English Language Creativity and Academic Achievement

A Study of Gender and Locality Differences

TARUN KUMAR TYAGI* MANISH KUMAR** AND PRAGYA GUPTA***

Abstract

The main aim of the present study was to investigate the gender and locality differences of English Language Creativity of senior secondary students. As a by-product of the main study, the relationship between English Language Creativity, Academic Achievement, and English Language Achievement was also examined. Sixty-seven eleventh grade students from three schools of Gaya District, India, age range from 16–19 years were included in the sample by using the convenience sampling technique. English Language Creativity test developed by Malhotra and Kumari (1990) was administered to the students. Academic achievement and English language achievement were measured based on grade/ percentage of marks obtained by the students in their previous examination. Mann-Whitney U test and Kendall Rank correlation (τ) were used to analyse the data. The results revealed that gender and locality differences were found in English language creativity, i.e., female students were found better than their counterparts on dialogue writing and poetic diction whereas urban students were found better than their counterparts. Furthermore, gender and locality differences were also found in the dimension of language creativity except for flexibility. Subsequently, it is also revealed that English language creativity was found to be positively related to academic achievement and English language achievement. Plausible explanations and implications of the findings of the research are discussed.

* *Assistant Professor*, Department of Teacher Education, Central University of South Bihar, Gaya
** *Research Scholar*, Department of Teacher Education, Central University of South Bihar, Gaya
*** *Assistant Professor*, Department of Teacher Education, Central University of South Bihar, Gaya

Introduction

Language is one of the most important means of communication. Therefore, its importance is not confined to the classroom but also plays an important role in other disciplines like science, mathematics, social science, etc. Noam Chomsky's (1982) writings have shown the importance of the creative aspect of language and defined language creativity as the unique capacity to organise and produce new sentences of a language. Language is a common creative act, and every human being uses it in their daily lives. It covers a large area like play, prose, poetry, film, storytelling, etc. Poets, writers, dramatists, and novelists, all of them have different types of unique abilities in their writing which is termed as language creativity. Language creativity is a multidimensional attribute, and it includes the following dimensions like fluency, flexibility, originality and elaboration. The literature also highlighted that learner's ability and environment have a profound impact not only on his or her performance in the cognitive domain but also in the non-cognitive domain.

Throughout the literature, numerous research studies have focused upon creativity in a general domain (e.g., Guilford, 1950; Cropley, 1967; Raina, 1969; Torrance, 1972; and Runco, 2004), the method for fostering creativity in a general domain (Torrance and Torrance, 1973), and ample evidence for creativity in a specific domain like mathematics (Jensen, 1973; Singh, 1987; Ervynck, 1991; Sriraman, 2004; Mann, 2005; Tyagi, 2017), and science (Majumdar, 1975; Sinha and Singh, 1987; Hu and Adey, 2010; and Yang et al., 2016).

Creativity in the specific domain has been a debatable issue and no final decision has been settled yet. Baer (2015) reported that creativity is considered not only content-specific but also task-specific within content areas. In 1993, Gardner pointed out that every person has creative potential in a specific domain; however, the degree may vary. Silver (1997) reported that creativity is closely related to deep-flexible knowledge in the content domain and similar findings were also reported by Singh (1987) and Tyagi (2017).

In the 21st century, for maintaining its existence and prosperity every nation is required to nurture its creative potentials/talents in different fields like science, mathematics, engineering, language, etc. Language is the only way to express our opinions, ideas, imagination, and dreams. Besides this, it plays a pivotal role to influence the learners' performance in every field. In the present era, the English language is the most spoken language and is considered an international language also. In several countries, it is considered as a second language too. Therefore, learning the English language is essential to excel in higher education and research in different fields. It is also the language of computers that

helps us to connect with the world via the internet. Even most of the reputed research journals are being published in the English language. So, the English language teachers have to take out the best creative ideas and thoughts of the students by engaging them in interesting activities for harnessing their writing skills. NCF (2005) also emphasised that literature can also be a spur to children's own creativity.

