



A STUDY OF CREATIVE THINKING ABILITIES OF SENIOR SECONDARY SCHOOL STUDENTS IN RELATION TO THEIR INTELLIGENCE

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Abstract

The present study was an attempt to find out the difference in creative thinking abilities of senior secondary school students in relation to their intelligence. A number of 150 male and female respondents were taken as a sample on the basis of random sampling method. Standardized questionnaires – Creative Thinking Abilities by Mehdi (1985) and Intelligence Test by Jalota (1976) were used for the collection of the data. 't' test was used to see the significant difference. The findings of the study reveal that (i) It was found that superior intelligent students and low intelligent students differ significantly on fluency superior intelligent students are higher fluency than the low intelligent students. Similarly, superior intelligent students and low intelligent students differ significantly on flexibility too. However, there is no significant difference found between superior intelligent students and low intelligent students regarding originality and creativity. It shows that originality and creativity are equally distributed between superior intelligent students and low intelligent students (ii) It was found that there is no significant difference between Average intelligent students and low intelligence students regarding all dimensions of creativity. It shows that all dimensions of creativity are equally distributed between Average intelligent students and low intelligent students; (iii) It was found that there is a significant difference between superior intelligent students regarding flexibility and creativity. It shows that superior intelligent students having more flexibility than Average intelligent students. However, there is no significant difference found superior intelligent students and Average intelligent students

regarding fluency and originality. It shows that fluency and originality are equally distributed between superior intelligent students and average intelligent students.

Key words: *Creativity, intelligence, senior secondary school students.*

Introduction

The future of any country rests in the creative talents of their people. Our political leaders, administrators and policy makers are very much worried about the natural resources, talk about the energy crisis, and neglect the most important of natural resources- the creative child who is our potential in all avenues of life- scientific, technological, educational. Countries without creative talents cannot raise standard of living among nations of the world not just economically but educationally as well. If any country does not comprehend the educational implications of research and development on creativity, he will depend upon foreign talents. Without creative talents, countries, even with great reserves of natural resources, would not enjoy their current standard of living. The reality today, in this country and elsewhere as well, is something different. The curricula, the methodologies, and practices in education are so oriented that “the minds of the pupils are still treated like black boxes with informational inputs fed in at one end by the teacher, and the output tested at the other end. And the measure of quality is how well the outputs correspond to the inputs. How many teachers teach with the expectation that they can get more out of the box than they put in?”

Creativity has been described as infinite ranging from a novel solution to a problem, an invention, composition of a poem and painting, discovery of new chemical processes, an innovation in law, an innovation in musical dance, fresh way of thinking about a problem, rearranging old learning and much more. Creativity is the ability to produce work that is both novel original, unexpected and appropriate. Creativity is important at both the individual and societal levels. Creativity can lead to new scientific findings, new movements in Arts, new inventions and new social programmes in the rapid developing era.

According to Drevdahl (1956), “Creativity is the capacity of a person to produce compositions, products or ideas which are essentially new or novel and previously unknown to the producer.”

Freud and his followers lay special emphasis on the repressed unconscious wishes and libidinal urges, the sublimation of which largely determines creativity. Thus, the school of psychoanalysis considers creativity as a means and product of emotional purging and an

opportunity for sublimation and catharsis. Thus, the artists through their creations or creative works of art for e.g. by portraying beautiful figures of men and women are able to express their repressed and sexual desires in a socially acceptable manner. It is the conflict in the unconscious mind, which is the source of wondering of the development of the strength of personality. In order to be creative one must be aware of the conflicts and experience them both intellectually and emotionally. Creativity helps a conflict-ridden person in releasing his inner conflicts; the conflicts, which are either at the conscious level or at the unconscious level. It is the ego which allows certain conflicts to be solved through turning to activity channels which result in creativity and certain conflicts-unsolved lay in the unconscious mind and result in Neurosis. Thus, Neurotic is an artist-san-art who has not created art.

NATURE AND CHARACTERISTICS OF CREATIVITY

Creativity is a unique and novel personal experience and may be said to possess the following characteristics.

- (1) **Creativity is Universal:** It is bound by the barriers of age, location or culture. Every one of us possesses and is capable of demonstrating creativity to some degree.
- (2) **Creativity is Innate as well as Acquired:** God-given gift or Divine, theory suggests that creativity is in born but the inspiration influence of cultural background, experiences, education and training affect in the nurturing or developing of creativity.
- (3) **Creativity produces something new or novel:** To make a fresh and novel combination of already existing elements or reshaping or rearranging the already known facts and principles are also the creative expression like the discovery of new formula in Mathematics.
- (4) **Creativity is Adventures and Open thinking:** Creativity is a departure from the stereotyped, rigid and closed thinking. It encourages and demands complete freedom to accept and express the multiplicity of responses, choices and lines of action.
- (5) **Creativity is a Means as well as an End in Itself:** Creativity as an urge inspires and persuades the individual to create something unique and thus acts as an impetus for expression. The creator experiences the warmth, happiness and satisfaction, which he receives through his creation. Thus creation is a source of happiness and reward in itself.
- (6) **Creativity Carries Ego Involvement:** One's style of functioning, philosophy of life and personality may be clearly reflected in one's creation be it a work of art or piece

of uniting etc. The creator takes pride in his creation and hence makes ego involved statements like “it is my creation,” “It is my idea” etc.

