

Relationship of Creative Thinking with the Academic Achievements of Secondary School Students

Muhammad Nadeem Anwar, University of Sargodha, Pakistan. nadeem.anwar@uos.edu.pk

Muhammad Aness, Deputy Regional Director, AIOU Campus, Mirpur, AJK, Pakistan.

Asma Khizar, M.Phil Scholar, Department of Education, University of Sargodha, Pakistan.

Muhammad Naseer, M.Phil Scholar, Department of Education, University of Sargodha, Pakistan.

Gulam Muhammad, M.Phil Scholar, Department of Education, University of Sargodha, Pakistan.

Abstract- *The major purpose of the present study was to explore the relationship between Creative Thinking and Academic Achievements of Secondary School Students. The study was conducted using survey design method. A total number of 256 students participated in the study. Participants were selected using random table. Torrance Tests of Creative Thinking [TTCT] was used to measure creative potential of participants on four elements. Pearson Correlation and one-way ANOVA were used to verify hypothesis. Results revealed a statistically significant relationship between i) creative thinking and students' academic achievements on different aspects of test of creative thinking, ii) creative thinking and academic achievements. However, the relationship could be altered when different level of academic achievement is examined and when creative thinking measure employed. The study has considerable implications for education as a whole.*

Keywords: Creative thinking, academic achievement, Fluency, Flexibility, Originality, Elaboration

I. INTRODUCTION

At the beginning of the nineteenth century the verb 'to create' was rarely used. Now a day's creativity is increasingly gaining in importance. Professionals from all fields are becoming aware of its importance and the development of creative thinking. In education, creative thinking varies from completely new ideas to new ways of considering and solving problems. It has been said that creativity is not the ability to create out of nothing, but the ability to generate new ideas by combining, changing or reapplying existing ideas.

There is no one universally agreed definition of creativity but, by considering some of the writers in the field, it may be possible to replace the notion of 'knowing it when one sees it' with something more specific and perhaps more tangible [2]. Creativity may suggest multiple meanings, from complementary to suspiciousness, [3] suggests that creativity is linked to a state of consciousness where images appear. This

is usually a passive state where we are not trying to be creative but are receptive to experience and ideas. Van Hook [4] defined creativity as "an interpersonal and intrapersonal process by which original, high-quality and genuinely significant products are developed" (p. 1) [5] added that

creativity involves "the openness to ideas and the willingness to encourage the exploration of the unknown, even if not easily manageable" (p. 222). Creativity in education has been viewed since the late 1990s as globally relevant in ways never seen before [6]. Once thought of only as an artistic quality, creativity has become sought after by engineers, executives, and researchers [7], [8] quoted the Albert Einstein saying as, "We can't solve problems by using the same kind of thinking we used when we created them." Creative thinking has been categorized as something we are born with but others have said that it can be developed through activities and teaching strategies.

Creative thinking is a way of generating ideas that can in some way be applied to the world. This often involves problem solving utilizing particular aspects of intelligence, for example linguistic, mathematical and interpersonal [8]. Creative thinking involves creating something new or original. It involves the skills of flexibility, originality, fluency, imagery, associative thinking, attribute listing, metaphorical thinking and forced relationships. The aim of creative thinking is to stimulate curiosity and promote divergence. Gough [9] said, "Perhaps most importantly in today's information age, thinking skills are viewed as crucial for educated persons to cope with a rapidly changing world. Many educators believe that specific knowledge will not be as important to tomorrow's workers and citizens as the ability to learn and make sense of new information." Creative thinking is a novel way of seeing and doing things that is characterized by four components: (a) Fluency (generating ideas), (b) Flexibility (shifting perspectives easily), (c) Originality (consisting of something new), and (d) Elaboration (building on existing ideas) [8].

