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A study of the relationship between scientific attitude and academic achievement of rural area's intermediate college girls (science stream only)

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Abstract

This paper is related to the study of the relationship between scientific attitude and academic achievement of rural area's intermediate college girls (science stream only) in Varanasi district of Uttar Pradesh.

The sample has been taken from four colleges. Here two components of scientific attitude are used i.e., scientific attitude 'in form of intent' and scientific attitude 'in form of action'. The study reveals that academic achievement is positively as well as significantly correlated with scientific attitude. It means that with increase in academic achievement, scientific attitude of female students also increases. The finding may lie in the fact that at the higher secondary level overall scientific attitude develops among the students in its optimal level.

Keywords: Scientific attitude, academic achievement and science stream.

Introduction

Education is a process of enlightenment and improvement for achievement of better and higher quality of life. For a secular and democratic state, it is necessary that people should have a broad scientific outlook to get rid of many irrational and dogmatic beliefs and elimination of obscurantism and superstition. A rational and just society requires scientific temper. The national curriculum for primary and secondary education (NCERT, 1988) ^[1] emphasizes the need for inculcation of scientific temper among the student in the following words:

"Education should help the individual not only in acquiring knowledge and its application but also in developing a scientific temper and rational world view."

The greatest impact in the sphere of science education in India came from the report of the Education Commission (1964-66) properly known as Kothari Commission. The commission laid great importance to teaching of science right from the primary stage to the university stage for development and prosperity of education should become an integrated part of school education with provision for compulsory teaching as a part of general education during first ten years of schooling.

At the same time it has also been observed that for selection of science stream at intermediate level, the student who have passed the C.B.S.E. or U.P. Board at high school level are required to obtain a specific percentage of marks in aggregate as well as in science subject too, to qualify and to be admitted in the science stream at intermediate level.

From these two observations it was felt by the researcher that there may be some short of relationship between these two variables which has been given a remarkable extent of importance at the school and intermediate college level of education.

Kozlov and Nay (1976) ^[3] in their research entitled "An Approach to Measuring Scientific Attitude" used a multidimensional approach. Each component of attitudes was labelled as the "cognitive", "intent" and "action" components. The cognitive component represents the student understanding of manner in which attitude manifest themselves in the professional behaviour of a scientist.

The "Intent" component represents the student tendency to show approval or disapproval of behaviours which define an attitude. This is indicated by this endorsement of special courses of action in certain situation relevant to the attitude. The "action" component represents the extent to which the students actually demonstrates in the science classroom, the behaviour which define an attitude.

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Golwalkar (1978) ^[4] studied the scientific attitude of higher secondary students offering different optional for preparing a tool. The researcher selected ten areas as component of the scientific attitude. These were:

1. Examine judgement and statements criticality
2. Is open mindedness?
3. Is sceptive in nature?
4. Perceives inconsistencies in view.
5. Has a strong desire for the extension of facts?
6. Is flexible in approach?
7. Is objective in approach?
8. Follows systematic method
9. Neglects the immediate values of things
10. Is precise?

Srivastava, N.N. (1980) ^[5] submitted his doctoral thesis entitled "A Study of the Scientific Attitude and Its Measurement." This piece of investigation was aimed at developing an instrument to measure scientific attitude and to compare scientific attitude of science and non-science students. Chandra Rani (1976) ^[6] found that cognitive development is positively and significantly related with age point of female science students. Scientific attitude was closely related to achievement in science (George, 2000). According to Thurstone (1929) ^[7], "Scientific attitude is the sum total of man's inclination and feelings, prejudices and biased preconceived notions, ideas, fears, threats and convictions about any specific topic."

The level of development of any country is largely based on the level of scientific knowledge. It has also been shown that one of the most important factors in science teaching is the attitude which determines behaviour (Amjad & Muhammed, 2012) ^[9]. One of the goals of the science teaching is to encourage students to have positive attitude towards science for positive effects on students learning (Northwest Region Education Laboratory (NREL), 2002) ^[10].