- (7) **Creativity has a wide scope:** Creative expression is not restricted by any limits or boundaries. Rather it covers all fields and activities of human life in any of which one is able to demonstrate creativity by expressing or producing a new idea or object.
- (8) **Creativity rests more on divergent thinking than on convergent thinking:** Divergent thinking involves multiple possible solution of a problem. The creative person is able to elicit as many responses which are diverse and unique as compared to the person who gives only one correct response, that is, the most appropriate and expected. So, in order to measure creativity such tests are being evolved which require divergent thinking for e.g. list many uses of a knife.
- (9) **Creativity cannot be separated from intelligence:** Thinking is involved both in an intelligent person and a creative person. And thinking cannot be entirely convergent or entirely divergent. So, a minimum level of thinking (convergent) or intelligence is also required and is involved in the creative process.
- (10) **Creativity and School Achievement are not correlated:** A person or a child is not able to reproduce the informational input the same which is expected *out* of him, on the other hand he is able to reproduce great output in comparison to low input, So, no significant relationship or correlation IS found between individual’s creative talent and school performance.
- (11) **Creativity and sociability are negatively correlated:** A creative person is more sensitive to the demand of a problem and less sensitive to the evaluation of his social environment. The creative individual is more inner than out oriented.
- (12) **Creativity and anxiety often go together:-** Creative people demonstrate an above average state of anxiety, but not with a disturbed personality. Their anxiety is due to their craving for the satisfaction of their creative urge or due to their slow rate of progress, made by them in attaining their creative motive. But creative individuals are able to keep their anxiety within manageable limits and direct it in to productive channels.
- (13) **Commitment towards problems:-** A creative person is aware of the problems present in his circumstances and makes every effort to find *out* new solutions of these problems. If the person is not committed towards the problem, he cannot think of different solutions of the problem.

- (14) **Dynamic thinking:-** The thinking of creative person changes according to new circumstances. He has more capacity of adjustment but this adjustment is sought through new combinations.
- (15) **Flexibility:-** An important characteristic of creativity is flexibility of thinking and behaviour. The creative person is always prepared to adopt new attitude, idea or behaviour. It is hence that he succeeds in finding out new solutions to problems.
- (16) **Curiosity:-** In order to achieve the above mentioned traits of creativity, the creative person should have sufficient curiosity. Curiosity leads to divergence in perception, thinking and behaviour.
- (17) **Harmony of abnormal and relevant thinking:-** According to Guilford creative children are those who accommodate with relevant and abnormal thinking through creative thinking, reasoning and imagination. They accept the challenge and give a creative reply to it.

Hence, creativity is the result of the combined effect of thinking, feeling, sensing and intuiting. All the functions of the human brain/mind system are involved at higher and higher levels when creativity occurs. These two viewpoints can be illustrated with the help of following diagrams.

INTELLIGENCE

Intelligence is not a thing or object but it is a way of acting in a situation. Generally speaking, alertness with regard to the actual situation of life is an index of intelligence. Cognitive faculties like observation, memory, imagination, perception and reasoning are also included in the meaning of intelligence. It also includes the capacity for solving practical problems of life. Intelligence consists of an individual's those mental or cognitive abilities which help him in solving his actual life problems and leading a happy and well contented life.

Intelligence and Creativity

The relationship between creativity and intelligence has been a matter of considerable debate. If the theoretical examination of the two is done critically, one must reach at the conclusion that the two are both originating from the same domain and have almost similar explanation in their theories and hence should have a close relationship with each other.

In 1930 Elizabeth Andrews did a study on preschool children and came to the conclusion that the relation between intelligence test and imagination test was near about zero. But other psychologists in their studies found a positive correlation ranging from .2 to .3

between intelligence and creativity. But Getzels and Jackson in their study found that scores of IQ and divergent thinking were not significantly correlated.

Taking a consolidated view of the researches conducted on this issue, we may conclude that although intelligence and the creativity component of one's personality can function independently, a certain minimum level of intelligence is a necessary pre-condition for successful creative expression.

But a person of below average mental ability like a moron or an idiot could be creative. But in actual life situation we hardly come across any such instances. Creativity can't be separated from intelligence. This is because thinking is neither purely divergent nor purely convergent and always has elements of both, which are simultaneously involved in the creative and intellectual process. It therefore, follows that when a person is considered to be creative, he has to have a minimum level of intelligence certainly above the average.