There have been numerous interesting studies made on creativity [10] including the impact that individual artistic techniques have on the development of creativity. Different studies [11],[12],[13] that searched for a correlation between intelligence and creativity indicated that all combinations were possible between intelligence and creativity. A research on academic achievement revealed that various variables had been identified as correlates of academic achievement

[14],[15],[16],[17],[18],[19],[20]. In this study, the effort was put to examine the relationship of creative thinking with achievement of secondary school students in Pakistan school culture. Therefore, the purpose of this study was to explore the relationships between creative thinking with academic achievements of secondary school students.

II. METHODS

This study was conducted using survey design method i-e the causal and non-experimental type of educational research.

A. Participants

A total of 256 students who belong to Gujranwala city and got through their Secondary School Examination from Board of Intermediate and Secondary Education, Gujranwala in spring 2011, Pakistan, were participated in the study. Participants were selected using random table.

B. Instrument

Creative thinking was assessed using an abbreviated version of the Torrance Tests of Creative Thinking (TTCT). The TTCT was developed within an educational context to test for creativity [7]. The TTCT was developed in 1966, and it has been re-normed four times: 1974, 1984, 1990 and 1998. The creativity test measure four elements of the creative thinking process: 1) fluency (the number of ideas produced), 2) flexibility (the different categories of ideas produced), 3) originality (the unusualness or the infrequency of an idea), 4) elaboration (embellishment and development of an idea).

It consists of two parts: i) a verbal section which requires a written response and ii) a figural section that requires drawing or figure completion responses. The verbal section consists of three activities: *Ask and Guess* task (given a picture of people in action (running) children are to write down questions, guess causes and guess consequences about what is occurring in the picture). *Product Improvement* task (given a picture of a toy animal, children are expected to list a number of ways they can change the toy and improve it). And the *Unusual Uses* tasks (given a number of many sized and shaped boxes, children are expected to list the number of creative ways they can use and make things from the boxes). The figural (drawing) section also included three activities: *Picture Construction* task (children were asked to draw the most interesting and creative picture, which included a "banana-shaped" paste-on as an integral part of their drawing). *Picture Completion* task (children are given incomplete figures which they complete as a finished drawing). *Circles* task (children are given a series of circles and are asked to make objects or pictures).

C. Hypothesis

The results were interpreted by investigating the following hypotheses:

Ho1: *There is no statistically significant relationship between creative thinking and academic*

achievements on different aspects of test of creative thinking.

Ho2: *There is no statistically significant relationship between creative thinking and academic achievements.*

D. Data Analysis

In addition to the descriptive statistics such as frequency, percentage, mean and standard deviation, Pearson Correlation and one-way ANOVA were used to verify the hypothesis.

III. FINDINGS

Table I shows the participants' marks from Secondary School Certificate in terms of their Creative thinking were Mean=80.95 for flexibility, Mean=80.03 for elaboration, Mean=79.55 for fluency, and Mean=79.18 for originality, respectively. Interestingly, flexibility outperformed elaboration, fluency, and originality, but the difference is not statistically significant [$F_{(4,252)} = .450, p > .05$].

TABLE I
PARTICIPANTS' ASPECTS OF CREATIVE THINKING AND MARKS
OBTAINED IN SECONDARY SCHOOL CERTIFICATE

ASPECTS OF CREATIVE THINKING	N	%AGE	MEAN	SD
FLUENCY	32	13	79.55	6.83
FLEXIBILITY	45	18	80.95	5.08
ORIGINALITY	92	36	79.18	7.26
ELABORATION	87	31	80.03	6.51
TOTAL	256	100	79.84	6.56

* Maximum points = 100

Table II reflects the relationship between the different aspects of creative thinking and academic achievement. The results indicate that the strongest relationship exists between fluency and academic achievement. ($r = 0.63, p < 0.01$).