Rationale of the Study

Getzels and Jackson (1962) conducted a landmark research study in the field of psychology and reported a low and positive relationship between creativity and achievement and firstly highlighted the role of creativity in school achievement (Ai, 1999). It has also been shown (Ai, 1999) that those who used the Grade Point Average as a measure of academic achievement have also reported consistent results with the findings of Getzels and Jackson. Torrance (1962) also reported similar findings. Sharma (2011) and Sumangala (2014) reported a significant difference between boys and girls with respect to language creativity. They found females better in language creativity than boys. In contrast, Rani (2013) and Uvaraj (2011) reported no significant difference between language creativity of male and female students, science and arts stream, Government and private institutions. Furthermore, he found a significant difference between language creativity of rural and urban students and concluded that urban students are better than rural students on language creativity scores. Baer and Kaufman (2011) conducted an extensive review of gender differences in creativity and pointed out no consistent pattern of gender differences, both in creativity test scores and in creative accomplishments. Despite this result, they argued that any gender differences in creativity may be the product of the interaction of different types of environments. Ergo, they suggested that further researches are needed to determine the gender differences in creativity. Research has shown the importance of an individual's background characteristics for influencing his/her cognitive and non-cognitive behaviours (Ai, 1999). Similarly, it has also been demonstrated that school and home environment (Sharma, 2011) and bilingualism (Kessler and Quinn, 1987) both have a positive effect on the language creativity of the students. Several research studies (Ai, 1999; Naderi et al., 2009) have shown the importance of gender as the most significant factor for influencing the students' academic achievement. Asore (2012) reported that Hindi language creativity is positively related to achievement in Hindi. Zhang, Ren and Deng (2018) reported a positive relationship between creativity and achievement but in contrast, several research studies reported a low and negative relationship between creativity and

achievement (Olatoye, Akintunde and Ogunsanya, 2010; Madu and Ebere, 2016). Different tests and different samples have been selected by the researchers in the different research studies. Some researchers used achievement tests scores and a few used grade point averages, while others used standardised tests.

After reviewing the research studies on English language creativity and academic achievement, however, ample evidence in this regard was found overseas but not in the Indian context. It is also observed that gender and locality, both variables affect the performance of learners and moderate the relationship between creativity and achievement. Therefore, to promote creativity and enhance the achievement of students, the role of gender and locality is needed to study for improving the learning process. Therefore, this study has been conducted to address the following research questions:

(i) Do gender and locality differences exist in the English language creativity of senior secondary students?

(ii) Is there any significant relationship between English language creativity, academic achievement, and English language achievement?

Objectives of the Study

The following objectives of the present study were:

1. To study English language creativity between male and female senior secondary school students.
2. To study English language creativity between rural and urban senior secondary school students.
3. To examine the relationship between English language creativity and English language achievement.
4. To find out the relationship between English language creativity and total academic achievement.

Hypotheses of the Study

The following null hypotheses were formulated to achieve the objectives of the study.

1. There is no significant difference between the English language creativity of male and female senior secondary school students.
2. There is no significant difference between the English language creativity of rural and urban senior secondary school students.
3. There is no significant relationship between English language creativity and English language achievement.
4. There is no significant relationship between English language creativity and academic achievement.

Method

The main aim of the present study is to investigate the gender and locality differences for influencing

the students' English language creativity and focus and ferret out the strength and direction of the relationship of English language creativity with academic achievement and English language achievement as a by-product of this study. For which descriptive survey method was used to achieve the objectives of the present study.

Participants

In the present study, the population consisted of all the students studying in CBSE-affiliated senior secondary schools especially located in Gaya city of India. Sixty-seven students of the eleventh standard were selected by using convenience sampling technique from three English medium schools located in Gaya District, Bihar. The age group of the selected sample was from 16–19 years.

Instruments

English Language Creativity

Language creativity of students was measured by using the English language creativity test developed by Malhotra and Kumari (1990). The items of the test encourage the students to freely play with the alphabets and statements. Plot building, dialogue writing, poetic diction, descriptive style, and vocabulary test were the five subtests that had been included in the test. The task pertaining to fluency, flexibility, and originality have been used in the present study. There were twenty-seven items in the test with an open range of possible test scores.