According to Karlinger (1970) ^[11] attitude is a psychological construct or latent variable, inferred from observable responses to stimuli which are assumed to mediate consistency and coherence among these responses.

A person with good scientific attitude is free from superstition, unverified assumptions and many times from popular opinion that has no empirical basis (Olatoye, 2002; Obtoye & Aderogbe; Klopfer, 1995) ^[14, 12]. In spite of all efforts by science education, science still remains a dreadful subject by learners in the schools. This is evidenced by the low enrolment for science in secondary schools (Olasehinde, 2008) ^[15], as well as underachievement at the secondary school certificate level examinations (Olangunju, 1998) ^[16].

Rationale of study

Science and scientific attitude has become a craze for government, teachers and researchers. Today science has become a part of our day to day life. All the governments want to enhance the scientific attitude of their student so that students could become competent citizens after the completion of their study and could contribute to G.N.P. and lead it their nations on way to modernization.

Now these qualities are being provided by education. Education devoid of scientific temper is useless just because spread of scientific temper by a teacher in society is much more needed than the spread of science and technology.

Then it has become very much important to know the relationship between scientific attitude and educational achievement. In such premise, the present study was

designed to assess the correlation between scientific attitude and educational achievement of higher secondary students.

Thus efforts have been made in this attempt to study the scientific attitude and academic achievement of the 10+2 level students (female) who belong to science stream and have been admitted in college after passing their higher secondary examination from U.P. Board.

Objectives of the Study

1. To find out of the relationship between scientific attitude (in the form of intent) and academic achievement of female students.
2. To find out of the relationship between scientific attitude (in the form of action) and academic achievement of female students.
3. To find out of the relationship between overall scientific attitude and academic achievement of female students.

Hypotheses of the Study

Ho1: There exists no significant relationship between scientific attitude (in the form of intent) and academic achievement of female students.

Ho2: There exists no significant relationship between scientific attitude (in the form of action) and academic achievement of female students.

Ho3: There exists no significant relationship between overall scientific attitude and academic achievement of female students.

Method of the study

The present study is descriptive survey type research. The details of the population, sample and the tool have been given below:

Population: Population of the study is confined to the higher secondary school girls studying in various intermediate colleges (affiliated to U.P.Board) of rural area in Varanasi district.

Sample: In the present study four colleges were selected from population randomly. A table of 75 female students studying in class XI (science stream only) were selected from colleges as the sample of the study. Here the type of sampling was "accidental sampling". The female students present on the day of data collection were taken into consideration.

Tool: To measure the scientific attitude of XI class female students, a questionnaire developed by Prof. K.S. Mishra, Education department, Allahabad University was used to collect data. It measures scientific attitude as manifested in 'action' and 'intent' form.

Statistics Used

- A. The raw scores were tabulated, the mean and S.D. for different groups were calculated for assessing that data is normal or not. It was found that nature of data was normal one.
- B. After that Karl Pearson's product moment correlation method was used to find out correction between the scientific attitude and academic achievement of female students studying in class XI.

Analysis and Interpretation of Data

In the present study objective wise analysis and interpretation of results is mentioned in Table 1 to 3.

Table 1: Correlation between scientific (in the form of intent) and academic achievement of female students

S. No.	Variables	Sex	N	Correlation Coefficient	Level of Correlation
1.	Scientific attitude (in the form of Intent)	Female	75	0.6307	Moderate positive correlation
2.	Academic achievement				

Observation of Table-1 shows that the value of correlation coefficient between scientific attitude (in the form of intent) and academic achievement of female students is 0.6307. It means that achievement is positively as well as significantly

correlated with scientific attitude (in the form of intent). It means with increase in academic achievement, scientific attitude (in the form of intent) of female students also increases.

