

Scientific Aptitude among English and Urdu Medium Secondary Level Students

Mohd. Moshahid

Dept. of Education and Training, Maulana Azad National Urdu University, Gachibowli, Hyderabad (TS), India

ABSTRACT

This paper intends to compare the scientific aptitude among the Urdu and English medium secondary level students. A sample of 178 students (90 English medium and 88 Urdu medium) was selected through stratified random sampling method from the 10 secondary schools of Hyderabad City of Telangana State, India. For the sake of data collection, Scientific Aptitude Test Battery (SATB) developed by Agarwal & Aurora was used. The mean, SD and t- test was employed to analyze the data. The result revealed that English medium secondary level students possess better scientific aptitude than Urdu medium secondary level students. There is no significant difference in the level of scientific aptitude among the English and Urdu medium female secondary level students. The study also found that Urdu medium female students possess significantly better level of scientific aptitude than their male counterparts.

Keywords: Scientific aptitude, English medium, Urdu medium, Secondary level students

In today's world, which is based on scientific and technological revolution, education is considered as a first step for every human activity. It plays a vital role in the development of human capital and is linked with an individual's well-being and opportunities for better living (Battle & Lewis, 2000). It ensures the acquisition of knowledge and skills that enable individuals to increase their productivity and improve their quality of life. This

increase in productivity also leads towards new sources of earning which enhances the economic growth of a country (Saxton, 2000).

One field of knowledge, which has had the greatest impact on the human lives, is science. Science, of all human endeavors, is one of the greatest adventures. Science is actually, a way thinking, a vital, ever growing way of looking at the world. (Spangeburg, Ray, 2005). The study of science brings behavioural change in the learner and enriches his/her character and personality. Science gives opportunity for creative thinking and constructive imagination. Our habits and attitudes have also been affected by science. Further, science is a subject where ideas can be experimented upon and verified. The learner develops the habits of searching for the truth. These qualities affect all aspects of the learner.

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Address for correspondence

Dept. of Education and Training, Maulana Azad National Urdu University, Gachibowli, Hyderabad (TS), India

E-mail: moshahidedu@gmail.com

The significant aspect of science is that whatever the students learns has immediate application in the world around him. Science has played an outstanding role in our life in recent years and is changing our entire existence as health, transportation, communication; power, etc. are all vitally influenced by science. Therefore, everyone should become familiar with applications and implication of principles of science to be able to live effectively, in the technological world and to be intelligent enough to solve the complicated problems of the society.

Aptitude being one psycho-social construct is found in different forms in the individuals. It is the inborn ability of the individual which is reflected in different areas like literature, art and science etc. Aptitude may be described as a specific ability or a specific capacity distinct from the general intellectual ability, which helps an individual to acquire degree of proficiency or achievement in a specific field. According to Sharma (2006) an individual's aptitude, we mean the capacity to acquire proficiency under appropriate conditions that is, his potentialities at present, as revealed by his performance on selected tests that have predictive values. As per Traxler (1957), aptitude is a condition, a quality or a set of qualities in an individual which is indicative of the 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. In this way, by taking note of one's present abilities and capacities we may come to know that one has an aptitude for learning and becoming successful in a particular area. Therefore, we must pay due regard to the aptitude possessed by individuals for guiding them about their educational and vocational choices. Aptitude is thus, an individual's ability to learn or to develop proficiency in an area if provided with appropriate training or education.

Scientific aptitude is a potentiality of future accomplishment in science without regard to past training and experience. An individual with high level of aptitude towards science develops better scientific aptitude which is very useful in selecting a career. Without possessing aptitude towards a subject one

cannot master or show any interest in a subject. Likewise, without good scientific aptitude an individual does not perform much in science. "The scientific aptitude in use implies that persons possessing certain characteristics can be identified and that much individual can succeed in scientific endeavors. Thus, the characteristic of able scientists suggests some of the criteria for locating individuals with aptitude for science. These characteristics include mental acuity, creative abilities, judgment, and open-mindedness. Factors that predispose to such traits constitute at least a part of scientific aptitude" (Henry, 1960). It shows that if an individual is endowed with better scientific aptitude, s/he will be in position to pursue science education with which he can climb the ladder of science with ease and effect.

Secondary education provides the link between primary and higher education. It leads to several middle level jobs and pre-job training courses and self-employment. Furthermore, it exposes students to contribute in the field of science, social sciences and humanities; to the development of a nation and provides them an opportunity to understand their constitutional duties and responsibilities. Secondary education is more valuable and of immense importance in a country with a large number of villages and rural population. It is a platform to foster and develop economic and societal growth. The strategic importance of the secondary school stage is well recognised in most of the developing countries. By knowing the scientific aptitude of the students, s/he can be guided to adopt a profession related to the field of science. As our society becomes more and more dependent on high level of technology, it become increasingly important that children should grown up with a basic competence and familiarity in science and its day to day development.

With the above discussion, it is clear that scientific aptitude is very essential for a successful person. It is also clear that the scientific aptitude predicts achievement of pupil in science and allied subjects. Hence, we can safely say that the study of scientific aptitude of the Urdu and English medium secondary level students will helps in the development of such important psychological traits.

