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Research Paper

Attitude towards science: a study of 9th grade adolescent students

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ABSTRACT

Currently in many countries, the promotion of favourable science- related attitude is considered to be one of the most important aims of science education programs. The development of any country is based on the scientific knowledge as well as favourable attitude towards science among its people. The aim of the present study is to check felt problems in studying science and attitude towards science among adolescent students of 9th grade. This study covers 100 students from the different government schools of Almora and nearby places of Almora city, in Uttarakhand. Stratified random sampling technique has been used for the selection of the subjects. Scientific Attitude Scale (SAS) was administered to collect the data. "t"-test was used to analyse quantitative data to check the mean difference among different groups. The findings of the study revealed that there is significant difference observed in attitude towards science between rural and urban adolescent students and as well as in attitude towards science of adolescent students of Almora city owing to difference in their achievement in previous class. It may therefore be concluded that the attitude towards science of rural students have less in comparison to their urban counterparts. Adolescent students belonging to urban areas were found to have more positive attitude towards science than rural students. It may also be concluded that the attitude towards science is correlated with the achievement in previous class. Students who scored greater than first division in their previous class, showed more favourable attitude towards science compared to student who scored below first division. For the sustainable development of society, we have to make our attitude positive towards science in our daily lives. For the development of attitude towards science we have to organize many scientific programs, workshops, and science activities for awareness among the students who are not interested in science. It is well known factor that knowledge of science and using scientific knowledge in our day to day life increases the quality of life.

Keywords: *Science, Adolescent Students, Attitude towards Science, Achievement*

Our society is inundated with technology of numerous forms. The contribution of science is steadfastly increasing nowadays. Never before has it been more important for students of all ages to comprehend and master concepts in science. Science helps us to understand the life, society and the world around us systematically. Science is not confined in the walls of books only but has touched every aspect of our life. Science gives us an idea about how to think and

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act critically. Science has become an indispensable feature of our society. Science is an integral part of our lives now days. Now science is not only used as a teaching subject but also as a process. Scientific and technological literacy is a universal requirement of the hour. Science is an endless process of knowing our nature effectively. Science penetrates into the root of objects. It is a process of discovering new truth. Scientific attitude, attitude towards science, scientific methods are the parts of science as a process. Science as a content as well as science as a process is both important in their own ways. Aims of science are for betterment of human life, prediction of natural events, trends and future consequences mainly. The science is for the sake of human being. The content of science is fully joyful. The motto of science is empowering society, inclusive and prosperous communities and sustainable development of the society. Science plays a major role in inculcating hope for continuous and progressive welfare of the society. The strength of a modern economy depends on the strength of its industry and its development. Strengthen and development comes from science and technology.

Science has brought revolutionary changes in every walk of life. It has contributed a lot towards the development of our society and civilization. It makes our society well structured. The progress, welfare and prosperity of any society depend on a rapid, planned and sustained growth in the quality and extent of education in research, in science and technology. The main object of education is to prepare humane for life. Science and technology have become imperative areas of education. Progress of every country depends upon continuous scientific investigations. Since last decades, global warming-cooling, greenhouse effect, disasters, pollution, health hazards are the areas which drew attention of scientists, environmentalists and educationist. It is also a point of attention that to save humanity and mother earth, the right knowledge of science is needed. Most of the countries popularize science among their pupils from primary classes. This is possible only when our student will adopt positive attitude towards science to approach the relevant resources regularly to acquire the latest knowledge. Pupils possessing positive scientific attitude get more benefits of science compared to those who lacked the scientific attitude. Without science and technology there can only be little progress towards sustainable development. Science has so much importance in life that it cannot be denied from having important place in our school curriculum. Lifelong scientific literacy begins with attitude and a value established in the earliest years of school days. In India the school science program must extend beyond the walls of the school to include the resources of the community. This is why the theme chosen for the Science Congress for the year 2012-13 is Science for Shaping the Future of India. (Prime Minister of India) (Dr. Manmohan Singh 2013). According to the article 51 A (h) of the constitution of India, it is now the duty of every citizen of India “To develop the scientific temper, humanism and spirit of inquiry”.

The efficiency and strength of any educational system largely depends upon the competence levels and character of its teacher and taught. The first major international conference on the teaching of integrated science, sponsored by UNESCO, was held in Droujba (Bulgaria) 1968 in cooperation with the international council of scientific unions (ICSU), committee on the teaching of science. The thing which is deduced: Science is an important part of primary education; particularly in arousing scientific curiosity and developing scientific attitudes and skills. About four decades ago science education became recognized around the world as an independent field of research. Science education mainly concerns with attitude formation. It does not give the information about facts but it develops in a person the quality of scientific temper, interest, attitude and attitudes towards science.

