



The Scientific Attitude and Reasoning Ability of Biology and Computer Group Students

KEYWORDS

Scientific attitude, Reasoning ability, Biology students, Computer students

Dr. P. Sekar

Reader, Achariya College of Education, No. 3 Villupuram Main Road, Villianur, Puducherry – 605 110

ABSTRACT *Scientific attitude, as we know, is necessary to dispel ignorance and backwardness, the spread of which will bring a balanced perspective to bear on social evils and conflicts. Reasoning is a form of thinking in which restructuring of concepts is made to derive a new truth from old valid conclusions. The present study was designed to make out the status of scientific attitude and reasoning ability of biology group and computer group students. The sample consists of three hundred XII standard students from Puducherry region. Among them, 150 are from biology group and 150 are from computer group. The findings showed the scientific attitude remains more or less the same for boys and girls of biology group and computer group students. However, the reasoning ability for boys and girls of computer group and biology group students significantly differed.*

Introduction

Attitudes have been defined as ideas with emotional context, important beliefs, prejudices, biases, predispositions, appreciations, and as status of readiness or set (Wan L Russell, 2006). A person who exhibits certain attitude towards something is reacting to his/her conception of that thing rather than to its actual state. Scientific attitude is absolutely necessary to dispel ignorance and backwardness; it will bring a balanced perspective to face the social evils and conflicts and could lead to a better world. On the other hand, one of the main responsibilities of the teacher is to improve the quality of his/her students' thinking. Broadly speaking, thinking signifies any type of mental alertness and ability.

Scientific Attitude

The scientific attitude includes the following traits:

1. Curiosity or inquisitiveness,
2. Objectivity,
3. Open-mindedness,
4. Perseverance
5. Humility,
6. Ability to accept failure, and
7. Skepticism.

Bhaskara Rao (1989) stated that the most useful scientific attitudes are open mindedness, critical mindedness, respect for evidence, suspended judgment, intellectual honesty, willingness to change opinion, search for truth, curiosity, rational thinking, etc.

Scientific attitude is really a composite of a number of mental habits, or tendencies to react consistently in certain ways to an innovative or problematic situation. These habits or tendencies include accuracy, intellectual honesty, open-mindedness, suspended judgment, critical mind, and a habit of looking for true cause and effect relationship. It is a cognitive concept; scientific attitudes are normally associated with the mental processes of scientists. These habits are important in the everyday life and thinking, not only to the scientist, but to everyone.

Reasoning Ability

Reasoning ability is a critical thinking and reflective thinking that is aimed at deciding what to believe or what to do (Ennis, 1987). It is a way of deciding whether a claim is always true, sometimes true, partly true, or false. Critical thinking is an important component of most professions. It is a part of the formal education process and is increasingly significant as students progress through school to university education. According to Raikums (2008), "Reasoning ability is nothing but thinking about thinking". The intellectually disciplined process of actively and skillfully conceptualizing, applying,

analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action" (Scriven and Paul, 1987). "Purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, critical, or contextual considerations upon which that judgment is based" (Facione, 2011)

Objectives

The objectives of the present study are as follows:

1. To find out whether there is any significant difference in the scientific attitude of biology group and computer group higher secondary students with respect to gender.
2. To find out whether there is any significant difference in the reasoning ability of biology group and computer group higher secondary students with respect to gender.

Hypotheses

The following hypotheses were framed for this study:

1. There is no significant difference in the scientific attitude of biology group and computer group higher secondary students with respect to gender.
2. There is no significant difference in the reasoning ability of biology group and computer group higher secondary students with respect to gender.

Sample

Three hundred XII standard students studying at Puducherry region are selected for the present study. Stratified random sampling technique was used in this study.

Tools

Following tools are used in this study:

1. Reasoning Ability Test (RAT) developed and standardized by Sadhana Bhatnagar (1986) was used to measure the reasoning ability of the higher secondary students.
2. Science Attitude Scale (SAS) developed and standardized by Avinash Grewal (1977) was used to measure the scientific attitude of higher secondary students.

Statistical Treatment:

The data has been subjected to differential analysis to find out the difference between the biology and computer group higher secondary students on scientific attitude and reasoning ability. The results of the analysis are presented in Tables 1- 4.

Table 1: Showing Scientific Attitude of Biology Group Students

Gender	Mean	S.D	t-value	Level of Significance
Boys	69.36	4.58	0.802	N.S
Girls	72.41	18.65		

NS – Not significant at 0.05 level.