Test-retest reliability of five subtests namely, plot building, dialogue writing, poetic diction, descriptive style and vocabulary test were found to be 0.87, 0.76, 0.79, 0.84 and 0.89 respectively (N=200). Whereas parallel form reliability of the test was found to be 0.62, 0.64 0.59, 0.61 and 0.63 respectively (N=200). The investigator established the construct validity of the language creativity test against the 'Things done on your own' checklist with a sample of eighty students. In addition, three other constructs namely, non-verbal intelligence, verbal intelligence, and language achievement tests were used to establish the validity of the test with a sample of 400 students of different grade levels. The coefficient of correlation between 'Things done on your own' and all the five subtests was found very high ranging from 0.63 to 0.71, whereas the relationship of all the five subtests with non-verbal intelligence verbal intelligence and language achievement test was very low ranging from 0.05 to 0.32.

Academic Achievement and English Language Achievement

In the study, academic achievement is considered as the percentage scores in the Class X examination. Whereas English language achievement is considered as the percentage scored in English subject only in the previous examination. Therefore, Class X results of eleventh standard

students were taken from the school records with the permission of school authorities to calculate academic achievement and achievement in the English language of the students.

Procedure

Before administering the test on the selected sample, the consent with all ethical considerations was taken from the school authorities. All the required instructions were given to the students succinctly before administering the tools. All the procedures of data collection had taken 15 days. The information about marks in academic achievement and English language achievement on the previous examination, i.e., Class X were collected through the concerned authorities. After the collection of data, the scoring process was done as prescribed in the manual of the English language creativity test.

Results

The mean, standard deviation, skewness, and kurtosis of the sum scores of English language creativity, academic achievement, and English language achievement are presented and summarized in Table 1. The ratio between standard deviation and mean is consistently higher on English language creativity scores than academic achievement and English language achievement. Therefore, the data did not follow the characteristics of normal distribution.

Tables 1, 2 and 3 show the basic statistics of the group of participants' age ranging from 16 to 19 years. The difference in mean scores of English language creativity and academic achievement was found. It is clearly apparent that the SD value of English language creativity is 98.26 for mean 242 which is very high and almost less than one-third to mean which shows that the group is very heterogeneous and does not satisfy the assumptions of parametric statistics.

It can be seen from the data in Table 2 and Table 3 that the nature of the data as collected through the language creativity test is positively skewed. Values (in bold) show the nature of the abnormality; therefore, parametric statistical technique is not appropriate to analyse the data.

It is also evident from Table 3 that data does not show the characteristics of normal distribution, i.e., positive skewness. The participants in the present study were selected by

Table 1
Descriptive Statistics of Scale Sum Scores (N=67)

Variable	Minimum	Maximum	Mean	SD	Kurtosis	Skewness
English Language Creativity	89	451	242	98.26	0.005	1.00
Academic Achievement	47.6	88.6	73.06	12.75	–1.27	–0.40
Achievement (English Language)	43	94	70.50	13.34	–1.00	–0.21

Table 2
Mean and S.D. of English Language Creativity (Gender)

Areas(A) / Gender	Plot Building (A-1)	Dialogue Writing (A-2)	Poetic Diction (A-3)	Description Style (A-4)	Vocabulary Test (A-5)	Fluency	Flexibility	Originality	Total (Language Creativity)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Male (N=30)	73.17 (34.13)	9.43 (12.28)	11.03 (9.53)	13.60 (12.24)	102.40 (54.84)	121.27 (54.85)	52.50 (21.42)	34.03 (17.12)	208.97 (92.09)
Female (N=37)	85.16 (30.23)	16.19 (10.23)	16.00 (7.76)	18.03 (10.29)	133.70 (68.70)	154.22 (58.91)	70.08 (25.85)	44.57 (16.70)	268.78 (96.05)
Total	79.79 (32.35)	13.16 (11.61)	13.78 (8.89)	16.04 (11.34)	119.69 (64.36)	139.46 (59.06)	62.21 (25.37)	39.85 (17.52)	242 (98.27)

A–Area of Language Creativity

Table 3
Mean and S.D. of English Language Creativity (Locality)

