Creativity and Academic Performance of Primary School Children

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Abstract  
The purpose of the study was to examine the relationship between creativity and academic achievement of fifth grade primary school children. The study was delimited in the Quetta city. Population of the study was consisted of 5th graders of Urdu Medium Government High Schools. A total number of two hundred and fifty seven children (68% boys and 32% girls) were selected through purposive sampling technique. Creativity Rating Checklist (CRC) was developed after reviewing various studies on creativity to identify the key attributes of creative children. Final instrument was administered through personal contact. Academic performance of students was investigated through test-papers of the academic subjects developed by the District Education Authority Quetta for 5th grade promotion examination. The subject-wise and aggregate scores acquired by the students were used to measure their academic achievement. A pilot study was also conducted on 5th grade students of Government High School Jinnah Town, Quetta. The data was analyzed in the form of Pearson Correlation. The findings of the study indicated significant positive relationship between creativity and academic achievement of students. It was recommended that more longitudinal studies may be conducted on a larger sample with different other social and socio-economic variables i.e. income level, age, gender differences, teaching methodologies, class environment etc.

Keywords: Creativity, Academic Performance, Primary Schools, Pakistan

I. Introduction  
In Psychology, creativity is elusively defined, but the very nature of creativity makes it unique to be defined from various perspectives. Different psychologists have their own perspective regarding creativity and it depends upon who is defining it. Hook
and Tegano (2002) defined creativity as "an interpersonal and intrapersonal process by which original, high-quality and genuinely significant products are developed" (p.1). Anwar (2000) is of view that a creative person thinks in a novel way to see and do things. Basically, there are four components of creativity: a) creative person has fluency in generating ideas, b) there is flexibility, c) creative person possess originality in his/her ideas, and d) he/she have elaboration of ideas. Edwards (2001) says that creativity engages "the openness to ideas and the willingness to encourage the exploration of the unknown, even if not easily manageable" (p. 222).

Wallach (1970) has elaborated that creativity can be fostered by establishing a strong base of skills/knowledge, using strong analogies, fostering curiosity, and encouraging positive affect. Sternberg (1988) has enhanced Wallach’s ideas and said that there is variety of opinions regarding creativity and its nature, however, a general agreement is that a creative person can apply past experiences in a novel way. Anwar (2000) is of the view that creative thinking is a process of creating inspirations that can in some way be applied to the world. He further says that creative thinking can be due to heredity, but others have said that it can be the product of environment and may be built up through activities and teaching strategies. The purpose of creative thinking is to arouse inquisitiveness and endorse divergence. Creative thinking is a process of making something innovative, original or new. It demands some skills i.e. flexibility, novelty, associative thinking, smoothness, and imagery. Gough (1991) says that nowadays, thinking skills are considered most important for educated persons to be able to deal with a swiftly changing world.

There may be different variables associated with creativity i.e. intelligence, heredity, etc. Different researches have explored it with academic achievement Chan and Chan (2007). Some of them found that creativity was related to academic achievement. Some studies found no or less relationship of creativity with academic achievement. Ai (1999) says that the quest of investigating creativity and academic performance dates back to the 1960s, when Getzels conducted a research and revealed the results of academic achievement and creativity of school children in 1962. Craft (2005) is of the view that in the late 1990s creativity in education has been globally viewed pertinent in ways never perceived before.

In a study conducted by Rempaul, Winston et al (1984) added other two variables (self-concept and teachers’ expectations) with creativity and academic performance of native children in a Northern Monitoba School. The study revealed positive relationship among teacher expectations, self-concept and academic performance but little positive correlation between creativity and academic achievement. In the later years, Ai (1999) conducted a study on creativity and academic achievement, the purpose was to see the relation between different aspects of creativity academic achievement in different subject areas. The study also aimed to explore the gender difference in creativity and academic achievement in different subjects. The sample consisted of students from 68 schools from the Basque County, Spain. Total sample of 2,264 students (38% boys and 62% girls) was selected through random sampling technique. Three creativity batteries were administered on sample as research instruments. Opinions of teachers were also solicited to rate students' creativity. Students 'self-report of their achievement in six subject areas (Natural science, Spanish, Basque, English, social science, and Mathematics) was
operationalized as academic achievement. The results of teachers’ rating indicated correlation of creativity with academic achievement for both boys and girls. The results on three creativity measures indicated that creativity was hardly related to academic achievement. Olatoye, Akintunde and Ogunsanya (2010) conducted a study on relationship between students’ creativity and academic achievement in terms of students’ CGPA scores. Data was collected through Nicolas Holt Creativity Test (NHCT) and Student CGPA Information Format (SCIF). Sample consisted of 235 HNDII business administration students of Polytechnics in the South Western States of Nigeria. Random sampling technique was employed for sample selection. There was a very low negative insignificant relationship between creativity and CGPA scores ($r=0.004$, $p>0.05$). Thus, the higher the students’ creativity, the lower the CGPA score.