Chadha and Chandna (1990) found that there was a negative significant correlation between creativity and scholastic achievement when the effect of intelligence was partialled out. **Gakhar (2006)** observed that intelligence was found to be significantly and positive correlated with the mathematical creativity. Variable of mathematical achievement was also found to be significantly and positively correlated with the mathematical creativity home environment was also found to be positively correlated with the mathematical creativity. **Jabeen and Khan (2013)** study highlighted that in comparison to low achievers high achievers possess significantly high creativity potential, in comparison to low achievers, high achievers are significantly high in different areas of creativity, viz. fluency, flexibility and originality and also in comparison to low achievers high achievers possess significantly high self-concept. The study has also revealed that there is a positive and significant relationship between creativity and academic achievement and self-concept and academic achievement of high and low achiever groups. **Ghaffari, Sarmadi & Safari (2013)** showed that there was a significant relationship between creativity and emotional intelligence.

NEED OF THE STUDY

There is no denying the fact that 'creativity' does exist in all children and that it is unique in each individual. In some children, the creativity urge is strong enough to find expression. In others, it is under surface, waiting for an opportunity to disclose itself. As creativity is nourished, it thrives and flourishes; and as it is oppressed, it declines and withers. Therefore, the most crucial concern, today for schools has been explore the aspect of

creativity and how for it is being emphasised as part of schooling and in what ways does it contribute to creative expression among the students? It also requires an urgent attention to be paid to the harnessing of the qualities of creativity on the assumption that a learning society not only needs intellectually facile people but also, and more especially, creative and constructive people to attain the target of sustainable development not alone in the world of education but also in the making of a fast developing society. The primary function of education should be identify creative potentialities in children and to plan the educational curricular and programmes, in such a manner that creative abilities are developed among them and their talents are harnessed to the fullest possible extent. This is a challenging task which the teachers must take up for the progress of nation.

With this basic assumption, the need for a study to examine the relationship of intelligence with the creativity of children seems quite important. Hence the statement of the problem:

STATEMENT OF THE PROBLEM

A STUDY OF CREATIVE THINKING ABILITIES OF SENIOR SECONDARY SCHOOL STUDENTS IN RELATION TO INTELLIGENCE.

OBJECTIVES OF THE STUDY

1. To study and compare the creative thinking abilities of senior secondary school students having superior intelligence and low intelligence.
2. To study and compare the creative thinking abilities of senior secondary school students having Average intelligence and low intelligence.
3. To study and compare the creative thinking abilities of senior secondary school students having superior intelligence and average intelligence.

HYPOTHESIS OF THE STUDY

1. There is no significant difference in creative thinking abilities of senior secondary school students having superior intelligence and low intelligence.
2. There is no significant difference in creative thinking abilities of senior secondary school students having average intelligence and low intelligence.
3. There is no significant difference in creative thinking abilities of senior secondary school students having superior intelligence and average intelligence.

METHOD

In this study, descriptive research method has been used for the selection of the sample.

SAMPLE OF THE STUDY

The study aims at describing the creativity of senior secondary school students and some psychological characteristics of student. It therefore, requires that data to be collected from the concern categories of all students, who form the population of the study, on the basis of random sampling. In the present study, students of 4 Senior Secondary Schools situated in Jhajjar district of the state of Haryana formed the sample.

In the present study, the multi stage random sampling technique was used to select the subjects from the population. Jhajjar district was divided into four zones namely North, South, East and West. Out of each zone one school was picked up randomly, using the lottery technique. The study was conducted on four schools. From each school, approximately 40 students of XI and XIIth classes were selected randomly. In this way, 150 students formed the sample of the present study.

VARIOUS INVOLVED IN THE STUDY

A. Dependent Variable

In the present study, **Creative Thinking** is dependent variable.

B. Independent Variable

In the present study, **Intelligence** is the independent variable.

TOOLS USED

- Creativity Scale development by **Baquer Mehdi** (1985)
- General Mental Ability Test developed by **S.S. Jalota** (1976)

STATISTICAL TECHNIQUES USED

To determine the significance of difference between means of different groups, 't' test was applied.

RESULTS

The results of the study is given in following tables:

Table 1

Means, S.D.s and ‘t’ ratios of students having superior intelligence and low intelligence on creativity

Dimension of Creativity	Group	Number	Mean	S.D.	‘t’ ratios	Level of Significance
Fluency	Superior intelligent	58	16.75	4.40	2.56	Significant at 0.05 level
	Low intelligent	66	14.71	4.45		
Flexibility	Superior intelligent	58	12.10	4.20	2.27	Significant at 0.05 level
	Low intelligent	66	10.42	4.02		
Originality	Superior intelligent	58	6.58	2.60	0.258	Not Significant
	Low intelligent	66	6.71	2.79		
Total creativity	Superior intelligent	58	35.48	9.44	1.88	Not Significant
	Low intelligent	66	32.16	10.03		

