A Study of Scientific Aptitude of Adolescents at Secondary Level

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ABSTRACT:

Education is the basic source of human development. It develops social, moral, emotional and spiritual value in human being. For empowering the human being education play a soul role in human. In this aspect science education also play a key role. We know that educational condition of India, especially minority education is very dismal. For empowering the people, science knowledge, scientific attitude and scientific aptitude are very necessary. Without scientific, logical, reasoning and rational thinking how can we say empowerment is possible? Present study conducted at MANUU, Model School Hyderabad on class IXth students to compare the scientific aptitude of boys and girls of class IXth students of MANUU model school. Study adopted descriptive method and 46 students had been selected with stratified random sampling. For this a standardized tool of K. K. Agarwal (SATB) was used. To analyze the data mean, standard deviation, and t-test had been used as a statistical techniques, and found that the mean of class IXth students was 48. Mean of boys and girls were respectively 47.8 and 48.08 and standard deviation was 13 and 8.1 and its t-value was 0.68 which showed that there was a significant difference between boys and girls. Whatever the significant difference between boys and girls, but according to weighted scores the scientific aptitude of students was found at low level. The finding was explained that there is a need to develop scientific aptitude among students, especially minority students, because the scientific aptitude helps to empower the students.

Key words: - Scientific aptitude, empowerment, educational condition.

Introduction:-

Education is the basic source of human development. It develops social, moral, emotional and spiritual value in human being. It is important for all group of peoples, it has no limit. It develops a unique perspective for seeing the world. It plays a major role in every individual to success socially and economically in community. Enabling to people make their life better. For empowering the human being education play a soul role. In this aspect science education also play a key role. Science education is that type of education which improves the logical & rational thinking in human. Today the scientific idea and thought make its unique place in the world. "Science is a beautiful gift to humanity; we should not distort it" (A. P. J. Abdul Kalam). Present time is the time of science and technology. In 21st century science becomes a very important part of our life. We are totally depends on science & technology. At present it is need of our society to develop in the field of

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science & technology. So, our Government, policies & schemes related to education have to full focus on science education & teaching. Due to its importance science consider as a core subject in school curriculum. Now the need of the time to develops scientific thinking, attitude and aptitude more & more in school students. Kothari Commission (1964-1966) recommended that Science & Mathematics should be taught on a compulsory basis to all pupils as a part of general education during the first ten years of schooling. The teaching of science offers students the ability to access a wealth of knowledge and information which will contribute to an overall understanding of how and why things work. For empowerment, science education is necessary. As we know that educational condition of our country, especially minority education is very dismal. For empowering the people science knowledge, scientific attitude and aptitude are very necessary. Without scientific, logical, and rational thinking, empowerment is not possible.

Definition of Aptitude

According to Taxler (1957):- "Aptitude is a condition, a quality or a set of qualities in an individual which is indicative of the people extent to which he will be able to acquire probable extent to which he will be able to acquire under suitable training, some knowledge, skill or composite of knowledge, understanding and skill, such as ability to contribute to art or music, mechanical ability, mathematical ability or ability to read and speak a foreign language."

According to Freeman (1971):- "An aptitude is a combination of characteristics indicative of an individual's capacity to acquire (with training) some specific knowledge, skill, or set of organized responses, such as the ability to speak a language, to become a musician, to do mechanical work."

Scientific Aptitude:- Scientific Aptitude means a competence to do a certain, special type of work in the field of science. It is inborn ability to perform a special, creative work in the field of science education.

Statement of the Problem

"A Study of Scientific Aptitude of Minority Students at Secondary Level"

Need and Significance of the Study

Science education is necessary for the development of any country. In modern world and technological era every aspect of life depends on science and its products. Due to its importance it is included in curriculum. Science education develops the student ability to think rationally and critically. For the better development of a nation and students we have to need to focus on science teaching. NCF 2005 suggests reducing curriculum load and integrates the theory and practical work in science teaching. It recommends at the secondary stage, students should be engaged in learning science with hands and tools to more advanced technological models. Due to this way we develop scientific attitude and improve the scientific aptitude in students. To rejuvenate science education & research in the country NKC consider it crucial to attract more students in Math & Science. To encourage this, National knowledge commission (NKC) (2009) has recommended launching a massive science outreach program upgrading available infrastructure, revitalizing the teaching profession & revamping teacher training at all the level. It means it also influences the science teaching with the help of learning material because without using the appropriate learning material we can't achieve the objectives of science teaching. National Council of Educational Research & Training, promote & conduct educational research experimentation of innovative idea & practices. It also develop syllabus, teaching learning material & kits, text books, training models of & strategies audio-

