

# RELATIONSHIP BETWEEN INTELLIGENCE AND CREATIVITY AMONG BOYS AND GIRLS OF SECONDARY LEVEL SCHOOLS IN BURDWAN DISTRICT, WEST BENGAL

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**ABSTRACT:** *The study of relationship between intelligence and creativity is a matter of concern since a long time. It is necessary to know whether intelligent people are creative or whether creative people should necessarily be intelligent. The measurement of intelligence quotient is done using Cattell's Culture Fair test and assessment of creativity, achievement test, and socio-economic status is done on basis of self-made standardized questionnaire. Some hypotheses are framed to find out the variation of intelligence and creativity with achievement test scores and socio-economic status of learners. It is found that no significant correlation exists between intelligence and creativity level of learners. Also, no correlation exists between intelligence level and socio-economic-status, intelligence and achievement score, creativity and socio-economic status, creativity and achievement scores among learners. The multiple correlations among different variable is not significant. That is, it is not necessary that learners with high intelligence level should necessarily score good marks in academic exams or should possess creative talents or belong to high socio-economic status background. The purpose of this study is to find out intelligent and creative talents, prevent them from getting wasted, form curriculum designs and new instructional methods to utilize these talents so that it can be used for betterment of life-standards of individuals as well as for betterment of the society.*

**KeyWords:** *Intelligence, creativity, achievement, socio-economic status, correlation, test of significance, graphical representation etc.*

## A. Introduction :

Various branches of study arose in the earlier years of twentieth century related to intelligence and creativity. According to Binet and Henri, 1896, "creativity is an aspect of intelligence". The relation between intelligence and creativity is a matter of importance. Studies are conducted to identify intelligence and creative talents of learners and to find out whether intelligent persons are necessarily creative or not, that is, whether they share a common cognitive basis or not. Based on these findings, curriculum designs and instructional procedures can be framed to nourish creative talents of learners and provide a good environment to manifest intellectual activities of learners.

Intelligence is crucial for all learning and education. It is essential to understand the intellectual ability of learners by assessing it through use of available tools and techniques. According to Woodrow, "Intelligence is an acquiring capacity". It is the ability of individuals to acquire knowledge from experiences and act accordingly to deal effectively with the environment. Intelligence is innate capacity of individuals or normal mental ability that is inherited to some extent, and also needs a proper environment to get nourished and nurtured. Usually, intelligence can be measured by level of difficult task a person can do. The term intelligence quotient (IQ) is used to assess intelligence level of learners. It is the ratio of mental age and chronological age of learners multiplied by 100. More is the IQ value, the learner is more intellect. If IQ value is above normal range, the learner is gifted and if IQ value is less than normal range, the learner is considered to be mentally retarded.

Creative attributes includes independent attitudes and diverse range of interests. The concept of retaining creative engagement of learners is essential since creative persons are of utmost importance for technological, aesthetic, cultural and educational progress of nation. According to Congdon P.H.(1980), 'creativity is the key to educational in the fullest sense and to the solution to the mankind's most serious problems". Creative persons generally have the following characteristics – strong motivation, endurance ,intellectual curiosity,deep commitment ,independence in thought and action, strong sense of self , openness of mind, high-sensitivity, strong desire for self-realization and high capacity of emotional involvement in their investigations. Responses to divergent thinking tasks (that is, fluency, flexibility, originality and

elaboration) are evaluated to assess creativity of learners.

### B. Objectives of the study:

The present study includes the following objectives-

- To assess the level of intelligence of learners.
- To assess creative talents of learners.
- To find out the relationship between intelligence and creativity of the learners.
- To find out the variation of intelligence, creativity and academic achievement of the learners among male and female students belonging to rural and urban area of Burdwan District.
- To find out the multiple correlation of intelligence, creativity and socio-economic status and achievement test scores of the learners.