Table 2: Correlation between scientific (in the form of action) and academic achievement of female students

S. No.	Variables	Sex	N	Correlation Coefficient	Level of Correlation
1.	Scientific attitude (in the form of action)	Female	75	0.5016	Moderate positive correlation
2.	Academic Achievement				

Observation of Table-2 shows that the value of correlation coefficient between scientific attitude (in the form of action) and academic achievement of female students is 0.5016. It means that achievement is positively as well as significantly correlated with scientific attitude (in the form of

action). It means with increase in academic achievement, scientific attitude (in the form of intent) also increases of female students.

Table 3: Correlation between overall scientific attitude and academic achievement of female students

S. No.	Variables	Sex	N	Correlation Coefficient	Level of Correlation
1.	Overall Scientific attitude	Female	75	0.6307	Moderate positive correlation
2.	Academic achievement				

Observation of Table-3 shows that the value of correlation coefficient between overall scientific attitude and academic achievement of female students is 0.6761.

It means that achievement is positively as well as significantly correlated with overall scientific attitude. It means with increase in academic achievement overall scientific attitude of female students also increases.

According to observation of Table 1 to 3 we can see that the scientific attitude in the form of intent, action and overall scientific attitude of female students are significantly correlated with academic achievement.

The results obtained from Table 1 to 3 are supported by the result of Ramachari (1982) [13]. Ramachari found that scientific attitude correlated positively with achievement in Science.

Findings of the Study

Finding related to Correlation between scientific attitude and academic achievement of female students.

1. The value of correlation coefficient between scientific attitude (in the form of intent) and academic achievement of female students is 0.6307 i.e., moderate positive correlation. So the null hypothesis, “There exists no significant relationship between scientific attitude (in the form of intent) and academic achievement of female students” is rejected.
2. The value of correlation coefficient between scientific attitude (in the form of action) and academic achievement of female students is 0.5016 i.e., moderate positive correlation. So the null hypothesis “There exists no significant relationship between scientific attitude (in the form of action) and academic achievement of female students” is rejected.
3. The value of correlation coefficient between overall scientific attitude and academic achievement of female students is 0.6761 i.e., moderate positive correlation. So the null hypothesis “There exists no significant

relationship between overall scientific attitude and academic achievement of female students” is rejected.

Conclusions and Educational Implications

On the basis of the above mentioned analysis and findings of the study, some important conclusions have been drawn as mentioned below.

1. There is moderate positive correlation between scientific attitude (in the form of intent) and academic achievement of female students.
As we know the meaning of scientific attitude (in the form of intent) is the student's tendency to show approval or disapproval behaviour which defines an attitude. In other hand science subject is totally based on facts. So we can say that with increase in academic achievement, scientific attitude (in the form of intent) of female students also increases.
2. There is moderate positive correlation between scientific attitude (in the form of action) and academic achievement of female students. According to the definition of scientific attitude (in the form of action), the action component represents the extent to which the students actually demonstrate in the science classroom, the behaviors is defining an attitude. The Science subject is totally practical subject, so we can say scientific attitude (in the form of action) is correlated with academic achievement.
3. There is moderate positive correlation between overall scientific attitude and academic achievement of female students. So we may conclude that at higher secondary level overall scientific attitude develops among the female students in its optimum level, it seems that student having scientific attitude will be critical minded, respect evidences, honest, objective, ready to change opinion, open minded and posses questioning attitude, which are essential for optimum academic achievement mainly is science subject.

The major educational implication for theory and practice in the field of education, based on the above conclusions is that, it is responsibility of all the Teacher Training/Education Institutions globally as well as at the national level in India to develop scientific attitude in students. Particularly in India to achieve this purpose scientific outlook based training programmes must be planned and implemented by NCERT and DIOS to enhance the scientific attitude of students. To improve scientific attitude among students of senior secondary students, there is an urgent need of modification in school curriculum, textbooks and pedagogy. An integrated approach of curriculum development should be adopted strategically so as scientific attitude may be inculcated at every stage. The findings and conclusions of this study may help a lot in the fulfilment of goals of science education in this direction.

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