Objectives

- ❑ To know the level of scientific aptitude among the English and Urdu medium secondary level students.
- ❑ To find out the level of scientific aptitude among the English and Urdu medium male secondary level students.
- ❑ To compare the level of scientific aptitude among the English and Urdu medium female secondary level students.
- ❑ To study the level of scientific aptitude among the English medium male and female secondary level students.
- ❑ To study the level of scientific aptitude among the Urdu medium male and female secondary level students.

Hypotheses

- ❑ There will be no significant difference in the level of scientific aptitude among the English and Urdu medium secondary level students.
- ❑ There will be no significant difference in the level of scientific aptitude among the English and Urdu medium male secondary level students.
- ❑ There will be no significant difference in the level of scientific aptitude among the English and Urdu medium female secondary level students.
- ❑ There will be no significant difference in the level of scientific aptitude among the English medium male and female secondary level students.
- ❑ There will be no significant difference in the level of scientific aptitude among the Urdu medium male and female secondary level students.

Methodology

In the present study, the survey type descriptive research method is adopted. A sample of 178 students (90 English medium and 88 Urdu medium) was selected through stratified random sampling method from the

10 secondary schools (05 English medium and 05 Urdu medium) of Hyderabad City of Telangana State, India. For the sake of data collection, Scientific Aptitude Test Battery (SATB) developed by Agarwal & Aurora was used. The test battery consists of four sub-tests namely - reasoning test, numerical ability test, science information test and science vocabulary test with 209 items. This tool predicts the success in science at the high school level. After collection of the data, the scoring was done according to the scoring procedure given in manual of the scale. The mean, SD and t- test was employed to analyze the data.

Results and Discussion

To verify the first hypothesis the mean score in the level of scientific aptitude among the Urdu and English medium secondary level students, the two groups are subjected to t-test and the results are presented in the table 1.

Table 1: Significant difference in the level of Scientific Aptitude among the Urdu and English medium secondary level students

Group Compared	N	Mean	SD	df	Calculated t-value at 0.05 level	Tabulated t-value at 0.05 level	Level of significance
English medium students	90	141.30	7.98	176	3.41	1.97	Significant
Urdu medium students	88	137.15	8.23				

It could be observe from the table -1, the mean of English medium students is found to be 141.30 with an SD of 7.98, while the mean of Urdu medium students is found to be 137.15 with an SD of 8.23. The calculated t-value is 3.41 and the tabulated t-value is 1.97. Since, the calculated t-value is more than tabulated t-value and which is significant at 0.05 levels. Hence, the null hypothesis, 'There will be no significant difference in the level of scientific aptitude among the Urdu and English medium secondary level students,' is rejected. Thus, it is concluded that there is significant difference in the level of scientific aptitude among the Urdu and English medium secondary level students. English medium

secondary level students are found to have significantly better level of scientific aptitude than the Urdu medium secondary level students.

To verify the second hypothesis the mean score in the level of scientific aptitude among the English and Urdu medium male secondary level students, the two groups are subjected to t-test and the results are presented in the table 2.

Table 2: Significant difference in the level of Scientific Aptitude among the English and Urdu medium male secondary level students

Group Compared	N	Mean	SD	df	Calculated Tabulated Level of		
					t-value at 0.05 level	t-value at 0.05 level	significance
English medium male students	40	140.00	7.90	80	2.95	1.99	Significant
Urdu medium male students	42	135.12	7.03				

As seen from the table 2, it can be observed that the mean of English medium male students is found to be 140.00 with an SD of 7.90, while the mean of Urdu medium students is found to be 135.12 with an SD of 7.03. The calculated t-value is 2.95 and the tabulated t-value is 1.99. Since, the calculated t-value is more than that of tabulated t-value and which is significant at 0.05 levels. Hence, the null hypothesis, 'There will be no significant difference in the level of scientific aptitude among the English and Urdu medium male secondary level students,' is rejected. Thus, it is concluded that there is significant difference in the level of scientific aptitude among the English and Urdu medium male secondary level students. English medium secondary level students are possessing better level of scientific aptitude in compare to Urdu medium secondary level students.

To verify the third hypothesis the mean score in the level of scientific aptitude among the English and Urdu medium female secondary level students, the two groups are subjected to t-test and the results are presented in the table 3.

Table 3: Significant difference in the level of Scientific Aptitude among the English and Urdu medium female secondary level students

Group Compared	N	Mean	SD	df	Calculated Tabulated Level of		
					t-value at 0.05 level	t-value at 0.05 level	significance
English medium female students	50	142.34	7.97	94	1.94	1.98	Not Significant
Urdu medium female students	46	139.00	8.87				

From the table 3, it can be observed that the mean of English medium female students is found to be 142.34 with an SD of 7.97, while mean of Urdu medium female students is found to be 139.00 with an SD of 8.87. The calculated t-value is 1.94 and the tabulated t-value is 1.98. Since, the calculated t-value is less than tabulated t-value and which not significant at any levels. Hence, the null hypothesis, 'There will be no significant difference in the level of scientific aptitude among the English and Urdu medium female secondary level students,' is accepted. Thus, it is concluded that there is no significant difference in the level of scientific aptitude among the English and Urdu medium female secondary level students.

