Vocational Interests and Academic Achievement of Secondary School Students at Different Levels of Creative Thinking Ability–A Comparative Study

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Abstract

The study was carried out with an attempt to find out how a particular age group with a fibre of high creative potential are differentiable from the ones who possess low level of creative ability on certain areas of vocational interests and academic achievement. A sample of 1000 students (700 boys and 300 girls) was selected from 26 secondary schools of Kashmir valley. Baquer Mehdi's Verbal Test of Creative Thinking Ability and Chatterji's Non-language Preference Record were used to collect the data. Following the criteria of top 25% (Q3) and bottom 25% (Q1), two extreme groups (high and low) were identified. Two way analysis of variance was used to find out the differences between these two categories. The findings revealed that the two groups have been seen to differ significantly on variables under investigation excluding academic achievement. Besides, gender differences could not be established.

1. Introduction

Of all the abilities that human beings are endowed with; creativity is considered to be the highly valued quality. It is this ability which seems to have an impact on all activities. These brains are considered to be the nations greatest asset. Therefore, proper nurturance of such brains demands not to be ignored. It is an admitted fact that we

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must protect these promising human resources at any cost by way of early identification, encouragement and opportunities for their upward mobility. It is reported that.... to give a fair chance to potential, creativity is a matter of life and death for any society (Toynbee, 1964). Manpower specialists have also observed that countries may not be able to sustain economic growth unless all the reserves of talent in the population are actively sought out and attracted into the needed educational channels (Raina, 1988). It is an established fact that every society has a *creative population* to be counted on finger tips and through their efforts the *commanding population* makes the decisions that control the collective life. In this context Lerner (1962) has rightly observed that educational revolution has two tasks, of which one is the confronting of the tendencies in a mass society. The second is to help a creative culture within the mass society and even out of many of its materials. Besides, if it is true that in every fat man there is a thin man shrieking to get out, it is also true that in every civilisation, there is a minority fibre always in the process of coming into being." Keeping this observation in line an effort is to be needed to discover, release and recognise this minority fibre in order to voyage in the developmental arena and aspirations. Ever since the inception of human race the contribution of talented has remained the area of focal interest. Even the early cave dwellers recognised the superiority of particular children and utilised their alertness, accuracy, and quickness in learning to teach them the more complex methods of fishing and hunting. Over more than 2000 years ago, Plato distinguished the 'men of gold with intellects from those of 'silver and 'iron (Chaudhari, 1988). As reported earlier, that creatives are the valuable resource of any country. They are capable of making major contributions to usher into innovative developments in almost every field of human endeavour—be it science, technology, literature, art, business, social and human relations (Gulati, 1988).It is said that human history more or less has been created by these small percentage and we must try to protect and sharpen their abilities. They have an important role in all areas of human activity (Torrance, 1969; Khatena, 1982; Renzulli, 1981; Wolfe, 1954). No one can afford to waste the specialities of its young buds at its own peril; these must be allowed to flourish (Saxena, 1984; Torrance, 1969; Guilford, 1968). History bears testimony to this fact that a single individual has a potential to shake the whole globe due to his consistent commitment for future scientific discoveries, future works of art, literature and other related fields (Goyal, 1988). Today, we notice a

sea change in and around the every nook and corner of this planet. Even impossible and difficult tasks seem to be within the possibility range in every field due to the challenging efforts of these promise keepers. Rightly remarked by University Education Commission (1948-49), "...special provision is needed for talented as they take leadership positions..." They are 'seed people, the concept changers and pulse takers of the society. Their worthwhile endeavour keeps a promising sharp line in music or graphic art, dramatics, mechanical skills, creative writings etc. (Zettle, 1979). The creative spark has made it possible to communicate on instant basis by the replacement of pigeon post into satellites. It is our national responsibility to provide an appropriate place to this fibre so that square pegs do not get fixed in round holes. Studies from Galton to Guilford and Terman to Torrance reveal that the area has gone to a tremendous change (Chaudhari, 1988). Shah (1960) has established that talented have leaning towards a wide range of fields like travelling, dramatics, sports reading, and debates.