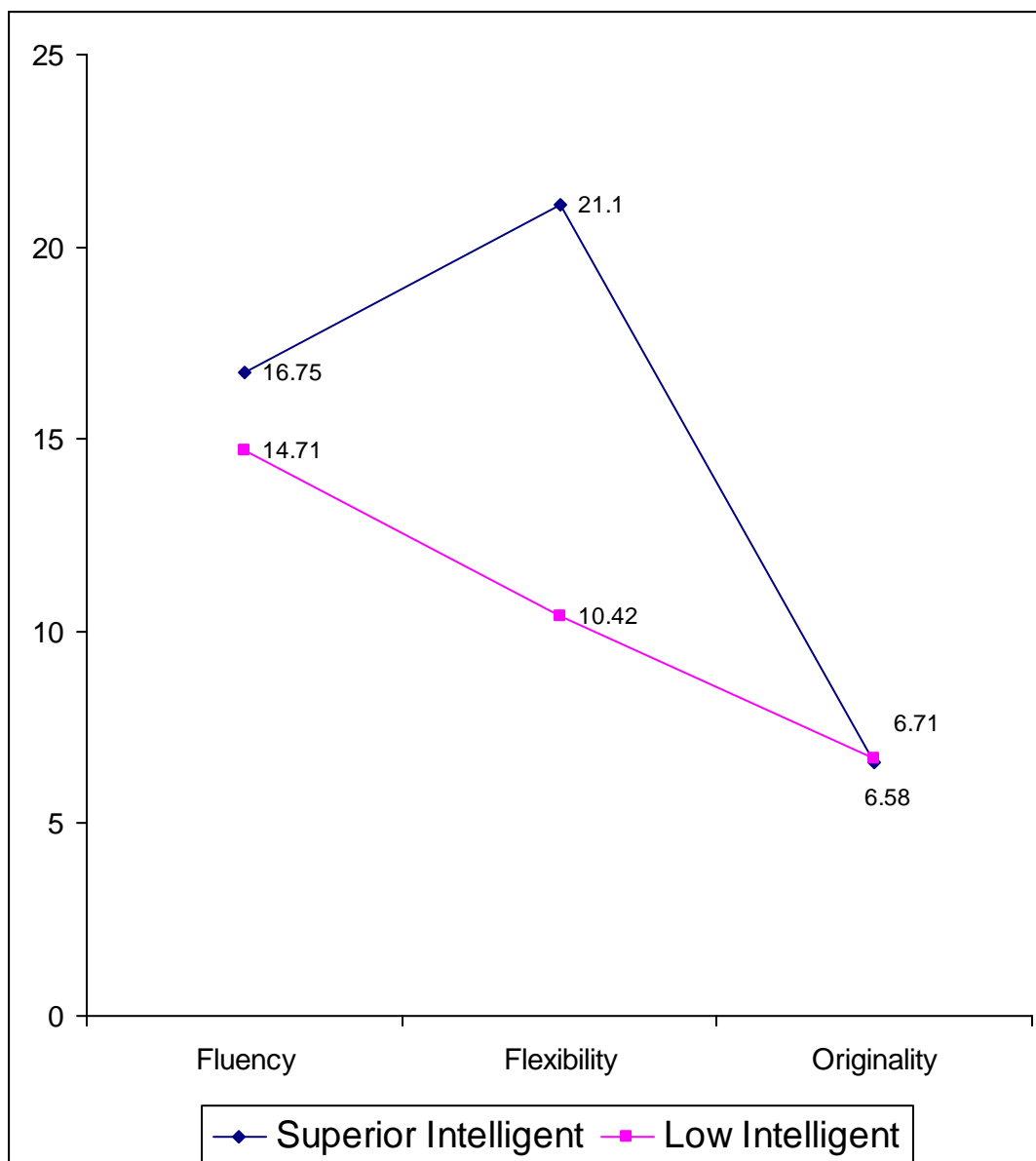


Fig. 1: Means scores of students having superior intelligence and low intelligence on creativity

Table 1 shows Means, S.D.s and ‘t’ ratios of superior intelligent students and low intelligent students. In the first dimension of creativity i.e. fluency, the mean score of superior intelligent students ($M = 16.75 \pm 4.40$) which is higher than the mean score ($M = 14.71 \pm 4.45$) of low intelligent students. The ‘t’ ratio is 2.56 which is significant at 0.05 level. It indicates that superior intelligent students have more fluency than low intelligent students.

In the second dimension of creativity i.e. flexibility, the mean score is ($M = 12.10 \pm 4.20$) which is higher than the means score ($M = 10.42 \pm 4.02$) of low intelligent students. The 't' ratio is 2.27 which is significant at 0.05 level. It indicates that superior intelligent students have more flexibility than the low intelligent students.