The concept of an attitude is one of the old concepts in psychology and we tend to associate it more directly with the area of social psychology. In other words, attitudes are not self-generated; they are learned in relation to identifiable references whether these are persons, groups, institutions, objects, values, social issues or ideologies. Attitudes are different from values, beliefs and opinions. They have intellectual, biological, social, and emotional components that are derived from experience and exercise a determining influence upon behaviour. Attitude has been defined as ideas with emotional content, important beliefs, prejudices, biases, predispositions, appreciations, and as states of readiness or set. Attitude towards science plays a crucial role in the teaching and learning processes of science. It effects student's achievement in science. It is a personal response to an object developed through experience which can be characterized as favourable or unfavourable. The use of science as the object or stimulus of these feelings delineates that set of attitudes known as 'attitudes towards science'. Developing positive attitude towards science has been an exposed goal of most of the curriculum development efforts since the last 1950s. It was hoped that increasing interest in science would result in increased science enrolment which in turn would yield a larger science work force pool and a science literate public. Research has consistently shown attitude as an important component of science education (Gardner, 1975)
According to Osborne et. al. (2003), attitude consists of different sub-constructs which ultimately give rise to a person's attitude towards science. A person, scientifically literate has acquired the ability to hold a scientific worldview; a positive attitude towards science may improve student's academic performance, in not only science subjects, but in other classes as well. It is the duty of educators / teachers / mentors, to improve student's attitudes toward science, and to prepare students to live in a highly scientific and technological society. Having positive attitude towards science in our young masses has the opportunity to acquire many skills. Our teachers can do, by manipulating various situations that infuse among the pupils' certain characteristics of attitude towards science. It is the demand of time to nurture and nourish that creativity and attitude towards science in our class rooms.

Simpson and Oliver (1985) found that student's attitude towards science correlated with science achievement and participation in advanced science courses. The study of Malviya (1991) founded that significant difference between means of rural school and urban school boys and girls revealed that attitude towards science differed in respect of area and sex in early ages. Muhammad et.al (2008) reported that girls from semi-urban areas performed better on attitude towards science. White (1982) studies the relationship between SES and academic achievement, the result shows that SES is correlated with academic achievement. Findings of Srivastava (2002), Shinde (1982) revealed that students with high achievement in science exhibit higher scientific attitude than their counterparts with low achievement. In the study of Deveci and Aydın, (2018) found that There is a statistically significant difference between students' attitudes to science and their tendency to take academic risks based on gender (female), grade level (low) and academic success (high). In addition, the students' tendency to take academic risks significantly predicted attitudes to science.

Need and Significance of the Study

Society is ever changing day by day. Everybody is facing changes in their lives. Life of the individual has become too much complicated in the process of changes, because science and technology have changed our lives drastically. To overcome this situation, it is very much important to develop attitudes towards science in our adolescent students so that they may solve their problems and can adjust themselves in society. Our society is moving into a technological era. For reasons such as this, the concept of attitude towards science is becoming increasingly important in modern societies. We need adolescent students as well as

common people having sound attitude towards science in every sphere of life. If we have to compete with the world in economic growth and knowledge capital then it is necessary that, our teachers should encourage and support our young masses with creativity, knowledge and favourable attitude towards science. One of the most important roles of science is to help the society prosper, better and bright. Only handful students are willing to pursue their carrier in science. Our duty is to motivate them in making their carriers in science, after getting attitude towards science most of the students find science extremely inspiring and interesting. Not many research studies have been carried out in India on these areas, especially with regards to adolescent students. In this area studies happened in modern countries only. Adolescence acts as a bridge between childhood and maturity. This is a phase wherein lot of changes, be it physical or emotional take place radically in an individual. Here we give special reference to adolescent students as they have enormous unmet health, education, social and economic needs. Empowerment of an adolescent definitely means empowering the whole household as she/he is the homemaker of tomorrow. Adolescent students are important in a critical demographic for social change and global development. If school going adolescent students were made aware of science and technology and its significance in lives as well as society it would go a long way in creating sustainable life styles. Keeping this in mind the researchers have tried to find the comparison in the attitude towards science of adolescent students of Almora and nearby places of Almora in Uttrakhand (India).

The present study is aimed at achieving the following objectives:

1. To study the attitude of adolescent students towards science with respect to their locality.
2. To study the attitude of adolescent students towards science with respect to their achievement in previous class.

For fulfilling above objectives researcher have made following research hypothesis.

H_O (1) - There is no significant difference in attitude towards science of adolescent students of Almora owing to difference in their place of living.

H_O (2) - There is no significant difference in attitude towards science of adolescent students of Almora owing to difference in their achievement in previous class.

