creative group' (N = 88) and those possessing less than the mean score formed the 'low creative group' (N = 112). Groups were also formed on variables such as socio-economic status (SES), Family Facility (FF), Media Exposure (ME), following the same procedure after obtaining scores as per the prescribed scoring schemes. The two-tailed test of mean difference for large independent samples was applied to examine the difference in creativity scores of student belonging to various sub-groups on the socio-educational variables under study. For this, the mean, standard deviation and critical ratios were computed. (The results are summarised in Table 1.

(In order to find the relation between the select variables under research the creativity and socio-educational variables such as sex, age, birth order, parental education (father), parental education (mother), parental occupation, socio-economic status

(SES), family facility (FF), media exposure, literary and social interests, pastimes and type of school, the data were arranged in appropriate contingency tables. Chisquare test was applied and co-efficient of contingencies (C) was calculated.)

TABLE 26 |

Summary of Results : Creativity vs. select socio-educational variables

Variable	²	df	P	C	Groups	N	M	SD	CR	P
Sex	1.062	1	NS	0.072						
Age	0.247	1	NS	0.035						
Birth Order	13.334	2	.01	0.250	A. First born	67	50.72	6.04	A&B 2.53	.05
					B. Middle born	70	53.93	7.12	B&C 0.35	.NS
					C. Last born	52	56.11	7.08	A&C 3.57	.01

Father's education	9.881	1	.01	0.216	Illiterate	139	49.60	7.81	10.45	.01
					Educated	61	62.00	6.73		
Mother's education	7.849	1	.01	0.194	Illiterate	147	51.60	8.466	7.94	.01
					Educated	43	59.87	5.014		
Parental occupation	1.644	2	NS	0.090						
Socio-economic status (SES)	6.807	1	.01	0.256	Low SES	116	57.70	7.002	4.39	.01
					High SES	84	55.66	6.385		
Family Facility (FF)	5.261	1	.05	0.160	Low FF	118	52.50	6.95	2.23	.05
					High FF	82	54.64	6.70		
Media Exposure (ME)	3.838	1	.05	0.137	Low ME	106	52.18	7.28	2.53	.05
					High ME	94	54.73	6.90		
Interests	7.403	1	.01	0.188	Literary	92	56.02	7.01	5.47	.01
					Social	108	51.13	6.22		
Pastime	17.453	2	.01	0.283	A. Recreational	73	51.91	6.98	3.48	.01
					B. Informative	38	58.01	6.41	3.39	.01
					C. Socio-cultural	89	52.61	6.73	0.59	NS
Type of School	5.513	1	.05	0.161	Govt.	123	54.09	7.00	1.98	.05
					Central	77	52.24	6.43		

Findings

1. The results of the research revealed that the male and female students did not show any significant difference in their creative thinking ability. ($\chi^2 = 1.062$ $df = 1$ $C = 0.072$ $p > .05$)
2. Students belonging to high (15 years and above) and low (below 15 years) failed to differentiate in their creative thinking ability. ($\chi^2 = 0.247$ $df = 1$ $C = 0.035$ $p > .05$)
3. The last born were found to be definitely superior in creative thinking ability when compared to the middle born and first born children. (ET)
4. Father's education was found to foster a higher creative thinking ability, the students with educated parents attained higher creativity scores than those with illiterate parents.
5. Mother's education also contributed to better creative thinking ability among the children as per the results of the present study. Children of educated mother possessed higher

creativity score than those of illiterate mothers.

6. Parental occupation was not found to be a factor related to the creativity of children. ($\chi^2 = 1.644$ $df = 2$
 $C = 0.090$ $p > .05$)
7. A moderately high positive linear relationship was observed between the variables of creativity and socio-economic status. Students from high socio-economic background were definitely superior to those from lower strata in their creative thinking ability.
8. Family facility was found to foster the creativity, the students with higher family facility score possessed a higher creativity score than their low family facility counterparts.
9. Exposure to mass media seemed to have a positive significant effect on the creative thinking ability of children. Students exposed high to media had an advantage over the low exposed students in their creative disposition.
10. Students with literary interests gained superiority in creative thinking ability when compared to those with social and cultural interests.

11. Students with high creative thinking ability sported pastimes of informative nature as against the recreational and socio-cultural leisure time activities of the low creative students.
12. Type of school in which the students study was also found to influence their creative thinking ability. The government school students had an edge over the central school students in creativity.

pl add (A)

Interpretation of Results and Educational Implications

The present study is a pioneering effort to promote creativity among students in Arunachal Pradesh. The research findings have great educational significance with respect to identification and development of talent in this tribal state of North-East India.