### C. Experimental procedure :

Creativity is a complex human phenomena, it is difficult to analyse and inaccessible to precise measurement. Assessment of creative talents of learners is a difficult task. In the present study, relevant measuring tools and statistical techniques are used to measure intelligence and creativity and to find the relationship between them. In the present study, schools are selected, located at urban area and rural area of Burdwan district. 50 samples are collected using random sampling procedure. Intelligence is assessed using Cattell's Culture Fair Test, Scale II. As a validated creativity test was not readily available, the investigator developed a standardized tool in the form of questionnaire for detection of creativity skills of students in the present study. Multiple choice items are selected for creativity test as this type was considered better than other objective type items. Another self-made standardized achievement test questionnaire on intelligence and creativity is prepared based on learner's knowledge, understanding, application and skill to determine the extent of learner's achievement after getting knowledge about intelligence and creativity. Item analysis, reliability and validity test is done where a few selected items is eliminated. Split-half method is used to estimate reliability of the test. Self-made standardised and revised socio-economic status measurement scale prepared by researcher has been used to measure socio-economic status of learners. Pearson's product moment formula is used to determine the coefficient correlation of the variables used in the study. Graphical representation of intelligence and creativity scores is done and t-test is applied to know about what extent correlations are significant.

The standardised norms of the scale which is used to categorise high, average and low IQ level of learners is given in Table 1

**Table 1**

IQ range	Classification
120 and above	High
80-119	Average
<=79	Low

The standardized norms used to categorise high, average and low creativity content of learners is given in Table 2

**Table 2**

Range of scores	Level of scores
>=58	High
33 - 57	Average
<= 32	Low

### D. Analysis and interpretation of data :

On basis of the above categorisation of intelligence and creativity scores, pie-chart is drawn to find out the percentage of learners who possess high, average and low intelligence and creativity content. The categorisations of scores are shown in figure 1 and 2 below-

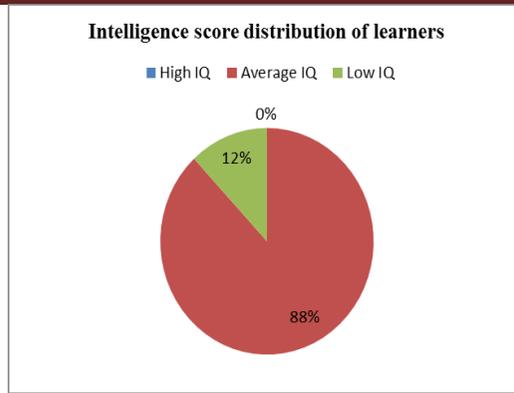


Figure 1

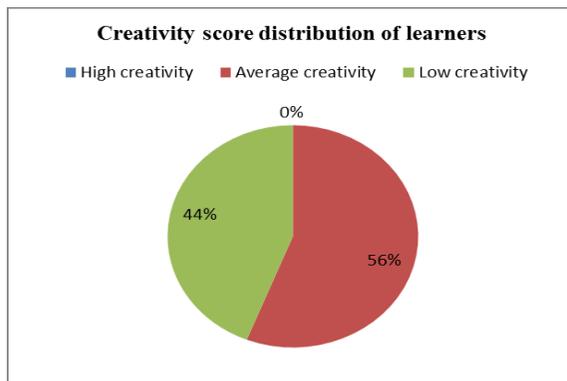


Figure 2

The above score distribution shows that most of the students have average level of intelligence. There are no such learners whose IQ value is high. Also, there are no such learners who are highly creative. This shows that there are almost no learners who are highly creative as well as highly intelligent. To overcome these deficiencies, there should be provisions in School curriculum for nourishment of manifestation of intellectual behaviour and creative talents and prevent them from getting wasted.

**The following hypothesis are framed in the present study and analysis and interpretation of data is done-**

**Hypothesis H<sub>0</sub>1 :**

There is no significant relationship between intelligence and creativity among male students studying in Secondary Schools of Burdwan district.