In the third dimension of creativity i.e. originality the mean score of superior intelligent students is ($M = 6.58 \pm 2.60$) which is less than the mean score ($M = 6.71 \pm 2.79$) of low intelligent students. The 't' ratio is 0.258 which is not significant at any level. It shows that superior intelligent students and low intelligent students do not differ significantly on originality.

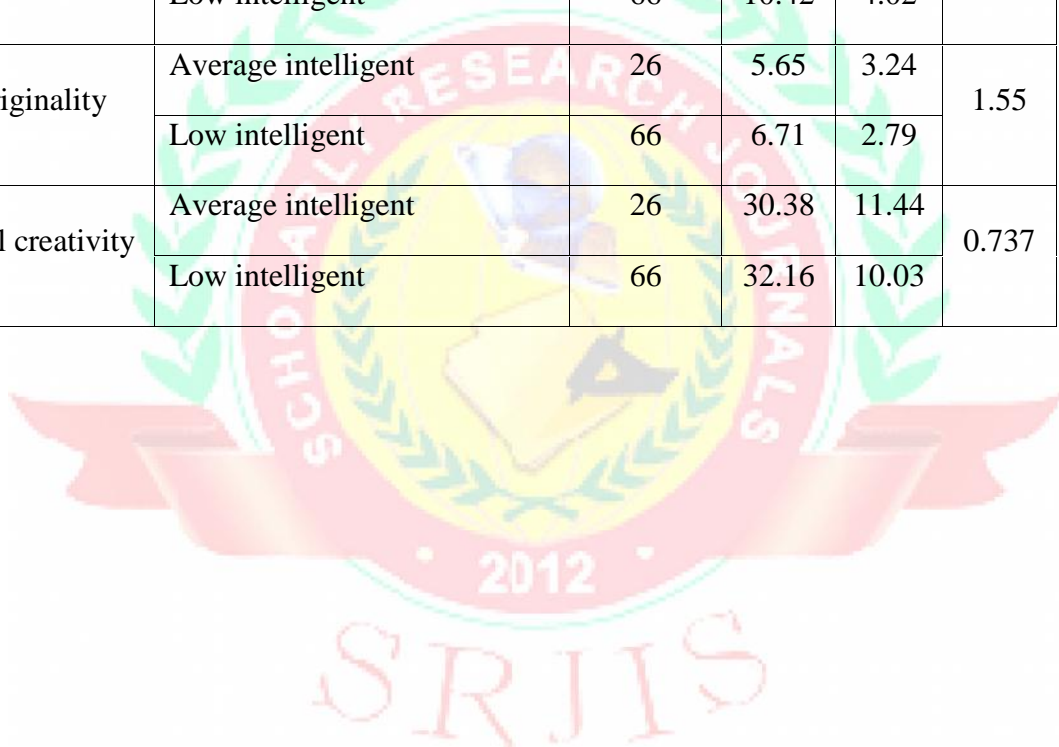
On creativity, the mean score of superior intelligent students is ($M = 35.48 \pm 9.44$) which is higher than the mean score ($M = 32.16 \pm 10.03$) of low intelligent students. It shows that superior intelligent students and low intelligent students do not differ significantly on creativity.

The results indicate that there is a significant difference among superior intelligent students on flexibility and fluency. However, no significant difference was observed on originality and creativity among these groups. Hence the hypothesis that "There is no significant difference in creative thinking abilities of senior secondary school students having superior intelligence and low intelligence" has been partly accepted.

Table 2

Means, S.D.s and ‘t’ ratios of students having average intelligence and low intelligence on creativity

Dimension of Creativity	Group	Number	Mean	S.D.	‘t’ ratios
Fluency	Average intelligent	26	15.07	5.87	0.322
	Low intelligent	66	14.71	4.45	
Flexibility	Average intelligent	26	9.92	3.74	0.548
	Low intelligent	66	10.42	4.02	
Originality	Average intelligent	26	5.65	3.24	1.55
	Low intelligent	66	6.71	2.79	
Total creativity	Average intelligent	26	30.38	11.44	0.737
	Low intelligent	66	32.16	10.03	



