International Journal of Advanced Education and Research
www.alleducationjournal.com
E-ISSN: 2455-5746
Received: 07-09-2026, Accepted: 07-10-2026, Published: 22-10-2026
Volume 11, Issue 4, 2026, Page No. 7-10

A comparative analysis of creativity among science and arts stream students: Influence of gender and locality

Anuradha Sindhwani
Professor & Principal, M. L.R.S. College of Education, Ch. Dadri, Haryana, India
DOI: https://doi.org/10.66856/ijaer.2026.11.4.11046

Abstract
Creativity is an essential mental resource for problem solving, science invention, and art creation. In this study, comparison of the degree of creativity among the science and arts stream students was done. A descriptive survey research design was used to sample a total number of N = 200 students in colleges in Haryana through a stratified random sampling method. Data were gathered using a Personal Data Sheet and *Passi Test of Creativity* (PTC). Descriptive statistics (Mean, S.D.) and inferential statistic (Critical Ratio / t-test) were employed in analyzing data. The results showed that there are differences in the total creativity scores of science and arts stream students with science stream students scoring significantly higher total creativity scores than the arts stream students. Male science stream students scored significantly higher creativity than their female counterparts, but gender does not have any effect on creativity among arts stream students. In terms of geographical origin, urban science stream students had higher creativity than rural science stream students while rural arts stream students had higher creativity than urban arts stream students.

Keywords: Creativity, science stream, arts stream, gender differences, geographical locality, *Passi Test of Creativity*

Introduction

One of the most important cognitive resources in personal, educational, and societal contexts is creativity. As opposed to being a natural ability inherent only to gifted people, modern psychological approach regards creativity as a trait that exists in all people with varying degrees of proficiency (Cropley, 2001; Runco, 2014; Sternberg & Lubart, 1995) [7, 17, 22]. Creativity in a wide sense of the word is the ability to generate new solutions to either ill-defined or known problems, create new ideas, and produce art or technical works of significance (Lloyd, 2008) [11]. This cognitive resource includes intuitive reasoning, inquisitive nature, vision, and cognitive flexibility (Lloyd, 2008; Sternberg & Lubart, 1999) [11, 23].

National Advisory Committee on Creative and Cultural Education (NACCCE, 1999) [14] defines creativity as "imaginative activity fashioned so as to produce outcomes that are both original and of value". Psychometric approaches view creativity as a multi-dimensional construct including ideational fluency, conceptual flexibility, originality, inquisitiveness, and sensitivity to complicated problems.

Today, in contemporary higher education, the link between academic discipline and creativity continues to be an important sphere for research. Although the goal of higher education is developing problem-solving abilities, there is empirical evidence that a more advanced formal schooling within one academic discipline might not only help to develop certain skills but also to make a person cognitively rigid and dogmatic (Dacey & Lennon, 1998; Simonton, 1983, 1988) [8, 18, 19]. Undergraduate learning usually develops a person's basic thinking, but excessive specialization in the future years could hinder divergent thinking skills (Simonton, 1983, 1994) [18, 20]. In addition, the decline in the levels of creativity in students may be caused by increased domain complexity and structuring of the problem (Dacey & Lennon, 1998) [8].

Different academic disciplines have different learning environments and different ways of problem solving. It is often claimed that the students of arts and humanities were shown to be better in divergent thinking than their counterparts who chose natural sciences (Charyton & Snelbecker, 2007; Hartley & Greggs, 1997 [6, 9]; Johnson, 1974; Lloyd-Bostock, 1979; Webster & Walker, 1981) [12, 25]. However, later research found that although students of the arts were better in ideational fluency and openness in expression, the students of science had better functional, analytic, and domain-restricted creativity (Ulger, 2017) [24].

Furthermore, research in socio-demographic variables such as gender and place of residence demonstrates inconsistent results. Many studies have demonstrated superior creativity in females (Oral *et al*., 2008; Razik, 1964; Sokić *et al*., 2021) [15, 21], but some show no substantial difference in terms of gender (Baer & Kaufman, 2008; Barrantes-Vidal *et al*., 1999 [3, 4]; Goyal, 1973) or even show superior creativity among males in certain technical dimensions (Abra, 1991; Chadha, 1985 [2, 5]; Middents, 1968). The relationship between the regional environment (urban vs. rural) and cognitive styles is another aspect under study (Madhu, 1987) [13].