Areas (A)/ Variable (Locality)	Plot Building (A-1)	Dialogue Writing (A-2)	Poetic Diction (A-3)	Description Style (A-4)	Vocabulary Test (A-5)	Fluency	Flexibility	Originality	Total (Language Creativity)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Urban (N=56)	83.98 (32.16)	14.70 (11.65)	14.71 (9.07)	17.34 (11.58)	124.52 (67.857)	146.80 (60.83)	64.77 (26.14)	42.55 (17.63)	254.75 (100.56)
Rural (N=11)	58.45 (24.89)	5.36 (7.99)	9.00 (6.21)	9.45 (7.28)	95.09 (34.93)	102.09 (28.82)	49.18 (16.33)	26.09 (8.25)	177.09 (50.69)
Total	79.79 (32.35)	13.16 (11.61)	13.78 (8.89)	16.04 (11.34)	119.69 (64.36)	139.46 (59.06)	62.21 (25.37)	39.85 (17.52)	242 (98.27)

A– Area of Language Creativity

convenience sampling technique. Due to abnormality in data and using non-probable sampling technique, it does not satisfy the assumptions of the parametric test. Therefore non-parametric statistical techniques namely, Mann-Whitney test (U) and Kendall Tau Rank Correlation test (τ) are the best alternatives of t-test and Pearson 'r' respectively which were used to analyse the data.

It is evident from Table 4 that the obtained z values with df = 65 were found to be significant with respect to dialogue writing and poetic diction areas of the English language creativity test. The mean values clearly indicate that female students were found to be significantly higher in dialogue writing and poetic diction areas of English language creativity than their counterparts.

As can be seen from Table 5 that the obtained z values were found to be significant with respect to all dimensions as well as a grand total of the English language creativity test with df = 65. The mean values clearly indicate that the female students were found to be better on all dimensions as well as on total English language creativity test scores than their counterparts.

The statistical values as indicated in Table 6 show that the obtained z values except vocabulary test were found to be significant with df = 65. The mean values indicated that the groups of urban and rural students were found to be significantly different from each other with respect to plot building, dialogue writing, poetic diction, and descriptive study of English language creativity test with

Table 4
Results of Mann-Whitney U Test on the Areas of Language Creativity Test (N = 67)

S.No.	Areas	Gender	N	Mean Rank	U	z	p-value
1.	Plot Building	Male	30	29.05	406.50	–1.87	0.06
		Female	37	38.01			
2.	Dialogue Writing	Male	30	27.60	363.00	–2.46	0.01*
		Female	37	39.19			
3.	Poetic Diction	Male	30	28.67	395.00	–2.02	0.04*
		Female	37	38.32			
4.	Description Style	Male	30	29.57	422.00	–1.68	0.09 (NS)
		Female	37	37.59			
5.	Vocabulary Test	Male	30	29.40	417.00	–1.74	0.08 (NS)
		Female	37	37.73			

*Significant at 0.05 level ($p < 0.05$)
NS-Not Significant at 0.05 level ($p > 0.05$)

Table 5
Results of Mann-Whitney U Test on the Dimension of Language Creativity (N=67)

S.No.	Dimensions	Gender	N	Mean Rank	U	z	p-value
1.	Fluency	Male	30	27.48	359.50	–2.46	0.01*
		Female	37	39.28			
2.	Flexibility	Male	30	26.43	328.00	–2.86	0.01*
		Female	37	40.14			
3.	Originality	Male	30	27.22	351.50	–2.57	0.01*
		Female	37	39.50			
4.	English Language Creativity	Male	30	27.07	347.00	–2.62	0.01*
		Female	37	39.62			

* Significant at 0.05 level ($p < 0.05$)

Table 6
Results of Mann-Whitney U Test on the Areas of Language Creativity Test (N=67)