The intelligence and creativity score distribution among male students is figure 3 —

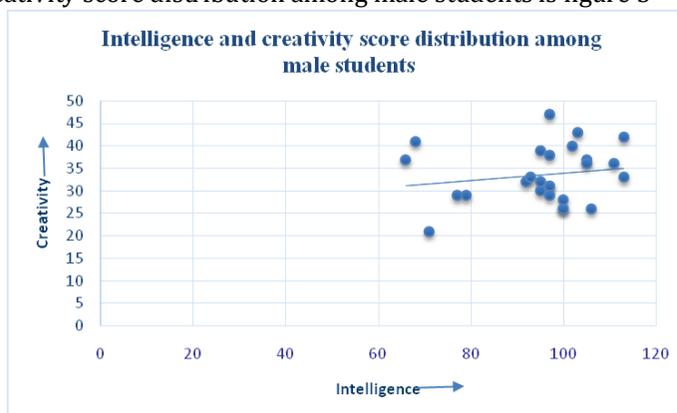


Figure 3

The slope of the obtained trend line is positive. The scores are scattered away from the trend line and not close to each other. This shows that IQ and creativity scores of different learners are different. Learners with same values of intelligence quotient do not possess always same value of creativity and vice versa. The table 3, given below, gives the correlation between intelligence and creativity scores among male students studying in Secondary Schools of Burdwan district-

Table 3

Total number of male students	Mean IQ of male students	Mean creativity scores of male students	Coefficient of correlation between intelligence and creativity scores	t-value
26	95.15	33.53	0.174	0.86

The obtained t-value is less than the critical value of  $t'$  ( $0.86 < 2.80$ ) for 24 degrees of freedom at 0.01 level of significance. So, the correlation between intelligence and creativity scores among male students studying in Secondary Schools of Burdwan district is insignificant. Thus, hypothesis H01 is retained.

**Hypothesis H<sub>0</sub>2 :**

There is no significant relationship between intelligence and creativity among female students studying in Secondary Schools of Burdwan district.

The intelligence and creativity score distribution among female students is shown below (figure 4) —

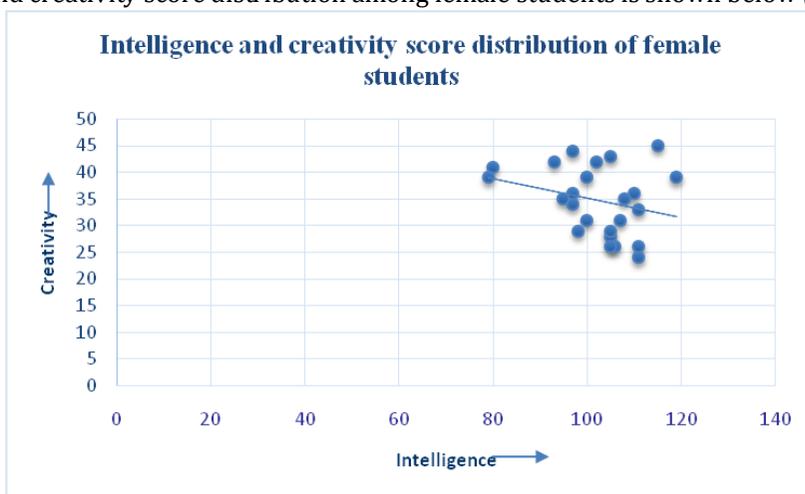


Figure 4

The slope of the obtained trend line is negative. The scores are scattered away from the trend line and not close to each other. This shows that IQ and creativity scores of different learners are different. Learners with same values of intelligence quotient do not possess always same value of creativity and vice versa.

The table given below denotes the correlation between intelligence and creativity scores among female students studying in Secondary Schools of Burdwan district-

Table 4

Total number of female students	Mean IQ of female students	Mean creativity scores of female students	Coefficient of correlation between intelligence and creativity scores	t-value
24	102.33	34.70	-0.279	-1.36

The coefficient of correlation value is negative. The obtained t-value is less than the critical value of  $t'$  ( $-1.36 < -2.82$ ) for 22 degrees of freedom at 0.01 level of significance. So, null hypothesis is retained. Thus, it can be said that no significant correlation between intelligence and creativity exists among female students studying in secondary Schools of Burdwan District, West Bengal.

**Hypothesis H<sub>0</sub>3 :**

There is no significant relationship between intelligence and creativity among students belonging to rural area of Burdwan district.