Operational Definitions

- **Creativity:** The cognitive ability to devise new associations, formulate new ideas, restructure old problems into innovative solutions, and execute original approaches across theoretical and applied domains.
- **Science Stream Students:** Students who are pursuing degrees in scientific, technical, or applied science fields.
- **Arts Stream Students:** Students who are studying in humanities, social sciences, or general liberal arts disciplines.

Research Objectives

The present study purported to realize the following objectives:

1. To assess and compare creativity level of Science and Arts stream college students.
2. To study effect of gender on creativity level of Science and Arts stream college students.
3. To study effect of locality on creativity level of Science and Arts stream college students.

Hypotheses

Based upon the above-mentioned objectives, the following hypotheses were formulated:

Ho1 There exist no significant differences in creativity level of Science and Arts stream college students.

Ho2 There exist no significant differences in creativity level of male/female Science and Arts stream college students.

Ho3 There exist no significant differences in creativity level of rural/urban Science and Arts stream college students.

Methodology

1. Method

In the present study, normative survey method was used. Mean, S.D. and Critical Ratio have been calculated.

2. Sample

The students studying in Degree Colleges of Haryana constituted the target population of the study. In the present study,200 college students studying Science and Arts stream were selected as the sample. For this, stratified sampling technique was used to select 100 students from Science stream and 100 students from Arts stream.

Table 1: Distribution of Sample (N=200)

Students of Science stream (100)				**Students of Arts stream (100)**			
Male (50)		Female (50)		Male (50)		Female (50)	
Rural Male (25)	Urban Male (25)	Rural Female (25)	Urban Female (25)	Rural Male (25)	Urban Male (25)	Rural Female (25)	Urban Female (25)

3. Tools Used

1. A Personal Data Sheet was prepared by the Investigator to collect the Personal details including gender, academic course stream, and geographical background of the subjects.
2. Passi's Test of Creativity (PTC) developed by Dr. B.K. Passi, (1979) [16] was used to assess the Creativity level of Students. The test evaluates distinct creative dimensions including seeing problems, unusual uses, consequences, and inquisitiveness.

Results and Discussion

In order to study the nature of data, descriptive statistics i.e. the measure of central tendency and dispersion- Mean, Standard Deviation, Standard error of difference were used. For further investigations Critical Ratio was calculated. The use of C.R. test is justified because the assumptions of continuity, normality in population and equality of variance were satisfied. The obtained results are given in the tables. The results pertaining to the creativity level of Science and Arts stream college students have been presented in table 2.

Table 2: Creativity level of Science and Arts stream college students

Groups	**N**	**Mean**	**S.D.**	**SP.**	**UN.**	**CON.**	**INQ**	**S.E.**	**C.R.**
Science stream students	100	154.7	13.41	44.7	47	45	18	1.74	35.74**
Arts Stream students	100	92.5	11.30	27	22.9	19.6	23		

**** S**ignificant at 0.01 level

Table 2 reveals that the mean and S.D. scores of the science stream college students have been found to be 154.7 and 13.41. it can be further seen that in terms of different components of creativity, the science stream college students have achieved the highest mean scores in area of unusual uses test (47) followed by the consequences test and seeing problems test (44.7). This indicates that the students can think imaginatively and tell about different unusual uses of objects like cloth piece, bottle etc. Their ability to think in different directions is revealed by expressing the utility of the different uses of objects. The consequences test scores represent the dimensions of fluency, originality and creativity. The mean value of 45 clearly reveals that in the matter of consequences, students are highly creative i.e. they can think directly & indirectly. The lowest score (18) is that of inquisitiveness test. The inquisitiveness test represents the power of different type of questioning. The marks for this area can be given according to the number of questioning.

It is apparent that the mean scores of the arts stream college students have been found to be 92.5 with S.D. 11.30 respectively. Further analysis of mean scores of the Arts stream college students reveals that that in terms of different components of creativity, the students have achieved the highest mean scores in area of seeing problems test (27) followed by the inquisitiveness test (23) and the unusual uses test (22.9). The lowest score (19.6) is that of the consequences test.

The mean and S.D. values for the science stream college students are 154.7 and 13.41 respectively whereas for the arts stream college students, it was counted to be 92.5 and 11.3. The differences in mean scores indicate significant differences in the creativity level of Science and Arts stream college students. The scores when compared with C.R. test are significant at 0.01 level of significance. Therefore, null hypothesis is rejected and it can be concluded that Science stream college students exhibit more creativity than Arts stream college students.