A plethora of research reveal that a host of variables have been investigated in the field of creativity- Adjustment problems, scholastic achievement, socio-economic status, level of aspiration, vocational interests, personality characteristics, values, scientific outlook, birth order syndrome and intellectual abilities. The findings have been reported to be of divergent nature. Studies have shown that creatives experience adjustment conflicts (Pathak, 1989; Asha,1980; Summungala, 1988; Zargar and Dhar, 1988; Kaile and Kour, 1987; Singh,1981). Some revealed that creativity and adjustment go together (Mishra, 1987; Jarial and Sharma, 1981; Sinha and Sharma, 1980; Kumari,1975). There are reports which reveal that highly creative people have entirely different patterns of career choices than those who seem to be low on creative ability (Nandwana, and Asawa, 2007; Mattoo, 2003; Jansari,1995; Pathak,1989; Vasesi,1985; Gupta,1984 Saxeena, 1984; Tiwari and Paul, 1983; Kumar,1981; Singh,1981; Singh and Mehra,1981 Asha, 1980; Kour,1980; Tripathi, 1979; Bharadwaj, 1978; Rasool, 1977; Parmesh and Narayanan,1976; Gakhar,1975; Passi,1972 Sharma, 1971; Dauw,1966).Besides, Creativity has been seen to have a link line with academic achievement (Charlton, 2009; Heinze, Shapira and Rogers, 2009; Ivcevic, 2009; Nori, 2009; Yousuf, 2009; Bal, 1988; Chadha, 1987; Mishra, 1987; Singh, 1987; Goyal, 1973; Asha, 1980; Vijaylakshmi, 1980; Ameerajan et.al.1978; Mehdi,1974; Passi, 1971). No agreement is seen between creativity and achievement (Sandhu, 1979). Review of studies reveals that there is inconsistency in the inferences drawn.

Therefore, further exploration merits attention. The present study is an attempt in this direction.

2. Objectives of the study

The present study was undertaken to with objectives as recorded under:

- To find out the differences in scientific and outdoor interests of high and low creative students,
- To find out the differences in the academic achievement of high and low creative students,
- To find out the effect of gender on scientific and outdoor interest of high and low creative students,
- To find out the effect of gender on academic achievement of high and low creative students, and
- To find the degree of relationship between vocational interests (scientific and outdoor), creative thinking ability and academic achievement.

2.1 Hypotheses

In the light of objectives, following hypotheses have been formulated.

- High creative students differ significantly in scientific and outdoor interests in comparison to low creative ones.
- High creative students will perform significantly better in their academic achievement than low creative ones,
- Gender has a significant impact on scientific and outdoor interests of high and low creative students, and
- Gender has a significant impact on academic achievement of high and low creative students.
- Vocational interests (scientific and outdoor), creative thinking ability and academic achievement are significantly related to each other.

3. Design of the study

3.1 Sample

A sample of 1000 high school teen agers (300 girls and 700 boys) was drawn randomly from nineteen secondary schools situated in the districts of Anantnag and Srinagar of Jammu and Kashmir state.

3.1.1 Tools

The investigator administered the following tools to collect the required information:

- Baquer Mehdis, Verbal test of creative thinking ability.
- Chatterjis Non-language Preference Record.
- Academic achievement—this has been considered as the total marks obtained by the students in their previous two annual examinations conducted by the Jammu and Kashmir Board of School Education.

3.1.2 Identification Criteria

In order to identify the high and low creative subjects, the raw scores obtained on verbal test of creative thinking were converted into standard scores as per the guidelines of the tool. Thereafter, subjects whose scores were found on and above the 75th percentile were considered as high creative and subjects whose scores were on and below the 25th percentile were considered as low creative. This criterion has also been adopted by most of the researchers (Mattoo and Sugra, 2008; Zargar and Dhar, 1988; Kumar, 1981; Gupta, 1979). Table 1 shows the cut-out points for these two extreme groups.