The intelligence and creativity score distribution among students of rural area is shown below (Figure 5) —

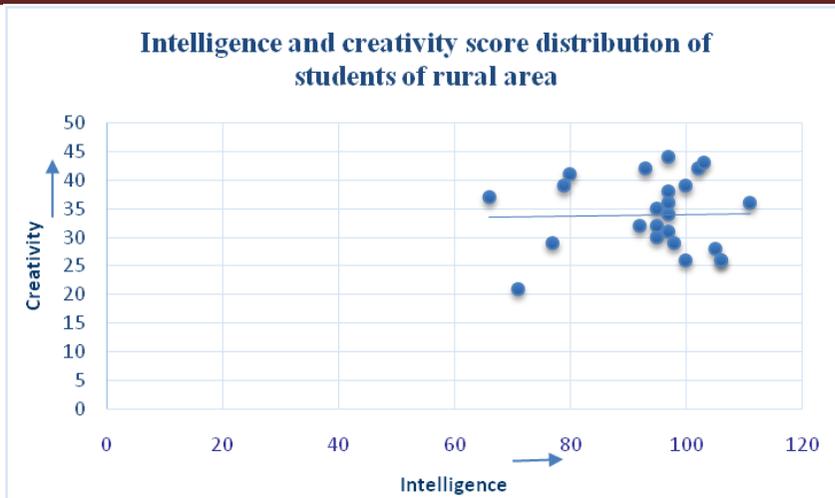


Figure 5

The slope of the obtained trend line is positive. The scores are scattered away from the trend line and not close to each other. This shows that IQ and creativity scores of different learners are different. Learners with same values of intelligence quotient do not possess always same value of creativity and vice versa. The table given below gives the correlation between intelligence and creativity scores among students of rural area studying in Secondary Schools of Burdwan district-

Table 5

Total number of students	Mean of IQ	Mean of creativity scores	Coefficient of correlation between intelligence and creativity scores	t-value
24	94.12	34	0.024	0.118

The obtained t-value is less than the critical value of  $t'$  ( $0.118 < 2.82$ ) for 22 degrees of freedom at 0.01 level of significance. So, hypothesis H03 is retained. Thus, it can be said that no significant correlation between intelligence and creativity exists among rural students studying in secondary Schools of Burdwan District, West Bengal.

**Hypothesis H<sub>0</sub>4:**

There is no significant relationship between intelligence and creativity among students belonging to urban area of Burdwan district.

The intelligence and creativity score distribution among students of urban area is shown below (Figure 6)—

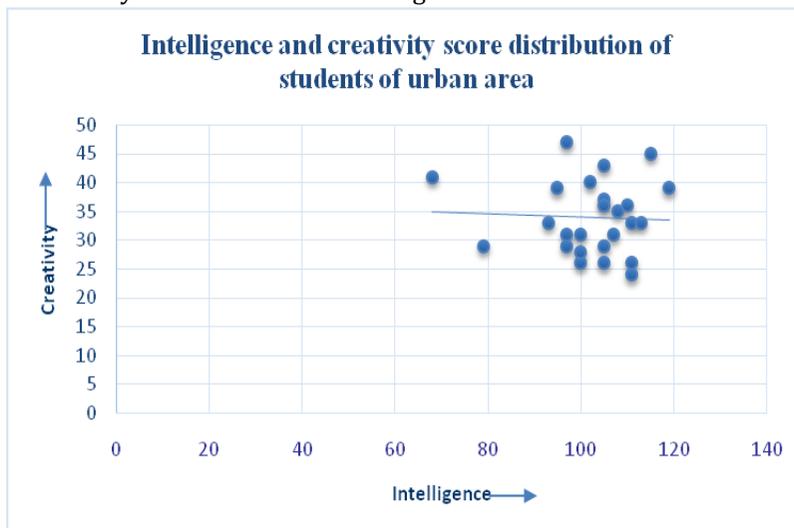


Figure 6

The slope of the obtained trend line is negative. The scores are scattered away from the trend line and not close to each other. This shows that IQ and creativity scores of different learners are different. Learners with same values of intelligence quotient do not possess always same value of creativity and vice versa. The table given below gives the correlation between intelligence and creativity scores among students of urban area studying in Secondary Schools of Burdwan district-