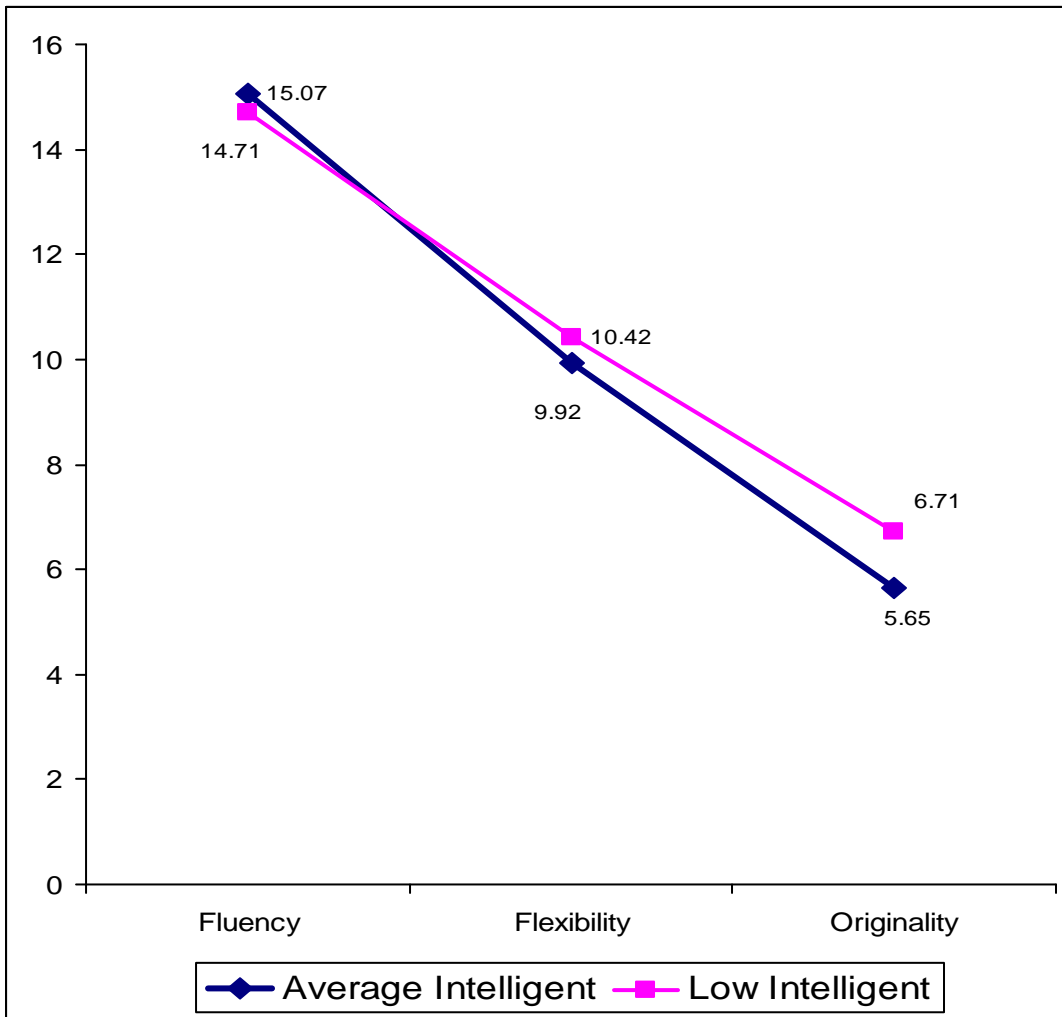


Fig. 2: Means scores of students having average intelligence and low intelligence on creativity

Interpretation

Table 4.2 shows Means, S.D.s and 't' ratios of average intelligent students and low intelligent students. In the first dimension of creativity i.e. fluency, the mean score of average intelligent students ($M = 15.07 \pm 5.87$) which is higher than the mean score ($M = 14.71 \pm 4.45$) of low intelligent students. The 't' ratio is 0.322 which is not significant at 0.05 level. It indicates that average intelligent students have more fluency than low intelligent students.

In the second dimension of creativity i.e. flexibility, the mean scores of average intelligent students is ($M = 9.92 \pm 3.74$) which is less than the mean scores ($M = 10.42 \pm 4.02$) of low intelligent students. The 't' ratio is 0.548 which is not significant at any level. It

indicates that students having Average intelligence and low intelligence do not differ significantly on flexibility.

In the third dimension of creativity i.e. originality the mean score of average intelligent students is ($M = 5.65 \pm 3.24$) which is less than the mean score ($M = 6.71 \pm 2.79$) of low intelligent students. The 't' ratio is 1.55 which is not significant at any level. It indicates that the students having average intelligence and low intelligence do not differ significantly on originality.

On creativity, the mean score of average intelligent students is ($M = 30.38 \pm 11.44$) which is less than the mean score ($M = 32.16 \pm 10.03$) of low intelligent students. The 't' ratio is 0.737 which is not significant at any level. It indicates that students having average intelligence and low intelligence do not differ significantly on creativity.

The results indicate that there is a significant difference among these groups of creativity. Hence the hypothesis that, "There is no significantly difference in creative thinking abilities of senior secondary school students having average intelligence and low intelligence" has been accepted.