Table 1 : Score distribution of High and Low categories

Group	*Cut Point*	*No. Identified*	*Boys*	*Girls*
High Creative	163 and above	240	160	80
Low Creative	130 and below	240	160	80

3.1.3 Explanation of Vocational Interest

Vocational interests play an important role in the life of an individual as these determine what one will do and how well he will do it. It refers to variety of choices which an individual makes with respect to activities in which he is engaged. It is an admitted fact that an individual shows preference for one and aversion for another. It is the sum total of many interests that bear in any way upon an occupational career (Strong, 1954). Vocational interests are motivating forces which impel one to attend to a person or an activity. These are considered as a form of selective awareness or attention that produces meaning to ones experience (James, 1981). It is considered as a tendency to become absorbed in an experience (Ahuwalia, 1988). Many other researchers have also considered

vocational interests as likings and disliking (Fryer, 1931; Gilger, 1942; Ginzberg, 1951; Trow, 1956; Hamburger, 1958; Crites, 1969). In the present investigation interests are taken in the light of above explanation.

Analysis of Data

The collected data was put to statistical analysis by applying two way analysis of variance. Besides, Pearsons Product movement coefficient of correlation was computed. The results are reflected in tabular forms as.

Table 2 : Summary of Two-way ANOVA on Scientific Interest

Source of Variance	*Sum of squares*	*df*	*MSS*	*F ratio*
Creativity	46.26	1	46.26	59.0805*
Gender	0.74	1	0.74	0.0860
C*G	33.34	1	33.34	42.5798*
Total	372.71	476	0.783	

*Significant at 0.01 level

A perusal of the above table reveals that the contribution of creativity towards variance in scientific interest seems to be significant, (F = 59.081, df 1/476) at 0.01 level. This means that high creative students have greater interest towards scientific activities than low creative ones. These interests include the tendency towards physics, lab work and studying literature, reading books with explorative information. The variable of gender does not interfere with scientific interests (F = 0.086, df 1/476).It can be said that boys and girls have more or less similar inclination towards the scientific choice. The joint effect (interaction) of C*G is significant (F = 42.579, df 1/476) at 0.01 level. It reveals that the creativity and gender have greater interaction towards scientific activities than lower interaction of C*G. The results are in line with the findings of other researchers (Nandwana and Asawal, 2007; Dfgh, 2008; Mattoo, 2003; Pathak, 1989; Bhardwaj, 1978; Tripathi, 1979; Hocevar, 1976;).The findings of Tripathi (1979) reveal that highly creative subjects often choose vocations which are unusual and provide scope for the expression of creative talent like work of an inventor, scientist, musician and explorer.

Table 3 : Summary of Two-way ANOVA on outdoor interest

Source of Variance	*Sum of squares*	*df*	*MSS*	*F ratio*
Creativity	10.34	1	10.34	2.825
Gender	19.58	1	19.58	5.349*
C*G	8.33	1	8.33	2.275

*Significant at 0.01 level

The information presented in table 3 reveals that F-ratio for the two levels of creativity has turned to be insignificant (F = 2.825, df 1/476).This means that the differences between the two groups i.e. high creative and low creative on outdoor interest are not significant. It can be said that both the groups have outdoor interest to an equal extent. The variable of gender has shown a significant influence in outdoor interest (F = 5.43, df 1/476). The results reveal that high creative boys have a greater tendency towards outdoor activities than high creative girls. The results obtained are significant at 0.01 level. The interaction effect between creativity and sex has been found to be insignificant (F = 2.275, df 1/476).The findings are supported by some of the earlier results (Mattoo, 2003; Pathak, 1989; Vasesi, 1985; Kumar, 1981; Singh and Mehra, 1981; Bharadwaj, 1978).

Table 4 : Summary of Two-way ANOVA on Academic Achievement

Source of Variance	*Sum of squares*	*df*	*MSS*	*F-ratio*
Creativity	148.99	1	148.99	179.73*
Gender	0.18	1	0.18	0.212
C*G	0.01	1	0.01	0.02
Total	394.640	476	0.829	