**Table 6**

Total number of students	Mean of IQ	Mean of creativity scores	Coefficient of correlation between intelligence and creativity scores	t-value
26	102.73	33.88	-0.049	-0.24

The obtained t-value is less than the critical value of t' (-0.24 < -2.80) for 24 degrees of freedom at 0.01 level of significance. So, hypothesis H04 is retained. Thus, it can be said that no significant correlation exists between intelligence and creativity among students studying in urban area of Secondary Schools of Burdwan District, West Bengal

**Hypothesis H<sub>0</sub>5:**

There is no significant relationship between intelligence and creativity of all students studying in Secondary Schools of Burdwan district.

The intelligence and creativity score distribution among all students are shown below(Figure 7) —

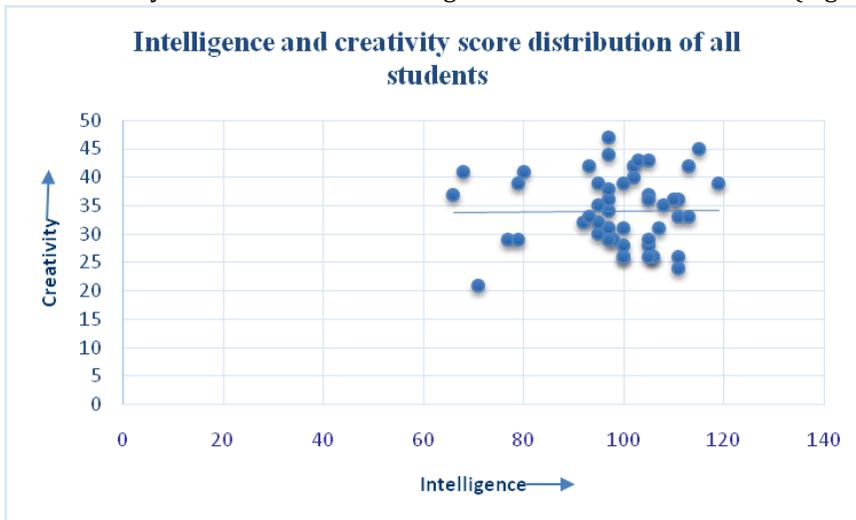


Figure 7

The slope of the obtained trend line is slightly positive. Some scores are close to trend line whereas some scores are scattered away from the trend line and not close to each other. This shows that IQ and creativity scores of different learners are different. Learners with same values of intelligence quotient do not possess always same value of creativity and vice versa.

The table given below gives the correlation between intelligence and creativity scores among all students studying in Secondary Schools of Burdwan district-

**Table 7**

Total number of students	Mean of IQ value	Mean of creativity scores	Coefficient of correlation between IQ and creativity	t-value
50	98.6	34.10	0.016	0.11

The obtained t-value is less than the critical value of t' (0.11 < 2.67) for 48 degrees of freedom at 0.01 level of significance. So, hypothesis H05 is retained. Thus, it can be said that no significant correlation exists between intelligence and creativity among all students studying in Secondary Schools of Burdwan District, West Bengal.

**Hypothesis H<sub>0</sub>6:**

There is no significant relationship between intelligence and achievement scores of students studying in Secondary Schools of Burdwan district.

The table 8 gives the correlation between intelligence and achievement test scores among all students studying in Secondary Schools of Burdwan district-

**Table 8**

Total number of students	Mean of IQ	Mean of achievement test scores	Coefficient of correlation between intelligence and achievement test scores	t-value
50	98.6	44.98	0.034	0.237

The obtained t-value is less than the critical value of  $t'$  ( $0.237 < 2.67$ ) for 48 degrees of freedom at 0.01 level of significance. So, hypothesis H06 is retained. Thus, it can be said that no significant correlation exists between intelligence and achievement test scores among all students studying in Secondary Schools of Burdwan District, West Bengal

**Hypothesis H<sub>0</sub>7 :**

There is no significant relationship between intelligence and socio-economic status of students studying in Secondary Schools of Burdwan district.