Table 2: Showing Scientific Attitude of Computer Group Students

Gender	Mean	S.D	t-value	Level of significance
Boys	68.22	7.21	1.253	N.S
Girls	69.24	8.11		

NS – Not significant at 0.05 level.

Table 3: Showing Reasoning Ability of Biology Group Students

Gender	Mean	S.D	t-value	Level of Significance at 0.05 level
Boys	72.41	18.65	2.733	S
Girls	74.20	14.58		

S – Significant at 0.01 level

Table 4: Showing Reasoning Ability of Computer Group Students

Gender	Mean	S.D	t-value	Level of Significance at 0.05 level
Boys	71.31	18.80	2.921	S
Girls	72.43	16.92		

S – Significant at 0.01 level

Findings:

From the analysis, the following findings are noted.

1. The obtained 't' value 0.802 of Table - 1 is less than the table value of 1.96 at 0.05 level, it is inferred that there is no significant difference between the higher secondary boys and girls of biology group in scientific attitude.
2. The obtained 't' value 1.253 of Table - 2 is less than the table value of 1.96 at 0.05 level, it is inferred that there is no significant difference between the higher secondary boys and girls of computer group in scientific attitude.
3. The obtained 't' value 2.733 of Table - 3 is greater than the table value of 1.96 at 0.01 level, it is inferred that there is significant difference between the higher secondary boys and girls of biology group in reasoning ability.
4. The obtained 't' value 2.921 of Table - 4 is greater than the table value of 1.96 at 0.01 level, it is inferred that there is significant difference between the higher secondary boys and girls of computer group in reasoning ability.

Conclusion and Discussion

Present study was planned to know if any difference exist between the scientific attitude of biology group and computer group students. For the scientific attitude, the scores of both the groups are almost similar. Moreover, the boys and girls have almost same positive attitude towards science. The same findings also obtained by Dani (1991), Shanti Francis and Stanley John (2003), and Nabi Ahmad et al .,(2003).

In the reasoning ability, the boys and girls of computer group have differed one another. Similar finding appeared in the study of Sivakumar (2005) too.

The present study clearly highlights the features regarding the scientific attitude and reasoning ability. It also enables us to make some important decisions for the educators to inculcate the reasoning ability and scientific attitude of the student community as it is needed for the developing of scientific and technological world. On the basis of the results of this study and others it is recommended that the science teachers may incorporate the reasoning ability during the teaching of science to improve the attitude of the students towards science learning, so that students may be able to work better in the field of science.

REFERENCE

- *Babatunde, A.M. (2002). Attitude of teachers and students towards biology and students | achievement in the subject. M.Ed Dissertation. University of Ibadan. | | Dani, D.N. (1991). Scientific attitude and cognitive styles of higher secondary students, IV Survey of Research in Education, (ed) M.B. Buch, New Delhi: NCERT, Vol. 1, p 358. | | Ennis, R. H. (1987). Taxonomy of critical thinking skills and dispositions. In J. B. Baron and R. J. Sternberg (Eds.), Teaching Thinking Skills: Theory and Practice, New York: Freeman (p 9-26). | | Facione, P. A. (2011). Critical Thinking: What It is and Why It Counts, 2013 Update, p 1-28. (Insightassessment.com) | | Mushtaq Ahmad, Malik Zubair Ahmad Shah, Zafar Iqbal & Muhammad Rauf. (2010). Effect of problem solving teaching strategy on 8th grade students' attitude towards science, Journal of Education and Practice, Vol. 1(3), p 16-27. | | Nabi Ahmad, Abdul Raheem and Ansari Hasan. (2003). Attitude of Secondary School Students towards Science in Relation to Sex, Socio-Economic Status and Intelligence, Indian Educational Review, Vol. 39(2), p 80-89. | | *Raikums, B.W. (2008). An analysis of the concept criticality in adult education, Doctoral Thesis, Capella University. | | Scriven, M. and Paul, R.W. (1987). Critical Thinking as Defined by the National Council for Excellence in Critical Thinking, paper presented at the 8th Annual International Conference on Critical Thinking and Education Reform, Summer 1987. (www.criticalthinking.org/aboutCT/define_critical_thinking.cfm) | | Sivakumar, D. (2005). A study of achievement in science related to scientific aptitude and scientific attitude, M.Phil Dissertation, Annamalai University. | | Wan L Russell (2006). Development of attitudes, interests and values, In: Educational Psychology, (Ed) Charles E Skinner, 4th Ed, Prentice-Hall of India Pvt. Ltd, New Delhi, p 326. | | * Originals not referred |