Apart from adapting a test to measure the creative thinking ability of the secondary school students, the study identified a number of factors fostering creativity among the children. The research also probed into the pastimes, literary interests and media habits of the creative children.

As per the finding of the present study, there

are no significant sex and age differences in creative thinking ability of children. These findings lend support to several investigations involving samples ranging from elementary through secondary school students which indicated that there were no sex differences in creativity (Phatak, 1962; Jackson, 1968; Kaltounis, 1971; Philips and Torrance, 1974). ^(Dutta 1982, Dimphkins and Eisenman, 1968) ^(Kogan, 1974, Raima, 1982)

This diminishing sex difference probably is due to the social trend in tribal cultures to accord equal status and treatment to children of both the sexes in rearing them as well as educating them. Further, the spirit of adventure reigns supreme in thought and behaviour of tribal children beyond the age of twelve and the transitional adolescent stage between 12 to 18 years is considered to be full of optimistic aspirations for the future both among the boys and girls. ^{Attention and care to girl child on an equal basis given in the tribal societies is quite an encouragement} Birth order and the socio-economic background seemed to exercise substantial influence on creativity.

Roe (1963) rated the chances of first born very high to become creative. However, researches by Schaffer ^{and Anastasi} (1963) ⁽¹⁹⁷⁰⁾ and the results of the present study do not uphold this view. The last born were found to sport a higher level of creativity when compared to the first and middle born. Children hailing from families with better facilities and superior socio-economic background were observed to possess higher creative thinking ability than those with less family facility and socio-

economic status. (These differences in creativity can be attributed to the differential treatment accorded to them. Homes with better family facility and socio-economic status may provide positive reinforcements, promote the need for achievement and afford to better child rearing practices which play crucial roles in the development of creativity (Smith, 1966; Feld, 1967).) The cozy, cajoling and carvy attitude of the parents and the elder siblings may become a bonus for the later borns to become creative. The encouragement and the democratic liberal outlook of the parents and elders may lead to creativity among the children. This view was further strengthened by the findings of the present research as the children of educated parents emulated higher creativity than those of the illiterate parents. Father's and mother's education returned as positive factors fostering creativity among the children.

(The study acknowledged the creative children's interest in literary activities and found them engaged in pastimes such as reading, writing, which are of informative in nature.) Mass media emerged as another main-spring of creativity. The openness to innovation and change and the widening of the range of experiences through media exposure may facilitate creative thinking ability among children. (Another significant finding of

the study was that the students from government schools showed an edge over those from the central schools in creativity.) The permissive, non-restrictive, non-dogmatic, and democratic atmosphere prevalent in the government schools may provide a congenial atmosphere to provoke divergent thinking ability among the students. On the other hand, the directive, highly restrictive, pedantic and impersonal nature of the central school may stifle the creative thinking ability in children at the expense of connative convergent result-oriented academic dispositions.

The review of the research on creativity and the results of the present study reveal that the creative mind interacts vigorously within the nexus of supportive and stimulating environment. A child is constantly influenced either by his home environment or his school environment. Therefore, creative development can be ensured if the dogmatic, authoritarian, restrictive and pedantic influences are removed from the school and family situations. A permissible and conducive climate has to be generated which can develop individual initiative, spirit of inquiry, taste for exploration, problem solving ability and inquisitiveness among the children. Following are certain recommendations which can enrich

the creative behaviour of children in school and family settings:

1. Assist children to assess and admit their own feelings, thoughts and actions.
2. Guide the children in their thinking through process for creative productions and innovative endeavours.
3. Acknowledge and appreciate children for being different, unusual and unique in their responses.
4. Make the children realize that certain problems have no easy answers and critical thinking is a pre-requisite for creative problem solving.
5. A number of alternative solutions are possible for a problem and insist children not to choose the immediate easiest answers.
6. Recognition and reward for creative responses should be encouraged.

Suggestions for Further Research

Talent research has failed to find attention from scholars in India. Not much work seems to have

been done in this field especially in tribal and backward regions of the country. The programmes and strategies in talent development are not based on scientific and empirical studies. The present research being the first of its kind examined certain personal and socio-educational variables affecting the creative thinking ability of the secondary school students. A creativity test has also been adopted^a to Arunachal. The test is likely to inculcate research interest in creativity and can be used as a scientific tool to detect and foster creative talent among the tribal students of Arunachal Pradesh.