The table 9, given below.gives the correlation between intelligence and socio-economic status scores among all students studying in Secondary Schools of Burdwan district-

**Table 9**

Total number of students	Mean of IQ	Mean of socio-economic status scores	Coefficient of correlation between intelligence and socio-economic status scores	t-value
50	98.6	10.98	0.281	2.042

The obtained t-value is less than the critical value of  $t'$  ( $2.042 < 2.67$ ) for 48 degrees of freedom at 0.01 level of significance. So, hypothesis H07 is retained. Thus, it can be said that no significant correlation exists between intelligence and socio-economic status scores among all students studying in Secondary Schools of Burdwan District, West Bengal.

**Hypothesis H<sub>0</sub>8 :**

There is no significant relationship between creativity and achievement score of students studying in Secondary Schools of Burdwan district.

The table 10, given below gives the correlation between creativity and achievement test scores among all students studying in Secondary Schools of Burdwan district-

**Table 10**

Total number of students	Mean of creativity scores	Mean of achievement test scores	Coefficient of correlation between creativity and achievement test scores	t-value
50	34.1	44.98	-0.062	-0.424

The obtained coefficient of correlation is negative. The obtained t-value is less than the critical value of  $t'$  ( $-0.424 < -2.67$ ) for 48 degrees of freedom at 0.01 level of significance. So, hypothesis H08 is retained. Thus, it can be said that no significant correlation exists between creativity and achievement test scores among all students studying in Secondary Schools of Burdwan District, West Bengal.

**Hypothesis H<sub>0</sub>9 :**

There is no significant relationship between creativity and socio-economic status score of students studying in Secondary Schools of Burdwan district.

The table 11 given below gives the correlation between creativity and socio-economic status scores among all students studying in Secondary Schools of Burdwan district-

**Table 11**

Total number of students	Mean of creativity scores	Mean of socio-economic status scores	Coefficient of correlation between creativity and socio-economic status scores	t-value
50	34.1	10.98	-0.036	-0.251

The obtained coefficient of correlation is negative. The obtained t-value is less than the critical value of  $t'$  ( $-0.251 < -2.67$ ) for 48 degrees of freedom at 0.01 level of significance. So, hypothesis H09 is retained. Thus, it can be said that no significant correlation exists between creativity and achievement test scores among all

students studying in Secondary Schools of Burdwan District, West Bengal.

**Hypothesis H<sub>0</sub>10 :**

There is no significant multiple relationship between intelligence, creativity and achievement score of students studying in Secondary Schools of Burdwan district.

The table 12, given below provides the data required to find out coefficient of multiple correlation and its test of significance :

**Table 12**

Coefficient of multiple correlation	Total number of observations	Degrees of freedom for smaller mean square	Degrees of freedom for greater mean square	F-value
0.071	50	47	2	0.12

Our obtained F-value is less than critical value of 'F' ( $0.12 < 5.11$ ) for 47 degrees of freedom of smaller mean square and 2 degrees of freedom for greater mean square variation at 0.01 level of significance. So, hypothesis H<sub>0</sub>10 is retained. That is, no significant multiple correlation exists between intelligence, creativity and achievement score of students studying in Secondary Schools of Burdwan district.

**Hypothesis H<sub>0</sub>11 :** There is no significant multiple relationship between intelligence, creativity achievement and socio-economic status score of students studying in Secondary Schools of Burdwan district.

The table 13, given below provides the data required to find out coefficient of multiple correlation and its test of significance :

**Table 13**

Coefficient of multiple correlation	Total number of observations	Degrees of freedom for smaller mean square	Degrees of freedom for greater mean square	F-value
0.11	50	47	2	0.19

Our obtained F-value is less than critical value of 'F' ( $0.19 < 5.11$ ) for 47 degrees of freedom of smaller mean square and 2 degrees of freedom for greater mean square variation at 0.01 level of significance. So, hypothesis H<sub>0</sub>11 is retained. That is, no significant multiple correlation exists between intelligence, creativity, achievement and socio-economic status score of students studying in Secondary Schools of Burdwan district.