TABLE II
PEARSON CORRELATION BETWEEN DIFFERENT ASPECTS OF
CREATIVE THINKING WITH ACADEMIC ACHIEVEMENT

DIFFERENT ASPECTS OF CREATIVE THINKING	ACADEMIC ACHIEVEMENT
FLUENCY	0.63 **
FLEXIBILITY	0.43**
ORIGINALITY	0.49**
ELABORATION	0.26*

* $p < 0.05$ ** $p < 0.01$

There was also a significant correlation between the flexibility and academic achievement ($r = 0.43, p < 0.01$). Significant relationship was also found between originality and academic achievement ($r = 0.49, p < 0.01$). Furthermore, there was less among remaining aspects but significant relationship also found between elaboration and academic achievement ($r = 0.26, p < 0.05$). Therefore, every aspect of

creative thinking is predicting a relationship with academic achievement. Hence, *the first null hypothesis is rejected.*

Table III depicts that the value of Pearson correlation between scores on creative thinking test and marks obtained in secondary school certificate was found to be 0.704 that is greater than the table value 0.2172. Therefore, the null hypothesis is rejected and it was found that relationship existed between creative thinking and academic achievements. Hence, *the second null hypothesis is rejected*

TABLE III
PEARSON CORRELATION BETWEEN CREATIVE THINKING AND ACADEMIC ACHIEVEMENT

VARIABLES	N	P
TEST OF CREATIVE THINKING ACADEMIC ACHIEVEMENTS	256	0.704*

* Significant at .05 level: table value= 0.2172

IV. DISCUSSION

The findings of the present study appear to be supported by the majority of earlier studies in the literature linking creativity with academic performance. Previous research has inconclusive results about the relationship between creativity and academic achievement. Some research suggests that creativity is positively related to academic achievement [21], [22], [23]. Research has also suggests that academic achievement can be predicted through creativity testing [24], [25], [26], [27], [28], [29]. In a study of underachieving (UA) and overachieving (OA) elementary school students who were assessed as being gifted, Karnes [30] found that creativity was related significantly to educational achievement. In addition, OA students had higher creative ability than did UA students. According to Ai [31] the relationship between creativity and academic achievement is consistent with each other.

To conclude, this study provides empirical support for the relationship between different aspects of creative thinking and academic achievement. However, the relationship could be altered when different level of academic achievement is examined and when creative thinking measure employed. However, before considering the implications of this study, it is important to consider the size of the sample, the environmental setup and some other variables may be playing some role for such findings. Therefore, care should be taken when generalizing from the results.

V. IMPLICATIONS

It was considered that education was merely informative, and child was being treated as a pitcher into which teacher poured gallons of empirical facts. Perhaps, most importantly in today's information age, creative thinking is viewed as crucial for educated persons to cope with a rapidly changing

world. Many educators believe that specific knowledge will not be as important to tomorrow's workers and citizens as the ability to learn and make sense of new information. Findings clearly support the importance of instruction in creative thinking skills to increase the probability of academic success for all students, especially those having low grades or I-Q level. The study revealed results important to educators, program designers, evaluators, and counselors who are aiming and targeting the preparation of students. Can we consider cognitive and learning styles with the demands in our schools, especially to problem-solving tasks and so on? The issues of transfer of creative thinking skills across domains and the use of authentic tasks were also discussed. However, further study is needed. That is, the transfer of creativity skills problem may be facilitated through the use of more authentic tasks in our schools.

An implication for teacher is to acknowledge the wide range of creative thinking found within our students. Here, teacher attitudes are also of concern that is how can teachers' negative attitudes toward creative students be changed? Teachers should recognize creative thinking as an important and find ways to enhance and promote the development in their students. Much of the research indicated that the idealist educational approach is the more propitious method for the development of creativity. Torrance [32] as a pioneer in creativity research concluded that too much pressure on children to learn academic subjects tends to prematurely stifle fantasy. He also set forth five principles that teachers should follow to develop creativity: 1) treat children's questions and ideas with respect; 2) treat unusual ideas with respect; 3) show children their ideas have value; 4) provide opportunities for self initiated learning; and 5) provide periods of non-evaluated practice.

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