*Significant at 0.01 level

Table 4 gives information that the contribution of creativity towards variance for variable of academic achievement is found to be significant at 0.01 level (F = 179.73 df 1/476). The results indicate that high creatives are differentiable from those of low creative ones on academic achievement. It is observed that high creatives have higher achievement than low creatives. The variable of gender does not contribute significantly towards the variance in academic achievement. It signifies that both the groups under discussion are not different in academic achievement. (F = 0.212, df, 476). The interaction of creativity and gender for academic achievement has also been found to be insignificant (F = 0.02 df,1/476). (Steinmayar

and Spinath, 2009; Coyle and Pillow, 2008; Ai, 2007; Palaniappan, 2007; Shan, 2003; Chandel, 2003; Mattoo,1995; Acharyulu, 1988; Chadha, 1987; Singh, 1987; Venkateswarn, 1987; Vijaylakashmi, 1980; Mehdi, 1977; Saxeena, 1977; Passi, 1971; Raina,1968; Getzels and Jackson, 1962).

Table 5 : Intercorrelation of Variables

Variables	*CR*	*SC*	*OD*	*AC*
CR	1.00	0.462	0.521	0.183
SC		1.00	0.392	0.321
OD			1.00	0.123
AC				1.00

The results reported in table 5.00 reveal the intercorrelations of variables viz. creativity, scientific interest, outdoor interest and academic achievement. Positive and significant relationship is found between creativity and scientific interest (r = 0.462, significant at 0.01 level). Creativity and outdoor interest are seen to be associated positively(r = 0.521, significant at 0.01 level), whereas creativity and academic achievement are in agreement to each other but their relation seems to be slightly weak (r = 0.183). The results also show that correlations of scientific interest with outdoor and academic achievement are all significant at 0.01 level of confidence(r = 0.392, and 0.321). Outdoor interest is also reported to be positively correlated with academic achievement (r = 0.123), but the relation seems to be low and insignificant.

Inferential Observations

The study is concluded with the following conclusions:

1. Scientific interest has been seen to go with high creativity. The variable of gender seems to contribute in scientific interest of the subjects.
2. Creativity thinking ability has shown a significant influence with respect to outdoor interest of the subjects. However, gender differences were found to exist.
3. High creatives have been found to be higher in their academic achievement than low ones. However, gender could not differentiate the subjects on the index of achievement.
4. Scientific interest and outdoor interest are reported to be positively correlated. However, outdoor interest and academic achievement are weakly related to each other.

REFERENCES

ACHARYULU, S.T.V.C. 1988. **A Study of the Relationship among Creative Thinking, Intelligence and School Achievement** (Unpublished). Ph.D. Thesis (Psychology) Utkal University.Cit. in M.B.Buch(Ed.) Third Survey of Research in Education, (NCERT).

AHUWALIA, MEENU. 1988. **Comparative Study of High and Low Intelligent Students in Relation to Vocational Maturity and Vocational Interests** (Unpublished). Ph.D. Thesis (Education) Punjab University, Chandigarh.

AI, X. 2007. Creativity and Academic Achievement: An Investigation of Gender Differences. **Creativity Research Journal,**12 (4), pp. 329–337.

AMEERAJAN, M.S., GIRIJA, P.R. AND BHADRA, B.R. 1978. Academic Achievement and its Relation to General Mental Ability, Academic Achievement and Neuroticism. **Journal of Education and Psychology,** 36(nil), pp. 107–112.

ASHA, C.B. 1980. Creativity and Academic Achievement among Secondary School Children. **Asian Journal Psychology and Education,** 6. pp. 1–4.

BAL, S. 1988. Creativity, Cognitive Style and Academic Achievement Among University Students. **Psychological Studies,** 33 (1), pp.10–13.

BHARADWAJ, R. 1978. **Vocational Interests as a Function of Creativity Components, Intelligence and Socio-Economic Status** (Unpublished). Ph.D. Thesis. Agra University, Agra.

CHADHA, N.K. 1987. Creativity as a Function of Intelligence, Personality and Scholastic Achievement—An Empirical Study. **Indian Educational Review.** NCERT, 22(1), pp.61–65.

CHARLTON, B.G. 2009. Why are Modern Scientists so Dull? How Science Selects at the Expense of Intelligence and Creativity. **Medical Hypotheses,** 72(3), pp.237–243.

CHATTERJI, S. 1966. **Examiners Manual Form 962.** Patna, Bratalaya Station Road.