S.No.	Areas	Locality	N	Mean Rank	U	z	p-value
1.	Plot Building	Urban	56	36.33	177.50	2.21	0.02*
		Rural	11	22.14			
2.	Dialogue Writing	Urban	56	36.68	158.00	2.59	0.01*
		Rural	11	20.36			
3.	Poetic Diction	Urban	56	36.34	177.00	2.22	0.02*
		Rural	11	22.09			
4.	Description Style	Urban	56	36.20	185.00	2.08	0.03*
		Rural	11	22.82			
5.	Vocabulary Test	Urban	56	35.13	245.00	1.07	0.28 (NS)
		Rural	11	28.27			

* Significant at 0.05 level ($p < 0.05$)
NS-Not Significant at 0.05 level ($p > 0.05$)

df = 65. The mean values indicate that the group of urban students was found to be higher on all dimensions of English language creativity test. Both groups of urban and rural students were found almost similar with respect to vocabulary tests.

As can be seen from Table 7 that the obtained *z* values were found to be significant on the creativity scores of the language creativity

test with df = 65 except only for one dimension, i.e., flexibility. The mean values indicated that the group of urban students was found to be more creative on the English language test. Both the groups were not found to be different significantly with respect to the flexibility dimension of English language creativity test.

It is evident from Table 8 that the obtained coefficient of correlation (τ= + 0.64, z = 8.05, $p < 0.05$) between English language creativity and academic achievement was found to be positive and significant. Further, Table 8 also shows that obtained coefficient of correlation (τ= + 0.68, z = 7.74, $p < 0.05$) between English language creativity and English language achievement was also found to be positive and significant. Therefore, it is concluded that English language creativity is positively related to academic achievement and English language achievement.

Discussion and Conclusion

The present study investigated the significant gender differences in the areas and dimensions of English language creativity. English language creativity and its two areas namely,

Table 7
Results of Mann-Whitney U Test on the Dimension of Language Creativity (N=67)

S.No.	Dimensions	Variable	N	Mean Rank	Rank sum	U	z	p-value
1.	Fluency	Urban	56	36.27	2031.00	181.00	2.15	0.03*
		Rural	11	22.45	247.00			
2.	Flexibility	Urban	56	35.98	2015.00	197.00	1.87	0.07 NS
		Rural	11	23.91	263.00			
3.	Originality	Urban	56	36.97	2070.50	141.50	2.82	0.01*
		Rural	11	18.86	207.50			
4.	Total Creativity	Urban	56	36.31	2033.50	178.50	2.19	0.02*
		Rural	11	22.23	244.50			

*Significant at 0.05 level ($p < 0.05$)
NS-Not Significant at 0.05 level ($p > 0.05$)

Table 8
Correlation Coefficient (Kendall Rank Correlation Coefficient)

Variable	N		z value	Significance
English Language Creativity and Academic Achievement	67	+ 0.64	8.05	$p < 0.05$
English Language Creativity and English Language Achievement		+ 0.68	7.74	$p < 0.05$

dialogue writing and poetic diction were found to be significantly different based on gender. Furthermore, a significant difference was found in English language creativity and its dimension namely, fluency, flexibility and originality caused by gender. The findings of the present study were strongly consistent with the findings of previous research studies (Sharma, 2011; Rani, 2013) who have revealed the existence of gender differences in English language creativity scores in which female students scored significantly higher than male students. Conversely, the results of the present study disagree with the findings of other research studies (Sumangala, 2014; Seng, 1991) in which male students are better than female students of language creativity. These differences in the different aspects and dimensions of English language creativity can be explained by the different identification of gender roles in Indian culture. Therefore, research studies have shown evidence that the dissimilar aspects of language creativity might be caused by the environment and gender stereotypes (Baer and Kaufman, 2011), gender identity (Ai, 1999), and gender roles of males and females in culture.

The second finding of the present study indicates a significant difference between the areas of English language creativity of rural and urban students except for one area of language creativity, i.e., vocabulary test; subsequently, similar results were found between English language creativity and its dimension except for one dimension, i.e., originality. It is, therefore, concluded that urban students have higher language creativity than rural students. However, similar findings were reported by Massarrat (2014) Uvaraj (2011). But Surapuramath (2014) showed no significant difference in language creativity among the urban and rural students. The reason for this could be that the urban people are more exposed to the language and other aspects as they have better socioeconomic status and other facilities than rural background students. The urban students may have the opportunity to use English language in their home, surroundings, etc. The teacher at urban schools may be better at English language in comparison to rural schools because of using interesting methods, attending in-service professional training programmes, and giving special attention to the development of language creativity.

