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EFFECT OF TREATMENT, SCIENTIFIC APTITUDE AND THEIR INTERACTION ON ACADEMIC ACHIEVEMENT OF LEARNERS BY TAKING PRE -ACADEMIC ACHIEVEMENT AS COVARIATE

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ABSTRACT:

The aim of present research was to Effect of Treatment, Scientific Aptitude and their interaction on Academic achievement of learners by taking pre-academic achievement scores as covariate. In this study the Senior Secondary schools of Banasthali, Rajasthan was considered as the population of the study. From these senior secondary schools one of senior secondary school of Banasthali, Rajasthan was randomly selected for the study. Test Battery developed by K.K. Agarwal and Saroj Aurora meant to access scientific aptitude of high school students was found appropriate. Although this tool was developed and standardized in 2012, the items were found to be relevant to the current study. The results indicated that the Null Hypothesis that there is no significant effect of Treatment on Academic Achievement of Learners when Pre-Academic Achievement was taken as covariate is rejected and the null hypothesis that there is no significant effect of Scientific Aptitude on Academic Achievement of learners when Pre-Academic Achievement is taken as covariate is not rejected. It may, therefore, be said that Academic Achievement of learners was found to be independent of Scientific Aptitude when Pre-Academic Achievement is taken as covariate.

KEYWORDS:

SCIENTIFIC APTITUDE WHEN PRE-ACADEMIC ACHIEVEMENT.

INTRODUCTION

Learning is an active process in which meaning is accomplished on the basis of experience. In the view of constructivists, learning is a constructive process in which the learner is building an internal illustration of knowledge, a personal interpretation of experience. This representation is continually open to modification, its structure and linkages forming the ground to which other knowledge structures are attached. In constructivism, learner is the centre of the learning process. The learner creates own knowledge and finds ways to learn. Each individual develops own learning strategies and regulates it. The self-regulated learning gives the idea of the process of taking control of and evaluating own learning and behavior.

Self-regulated learning leads to construction of knowledge by learner that makes learning more interesting and meaningful. Once students get mastery over own learning automatically their interest in mathematics increases which leads higher achievement and lower anxiety, and hence it helps in enhancing Scientific thinking as well. Learning through all of these tools is referred to as web based learning and technology-based learning. Social media integrates technology, social interaction and content creation and to collaboratively connect online information. All of these online learning tools are included in web-space. Mentioned technologies provide tools to connect users and to update on recent changes in school content.

There are many factors which affects achievement in mathematics. Few can be listed as low confidence, fear, anxiety, self-esteem, parents support, social environment, psychological state of learners etc. Among this, anxiety is a commonly seen as a major factor for low achievement. When teacher uses self-regulated learning strategies in the classroom, student's scientific aptitude level increases.

Moreover, Scientific Aptitude Social interacting with wiki-space can influence the academic achievement in science needed to be found out. Online learning tool Wiki space intends to provide the learner a podium, to self-regulate free from any influence, helping them to develop scientific aptitude and thinking process and their communication in science.

REVIEW OF RELATED LITERATURE

The studies in respect of Scientific Aptitude and Academic Achievement carried out on **Schools Students** included study by ***Sekhri, A. (2016)*** who experimented on 150 senior secondary students to study the effect of scientific aptitude on achievement in chemistry and found scientific aptitude had a positive effect on achievement in chemistry. Another study carried out by ***Gogoi, M. and Binoy , M. (2016)*** included experimentation on secondary school students to study the scientific aptitude in relation to academic achievement and found that achievement in science was positively related with scientific attitude. ***Olasehinde, K. J. and Olatoye R. A. (2014)*** experimented on 90 secondary school students to study the effect of scientific attitude on science achievement and found that scientific attitude influenced science. ***Dhaval, R. P. (2010)*** included experimentation on 120 secondary school students to study effect of scientific aptitude on learning performance and found that there was positive relation between learning performances and scientific aptitude of students. The scientific aptitude scores of std. 9th were

superior to std. 8th and the students of std. 10th were superior in scientific aptitude than the students of std.9th.

Yet there were some studies observed in respect to Scientific Aptitude and Academic Achievement to have different findings such as the study by ***Sung, Y. T. Chang, kuo-En, C. and Liu, T. C. (2016)*** who qualitatively analysed 110 experimental and quasi experimental journal articles on mobile devices on teaching learning process with moderate variables as intelligence, scientific aptitude, reasoning ability, gender and other personality factors and found that moderate variables influence was less on integration of mobile devices during teaching learning process. Another study by, ***Barmola, K. C. (2013)*** included survey of 84 students of grade XII to find role of aptitude in performance and found that the students' positive aptitude had no role for their academic performance.

OBJECTIVE OF THE STUDY

Effect of Treatment, Scientific Aptitude and their interaction on Academic achievement of learners by taking pre-academic achievement scores as covariate

HYPOTHESES OF STUDY

There is no significant effect of Treatment, Scientific Aptitude and their interaction on Academic Achievement of learners by considering Pre Academic Achievement as covariate.

SAMPLE OF THE STUDY

In this study the Senior Secondary schools of Banasthali, Rajasthan was considered as the population of the study. From these senior secondary schools one of senior secondary school of Banasthali, Rajasthan was randomly selected for the study.

