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A correlational study of lateral thinking ability and academic achievement of secondary school students

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Abstract
The educational process should be aimed at developing creative abilities among children. This can be achieved by acquainting students by teachers and parents the real meaning of the creative process and the ways and means of developing and nurturing creative thinking abilities. Edward de Bono who invented the term "*lateral thinking*" in 1967 is the pioneer of lateral thinking. Lateral thinking is concerned with the generation of new ideas. Academic achievement means "The performance of the students in the examination''. Achievements is a progress that a learner makes in learning often measured by other standardized or teacher made tests. In this study, the researcher made an attempt to study lateral thinking ability and academic achievement of secondary school students of Vijayapur district. Data for the study were collected using self-made Lateral Thinking Ability Test (LTAT). The researcher used stratified random sampling technique. The sample consisted of 600 students in which 300 rural and 300 urban area. For analyzing the data correlation analysis, Karl Pearson's correlation coefficient were used as the statistical techniques. Findings show that significant and positive correlation was observed between academic achievement and lateral thinking ability scores of students of secondary schools.

Keywords: lateral thinking, academic achievement

Introduction
In today's information age, creative thinking skills are viewed as crucial for students to cope with a rapidly changing world. If adolescents are to function effectively in this age of massive discontinuities and accelerating change, they must be equipped with lifelong learning and creative thinking skills necessary to acquire and process information. The world is becoming more and more competitive. Quality of performance has become the key factor for personal progress. Parents' desire that their children climb the ladder of performance as high level as possible. This desire for a high level of achievement puts a lot of pressure on students, teachers, and schools and in general the education system itself. In fact, it appears as if the whole system of education revolves round the Academic achievement of students, though various other outcomes are also expected from the system. Thus a lot of time and effort of the schools are used for helping students to achieve better in their scholastic endeavours.
Edward de Bono who invented the term "*lateral thinking*" in 1967 is the pioneer of lateral thinking. Lateral thinking is concerned with the generation of new ideas. Liberation from old ideas and the stimulation of new ones are twin aspects of lateral thinking. Lateral thinking is a creative skill from which all people can benefit enormously.

Lateral Thinking
Lateral thinking is solving a problem through an indirect and creative approach, using reasoning that is not immediately obvious and involving ideas that may be not obtainable by using only traditional step-by-step logic. Dr. de Bono speaks about two types of thinking -- Vertical thinking and Lateral thinking. Vertical thinking is high probability thinking, whereas lateral thinking is low probability thinking. In the former type, the thinker selects the most logical solution possible. This will be the one that is the most used and the most tested one. For example, suppose you want to cut a cake or hardboiled egg into two. Using a knife or a sharp blade to cut it is the most probable and most logical solution. But there are other less probable ways: for example, you can use a twine. The former is an example of a solution arrived at by Vertical thinking while the later is an example of a solution arrived at using Lateral thinking.
Lateral thinking is closely related to insight, creativity and humour. All four processes have the same basis. But whereas insight, creativity and humour can only be prayed for, lateral thinking is more deliberate process. It is a definite way of using the mind as logical thinking- but in a very different way. Lateral Thinking is concerned with the generation of new ideas. There is a curious notion that new ideas have to do with technical invention. This is a very minor aspect of the matter. New ideas are the stuff of change and progress in every field from science to art, from politics to personal happiness. The need for Lateral Thinking arises from the limitations of the behavior of mind as a self-maximizing memory system.

Academic Achievement
Academic achievement means "The performance of the students in the examination.'' Achievements is a progress that a learner makes in learning often measured by other standardized or teacher made tests. Therefore, academic achievements is knowledge acquired and skills developed in school subject generally indicated by marks obtained in tests. There are number of studies in the area of academic achievements. These studies examine the relationship between academic achievement and a large number of factors in the cognitive, environment and affective domain including self-

concept, persistence level of aspiration, need for achievement, adjustment, behavior problems, fear anxiety, emotion, drive, values, memory, reasoning & interest. Academic achievement refers to the level of schooling one has successfully completed and the ability to attain success in one's studies. Students achieve satisfactory or superior level of academic performance as they progress through and complete their college experience. For example, students avoid academic portion or qualify for academic honours.