Several studies indicated correlation of creativity with academic achievement Chan and Chan (2007). In an intensive research conducted by Torrance (1962) reported that those elementary school and graduate students who were highly intelligent and highly creative exhibited high academic achievement. In the same year, another study was conducted by Getzel and Jackson (1962) who used standardized achievement tests to investigate the relationship among creativity, academic performance and intelligence. They reported that the academic performance of highly creative and highly intelligent students was good on these tests. In the later years, Trivedi and Bhargava (2010) conducted a study on a sample of 240 students (120 male and 120 female ages 15 to 17 years) from Senior Secondary schools of Jodhpur city to investigate the correlation between academic achievement and creativity. To measure the level of creativity, Passi’s Tests of Creativity (PTC) was administered on subjects. Previous examination results were taken as academic achievement of students. The results revealed gender differences on creativity on the basis of high and low achiever grouping. Correlation was found between academic achievement and creativity; however, gender impact was less on creativity as compared with academic achievement. Cicirelli and Victor (2012) represented their investigation with reference to correlation between creativity and IQ as they influence achievement; and IQ thresholds where creativity affects achievement and where IQ itself has no further impact. The sample was consisted of 609 6th graders whose IQ ranged from 70-162. The study used a factorial design with 8 levels of IQ (CTMM) and 3 levels of creativity (Minnesota Tests of Creative Thinking). For separate analyses of variance, Gates Basic Reading Tests and the California Tests of Arithmetic and Language were used as measures of achievement. The results revealed weak relationship between creativity and achievement as compared with some previous studies on the same issue. Anwar at al. (2012) conducted a survey on 256 secondary school students to find out the relationship between creative thinking and academic achievements. Sample was selected through random table. Torrance Tests of Creative Thinking (TTCT) was employed to gauge creative capability of students on four elements. Data was analyzed in Pearson Correlation and one-way ANOVA. Results disclosed significant correlation between creative potential and students’ academic performance.

### II. Problem Statement

A multiple factors may be held responsible for rapid decline in quality education in Pakistan. They include ineffective pedagogy, poor teaching competence, obsolete assessment methods and non-conducive classroom environment etc. Innovative methods of teaching are required to be introduced to arouse curiosity and to develop divergent
thinking among children. Instructional process should provide for the establishment of classroom climate which encourages the emergence of children's natural creativity. The most important from a practical point of view is that how creativity can be fostered and encouraged among the children. What can educational institutions do to foster creativity? Decade of researches on this question has been conducted. In this regard, the present study was focused to investigate the relationship between creativity and academic achievement of 5th grade primary level students in Baluchistan, Pakistan.

Objectives:
Objective of the study was to determine the relationship between creativity and academic achievement.

Hypothesis:
H0: There will be no relationship between creativity and academic achievement.
H1: There will be a significant relationship between creativity and academic achievement.

Definition of Terms
- Creativity:
  Hook and Tegano (2002) defined creativity as "an interpersonal and intrapersonal process by which original, high-quality and genuinely significant products are developed" (p.1).
- Academic Achievement:
  Academic achievement is defined by Crow and Crow (1969) as the extent to which a learner is profiting from instructions in a given area of learning i.e., achievement is reflected by the extent to which skill and knowledge has been imparted to him.

III. Methodology
- Population:
  Population of the study was 5th grade students of Urdu Medium Government Primary Schools in Quetta city. Pakistan.
- Sample:
  Sample consisted of 257 students of 5th grade. Out of this sample, 173 were male students and 84 were female students (10 to 12 years age) from the following schools:
  1. Lady Sundamon Government Girls High School, Patel Road Quetta.
  2. Government Boys High School, Killi Shekhan, Arbab Karam Khan Road Quetta.
  About 80% students belonged from lower middle-class socioeconomic status families. Sample was selected through purposive sampling technique.
- Research Instrument:
  Various researchers on creativity and academic achievement were evaluated to categorize key characteristics of creative children. These recognized characteristics were conversed operationalized and defined. Based on their operational definitions, the
instrument of Creativity Rating Checklist (CRC) was developed. The CRC comprised twenty items, measuring the characteristics of creative children (assertiveness, aspiration, appropriateness, conformity, conventional, endurance, elaboration, fluency, flexibility, self-confidence, self-reliance, self-centered, spontaneity, venturesome, inventive ideas, imaginative, insight, novelty). The class teachers were asked to evaluate students on each item, contained in this instrument (CRC), according to a 5-point scale, with choices ranging from 1 (Very Low) to 5 (Very High). The choices were assigned score of 1, 2, 3, 4, 5 to very low, low, moderate, high and very high respectively.