CHAUDHARI, U.S. 1988. The Nature of Talent and Education. Cit. in M.K. Raina (Education) **Identification and Development of Talent.** New Delhi: NCERT, p. 48.

CRITES, J. D. 1969. **Vocational Psychology: The Study of Vocational Behaviour and Development.** New York: McGraw Hill.

DAUW, D. C. 1966. Career Choices of High and Low Creative Thinkers, **Vocational Guidance Quarterly,** 9(2) pp.135–140.

FRYER, D. 1931. **The Measurement of Interests in Relation to Human Adjustment.** New York: Holt.

GAKHAR, S.K. 1975. **Intellectual and Personality Correlates of Creativity** (Unpublished) Ph.D. Thesis, Punjab University Chandigarh.

GETZELS, J.W. AND JACKSON,P.W. 1962. **Creativity and Intelligence: Explorations with Gifted Students.** New York: Wiley.

GILGER, G. A. 1942. Declaration of Vocational Interests. Cit in. J. S. Grewal. **Vocational Environment and Educational and Occupational Choices.** Agra,National Psychology Corporation.

GINZBERG, S. W. 1951. **Occupational Choices: An Approach to a General Theory.** New York : Columbia University Press.

GOYAL, R. P. 1973. Creativity and School Climate—An Exploratory Study. **Journal of Psychological Researches,** (17)2, pp. 77–80.

GOYAL, R. P. 1988. Role of Parents and Teachers in Talent Development. Cit. in M.K.Raina and S.Gulati (Eds.). **Identification and Development of Talent.** NCERT. P. 193.

GUILFORD, J.P. 1968. **Intelligence, Creativity and their Educational Implications.** California : Robert R. Knapp.

GULATI, S. 1988. Developing Creativity in School Students—Some Considerations for Teacher Training. Cit. in M.K.Raina and S.Gulati (Eds.). **Identification and Development of Talent.** New Delhi: NCERT. p. 213.

GUPTA, A.K. 1979. Adolescents with High and Creativity. **Indian Education Review,** 14 (2), pp.31–41.

GUPTA, M.S. 1984. **Psychology of Engineering Creativity.** New Delhi: Cosmo Publications.

HABIBOLLAH, N. ET,AL. 2010. Relationship Between Creativity and Academic Achievement-A Study of Gender Differences. **Journal of American Science.** Marshland Press. 6(1), pp.181–190.

HAMBURGER,M. 1958. Realism and Consistency in Early Adolescent's Aspirations and Expectations. Cit. in. D.E. Super and J. O. Crites. **Apprising Vocational Fitness.** New Delhi: University Book Stall.

HEINZE, T.ET,AL. 2009. Organisational and Institutional Influences on Creativity in Scientific Research. Research Policy. In Press.

HOCEVER, D. 1976. The Un-dimensional Nature of Creative Thinking in First Grade Children. **Child Study Journal.** Vol.4, pp.273–278.

IVCEVIC, Z. 2007. Creativity and Cognitive Style: The Relationship between Field Dependence and Independence, Expected Evaluation and Creative Performance. **Psychology of Aesthetics, Creativity and the Arts,** 1 (14). pp. 43–246.

JAMES, A. W. 1981. Influence of Selected Variables on Vocational Choice of Rural Students. **Dissertation Abstract International,** Vol.42, No.5.

JANSARI, A. 1995. An Impact of Cognitive Styles of Students on Vocational Interests. Cit. in H.L.Sharma. **Dynamics of Creativity and Interests.** New Delhi: Vista Publishing House (2006).

JARIAL, G.S. AND SHARMA, A.K. 1981. Sex Roles in Verbal Creative Thinking Abilities. **Psycho-Lingua,** 11 (1), pp.15–18.

KAILE, H.S. AND KOUR, S.P. 1987. A Study of Creative Talent of Students in Relation to Their Adjustment. **The Educational Review.** Triplicane. Pp. 175–179.

KANDU, R.N. 1988. Identification of Talent at School: Some Constraints and Remedies. Cit. in M.K. Raina and S. Gulati (Eds.) **Identification and Development of Talent.** NCERT.