These findings align with recent empirical studies indicating that scientific curricula foster analytical problem-solving and functional fluency, whereas humanities curricula cultivate open-ended questioning and problem formulation (Ulger, 2017) [24].

Influence of Gender on Creativity level of Science and Arts stream College students

The results pertaining creativity level of Science and Arts stream college students with respect to their gender have been presented in table 3.

Table 3: Influence of Gender on Creativity level of Science and Arts stream College students

S. No.	Group	N	Mean	S.D.	S.E.	C.R.
1.	Science stream Male	50	159	10.19	2.26	3.80**
2.	Science stream l female	50	150.4	12.36		
3.	Arts stream Male	50	94	7.57	1.35	2.22(NS)
4.	Arts stream female	50	91	12.30		

** **S**ignificant at 0.01 level; NS: Not Significant

Table 3 reveals that C.R.-value for difference in mean scores of Science stream male and Science stream female college students is significant at 0.01 level of significance. The mean and S.D. Values for Science stream male students are 159 and 10.19 respectively whereas for Science stream female students, it was counted to be 150.4 and 12.36 in the same order. When results are compared in the context of means scores it is found that the mean scores of Science stream male students are higher by 8.6 (df= 98) than that of their counter parts i.e. Science stream female college students. The critical ratio calculated as 3.80 is also significant at o.o1 level of significance. Therefore, it can be concluded that the Science stream male college students are more creative than Science stream female students.

The mean scores of Arts stream male and female students have been found to be 94 and 91. with S.D. 7.57 and 12.30 respectively. In terms of mean scores, little difference appeared between the creativity level of Arts stream male and female students. The calculated value between these two groups 2.22 being less than the table value of C.R test at 0.05 level of significance also shows no significant difference between them. Though the Arts stream male students have a little edge over their counterparts, there is no remarkable effect of the gender on the creativity level of the students pursuing Arts stream courses.

Influence of Locality on Creativity level of Science stream and Arts stream College Students

The results pertaining creativity level of Science stream and Arts Stream College students with respect to their gender have been presented in table 4.

Table 4: Influence of locality on Creativity level of Science stream and Arts stream College students

S. No.	Group	N	Mean	S.D.	S.E.	C.R.
1.	Science stream Rural	50	146	14.59	2.59	6.71**
2.	Science stream Urban	50	163.4	11.16		
3.	Arts stream Rural	50	102	12.06	2.88	6.59**
4.	Arts stream Urban	50	83	5.65		

** **S**ignificant at 0.01 level

Table 4 reveals that C. R. value of 6.71 (df=98) for difference in mean scores of the Science stream rural and urban students is significant at 0.01 level of significance. The mean and S.D. Values for Science stream rural students are 146 and 14.59 respectively whereas for those pertaining to the Science stream urban students, it was counted to be 163.4 and 11.16 in the same order. When results are compared in the context of means scores it is found that the mean scores of the creativity level of Science stream urban students are higher by 17.4 than that of their counter parts belonging to Science stream rural category. Therefore, it can be concluded that the students belonging to Science stream urban Category exhibit better creativity than their counterparts.

The mean scores of Arts stream rural and urban students have been found to be 102 and 83 with S.D. 12.6 and 5.65 respectively. The critical ratio calculated as 6.59(df= 98) is also significant at o. o1 level of significance. Therefore, null hypothesis is rejected and it can be concluded that the Arts stream rural students are more creative than Arts stream urban students.

Major Findings

1. **Stream Disparity:** The students of the Science stream demonstrate significantly higher total creativity levels as compared to the arts stream students. Science students excel in unusual applications and evaluating consequences.

2. **Gender Moderation:** Male students have a significantly higher creativity than females in the science stream. However, gender does not have any significant effect on the creativity of arts stream students.

3. **Geographical Interaction:** Locality interacts significantly with the academic stream. An urban background serves as an edge for the science stream while a rural background is related to better creativity among arts stream students.

Implications for Educational Practice and Future Research

1. **Educational Implications**

- **Curriculum Design in Arts Streams:** Curriculum Design should add hands-on lessons, problem-solving, project work that explores new ideas and exercises that help think of many different ideas so that arts students can close the creative gap compared to science students.

- **Addressing Gender Differences in Science Education:** Science teachers should build supportive classrooms that boost creative confidence and encourage risk-taking for female students.