The third finding of the present study revealed a strong positive relationship between English language creativity and academic achievement. The result of research studies (Chauhan and Sharma, 2017; Naderi et al., 2010; Asore, 2012; Surapuramath, 2014; Nami, et al., 2014; Bagaria, 2016; Gajda et al., 2017) has shown the evidence of a positive relationship between English language creativity and achievement. In contrast, Madu and Ebere (2016)

and Olatoye et al. (2010) reported no significant relationship between these two constructs. Furthermore, the fourth finding of the present study revealed a significant and positive relationship between English language creativity and English language achievement which was supported by some research studies (Inuusah et al., 2019; Asore, 2012; Bagaria, 2016; Gajda et al., 2017). In addition, Jyothsna (2020) also reported a high positive relationship between creative writing and academic achievement in English. Therefore, language teachers should emphasise students' active involvement in the process of language learning, use of open-ended problems, and use of computer-assisted language tools (Mehar and Lehal, 2016) to benefit students' development of creativity in language.

The findings of this study have the following educational implications that English language learning should be given special attention and a support system must be provided to nurture the seed of language creativity among students so that their academic achievement and achievement in language can be enhanced. Therefore, this study advocates that the teachers and teacher educators should develop innovative strategies by using contextualized content that will make the learners more acquainted with the English language. It is also suggested the use of open-ended problems and multiple-solution tasks (Tyagi, 2019), freedom for expressing the ideas of the students, brainstorming, Synectic method (Vani, 2013), etc. It would also help them to enhance the imagination power and divergent thinking abilities of the students and finally magnify their language creativity and academic achievement. In addition, teachers should upgrade their skills and knowledge through different trainings and use innovative teaching-learning strategies to foster English language creativity among students. In rural schools, English language teachers should provide several opportunities to the students to express their ideas and creative writing by engaging them in different interesting activities so that their language creativity can be enhanced.

Despite the methodological strength, the present study has some limitations. One concern is the operationalization of academic achievement. However, academic achievement was measured using cumulative grade point average (CGPA) in the general domain. It is very difficult to describe adequately because it involves many different abilities and skills, e.g., for convergent thinking, students must move in a convergent or restricting direction, eliminating the incorrect choices, whereas, for the divergent direction of thinking no one response/answer is correct or incorrect. Another limitation is related to sample size. To make a generalisation of the findings of the study, a large and representative sample is required.

Language creativity and achievement are commonly identified as important areas for the student's growth in the school curriculum. The sample consisted of only eleventh grade students; a different pattern might well emerge with elementary school or university students. The exact relation may be identified by using the partial correlation technique between language creativity, English language achievement, and academic achievement. Therefore, further research is needed to look for gender differences in the interactions among aptitudes, motivations, and the effect of environment and opportunities. Besides this, future research may be conducted to identify the causal relationship between language creativity and other variables like linguistics intelligence and linguistic aptitude by using cross-lagged panel analysis (Tyagi and Singh, 2014). Past and present studies have not addressed the concerned issues of which one is independent and dependent variable. How can we foster students' language creativity? Ergo, longitudinal and experimental research may be conducted to look at other issues and a better understanding of language creativity.

References

Ai, X. 1999. Creativity and academic achievement: An investigation of gender differences. *Creativity Research Journal*. Vol. 12, No. 4. pp. 329–337.

Asore, M. D. 2012. Study of Hindi language creativity of Class IX students in relation to their achievement in Hindi. *An International Research Journal*. Vol. 4, No. 37. pp. 45–46.

Baer, J. 2015. The importance of domain specific expertise in creativity. *Roeper Review*. Vol. 37, No. 3. pp. 165–178.

Baer, J. and J. C. Kaufman. 2011. Gender differences in creativity. *The Journal of Creative Behaviour*. Vol. 42, No. 2. pp. 75–105.