Need and Importance of the study

Lateral Thinking is intended for use both at home and at school. At school, the emphasis has traditionally always been on vertical thinking which is effective but incomplete. This selective type of thinking needs to be supplemented with the generative qualities of creative thinking. Lateral Thinking is the process of using information to bring about creativity and insight restructuring. Lateral thinking can be learned, practiced and used. It is possible to acquire skill in it just as it is possible to acquire skill in school subjects.

Today the students are being trained mostly in vertical thinking. The teachers are not aware of the importance of developing Lateral Thinking ability in students. The students face many challenge situations well searching for jobs and in their work places. If the students are trained in Lateral Thinking form of creative thinking, the students can achieve something significant in their life. Accordingly, this study assumes greater importance in today's educational field. To develop Lateral Thinking ability a teacher should know some co-relation like how Lateral Thinking ability is related to academic achievement of students. This study assumes that Lateral Thinking is the genesis of creativity, which happens to be the goal of present day education. Class teaching in our country, has unfortunately been convergent in nature. The emphasis is therefore to be laid on Lateral Thinking. Academic Achievement have relationship with Lateral Thinking form the main basis of this study.

Objectives

1. To study the Lateral Thinking ability of secondary school students in relation to their academic achievement.
2. To study the Lateral Thinking ability of rural secondary school students in relation to their academic achievement.
3. To study the Lateral Thinking ability of urban secondary school students in relation to their academic achievement.

Hypotheses

1. There is no significant relationship between Lateral Thinking ability and academic achievement of secondary school students.
2. There is no significant relationship between Lateral Thinking ability and academic achievement of rural students.
3. There is no significant relationship between Lateral Thinking ability and academic achievement of urban students.

Method and Sample

Descriptive Survey method of research was used in the present study to collect the data. The sample for investigation was drawn from various secondary school students of Vijaypur district students. A total of 600 sample were selected by stratified random sampling method. The sample includes 300 rural and 300 urban students were selected. For analyzing the data correlation analysis, Karl Pearson's correlation coefficient technique were used as the statistical techniques in the SPSS package.

Tools Used

For the purpose of data collection, Lateral Thinking Ability Test (LTAT) tool was designed and standardized by the investigator. For validating the LTAT Item discrimination index and Item difficulty index was calculated. The test-retest method was used to establish the reliability co-efficient for the tool which was 0.9758. Thus, a total of 60 items with 5 dimensions namely analogies, fractionation, generation of alternatives, brainstorming and dominate ideas were selected for the final tool. For ascertaining Academic Achievement of students school annual examination scores were used.

Data Collection Procedure

For collecting the data, the researcher visited the selected secondary schools with the tools for students. The investigator took the help of friends and teachers of the schools for collecting data. To ensure quick and complete return of the tool, it was administered personally to the target population with prior permission of the heads of the institutions.

Result and Findings

Hypothesis 1

There is no significant relationship between academic achievement and lateral thinking ability and its dimension scores (i.e. analogies, fractionation, generation of alternatives, brain storming and dominant ideas) of students of secondary schools.