- **Rural-Urban Educational Equity:** Science departments should give academic help and real-world opportunities to rural students so they can catch up with resources. At the time arts programs in cities should use hands-on, real-world lessons to help students think in many ways.

2. Suggestions for Future Research

- Future studies should grow the number of participants by including more regions and different kinds of universities.
- Long-term studies could look at how ability changes from the start to the end of different science and arts courses.
- More factors, like thinking style, motivation, family income and classroom atmosphere should be added to models to see how they affect results.

References

1. Abra N, Bartsch T, Silberstein S, Lipton R, Dodick D. Gender differences in creative achievement: A survey of explanations. International Journal of Multidisciplinary Research and Development,1991:117(3):235–284.
2. Baer J, Kaufman JC. Gender differences in creativity. International Journal of Multidisciplinary Research and Development,2008:42(2):75–105.
3. Barrantes-Vidal N, Caparrós B, Obiols JE. Creative potential and personality in university students. International Journal of Multidisciplinary Research and Development,1999:85(1):235–242.
4. Chadha NK. Creativity and cognitive style. International Journal of Multidisciplinary Research and Development,1985:15(2):81–88.
5. Charyton C, Snelbecker GE. General, artistic and scientific creativity attributes of engineering and music students. International Journal of Multidisciplinary Research and Development,2007:19(2–3):213–225.
6. Cropley AJ. Creativity in education and learning: A guide for teachers and educators. International Journal of Multidisciplinary Research and Development,2001:1(1):1–220.
7. Dacey JS, Lennon KH. Understanding creativity: The interplay of biological, psychological, and social factors. International Journal of Multidisciplinary Research and Development,1998:1(1):1–280.
8. Hartley J, Greggs MA. Divergent thinking in arts and science students: Contrary imaginations at Keele revisited. International Journal of Multidisciplinary Research and Development,1997:22(1):93–97.
9. Joseph Alexander E, Abirami R. A study of creativity of high school students in relation to information processing style, conformity behaviour and self-confidence. International Journal of Multidisciplinary Research and Development,2012:1(1):1–150.
10. Lloyd P. Organizing the creative mind: The artful intellect. International Journal of Multidisciplinary Research and Development,2008:29(4):41–49.
11. Lloyd-Bostock SMA. Convergent-divergent thinking and arts-science orientation. International Journal of Multidisciplinary Research and Development,1979:70(1):155–163.
12. Madhu. Relationship between creative thinking and field dependence-independence cognitive styles of rural and urban female students. International Journal of Multidisciplinary Research and Development,1987:22(1):54–62.
13. National Advisory Committee on Creative and Cultural Education (NACCCE). All our futures: Creativity, culture and education. International Journal of Multidisciplinary Research and Development,1999:1(1):1–225.
14. Oral G, Kaufman JC, Agars MD. Examining creativity in Turkey: Do Western findings apply? International Journal of Multidisciplinary Research and Development,2008:18(2):235–246.
15. Passi BK. *Passi Test of Creativity* (PTC). International Journal of Multidisciplinary Research and Development,1979:1(1):1–50.
16. Runco MA. Creativity: Theories and themes: Research, development, and practice. International Journal of Multidisciplinary Research and Development,2014:2(1):1–500.
17. Simonton DK. Formal education, eminence, and dogmatism: The curvilinear relationship. International Journal of Multidisciplinary Research and Development,1983:17(3):149–162.
18. Simonton DK. Scientific genius: A psychology of science. International Journal of Multidisciplinary Research and Development,1988:1(1):1–240.
19. Simonton DK. Greatness: Who makes history and why. International Journal of Multidisciplinary Research and Development,1994:1(1):1–500.
20. Sokić M, Bjekić J, Zupančič M. Gender differences in creativity among students in higher education. International Journal of Multidisciplinary Research and Development,2021:55(4):980–992.
21. Sternberg RJ, Lubart TI. Defying the crowd: Cultivating creativity in a culture of conformity. International Journal of Multidisciplinary Research and Development,1995:1(1):1–300.
22. Sternberg RJ, Lubart TI. The concept of creativity: Prospects and paradigms. International Journal of Multidisciplinary Research and Development,1999:1(1):3–15.
23. Ulger K. Comparing the effects of art education and science education on creative thinking in high school students. International Journal of Multidisciplinary Research and Development,2017:120(2):57–79.
24. Webster MA, Walker MB. Divergent thinking in arts and science students: The effect of item content. International Journal of Multidisciplinary Research and Development,1981:72(3):331–338.