TOOL FOR THE STUDY

Test Battery developed by K.K. Agarwal and Saroj Aurora meant to access scientific aptitude of high school students was found appropriate. Although this tool was developed and standardized in 2012, the items were found to be relevant to the current study.

DATA ANALYSIS METHOD

For studying the effect of Treatment, Intelligence and their interaction on Academic Achievement of learners by considering Pre-Academic Achievement as co-variate, 2×2 Factorial design ANCOVA was used

EFFECT OF TREATMENT, ACHIEVEMENT MOTIVATION AND THEIR INTERACTION ON ACADEMIC ACHIEVEMENT OF LEARNERS BY TAKING PRE-ACADEMIC ACHIEVEMENT AS COVARIATE

The objective was to study the effect of Treatment, Scientific Aptitude and their interaction on Academic Achievement of learners by taking Pre-Academic achievement is taken as covariate. There were two levels of Treatment namely, Wiki-space enabled Learning (WSL) Program and Conventional method. On the basis of Scientific Aptitude, the learners were divided into two levels namely, Above average Scientific Aptitude and Below average Scientific Aptitude. Thus the data were analysed with the help of 2×2 Factorial Design ANCOVA where Pre-Academic Achievement was taken as covariate. The result is given in Table.

TABLE - SUMMARY OF 2×2 FACTORIAL DESIGN ANCOVA FOR ACADEMIC ACHIEVEMENT OF STUDENTS BY TAKING PRE-ACADEMIC ACHIEVEMENT AS COVARIATE

SOURCE OF VARIEACE	Df	SS y.x	MSS y.x	F y.x - value
Treatment (A)	1	1105.11	1105.11	7.19**
Scientific Aptitude (B)	1	33.37	33.37	0.21
A × B	1	21.82	21.82	0.14**
Error	73	10166.29	139.26	
Total	77			

**Significant at 0.01 level

4.3.1 EFFECT OF TREATMENT ON ACADEMIC ACHIEVEMENT BY TAKING PRE-ACADEMIC ACHIEVEMENT AS COVARIATE

From the Table, It can be seen that the adjusted F-value for treatment is 7.19 which is significant at 0.01 level with df = 1/73. It indicates that the adjusted mean score of Academic Achievement of Learners taught through WSL Programme and Conventional Method when Pre-Academic Achievement was taken as covariate differed significantly. So there was a significant effect of Treatment on Academic Achievement of Students when Pre-Academic Achievement was taken as covariate. Thus, the Null Hypothesis that there is no significant effect of Treatment on Academic Achievement of Learners when Pre-Academic Achievement was taken as covariate is rejected. Further the adjusted mean score of Academic Achievement of WSL Programme Group is 59.73 which is significantly higher than those of Conventional Method Group whose adjusted mean score of Academic Achievement is 50.77. Thus, it may be said that the WSL Programme was found to be significantly superior to Conventional Method when Pre-Academic Achievement was taken as covariate.

4.3.2 EFFECT OF SCIENTIFIC APTITUDE ON

ACADEMIC ACHIEVEMENT BY TAKING PRE-ACADEMIC ACHIEVEMENT AS COVARIATE

The adjusted F-value for Scientific Aptitude is 0.21 (vide Table) which is not significant. It indicates that the adjusted mean scores of Academic Achievement of learners belonging to Above Average Scientific Aptitude as well as Below Average Scientific Aptitude did not differ significantly. So there was no significant effect of Scientific Aptitude on Academic Achievement of learners when Pre-Academic Achievement is taken as covariate. In the light of this, the null hypothesis that there is no significant effect of Scientific Aptitude on Academic Achievement of learners when Pre-Academic Achievement is taken as covariate is not rejected. It may, therefore, be said that Academic Achievement of learners was found to be independent of Scientific Aptitude when Pre-Academic Achievement is taken as covariate.

4.3.3 EFFECT OF INTERACTION BETWEEN TREATMENT AND SCIENTIFIC APTITUDE ON ACADEMIC ACHIEVEMENT OF LEARNERS BY TAKING PRE-ACADEMIC ACHIEVEMENT AS COVARIATE

The adjusted F-value for interaction between Treatment and Scientific aptitude is 0.14 which is not significant (vide Table 4). It indicates that there was no significant effect of the resultant of interaction between Treatment and Scientific aptitude on Academic Achievement of learners when Pre-Academic Achievement is taken as covariate. In light of this, the null hypothesis that there is no significant effect of interaction between Treatment and Scientific Aptitude on Academic Achievement of learners when Pre-Academic Achievement is taken as covariate is not rejected. It may, therefore, be said that Academic Achievement of Learners was found to be independent of the interaction between Treatment and Scientific Aptitude when Pre-Academic Achievement is taken as covariate.

DELIMITATIONS

The delimitations of the study were as follows

1. The present study was conducted on grade XI Senior Secondary Students of Banasthali School, Banasthali Rajasthan.
2. Wiki-space enabled Program was the independent variable and Scientific Aptitude was taken as moderate variables.
3. The wiki-space operation included themes from Biology science of grade XI syllabus.

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