RESEARCH METHODOLOGY

For the present study the investigator has taken up a random sample of 3 schools and 100 pupils from government inter colleges of Almora and nearby places of Almora studying in class 9^{th} (adolescent age group). The researcher has used attitude towards science scale (ATSS) which have been made by the researcher. Tool has the face validity. Item selection was based on content validity. While preparing the test, the investigator consulted experts and peers for suggestions. The resulting odd-even correlation of coefficient was 0.633. The Split-Half coefficient of correlation is 0.775. This ensures a high reliability of the test. The t-test was used to find out the statistical significance of the differences between means for all the variables separately.

Analysis and interpretation of quantitative data

H_O (1) - There is no significant difference in attitude towards science of adolescent students of Almora city owing to difference in their place of living.

Table 1.1- Attitude towards science and their locality

Locality	N	Mean	Std. Deviation	t value* *Significant at 0.05 level of significance	Significant or not Significant
Rural	50	43.92	6.23	**4.289**	**Significant**
Urban	50	49.06	5.75		

Interpretation-Table 1.1 reveals that t-value (4.289) for the mean scores of locality between rural and urban adolescents students which is significant at 0.05 level of significance, as the tabulated values of 't' is 1.96 at 0.05 level of significance. Thus, the null hypothesis that "There is no significant difference in attitude towards science of adolescent students of Almora city owing to difference in their place of living." is rejected. So it was found that the mean score of rural students (43.92) is less than urban students (49.06). It may therefore be concluded that the attitude towards science of rural students have less in comparison to their urban counterparts. Students belonging to urban areas were found more positive attitude towards science than their rural counterparts. Because in urban areas, there are many facilities available for adolescent students related to studying as well as awareness. Studying the felt problems, regarding study of science subjects, students included in the sample viewed that due to lack of infrastructure in science classes and laboratories, specially lack of technology, unavailability of science teachers in rural areas, lack of knowledge among teachers regarding motivating and interesting teaching techniques are main factors. It is concluded that attitude towards science of the students in general and rural one in particular should be enhanced for betterment of individuals as well as society. It is well known factor that knowledge of science and using scientific knowledge in our day to day life increases the quality of life.

H_O (2) - There is no significant difference in attitude towards science of adolescent students of Almora city owing to difference in their achievement in previous class.

Table 1.2 - Attitude towards science and achievement in previous class

Achievement In Previous Class	N	Mean	Std. Deviation	t value* *Significant at 0.05 level of significance	Significant or not Significant
First div.	56	48.50	5.09	**3.708**	**Significant**
Below First div.	44	43.93	7.22		

Interpretation-Table 1.2 reveals that t-value (3.708) for the mean scores in respect to their achievement in previous class which is significant at 0.05 level of significance, as the tabulated values of 't' is 1.96 at 0.05 level of significance. Thus, the null hypothesis that "There is no significant difference in attitude towards science of adolescent students of Almora city owing to difference in their achievement in previous class." is rejected. So it was found that the mean score of first division student's is greater than their counterparts. It may therefore be concluded that the attitude towards science is correlated with the achievement in previous class. Students who scored greater than first division in their previous class they showed more favourable attitude towards science compared to student who scored below first division.

CONCLUSION

The attitudes towards science of rural adolescent students have less in comparison to their urban counterparts. Adolescent students belonging to urban areas were found having more positive attitude towards science than their rural counterparts. The mean score of the students who secured first division in their previous classes is greater than their counterparts. It may therefore be concluded that the attitude towards science depends upon the achievement in previous class. It may be due to lack of guidance provided from parent or school staff to rural school's students compared to urban school's students. So rural school's teachers should pay enough attention on their students and parents should also guide their child for better future because rural adolescent students are also important for the integral development of society. Adolescents have the power to change the nation. We can utilize the potential and the energy of adolescent students in a right direction who have favourable attitude towards science. Studying the felt problems, regarding study of science subjects, students included in the sample viewed that due to lack of infrastructure in science classes and laboratories, specially lack of technology, unavailability of science teachers in rural areas, lack of knowledge among teachers regarding motivating and interesting teaching techniques are main factors. It is concluded that attitude towards science of the students in general and rural one in particular should be enhanced for betterment of individuals as well as society. It is well known factor that knowledge of science and using scientific knowledge in our day to day life increases the quality of life. In order to improve student's attitude towards science, teachers/ mentors/ parents/ schools should manage visits to science museums, science centres, science cities, scientific movie shows, excursion to local places, awareness about different carriers in science, scientific games, different hobbies related to science and organized different workshops, focused hands on activities and science related activities. Classroom activities should be managed in such a manner that students understand and learn their subject completely and easily without making science bore and have more time for individual activities. This would help them to have positive feelings about science. After applying these techniques, we can enhance attitude towards science in our adolescent student.

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Conflict of Interest

The author declared no conflict of interest.

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