Bagaria, S. 2016. Study of English language creativity in relation to achievement in English of Class XII students. *Indian Journal of Research-PARIPEX*. Vol. 5, No. 4. pp. 318–320.

Chauhan, S. and A. Sharma. 2017. A study of relationship between creativity and academic achievement among public and private school students in both the genders. *International Journal of Science Technology and Management*. Vol. 6, No. 1. pp. 39–45.

Chomsky, N. 1982. A note on the creative aspect of language use. *The Philosophical Review*. Vol. 91, No. 3. pp. 423–434.

Cropley, A. J. 1967. *Creativity*. UK: Longnans, Green.

Ervynck, G. 1991. Mathematical creativity. In D. Tall (Ed.), *Advanced Mathematical Thinking*. pp. 42–53. Dordrecht: Kluweer.

Gajda, A., Karwowski, M. and R. A. Beghetto. 2017. Creativity and academic achievement: A meta-analysis. *Journal of Educational Psychology*. Vol. 109, No. 2. pp. 269–299.

Gardner, H. 1993. *Multiple intelligences: The theory in practice*. New York: Basic Books.

Getzels, J. W. and P. W. Jackson. 1962. *Creativity and intelligence: Exploration with gifted students*. New York: Wiley.

Guilford, J. P. 1950. Creativity. *American Psychologists*. 5. pp. 444–454.

Hu, W. and P. Adey. 2010. A scientific creativity test for secondary school students. *International Journal of Science Education*. Vol. 24, No. 4. pp. 389–403.

Inuusah, M., Regine, K., Jonathan, M., Kwame, Ebenezer, A. and M. Richard. 2019. Relationship between creative thinking and students' academic performance in English language and mathematics: The moderating role of gender. *Journal of Education, Society and Behavioural Science*. Vol. 31, No. 4. pp. 1–10. https://doi.org/10.9734/jesbs/2019/v31i430159

Jensen, L. R. 1973. The relationship among mathematical creativity, numerical aptitude and mathematical achievement. *Dissertation Abstract International*. Vol. 34, No. 5. pp. 2168.

Jyothsna, N. G. 2020. Secondary school students' creative writing and academic achievement in English. *The International Journal of Indian Psychology*. Vol. 8, No. 1. pp. 956–960.

Kessler, C. and M. E. Quinn. 1987. Language minority children's linguistic and cognitive creativity. *Journal of Multilingual and Multicultural Development*. Vol. 8, No. 1 and 2. pp. 173–184.

Madu, A. and C. Ebere. 2016. Relationship between creativity and academic achievement of secondary school students in plateau state. *International Journal of Innovative and Applied Research*. Vol. 4, No. 3. pp. 60–64.

Majumdar, S. K. 1975. A systems approach to identification and nurture of scientific creativity. *Journal of Indian Education*. Vol. 1. pp. 17–23.

Malhotra, S. P. and S. Kumari. 1990. *Language Creativity Test*. New Delhi: National Psychological Corporation.

Mann, E. L. 2005. Mathematical creativity and school mathematics: Indicators of mathematical creativity in middle school students. *Unpublished Doctoral Dissertation*, University of Connecticut.

Massarrat, L. 2014. *A study of language creativity of English medium students in English language with special reference to standard VIII of Aurangabad district*. Doctoral Dissertation, Dr. Babasaheb Ambedkar Marathwada University.

Mehar, R. M. and A. Lehal. 2016. Using computer-assisted language learning as a tool to enhance the language creativity among children. *International Journal of Applied Research*. Vol. 2, No. 1. pp. 624–626.

Naderi, H., Abdullah, R., Aizan, H. T., Sharir, J. and V. Kumar. 2010. Relationship between creativity and academic achievement: A study of gender differences. *Journal of American Science*. Vol. 6, No. 1. pp. 181–190.

Naderi, H., Abdullah, R., Aizan, H. T., Sharir, J. and V. K. Mallan. 2009. Gender Differences in Creative Perceptions of Undergraduate Students. *Journal of Applied Sciences*. Vol. 9. pp. 167–172.

Nami, Y., Marsooli, H. and M. Ashouri. 2014. The relationship between creativity and academic achievement. *Procedia-Social and Behavioural Sciences*. Vol. 114. pp. 36–39.