1. An analytical study of the personality factor patterns of the gifted children with special reference to Secondary Schools of Arunachal Pradesh.
2. Parental perception and child rearing practices as related to talent development.
3. A comparative study of high and low creative students in relation to their achievement, adjustment and aspirations.
4. A study of verbal and non-verbal creative thinking

ability of science, arts, and commerce college students of Arunachal Pradesh.

- 5. Effect of classroom climate, teacher behaviour and learning strategies on the development creative thinking ability.

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APPENDIX I

DEPARTMENT OF EDUCATION
ARUNACHAL UNIVERSITY
ITANAGAR

C R E A T I V I T Y — T E S T

INSTRUCTIONS

1. The Activities in this booklet have been given with the purpose to see how quickly and imaginatively you can think.
2. Answer each question carefully.
3. There are no right or wrong responses to any of the questions.
4. Each question will have an instruction.
5. Do not turn to the next question until you are told to do so.

1. SEEING PROBLEMS TEST.

Study carefully the instructions given below :-

1. On page 3 of this booklet, you will find the names of three (3) objects. When these objects are used, they can give us a number of problems. Try to find out as many problems as you can think of.
2. You will be given 6 minutes to answer the question. You can use the time as you like ; you are not bound to answer the first one first.
3. You will be told the time after every 2 minutes.
4. You are to begin only when told to commence.
5. Stop writing when it is announced " Time is Over ".
6. Write your answer in the space provided, without disturbing your friends.
7. Clear any doubt that you may have before the signal to start is given.
8. Follow the example given below :-

Object : Electric Iron

Sl.No.	Problems.
1.	Needs Electricity.
2.	Causes burns
3.	Damages clothes
4.	Rust easily
5.	Is expensive
6.	.....
7.	.....
8.	.....

(1) Object : TV (Television)

S. No.	Problems	S. No.	Problems
--------	----------	--------	----------

(2) Object : Gun

S. No.	Problems	S. No.	Problems.
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(3) Object : Thatched House

S. No.	Problems	S. No.	Problems
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II. UNUSUAL USES TEST.

On the next page, you will find the names of common object. These objects can be used in a number of ways. You may think of the size, shape and colour of the object in any way you wish. Try to write as many uses of the object as you can.

2. Try to think of uses that your friend may not have through of. Be clear and precise in writing your answer.
3. The time given for answering the question is 12 minutes. You may use the time as you like. You will be informed about the time after every 4 minutes.
4. You are to begin only when told to commence.
5. Stop writing when it is announced " Time is Over ".
6. Write your answer in space provided, without disturbing your friends.
7. Clear any doubts that you may have before beginning.
8. Follow the example given below :-
Example :-

Object Pencil.

S. No. Uses.

1. Use as a ruler.
2. Use to block holes.

III. CONSEQUENCES TEST

Please study the instruction given below carefully.

1. On page 7 are written three impossible statements that may never happen in real life. Suppose the events expressed in these statements happen to occur all of a sudden, please write down the consequences you envisage to follow these events.
2. The time given for the activity is 6 minutes. You may make use of the time as you like. You will be told about the time after every 2 minutes.
3. You are to begin only when the signal to start is given.
4. Stop writing when it is announced " Time is Over ".
5. Clear any doubt you may have before you begin.
6. Follow the example given below.

Example :-

Sentence :- If all people become dumb

S. No. What may happen.

1. . There will be less noise.
2. Everyone will learn sig-language.
3. There will be no singing.
4. Telephone will be useless.
5. No. cheering crowds to games.
6.
7.
8.

(7) Sentence : If all the people started dancing
S. No. What may happen † S. No. What may happen.

(8) Sentence : If all the hills turned into plains.....
S. No. What may happen. . . . S. No. What may happen.....

(9) Sentence : If it did not rain at all
S. No. What may happen S. No. What may happen

(10) Billy-cart

S.No. How to make the billy-cart more interesting

(11) Toy-propeller

S.No. How to make the toy-propeller more interesting

V. SIMILARITIES TEST

Please study the instruction very carefully.

1. On page 11, two objects having various similarities and relations are given. Write down their similarities.
2. Try to think of and write as many peculiar connections as possible between the two objects.
3. The time given for this exercise is 8 minutes. You will be informed about the times after every 4 minutes.
4. You are to begin only when told to commence.
5. Clear any doubts you may have before answering.
6. Follow the example given below :-
Example :- Bee-hive and Office.

S. No. Similarities.

1. Both have a special house.
2. Both have workers.
3. Both have idlers.
4. Both have leader.
5. Both will not tolerate disturbance.
6.
7.
8.

(12) Fish and Frog

S. No. Similarities. S. No. Similarities.

(13) Flower and Tree

S. No. Similarities. S. No. Similarities.

VI. PICTURE CONSTRUCTION TEST.

Please study the instruction very carefully.