To achieve this hypothesis, the Karl Pearson's correlation coefficient technique has been applied and the results are presented in the following table:

Table 1: Results of correlation coefficient between academic achievement and lateral thinking ability and its dimension scores of students of secondary schools

Variables		Correlation coefficient between academic achievement scores of students of secondary schools with		
		r-value	t-value	p-value
Lateral thinking ability		0.1985	4.9534	0.0001*
Dimensions	1) Analogies	0.1538	3.8074	0.0002*
	2) Fractionation	0.1536	3.8023	0.0002*
	3) Generation of alternatives	0.0560	1.3709	0.1709
	4) Brain storming	0.1354	3.3411	0.0009*
	5) Dominant ideas	0.0195	0.4763	0.6340

*p<0.05

From the results of the above table, it can be seen that,

- A significant and positive correlation was observed between academic achievement and lateral thinking ability scores of students of secondary schools (r=0.1985, p<0.05) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the academic achievement and lateral thinking ability scores of students of secondary schools are dependent on each other.
- A significant and positive correlation was observed between academic achievement and dimension of lateral thinking ability i.e. analogies scores of students of secondary schools (r=0.1538, p<0.05) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the academic achievement and analogies scores of students of secondary schools are dependent on each other.
- A significant and positive Karl Pearson's correlation coefficient technique correlation was observed between academic achievement and dimension of lateral thinking ability i.e. fractionation scores of students of secondary schools (r=0.1536, p<0.05) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the academic achievement and fractionation scores of students of secondary schools are dependent on each other.
- A non-significant and positive correlation was observed between academic achievement and dimension of lateral thinking ability i.e. generation of alternatives scores of students of secondary schools (r=0.0560, p>0.05) at 5% level of significance. Hence, the null hypothesis is accepted and alternative hypothesis is rejected. It means that, the academic achievement and generation of alternatives scores of students of secondary schools are independent on each other.
- A significant and positive correlation was observed between academic achievement and dimension of lateral thinking ability i.e. brain storming scores of students of secondary schools (r=0.1354, p<0.05) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the academic achievement and brain storming scores of students of secondary schools are dependent on each other.
- A non-significant and positive correlation was observed between academic achievement and dimension of lateral thinking ability i.e. dominant ideas scores of students of secondary schools (r=0.0195, p>0.05) at 5% level of significance. Hence, the null hypothesis is accepted and alternative hypothesis is rejected. It means that, the academic achievement and dominant ideas scores of students of secondary schools are independent on each other.

Hypothesis 2

There is no significant relationship between academic achievement and lateral thinking ability and its dimension scores (i.e. analogies, fractionation, generation of alternatives, brain storming and dominant ideas) of students of rural secondary schools.

To achieve this hypothesis, the Karl Pearson's correlation coefficient technique has been applied and the results are presented in the following table:

Table 2: Results of correlation coefficient between academic achievement and lateral thinking ability and its dimension scores of students of rural secondary schools.

Variables		Correlation coefficient between academic achievement scores of students of rural secondary schools with		
		r-value	t-value	p-value
Lateral thinking ability		-0.0111	-0.1913	0.8484
Dimensions	1) Analogies	-0.0670	-1.1588	0.2475
	2) Fractionation	0.0961	1.6673	0.0965
	3) Generation of alternatives	-0.0582	-1.0065	0.3150
	4) Brain storming	0.1474	2.5722	0.0106*
	5) Dominant ideas	-0.1527	-2.6673	0.0081*

*p<0.05

From the results of the above table, it can be seen that,

- A non-significant and negative correlation was observed between academic achievement and lateral thinking ability scores of students of rural secondary schools (r=-0.0111, p>0.05) at 5% level of significance. Hence, the null hypothesis is accepted and alternative hypothesis is rejected. It means that, the academic achievement and lateral thinking ability scores of students of rural secondary schools are independent on each other.
- A non-significant and negative correlation was observed between academic achievement and dimension of lateral thinking ability i.e. analogies scores of students of rural secondary schools (r=-0.0670, p>0.05) at 5% level of significance. Hence, the null hypothesis is accepted and alternative hypothesis is rejected. It means that, the academic achievement and analogies scores of students of rural secondary schools are independent on each other.
- A non-significant and positive correlation was observed between academic achievement and dimension of lateral thinking ability i.e. fractionation scores of students of rural secondary schools (r=0.0961, p>0.05) at 5% level of significance. Hence, the null hypothesis is accepted and alternative hypothesis is rejected. It means that, the academic achievement and fractionation scores of students of rural secondary schools are dependent on each other.
- A non-significant and negative correlation was observed between academic achievement and dimension of lateral thinking ability i.e. generation of alternatives scores of students of rural secondary schools (r=-0.0582, p>0.05) at 5% level of significance. Hence, the null hypothesis is accepted and alternative hypothesis is rejected. It means that, the academic achievement and generation of

alternatives scores of students of rural secondary schools are independent on each other.

