P-ISSN 2708-6453	Pakistan Languages and Humanities Review	Jan -Mar 2023, Vol. 7, No. 1
O-ISSN 2708-6461	http://doi.org/10.47205/plhr.2023(7-I)21	[238-244]

Pakistan Languages and Humanities Review
www.plhr.org.pk

RESEARCH PAPER

To Explore the Relationship between Attitude toward Science and Achievement among Students in Tehsil Sarai Alamgir

Muddassar Hussain*[1] Prof. Dr. Muhammad Hameed Nawaz[2]

1. PhD Scholar, Department of Education, University of Lahore, Punjab, Pakistan
2. Professor, Department of Education, University of Lahore, Punjab, Pakistan

***Corresponding Author** muddassar095@gmail.com

ABSTRACT

The main purpose of the current research was to explore the relationship between students' attitudes toward science and its relationship with achievement in it at elementary level in tehsil Sarai Alamgir district Gujrat. It was descriptive-correlational research based on survey design. Data were collected from randomly selected 1,166 students by self-developed questionnaire. The data were analyzed by applying inferential and descriptive statistics in software named SPSS. After analysis, significant positive correlation coefficient between students' attitude towards science and achievement was found among students regarding their group of gender. It was found that the students possessing high level of attitude performed "excellent", students possessing medium level of attitude performed "good" and students possessing low level of attitude toward science performed "average" in science exam. It was also found that majority of the male had high level of perception about science and the female students had medium level of perception about science.

KEYWORDS Achievement, Attitude, Elementary Schools, Science

Introduction

India It has been taken into consideration that students' physical states of mind are related to their attitudes. The component of attitude towards science are most important in science like, pleasure and enjoyment in science, attitude of peers toward science, environment of the classroom, motivation level in science, success level in science, failure or fear of failure in science and self-esteem on science (Minshra, 2013).

In the views of Willets (2014), education is about foster learning which have tendency to change values, achievements and attitude of the individuals' also. Attitude is our control of temperament which we do in different situations towards different objects. With the passage of time, this control of temperament may be changed according situations and needs. The mindset of a student towards the studies of science is attitude towards science. Science is related to our daily routine, so it is the subject of common people.

Now in the present scenario because of the different inventions in science and technology, the whole world is depending on such innovations. Consequently, it is observed that our daily routine, social and commercial requirements have a great concern with such scientific and technological innovations (Minshra, 2013).

Scientific discoveries are unstoppable as it is a progressive subject. We can achieve many discoveries if we develop a positive and effective attitude towards science

and technology. Skills such as rational thinking and the action in the approach can be developed by science as it is a subject of development and progress. It is the area under discussion which fabricates the relationship of humans to their surroundings. It develops self-assurance and inter-dependence in humans (Minshra, 2013).

Attitudes of the students' toward science are occasionally appraised during the schooling of the students. In the view of Blalock et al. (2008), illustrated that most of the researchers use self constructed appraising instrument for attitudes and some of them use others older ones, and hence so far, the attitude scales in such researches have not been yet assessed with up to date, modern and vigorous techniques to support a valid fact.

The definition of attitude is different according to different researchers as they are not agreed on a single one. Salta and Tzougraki (2004) has defined attitude as a procedure where a person think, feel and act in an environment positively or negatively. Ramsden (1998) described that the words attitude, interest and motivation has been used interchangeably by different researchers (Ali & Awan 2013). Gardner (2010) has defined the attitudes are the learned ways, situations, actions or reasons of the persons to judge objects in different patterns which are involved in science teaching and learning.

As mentioned earlier that researchers are not agreed on the definition of attitude, same is the case with attitude towards science. Different researchers have different aspects of attitudes toward science in different manners. Osborne et al. (2003) said that attitudes toward science are the ultimate result of different sub-constructs of a person's attitude. There are different aspects of attitude that has been discussed by different researchers (Crawley, 2014).

Attitude has been defined by different researchers in a variety of ways in science learning. Tzougraki and Salta (2004) has explained the definition off attitude as the degree of feeling, thinking or acting positively/negatively towards any object in surroundings/atmosphere.

There are some findings in literature that have been found gender differences among them regarding science, which are to a greater extent contradictory to each other. Some of the research findings show that at elementary level male students show more optimistic attitude towards science as compared to females (Greenfield et al, 2009).

There are different researches which are interrelated to the gender differences among students' attitudes towards science and are mostly carried out on the students of elementary and high schools. On the other hand if we look at other studies which does not show any gender differences in attitudes regarding science among students, which are quite contradictory results to other researches (Oliver et al. 2011).

The achievement in academic careers of the students is usually determined by the marks and grades obtained by them. Achievement is used as a measurement tool by which an educator gives ranks to the students according to their abilities. It works as a parameter which shows how much the students had performed. These are multi-directional tasks which the students had to perform for the assessments during the studies. Co-curricular and curricular activities are mixed up in this process also. The co-curricular are too much necessary for the learners to keep them healthy.

Schibeci (2014) have pointed out their views that achievement of the students is dependent on their attitudes but achievement does not have any effect on the attitudes. Higher the attitudes of the students towards science the high would be the learning achievement.

There are numerous studies in literature that show that the achievements of students is predicted by factors such as variable of socio demographic learning approaches , orientations of goals and the self efficiency of students. A number of studies revealed a fact that huge percentage of students is not inclined towards science amongst them the number of females is more as compared to males and female students are having negative attitude towards science due to which they are unable to do inquiries in science (Weinburgh, 2015).