KARIMI, A. 2000. **The Relationship between Anxiety, Creativity, Gender, Academic Achievement and Social Prestige among Secondary School.** University Of Shiraz. Shiraz.

KHATENA, J. 1982. **Educational Psychology of the Gifted.** New York: John Wiley.

KOUR, A. 1980. **A Study of Creative Thinking of IX Grade Boys in Relation to Their Problems of Adjustment** (Unpublished). M.Phil. dissertation. Punjab University Chandigarh.

KUMAR, A. 1981. Interest Patterns of High and Low Creative's. **Journal of Creative Behaviour,** (15)3 p. 270.

KUMARI, K. 1975. **A Study of Relationship among Creativity, Intelligence, Adjustment and Value Patterns in Adolescents** (Unpublished). Ph.D. Thesis. Agra University, Agra.

LERNER, MAX. 1962. **Education and a Radical Humanism.** Columbus, Ohio: State University.

MATTOO, M.I. 2003. Creative Thinking and Vocational Interests–A Study. **Insight Journal of Applied Research in Education,** 9(1), pp. 25–30.

MATTOO, M. I. AND SUGRA, M. 2008. Vocational Interests of Rural and Urban Secondary School Students in Relation Academic Achievement. **Insight Journal of Applied Research in Education,** 13 (1), pp.95–100.

MEHDI, B. 1974. Creativity, Intelligence and Achievement-Some Findings of Research. **Indian Education Review,** 9 (1), pp.1–10.

MISHRA, B.C. 1987. Creativity as Related to Academic Achievement. **Journal of Education and Psychology,** 45 (2–3), pp.123–127.

NANDWANA, S AND ASAWA, N. 2007. Vocational Interests of High and Low Creative Adolescents. **Journal of Social Science,** 14(2), pp.185–190.

NORI, Z. 2009. **Gender Differences, Creativity, Academic Achievement.** (Mathematics, Sciences and Language of Literature) Among High School City of Shiraz, Iran. University of Shiraz.

PALANIAPPAN, A.K. 2007. Creative Personality and Academic Achievement. **Implication for Education in Malaysia.** Kuala Lumpur. In reach Edition.

PARAMESH, C. R. 1976. Value Orientation of Creative Persons. **Psychological Studies,** (15)2, pp.108–112.

PARAMESH, C.R. AND NARAYANAN, S. 1976. Creativity, Intelligence, and Vocational Interests. **Indian Journal of Psychology,** 51(3), pp.221–224.

PASSI, B.K. 1971. ***An Exploratory Study of Creativity and its Relationship with Intelligence and Achievement in School Subjects at Higher Secondary Stage*** (Unpublished). Ph.D. Education. Punjab University Chandigarh.

PASSI, B.K. 1972. Definition of Creativity—A Review Study. **Creativity Newsletter,** (2)2, pp.5

PATHAK, A.N. 1989. **Creativity and Personality.** New Delhi: Amar Prakashan.

RAINA, M. K. 1988. Concept and Identification of Talent.Cit.in M.K.Raina and Sushma Gulati(Eds.) **Identification and Development of Talent.** New Delhi (NCERT). pp. 32–47.

RAINA, B.L. 1987. Vocational Preferences of Secondary School Pupils of Kashmir Valley. **Indian Educational Review.** NCERT: (22)4, pp.39–47.

RASOOL, G. 1977. A Study of Divergent Thinking of School Going Children. **Creativity Newsletter,** Vol.6 (2), pp.23–26.

RENZULI, J. S. 1981. **The Revolving Door Identification Model.** Connecticut, Creative Learning Press.

SANDHU, T.S. 1979. Relationship of Creativity with Academic Achievement in Science Subjects. Cit. in B.K.Passi (Education). **Creativity in Education.** Agra, National Psychological. Corporation. Kachari Ghat Agra. pp. 85–86.

SAXEENA, P.C. 1977. **A Study of Interests, Need patterns and Adjustment Problems of Over and Under Achievers.** D.Phil. Education Allahabad University.