visual & ICT. At secondary level it searches the talented students & give them scholarship to continue his/her study in the field of science & technology due to development of science & technology. **P. N. Natraj and G. Manjula (2012)** "A Study on Scientific Aptitude of high school Students in Relation to their Achievement in Science" in present study the researcher has attempted to study the scientific aptitude of high school students in relation to their achievement in science. The finding of the study on scientific aptitude and achievement in science shows that male and female Hindu, Christian and Muslim do not different significantly. While scientific aptitude and achievement in science between rural and urban high school students differ significantly. Also a significant correlation is found between achievement in science and scientific aptitude of high school students. **Adesoji, Francis. A (2012)** was studied on "Students Aptitude Indices as Predictors of Learning Out comes in Chemistry" there search question of this study is- 1) what is composite effect of students aptitude indices on students achievement in chemistry? 2) What are the relative contributions of student aptitude indices to student achievement in chemistry? 3) Which of the selected aptitude indices will predict student achievement in Chemistry? And they found that performance of students depends largely on the student aptitude indices in chemistry. Each of the four student aptitude indices made significant contributions and could also predict student achievement in chemistry. **Dr. Rajnish Pandey (2012)** "A Study of Mathematical Aptitude in Relation with intelligence and SES of class VI Students". To check the relationship between mathematical aptitude and intelligence of class V students, And to find the relationship between mathematics aptitude and SES of class V students is the objectives of this study. And found that the Mathematical aptitude of class V students of Govt. schools is significantly related with their intelligence. There is no significant relationship between mathematical aptitude and SES of class V students in the Govt. schools. **Navneet Kaur (2013)** "Scientific aptitude and intelligence as correlates of performance of students in premedical entrance test" objectives of the study 1) To Study the relationship between scientific aptitude and performance in paramedical entrance test. 2) To study if gender difference exist in scientific aptitude. 3) To study if sex difference exist in intelligence. And found that scientific aptitude in both boys and girls was average. There is no difference science aptitude possessed by both boys and girls. Mean score of science aptitude of boys and girls is 52.47 and 48.09 respectively. **Dr. Rajib Mukhopdhay (2013)**-"Scientific Aptitude-some psychometric considerations with special emphasis to aptitude in Physics." Research question of these study- 1) How are scientific aptitude and attitude in physics particularly explain and defined by researchers? 2) What are various psychometric dimensions of these two? 703 students selected as a sample and chi square technique used to analyze the data and found that learner basic knowledge and understanding is physics depend. **P. A Caballaero, E. Cifuentes (2014)** was study on the "emotional intelligence and aptitude: A Study with primary students" .The purpose of these study to determine the emotional intelligence, general aptitude and Math achievement of students in 6^{th} year of primary education. The result the student sample, their emotional intelligence profile, aptitude and average mathematics achievement, the influence of gender in the relationship and the predictive value of the emotional intelligence and aptitudes in mathematics achievement. There is need to know what type of learning material and methods are more effective in science teaching & how we use it to great revolution in science teaching and encourage the student's interest in the field of science education and empower the students. There is need to know the scientific aptitude in

students. To know this we improve the science teaching and guide the students to choose their future according to their ability, potential and interest. And this way we help students to take a better step towards their bright future and play a great role in serving the country. This study rarely found in my review especially on minority students. There lack of empirical evidence in this field at secondary level. There was very need to be concentrate on this regard. For seeing all these aspects researcher selected this area to research.

Variables of the Study

Independent Variable:- Gender

Dependent Variable:- Scientific Aptitude

Operational Definitions

Scientific Aptitude:- It means student has special ability (reasoning, numerical and science information and science vocabulary) to do special work in the field of science.

Secondary level:- It means IXth class.

Objectives of the Study

1. To study the scientific aptitude of IXth class students of MANUU Model School.
2. To compare the scientific aptitude of boys and girls of IXth class students of MANUU Model School.

Hypotheses of the Study

1. There is no significant difference on scientific aptitude between boys and girls of IXth class at MANUU Model School.

Delimitation of the Study

This study has been delimited to MANUU Model School and only IXth class students at Secondary Level.

Research Methodology: It is a process of how research is to be carried out. it is a method how research is done scientifically. Descriptive Survey method has been adopted for this study.

Population : All students of MANUU Model School have been considered as a population.

Sample and Sampling: In present study the students of IXth class were taken as a sample by stratified random sampling. In IXth class the total number of student was 77 in which 17 boys and 60 girls. Researcher taken 60% of both groups and this way 10 boys and 36 girls were selected by simple random sampling technique.

Tool of the Study: To acquiring the reliable and valid data researcher used a standardized tool (S. A. T. B) Scientific Aptitude Test Battery of Dr. K. K. Agarwal. The reliability of this tool is .94 by Test retest and .93 by Split half method.

Statistical Techniques : To interpret the raw data suitable statistical techniques Mean, Standard Deviation, t-test and Bar Graph were used.

Analysis and interpretation of Data:

1. To study the scientific aptitude of IXth class students of MANUU Model School. To analyze this study mean used. And mean of the all students of IXth class is 48.
2. To compare the scientific aptitude of boys and girls of IXth class students of MANUU Model School. To analyze this study mean, standard deviation and t-test were used.