- A significant and positive correlation was observed between academic achievement and dimension of lateral thinking ability i.e. brain storming scores of students of rural secondary schools (r=0.1474, p<0.05) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the academic achievement and brain storming scores of students of rural secondary schools are dependent on each other.
- A significant and negative correlation was observed between academic achievement and dimension of lateral thinking ability i.e. dominant ideas scores of students of rural secondary schools (r=-0.1527, p<0.05) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the academic achievement and dominant ideas scores of students of rural secondary schools are dependent on each other.

Hypothesis 3

There is no significant relationship between academic achievement and lateral thinking ability and its dimension scores (i.e. analogies, fractionation, generation of alternatives, brain storming and dominant ideas) of students of urban secondary schools.

To achieve this hypothesis, the Karl Pearson's correlation coefficient technique has been applied and the results are presented in the following table:

Table 3: Results of correlation coefficient between academic achievement and lateral thinking ability and its dimension scores of students of urban secondary schools

Variables		Correlation coefficient between academic achievement scores of students of urban secondary schools with		
		r-value	t-value	p-value
Lateral thinking ability		0.2896	5.2227	0.0001*
Dimensions	1) Analogies	0.2973	5.3743	0.0001*
	2) Fractionation	0.1655	2.8975	0.0040*
	3) Generation of alternatives	0.1258	2.1883	0.0294*
	4) Brain storming	0.1012	1.7562	0.0801
	5) Dominant ideas	0.1816	3.1883	0.0016*

*p<0.05

From the results of the above table, it can be seen that,

- A significant and positive correlation was observed between academic achievement and lateral thinking ability scores of students of urban secondary schools (r=0.2896, p<0.05) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the academic achievement and lateral thinking ability scores of students of urban secondary schools are dependent on each other.
- A significant and positive correlation was observed between academic achievement and dimension of lateral thinking ability i.e. analogies scores of students of urban secondary schools (r=0.2973, p<0.05) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the academic achievement and analogies scores of students of urban secondary schools are dependent on each other.
- A significant and positive correlation was observed between academic achievement and dimension of lateral thinking ability i.e. fractionation scores of students of urban secondary schools (r=0.1655, p<0.05) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the academic achievement and fractionation scores of students of urban secondary schools are dependent on each other.
- A significant and positive correlation was observed between academic achievement and dimension of lateral thinking ability i.e. generation of alternatives scores of students of urban secondary schools (r=0.1258, p<0.05) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the academic achievement and generation of alternatives scores of students of urban secondary schools are dependent on each other.
- A significant and positive correlation was observed between academic achievement and dimension of lateral thinking ability i.e. brain storming scores of students of urban secondary schools (r=0.1012, p<0.05) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the academic achievement and brain storming scores of students of urban secondary schools are dependent on each other.
- A significant and positive correlation was observed between academic achievement and dimension of lateral thinking ability i.e. dominant ideas scores of students of urban secondary schools (r=0.1816, p<0.05) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the academic achievement and dominant ideas scores of students of urban secondary schools are dependent on each other.

Conclusion

The study indicates a positive correlation between Lateral Thinking Ability and Academic Achievement of Secondary Schools Students. Further it has revealed that all the five dimensions of Lateral Thinking Ability are also positively correlated with Academic Achievement. Therefore, it can concluded that efforts are made by teachers to develop Lateral Thinking Ability of students along with teaching of academic subjects.

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