1. On the next page , there are two simple drawings. Using them, draw a complete picture and try to make it very interesting and original.
2. To show your power of imagination, try to produce a very interesting title for your picture. Write it down on the space given below the drawing.
3. Do not make a copy of any other drawing you might have seen. The originality and interest that the picture arouses is far more important than its beauty or likeness.

4. The time given for this activity is 10 minutes. You will be informed about the time after every 5 minutes.
5. You are to begin only at the given signal.
6. Stop writing when the allotted time is over.
7. Follow the example given below.

Example :-

TITLE : Is there enough for everyone's need ?

TITLE :

(15)

TITLE :

VII. PICTURE COMPLETION TEST.

Please study the instruction carefully.

1. On page 15, you will find two incomplete figures. Your task is to complete them in any way you like. Try to make the picture as interesting and unusual at possible. Think of a picture which you feel no one else would be able to make.
2. When you have completed your picture, give a title to it in the space provided for it. Try to make the title as interesting and novel as possible, which will show how imaginatively you can think.
3. You will be given 6 minutes to do this activity. The time will ^{be} announced after every 3 minutes.

4. Start only when the signal is given, and stop writing when the time is over.

5. Follow the example given below.

Example :-

TITLE: You are the light of the world.

TITLE :

(17)

TITLE :

VIII. CIRCLES TEST.

Please study the following instruction carefully.

1. Using the following circles as base, try to draw as many pictures as you can within 5 minutes. There must be a circle in each of your drawing. You may add to the circle inside, or both with a pencil.
2. Try to draw unusual figures which your friends may not have thought of.
3. If the figures is not clear, write the title next to it.
4. You are to begin only at the given signal, and stop drawing when 5 minutes are over.

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APPENDIX II

C R E A T I V I T Y T E S T
(S C O R I N G S H E E T)

Activity No.	Item No.	Fluency	Flexibility	Originality
I.	1.			
	2.			
	3.			
II.	4.			
	5.			
	6.			
III.	7.			
	8.			
	9.			
IV.	10.			
	11.			
V.	12.			
	13.			
	Total			

Activity No.	Item No.	Elaboration	Originality	For Titles	
				Elaboration	Originality
VI.	14				
	15				
VII.	16				
	17				
VIII.	18				
	Total				

SCORE SUMMARY

	Fluency	Flexibility	Elaboration	Originality
Total				

	Verbal	Non-Verbal	Composite	Creativity
Total				

**FACULTY OF EDUCATION
ARUNACHAL UNIVERSITY
PERSONAL DATA SHEET**

1. Name (2) Sex
3. Age (4) Class
5. Name of the School
6. Permanent Residence
7. How many brothers and sisters do you have
 Brothers Sisters
 (a) Are you the first born child?
 (b) Are you the Middle born child?
 (c) Are you the Last born child?
 (d) Are you the only child of your parents?

8. -----

	Relation, Age	Educational Qualification	Occupation	Tribe	Religion
	1	2	3	4	5
Father					
Mother					

K. New

Guardian
(Please specify)
.....



9. Do you participate in any of the following :

- (a) Sports & games
- ~~(b)~~ Name of the event
- (c) Social works
NEC Scoutes, guide etc.

10. Are you the member of any club or association or any other such organisation? yes No

If yes, please give name of the organisation

✓

Your position in the organisation

11. Mention the cultural Programmes you have participated

- (a) Singing (b) Dancing
- (b) Drama (d) Drawing
- ✓ (e) Painting (f) Recitation
- (g) Essay Writing (h) Quiz
- (i) Debate (j) Any other

12. Do you listen to Radio ?

Yes No

If yes, how often

✓ Regularly Sometimes

✓ Mention the programmes you like best

13. Do you watch Television Programmes ?

Yes No

✓ If yes, how often

✓ Regularly Sometimes

14. Do you go for Cinema?

Yes No

If yes, how often

Regularly Sometimes

15. Please mention your favourite

Movie Song

Game Book

16. The person you admired most

17. How do you spend your free time ?

Reading Visiting Friends

Games & Sports Gardening

Cooking Model Making

Hunting

Any other (name the items)

18. Please tick against the following you possess

Radio ()

Pressure Cooker () Bicycle ()

Scooter () Watch ()

Television () Record Player ()

Telephone () Taperecorder ()

Electric Fan () Typewriter ()

Sewing Machine () Car / jeep ()

Refrigerator () Bus ()

Truck () Camera ()

Knitting Machine ()

19. Your ambition in life