The District Education Authority (DEA), Quetta conducts 5th grade promotion examinations. The researchers obtained the test-paper of five subjects (Urdu, Mathematics, Social Studies, Science and Islamiat) set for 5th grade promotion examination by the DEA, Quetta. These test-papers were used to assess academic achievement of the 5th grade children. The subject-wise and aggregate marks obtained by the students were used to measure their academic achievement.

- **Pilot Testing:**
  A pilot testing was done on 49 students of 5th class from Government High School, Jinnah Town Quetta. A team of five teachers of the 5th grade of the school was selected and trained to assist the researchers to administer the research instrument on students. The subject teachers assisted in providing academic achievement test in the class room. The pilot testing identified recommendations/modifications in the instrument which were adequately addressed by the researchers.

- **Data Collection Procedures:**
  The researchers organized a one-week workshop on creativity and five 5th class Incharge-teachers were trained (03 males and 02 female teachers). It was kept in mind that these teachers are teaching as Incharge since last ten months. The purpose and use of Creativity Rating Checklist (CRC) was clarified to the teachers. The teachers rated their students. They individually filled out CRC each student of their 5th class. The researchers assessed academic achievement of the students in an academic session which held by the end of November every year. The students were examined in each subject (Mathematics, Urdu, Islamiat, Science and Social Studies) in the prescribed examination. After seeking the permission, the researchers along with three teachers of the school invigilated the test. The researchers also evaluated the answer transcripts of the students. The subject-wise and aggregate scores achieved by each student were computed in percentage to measure their academic success.

- **Data Analysis:**
  Data was analyzed in regression analysis and Pearson Correlation in SPSS (version 16.0 for Windows).
IV. Results

Table 1: Correlation between Creativity and Academic Achievement

<table>
<thead>
<tr>
<th></th>
<th>Creativity</th>
<th>Mathematics</th>
<th>Urdu</th>
<th>Islamiat</th>
<th>Science</th>
<th>Social Study</th>
<th>Total Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creativity</td>
<td>1</td>
<td>0.605</td>
<td>0.548</td>
<td>0.554</td>
<td>0.470</td>
<td>0.572</td>
<td>0.665</td>
</tr>
<tr>
<td>Mathematics</td>
<td>1</td>
<td>0.552</td>
<td>0.483</td>
<td>0.369</td>
<td>0.493</td>
<td>0.493</td>
<td>0.784</td>
</tr>
<tr>
<td>Urdu</td>
<td>1</td>
<td>0.638</td>
<td>0.608</td>
<td>0.690</td>
<td>0.821</td>
<td>0.690</td>
<td>0.821</td>
</tr>
<tr>
<td>Islamiat</td>
<td>1</td>
<td>0.638</td>
<td>0.663</td>
<td>0.807</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science</td>
<td>1</td>
<td>0.675</td>
<td></td>
<td>0.753</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Study</td>
<td>1</td>
<td>0.675</td>
<td></td>
<td>0.753</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Marks</td>
<td>1</td>
<td>0.675</td>
<td></td>
<td>0.753</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pearson's coefficient of correlation between creativity and achievement in mathematics is 0.605 and is significant at 99 percent confidence level. There is not only positive correlation between creativity and achievement in mathematics but also the value of Pearson's coefficient is very high. This indicates that the students who are more creative, they are also high in achievement of mathematics.

Pearson's coefficient correlation between creativity and achievement in Urdu is 0.548 which is significant at 99 percent confidence level. This reflects that the children, who are more creative, are also high on achievement in Urdu.

The value of correlation-coefficient 0.554 which is significant at 99% confidence level shows that there exists positive relationship between creativity and Islamiat. This points out that higher the creativity, higher the achievement in Islamiat and lower the creativity, lower the achievement in Islamiat.

The coefficient of correlation between creativity and achievement in Science is positive i.e., 0.470 and significant at 99% confidence level. This shows that those who have got more creativity performs high in Science and those who are less creative perform low in Science.

The relationship between creativity and achievement in social studies is positive as it is evident from the correlation coefficient which is 0.572 and is significant at 99% confidence level. Based on the value of correlation coefficient, one can conclude that those who are more creative are also high in achievement of Social Studies.

As can be seen from the table, all correlations among creativity and academic achievement in the objects-mathematics, Urdu, Islamiat, science and social study, as well as in aggregate are positive and significant at 99% confidence level. Comparing all the coefficients of correlation between creativity and academic achievement in the subjects, the highest correlation is found between creativity and achievement in mathematics i.e., 0.605. The lowest correlation is between creativity and science i.e., 0.470. The correlation between creativity and overall academic achievements i.e., 0.665 is higher.
than the correlation between creativity and mathematics i.e., 0.605.