Table 4: Significant difference in the level of Scientific Aptitude among the English medium male and female secondary level students

Group Compared	N	Mean	SD	df	Calculated Tabulated		Level of significance
					t-value at 0.05 level	t-value at 0.05 level	
English medium male students	40	140.00	7.90	88	1.39	1.99	Not Significant
English medium female students	50	142.34	7.97				

To verify the fourth hypothesis the mean score in the level of scientific aptitude among the English medium male

and female secondary level students, the two groups are subjected to t-test and the results are presented in the table 4.

As seen from the table 4, the mean of English medium male students is found to be 140.00 with an SD of 7.90, while mean of English medium female students is found to be 142.34 with an SD of 7.97. The calculated t-value is 1.39 and the tabulated t-value is 1.99. Since, the calculated t-value is less than tabulated t-value which is not significant at any levels. Hence, the null hypothesis, 'There will be no significant difference in the level of scientific aptitude among the English medium male and female secondary level students,' is accepted. Thus, it is concluded that there is no significant difference in the level of scientific aptitude among the English medium male and female secondary level students.

To verify the fifth hypothesis the mean score in the level of scientific aptitude among the Urdu medium male and female secondary level students, the two groups are subjected to t-test and the results are presented in the table 5.

Table 5: Significant difference in the level of Scientific Aptitude among the Urdu medium male and female secondary level students

Group Compared	N	Mean	SD	df	Calculated t-value at 0.05 level	Tabulated t-value at 0.05 level	Level of significance
Urdu medium male students	42	135.12	7.03	86	2.26	1.99	Significant
Urdu medium female students	46	139.00	8.87				

It could be observe from the table -5, the mean of Urdu medium male students is found to be 135.12 with an SD of 7.03, while the mean of Urdu medium female students is found to be 139.00 with an SD of 8.87. The calculated t-value is 2.26 and the tabulated t-value is 1.99. Since, the calculated t-value is more than tabulated t-value and which is found to be significant at 0.05 levels. Hence, the

null hypothesis, 'There will be no significant difference in the level of scientific aptitude among the Urdu medium male and female secondary level students,' is rejected. Thus, it is concluded that there is significant difference in the level of scientific aptitude among the Urdu medium male and female secondary level students. Urdu medium female students are found to have significantly better level of scientific aptitude than the Urdu medium male counterparts.

Findings of the Study

- ❑ There is significant difference in the level of scientific aptitude among the Urdu and English medium secondary level students. English medium students possess more scientific aptitude in compare to their Urdu medium counterparts.
- ❑ There is significant difference in the level of scientific aptitude among the English and Urdu medium male secondary level students. The level of scientific aptitude among the English medium male students is more than their Urdu medium counterparts.
- ❑ There is no significant difference in the level of scientific aptitude among the English and Urdu medium female secondary level students.
- ❑ There is no significant difference in the level of scientific aptitude among the English medium male and female secondary level students.
- ❑ There is significant difference in the level of scientific aptitude among the Urdu medium male and female secondary level students. Urdu medium female students are found to have significantly better level of scientific aptitude than their male counterparts.

Conclusion and Educational Implication

Scientific aptitude is a potential for acquiring certain skills or knowledge. The quality of the people is mostly dependent upon their knowledge and skill and how they are adjusting with different societal challenges and forces. Due to technological and scientific advancements in different aspects, people in general are expected to be in tune with such changes, but this will be possible

only if the people are having a strong scientific aptitude. The role of parents and teachers are very important in developing the scientific aptitude among children.

On the basis of the findings of the present study, it is very much obvious that the level of scientific aptitude among the English medium secondary level students is more than that of Urdu medium students. It may be due to family or school factors in terms of parental education, encouraging home environment, exposure to knowledge, better educational facilities, favourable atmosphere in school, dedicated teachers towards the development of scientific aptitude among the students of English medium schools. It is clear that the better educational facilities and good teaching-learning environment share a major part in the inculcation and promotion of scientific aptitude among the students. It is the need of hour that scientific aptitude must be developed among the Urdu medium students through providing better educational facilities and good teaching-learning environment in the Urdu medium schools. This will be helpful to the students for nourishing and developing their scientific aptitude.

In addition, efforts should be made to develop and boost up the scientific aptitude among the Urdu medium students. For this purpose, they may be exposed to science fair, science exhibitions, science quizzes, science debates, visits of zoo, parks, industries and laboratory experiments etc. at all stages of education particularly at the secondary level for better accomplishment. Therefore, the science educators must try to promote the level of scientific aptitude possessed by the students. If necessary steps are taken, our students will accomplish and achieve satisfactorily in science education. Parents, teachers and community have a significant role to play in developing proper study skills, persistent in learning and motivation, developing positive attitude and interest etc. which are some important factors that promote scientific aptitude. This will not only be helpful in creating a healthy environment at home, school and society, but also necessary for a healthy and flourishing nation.

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