**E. Significance of the study :**

Individuals are born in different social, economic and political circumstances. Each individual is different from one another. Learners are individually different and possess different talents of doing work using their convergent and divergent thinking abilities. The present study thus focuses to assess learner's creative talents and level of intelligence and to find out their interrelation. Some studies show that intelligent students are highly creative whereas other studies explain that it is not essential for all creative students to be highly intelligent. This study is done to get a concrete conclusion about the relationship between intelligence and creativity.

The variation of intelligence, creativity and academic achievement is also found out in the study. This is done to find out whether intelligent, creative learners are academically good or not or whether only intelligence is sufficient to obtain good academic record or whether creative learners necessarily need to score high in academic examinations. The variation of intelligence, creativity and socio-economic status is also found out in the study. Some studies say that highly creative students tended to come from somewhat less well educated homes

experience greater independence from their mothers. This is done to find out whether socio-economic status affects intelligence and creativity level of learners or not.

Thinking is always influenced by creativity and intellectual ability of a person. The present teaching learning system focuses on development of child centered curriculum .i.e. a curriculum based on need and necessity of child. It is the responsibility of all parents and teachers to support creative development of learners on basis of their intelligence level. Curriculum in Schools can be framed on the basis of individual cognitive abilities of learners. Curriculum should be such that it can facilitate to explore creative abilities of learners. This can help to nourish individual talents of learners so that they can show their excellence in particular fields and contribute in diverse areas for progress of society and in turn nation.

**F. Result and discussion :**

In the present study correlation between intelligence and creativity is determined using Pearson's product moment correlation method. It is found, in general, no such direct relation exists between intelligence and creativity among all students taken as samples. Also, no significant relationship exists between intelligence, creativity and other variables such as socio-economic status and achievement test scores considered individually. Multiple correlation is insignificant when all the variable's relationship are taken together. But, from these observations only, it is difficult to conclude a generalized concept or rule regarding this phenomena. This is because, there are different extraneous variables that affect the estimation of IQ value and creativity scores of learners. The family background, cultural background, level of education of family members, generation of learners, means of livelihood of family of learners are important factors that enhance or constraint intellect intellectual and creative talents of learners. A learner belonging to low socio-economic status may be highly creative as creative arts such as painting, drawing, making earthened pots, carpet designs etc. is his means of livelihood. He may or may not be intelligent persons. A third generation learner whose parents and grand-parents are highly educated and well established in society, generally have IQ above average level since genes are the suppliers of characteristics, an individual generally possess. In our present study, though we find no such specific significant relationship between intelligence and creativity, more research work is required to get more specific results and conclusions regarding this relationship taking into consideration many other variables, different categories of learners in different situations and learning environment.

**G. Conclusion :**

Very little research work has been carried out in India which can confirm the existence of significant relationship between intelligence and creativity and other variables. Our present study has been conducted among male and female students of Schools located in rural and urban areas of Burdwan District. It concludes that no significant relationship is found between intelligence and creativity. From this study, it is verified that it is not essential that an intelligent person should surely be creative or a creative person should necessarily have a high level of intelligence. It is also found that children who are intelligent, may or may not get good academic achievement scores. Also, level of intelligence of learners is not correlated to the socio-economic status where he or she belongs. Creativity scores are not related to socio-economic status of learners i.e. learners belonging to high, moderate or low socio-economic status may or may not be creative or intelligent. Also, it is not a necessary condition, that creative learners should be good in academic achievement. In some cases it is found that learners belonging to low socio-economic status may possess good creative skills whereas learners from high or average socio-economic status group may or may not score well in creativity test questionnaire. The multiple correlation coefficient among intelligence, creativity and achievement test scores, as well as multiple correlation coefficient among intelligence, creativity, achievement test scores and socio-economic status scores is not significant i.e. high value in one variable is not affected by high or low variation of values of other variables and vice-versa. According to Maria Montessori,

**“Early childhood education is the key to the betterment of society”**

In order to impart education in proper way, learners should be classified and guided on basis of their high, average and low intellectual capacities as well as creative talents separately so that they can utilize their abilities to the full extent, make use of their knowledge to earn their livelihood, and in turn, contribute something for welfare of our society. Further research work should be continued to establish and confirm the relation between intelligence and creativity and many other variables in different experimental setup and in different cultures to obtain generalized idea of the findings.

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