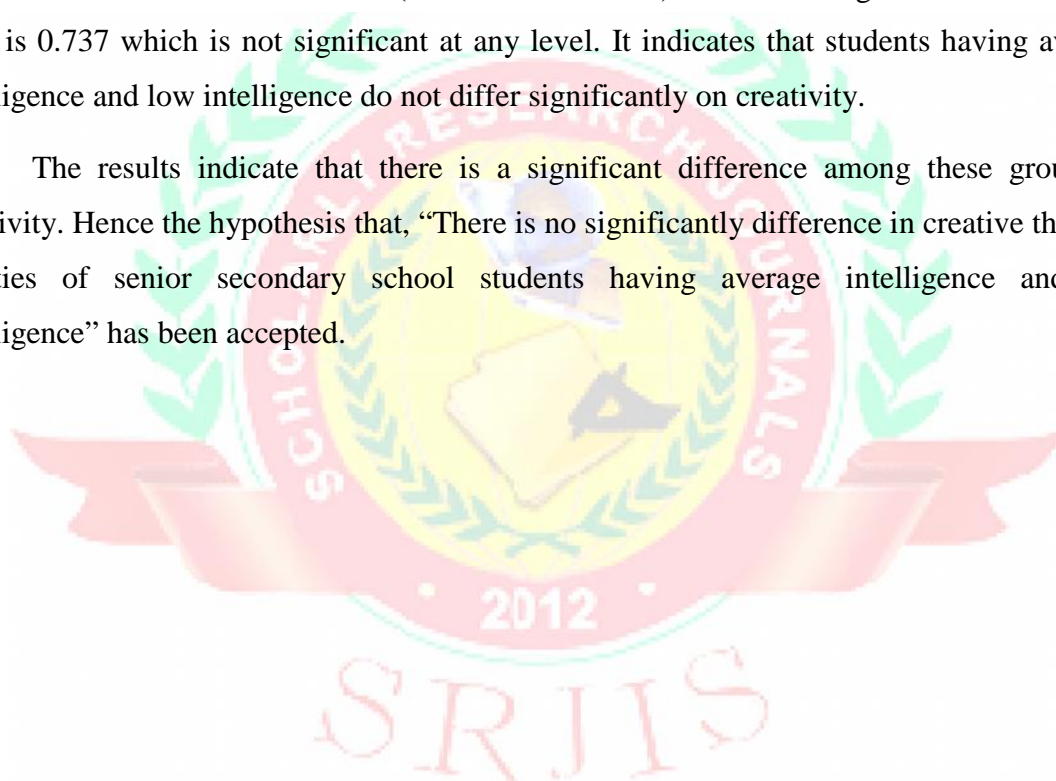


Table 3

Means, S.D.s and ‘t’ ratios of students having superior intelligence and average intelligence on creativity

Dimension of Creativity	Group	N	Mean	S.D.	‘t’ ratios	Level of Significance
Fluency	Superior intelligent	58	16.75	4.40	1.45	Not significant
	Average intelligent	26	15.07	5.87		
Flexibility	Superior intelligent	58	12.10	4.20	2.27	Significant at 0.05 level
	Average intelligent	26	9.92	3.74		
Originality	Superior intelligent	58	6.58	2.60	1.40	Not significant
	Average intelligent	26	5.65	3.24		
Total creativity	Superior intelligent	58	35.48	9.44	2.13	Significant at 0.05 level
	Average intelligent	26	30.38	11.44		