SAXEENA, S. 1984. A Study of Need Achievement in Relation to Creativity, Values, Level of Aspiration and Anxiety. **Indian Education Review.** (19)4, NCERT.

SHAH, C.Z. 1960. **A Study of Superior Students of Standard X of the Secondary Schools of Surat** (Unpublished) Masters Dissertation. Barooda University.

SHAN, H.R. 2003. Academic Achievement among High School Students of Jammu in Relation to Intelligence and Creative Thinking. **Insight Journal of Applied Research in Education,** (9)1, pp.10–16.

SHARMA, K. N. 1971. Creativity as a Function of Intelligence, Fine Arts Interest and Culture. **Indian Journal of Psychology,** (49)4, pp. 313–319.

SINGH, K. 1987. Academic Achievement as a Function of Creative Thinking and Intelligence among High School Students of Himachal Pradesh. **Journal of The Institute of Educational Research,** 10 (4), pp.1–6.

SINGH, R. P. 1981. A Study of Creativity in Relation to Adjustment and Level of Aspiration. **Indian Education Review,**15 (3), pp. 42–48.

SINGH, S AND MEHRA, G.P. 1981. Verbal Creativity as Related to Educational and Career Aspiration. Cit. in B.K. Passi (Ed.) **Creativity in Education.** Agra, NPC. pp. 105–106.

SINHA, N.C.P. AND SHARMA, M. 1980. Creativity and Adjustment. ***Indian Psychological Review,*** (16)2, pp.4–7.

STEINMAYAR, R. AND SPINATH, S. 2009. The Importance of Motivation as a Predictor of School Achievement. **Learning and Individual Differences,** 19(1), pp. 80–90.

STRONG, E. 1954. **Vocational Interests of Men and Women.** Stanford, Stanford University Press.

SUMANGALA, V. 1988. Psychological Factor Structures of High and Low Creative Secondary Pupils (A Comparative Study). **Experiments in Education.** Madras: 16(3), pp.85–88.

TIWARI, G. AND PAUL, R. 1983. **Status of Indian Researches in Creativity.** Agra, Agra Psychological Research Cell.

TORRANCE, E.P. 1969. **Guiding Creative Talent.** Englewood Cliffs: N. J. Prentice Hall.

TORRANCE, E.P. 1975. Some Guiding Principles In Evaluating Excellence. **Creativity Newsletter,** Vol. 4(1), P 1–10

TOYNBEE, A. 1964. Is America Neglecting Her Creative Minority? Cit. in C.W. Taylor (Ed.) **Widening Horizons in Creativity.** New York: John Willey & Sons, Inch.

TRIPATHI, S. N. 1979. **A Psychological Study of Five Indian Writers.** Bopal: Regional College of Education.

TROW, W. D. 1956. Fantasy and Vocational Choices. Occupations Cit in. J. S. Grewal. **Vocational Environment and Educational and Occupational Choices.** Agra, NPC.

VASESI, R. 1985. **Cognitive Styles, Needs and Values High and Low Creative Students** (Unpublished). Ph.D. Thesis. Punjab Univ. Chandigarh.

VENKATESWARAM, S. 1987. Academic Achievement and Creativity. **Journal of Educational Research and Extension,** 24 (1), pp, 52–59.

VIJAYLAKSHMI, J. 1980. Academic Achievement and SES as Predictors of Creative Talent. **Journal of Psych. Researches,** (24)1, pp.43–47.

GOVERNMENT OF INDIA. **University Education Commission (1948–49).** Ministry of Education, New Delhi:

WOLFE, D. 1954. **America's Resources of Specialised Talent.** New York: Harper and Row Publishers.

YUSUF, S. 2009. From Creativity to Innovation. **Technology in Society.** 31(1), pp. 1–8.

ZARGAR, A. H. AND DHAR, N. 1988. A Study of Problems of Creative and Non-Creative Subjects. **Journal of the Institute of Educational Research.** Madras :12(3), pp.1–8.

ZETTLE, J. 1979. State Provisions for Educating the Gifted and Talented. Cit. in Passow, Harry A (Ed.) **The Gifted and the Talented: Their Education and Development.** Chicago, Illinois: The University of Chicago Press.