Olatoye, R. A., Akintunde, S. O. and E. A. Ogunsanya. 2010. Relationship between creativity and academic achievement of business administration students in South Western Polytechnics, Nigeria. *African Research Review*. Vol. 4, No. 3. pp. 134–149.

Raina, M. K. 1969. A study of sex differences in creativity in India. *Journal of Creative Behaviour*. Vol. 3, No. 2. pp. 111–114.

Rani, R. 2013. *A study of language creativity among secondary school students in relation to their linguistic skills, school environment and home environment*. Retrieved from http://shodhganga.inflibnet.ac.in/handle/10603/112444.

Runco, M. A. 2004. Creativity. *Annual Review of Psychology*. Vol. 55. pp. 657–687.

Seng, L. Y. M. 1991. Creativity and sex differences in Malaysian pupils. S*ingapore Journal of Education*. Vol. 11, No. 2. pp. 62–67.

Sharma, R. 2011. Effect of school and home environment on creativity of children. *MIER, Journal of Educational Studies, Trends and Practice*. Vol. 1, No. 2. pp. 187–196.

Silver, E. A. 1997. Fostering creativity though instruction rich mathematical problem solving and problem posing. *International Reviews on Mathematical Education*. Vol. 29, No. 3. pp. 75–80.

Singh, B. 1987. The development of tests to measure mathematical creativity. *International Journal of Mathematical Education in Science and Technology*. Vol. 18, No. 2. pp. 181–186.

Sinha, A. K. and C. Singh. 1987. Measurement of scientific creativity. *Indian Journal of Psychometry and Education*. Vol. 18. pp. 1–13.

Sriraman, B. 2004. The characteristics of mathematical creativity. *The Mathematics Educator*. Vol. 14, No. 1. pp. 19–34.

Sumangala, N. 2014. A study of language creativity of Class IX students in relation to intelligence and gender. I*nternational Journal of Educational Planning and Administration*. Vol. 4, No. 2. pp. 109–112.

Surapuramath, A. K. 2014. A study of relationship between creativity and academic achievement of secondary school pupils. *International Journal of Social Science*. Vol. 3. pp. 304–309.

Torrance, E. P. 1962. *Guiding creative talent*. NJ: prentice Hall.

Torrance, E. P. 1972. Can We Teach children to think creatively? *Journal of Creative Behavior*. Vol. 6, No. 2. pp. 114–143.

Torrance, E. P. and P. J. Torrance. 1973. *Is Creativity Teachable?* Bloomington, IN: Phi Delta Kappa Educational Foundation.

Tyagi, T. K. 2017. Mathematical creativity and mathematical intelligence: A causal relationship. *Creativity Research Journal*. Vol. 29, No. 2. pp. 212–17.

Tyagi, T. K. 2019, Dec 19–21. *Fostering mathematical creativity in middle school children: Use of multiple solution tasks and multiple methods*. Presented in '8th National Conference on Teaching-Learning in Mathematics', RIE Ajmer, NCERT.

Tyagi, T. K. and B. Singh. 2014. The application of cross-lagged panel analysis in educational research. *Philosophy, Sociology, Psychology and History*. Vol. 13, No. 1. pp. 1–24.

Uvaraj, T. 2011. A study on language creativity of college students. *Language in India*. Vol. 11, No. 5. pp. 520–533. Retrieved from: http://www.languageinindia. com/ may2011/ uvarajcreativityfinal.pdf

Vani, M. 2013. Effectiveness of synectics model of teaching on the development of English language creativity in school level. *Unpublished doctoral dissertation*. Karnatak University.

Yang, K-K., Lee, L., Hong, Z-R. and Lin, H-S. 2016. Investigation of effective strategies for developing creative science thinking. *International Journal of Science Education*. Vol. 38, No. 13. 2133–2151.

Zhang, W., Ren, P. and L. Deng. 2018. Gender differences in the creativity-academic achievement relationship: A study from China. *Journal of Creative Behaviour*. Retrieved from https://onlinelibrary.wiley.com/doi/pdf/10.1002/jocb.387