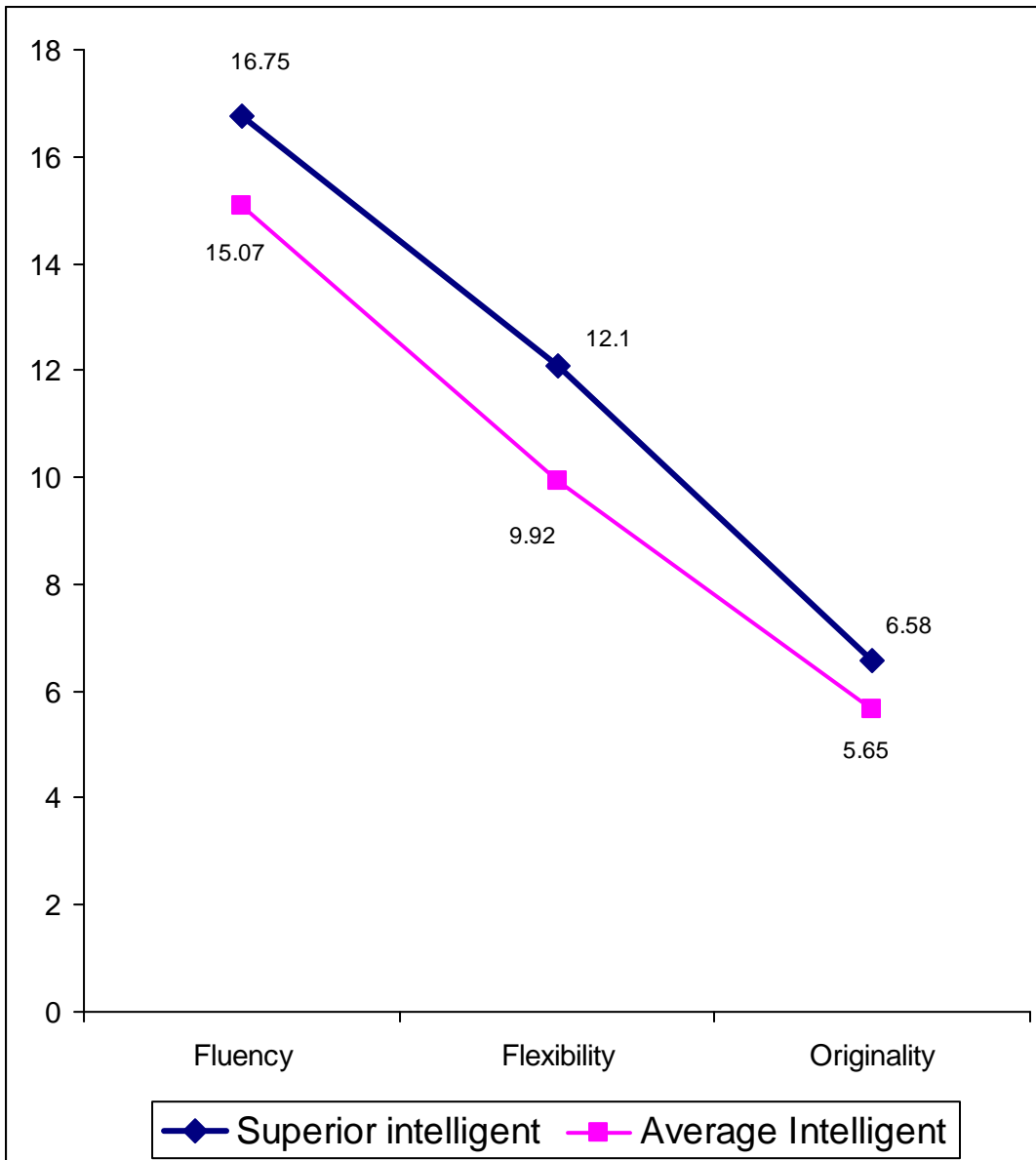


Fig. 3: Means scores of students having superior intelligence and average intelligence on creativity

Interpretation

Table 3 shows Means, S.D.s and 't' ratios of superior intelligent students and low intelligent students. In the first dimension of creativity i.e. fluency, the mean score of superior intelligent students is ($M = 16.75 \pm 4.40$) which is higher than the mean score ($M = 15.07 \pm 5.87$) of Average intelligent students. The 't' ratio is 1.45 which is not significant at any level.

It indicates that superior intelligent students and Average intelligent students do not differ significantly on Fluency.

In the second dimension of creativity i.e. flexibility, the mean score of superior intelligent students is ($M = 12.10 \pm 4.20$) which is higher than the means score ($M = 9.92 \pm 3.74$) of Average intelligent students. The 't' ratio is 2.27 which is significant at 0.05 level. It indicates that superior intelligent students and average intelligent students differ significantly on flexibility.

In the third dimension of creativity i.e. originality the mean scores of superior intelligent students is ($M = 6.58 \pm 2.60$) which is higher than the mean score ($M = 5.65 \pm 3.24$) of average intelligent students. The 't' ratio is 1.40 which is not significant at any level. It indicates that superior intelligent students and average intelligent students do not differ significantly on originality.

On creativity, the mean score of superior intelligent students is ($M = 35.48 \pm 9.44$) which is higher than the mean score ($M = 30.38 \pm 11.44$) of average intelligent students. The 't' ratio is 2.13 which is significant at 0.05 level. It indicates that the superior intelligent students and average intelligent students differ significantly on creativity.

The results indicate that there is a significantly difference between superior intelligent students and average intelligent students on flexibility and creativity. However, no significant difference was observed on fluency and originality. Hence the hypothesis that "There is no significant difference is creative thinking abilities of senior secondary school students having superior intelligence and average intelligence" has been partly accepted.

FINDINGS OF THE STUDY

5.1.1 Difference between creative thinking abilities of superior intelligent students and low intelligent students.

1. It was found that superior intelligent students and low intelligent students differ significantly on fluency superior intelligent students are higher fluency than the low intelligent students. Similarly, superior intelligent students and low intelligent students differ significantly on flexibility too. However, there is no significant difference found between superior intelligent students and low intelligent students

regarding originality and creativity. It shows that originality and creativity are equally distributed between superior intelligent students and low intelligent students.

2. It was found that there is no significant difference between Average intelligent students and low intelligence students regarding all dimensions of creativity. It shows that all dimensions of creativity are equally distributed between Average intelligent students and low intelligent students.
3. It was found that there is a significant difference between superior intelligent students regarding flexibility and creativity. It shows that superior intelligent students having more flexibility than Average intelligent students. However, there is no significant difference found superior intelligent students and Average intelligent students regarding fluency and originality. It shows that fluency and originality are equally distributed between superior intelligent students and average intelligent students.

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