Table 1

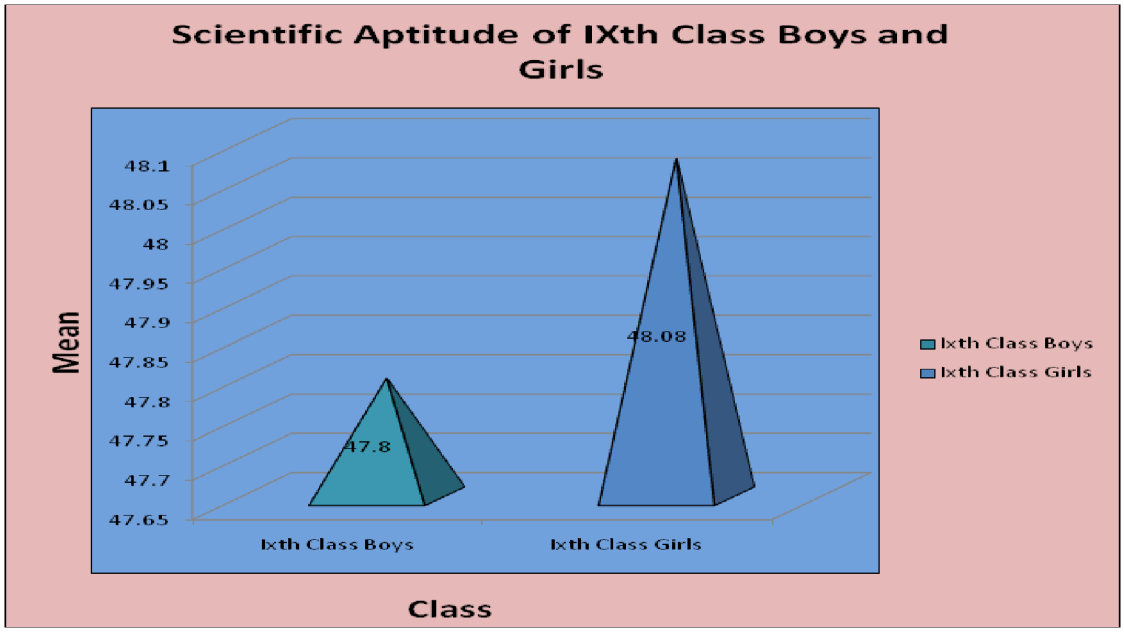
Significance of difference between the mean score of scientific aptitude of IXth class boys and girls

Gender	Mean	S. D	t- value	df	Result
Boys	47.8	13	0.68	44	N. S
Girls	48.08	8.1			

Interpretation

Table 1 showed that the mean of IX class boys and girls are 47.8 and 48.8 respectively. t-value is 0.068, which is less than at 2.61 at 0.01 level and 2.02 at 0.05. It means it is not significant at 0.01 and 0.05 levels, which means that there is no significant difference between the boys and girls of IXth class. It had been showed in Graph no. 1. This way the formulated hypothesis "There is no significant difference of scientific aptitude of boys and girls of IXth class" is proved right. That's why this hypothesis is accepted.

GRAPH NO. 1



Findings

The finding of first objective- the mean of scientific aptitude of IXth class students is 48 which are not so better. All students of IXth class are come under the low grade. Finding of second objective, mean of boys and girls of class IXth students respectively 47.8 and 48.08. The standard deviation of both boys and girls are 13 and 8.1, t-value of both is 0.068 which is not significant at both 0.01 and 0.05 level.

Conclusions

Education is very necessary in today's curious world. Today almost everything is connected with science. We are surrounded with the science and its products. And in these perspectives it is very necessary to develop the science education and for that scientific aptitude in students is necessary. Present study is on scientific aptitude of minority students at

secondary level is based on these facts. In this study after statistical analysis of raw data hypothesis have been tested and found that, "There is no significant difference on scientific aptitude between boys and girls of IXth class". The statistical reveals that there is no significant difference on scientific aptitude between boys and girls of IXth class. This concluded that there is no significant difference in scientific aptitude among students on the basis of gender.

Suggestions:

Present study "A study of scientific aptitude of minority students at secondary level" which shows the result of IXth class students of MANUU model school is low according to scoring key of standard tool. Today is the time of science and technology and this era students must have the scientific aptitude. That's why on the basis of the study there are some suggestions which may help the students to develop the scientific aptitude. i-e, to develop the scientific value, to show the utility of science, we may develop or improve the scientific aptitude. To aware from life of different scientists and their struggle. If anyone doing better in science field, invite him/ her in school as a guest to motivate the students. This way student's interest may increase towards science. Teachers must have also the scientific aptitude, so that they can show the benefit of Science to the students in their day to day life.

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