Creativity and overall achievement in all subjects of education are not only positively related but also highly correlated as it is evident from the value of Pearson's coefficient correlation i.e., 0.665 which is significant at 99% confidence level. This reflects that the students who are creative are also high on over all achievement in academic.

Table 2: Coefficient of Regression and Coefficient of Determination for Creativity with Academic Achievement in the Various Subjects

<table>
<thead>
<tr>
<th>Subject</th>
<th>Coefficient of regression</th>
<th>Coefficient of determination</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
<td>1.461</td>
<td>0.371</td>
<td>0.000</td>
</tr>
<tr>
<td>Urdu</td>
<td>0.702</td>
<td>0.314</td>
<td>0.000</td>
</tr>
<tr>
<td>Islamiat</td>
<td>0.840</td>
<td>0.307</td>
<td>0.000</td>
</tr>
<tr>
<td>Science</td>
<td>0.532</td>
<td>0.221</td>
<td>0.000</td>
</tr>
<tr>
<td>Social Study</td>
<td>0.789</td>
<td>0.340</td>
<td>0.000</td>
</tr>
<tr>
<td>Total Marks</td>
<td>4.425</td>
<td>0.437</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**Mathematics and Creativity:** Creativity leads to positive change in mathematics. It is evident from the value of coefficient of regression which is 1.461 and is significant at 0.000 levels. The value of R² is 0.371 which means that creativity explains only 37 percent of the variation in achievement in mathematics in this study and the remaining 63 percent variation is to be explained by some other variables.

**Urdu and Creativity:** The coefficient of regression is equal to 0.702 which is significant at 0.000 levels. This means that creativity leads to positive change in achievement in Urdu. The value of coefficient of determination R² is 0.314 which means that 32% of the variation in achievement in Urdu is explained by creativity and the rest of 68% variation is to be explained by some other variables.

**Islamiat and Creativity:** The coefficient of regression 0.840 significant at 0.000 level, shows that creativity contributes positive change in achievement in Islamiat. The value of R² is equal to 0.307 which means that creativity explains 30 percent variance in achievement in Islamiat is unexplained and 70 percent variance in Islamiat is unexplained.

**Science and Creativity:** The value of coefficient regression 0.532 indicates that creativity leads to positive change in achievement in science. Twenty two percent variations in achievement in science can be explained by creativity and the balance 78% variance can be explained by other variables as the coefficient of determination R² is equal to 0.221.

**Social Study & Creativity:** The coefficient of regression is 0.789 which is significant at 0.000 level. This reflects that creativity has got positive impact on
achievement in social study. Creativity explains thirty four percent variance in achievement in social study as the value of $R^2$ is equal to 0.340. Other variable may be considered to explain the rest of sixty six percent variance in achievement in social study.

**Overall academic achievement & Creativity:** The coefficient of regression is equal to 4.425 which is significant at 0.000 level. This indicates that creativity leads to positive change in overall academic achievement. The value of $R^2$ is equal to 0.437 which means that 44% variation in overall academic achievement can be explained by creativity. The remaining 66% variance in achievement can be explained by some other variables.

V. Conclusions

Based on the findings of this study, the followings conclusions could be drawn:

i. Academic achievement is significantly related to creativity.

ii. There is found to be a positive relationship between creativity and achievement in each individual subject of education that is Mathematics, Urdu, Islamiat, Science and Social study. There appears to exist the highest positive relationship between creativity and achievement in mathematics whereas the relationship between creativity and science is found to be the lowest. Overall academic achievement and creativity are not only positively related to each other but are also highly correlated. Thus the students, who were more creative, were also high on achievement in each subject as well as on aggregate achievement in all subjects of education. Those who were less creative were poor in academic achievement.

iii. Creativity is found to be significant predictor of academic achievement. It has got positive impact on achievement in each subject as well on overall academic achievement. Variance in academic achievement is adequately explained by creativity.

VI. Recommendations

Following recommendations are offered on the basis of the conclusions of the study:

i. An intensive study may be conducted on a larger sample.

ii. Other variables may be explored with creativity.

iii. Psychological and social variables may be controlled and experimental studies may be conducted.

iv. Longitudinal studies may be conducted.

v. This study was aimed at for students of 5th grade of primary educational level. A replication study for secondary school students is desirable.

vi. The present study was confined to Urdu medium schools. A study should be conducted to compare students of Urdu medium and English medium schools with respect to creativity, social adjustment and academic achievement.

vii. The study revealed that substantial variance in academic achievement remains unexplained by creativity and social adjustment. A replication study
including some other variables such as class environment, teaching-methods, teacher’s qualification and experience is proposed.

References