Material and Methods

It was descriptive- correlational research based on survey design.

Population

The population comprised all 87 male and female elementary school students of tehsil Tehsil Sarai Alamgir District, Gujrat.

Sample and Sampling Technique

91 (42 male and 49 female) secondary school teacher were selected by using simple random sampling from tehsil Wazir Abad, district Gujranwala.

Research Instruments

The researcher used self-developed questionnaire to collect the data which consisted of four attitudinal sub-constructs. There were total 50 items in the questionnaire which comprised of 15 items regarding students' perception about science, 12 items regarding students' perception about science teacher, 10 items regarding value of science in students' perspective, and 13 items regarding students' motivation towards science. All items were based on 5 points Likert scale i.e. strongly agree, agree, neutral, disagree and strongly disagree. To measure students' academic achievement, the researcher consulted annual PEC result of science subject 2018 grade 8

Pilot Study of the Instrument

It was validated by 15 elementary school students who were not counted in the sample. Some changes were made before its final application on the basis of feedback from the respondents. Cronbach's alpha reliability coefficient was applied to find out the internal consistency coefficient by using SPSS software (20.0 version) to sure the reliability of the questionnaire. The computed final alpha reliability of questionnaire was 0.84 shows that items in the questionnaire were highly correlated.

Procedure of the Data Collection

For the collection of data, the researcher visited CEO education office for getting permission for data collection from elementary schools. After collecting permission letter from the CEO, the researcher visited the elementary schools that were included in the sample, and showed letter to the headmaster. Headmaster of each selected school

allowed the researcher to collect data from the students. The researcher delivered questionnaires to them. After briefing it they filled it and researcher collected it on the spot. The researcher delivered 100 questionnaires to the respondents and got back 100. The response rate was 100%.

Data Analysis

The collected data were coded and entered into computer. With the help of Statistical Package for Social Sciences (SPSS) software, data was analyzed by applying descriptive and inferential statistics. The result was shown in the following tables;

Table 1
ANOVA analysis to determine effect of students' level of attitude towards Science on their academic achievement

	SS	Df	MS	F	Sig.
Between Groups	6.234	2	3.117	3.622	.027
Within Groups	1000.771	1,163	.861		
Total	1007.005	1,165			

The accompanying table exposed that the table value (3.00) was less than the calculated *F*-value (3.622) at the degree of freedom *df* (2, 1,163) and the *p*-value = .05 was greater than the calculated sig. value .027 which explained that the students' levels of attitude towards science effect significant differently on their academic achievement. Therefore, it was concluded that there was a significant difference in the effect of students' levels of attitude on their academic achievement.

To determine further as which level of attitude effect differently to the students' academic achievement, Post Hoc test was used.

Table 2
Post-hoc analysis to find out which level of students' attitude effect more on their academic achievement

(I) Level of Attitude	(J) Level of Attitude	MD (I-J)	Std. E	Sig.
High level	Low level	.186(*)	.234	.009
	Medium level	.143(*)	.056	.010

* The mean difference is significant at the .05 level.

The accompanying table exposed that the high level of students' attitude effect differently on the students' academic achievement than the other level of attitude.

To determine further as how students perform in exam that possessed high level of attitude towards science, *chi*-square test was applied in (table 3).

Table 3
Level of students' attitude towards Science wise academic achievement in science subject

Level of Attitude	Count %	Performance					Total
		B.Avrg.	Avrg	Good	V. Good	Excellent	
High Attitude	Count	0	66	89	162	**191**	508
	% within Level of Attitude	0.0%	13.0%	17.5%	31.9%	**37.6%**	100.0%
	% within Performance	0.0%	40.4%	24.5%	39.1%	**88.4%**	38.5%

	% of Total	0.0%	5.6%	7.6%	13.9%	**16.3%**	43.6%
Medium Attitude	Count	6	79	**258**	244	24	611
	% within Level of Attitude	1.0%	12.9%	**42.2%**	39.9%	3.9%	100.0%
	% within Performance	66.7%	48.5%	**70.9%**	58.9%	11.1%	51.2%
	% of Total	.5%	6.8%	**22.1%**	20.9%	2.1%	52.4%
Low Attitude	Count	3	**18**	17	8	1	47
	% within Level of Attitude	6.4%	**38.3%**	36.2%	17.0%	2.1%	100.0%
	% within Performance	33.3%	**11.0%**	4.6%	1.9%	0.5%	10.3%
	% of Total	.3%	**1.5%**	1.5%	.7%	.1%	4.0%
Total	Count	9	163	364	414	216	1,166
	% within Level of attitude	2.4%	40.0%	36.4%	15.1%	6.2%	100.0%
	% within Performance	100.0 %	100.0%	100.0%	100.0 %	100.0%	100.0%
	% of Total	.8%	40.0%	36.4%	15.1%	6.2%	100.0%

The accompanying table exposed students' academic achievement regarding their level of attitude towards Science. Among the students who possessed high level of attitude, 66 (13.0%) of the students performed "average", 89 (17.5%) of the students performed "good", 162 (31.9%) of the students performed "very good", and 191 (37.6%) performed "excellent" in the exam.

Among the students who possessed medium level of attitude, the percentage of the students who performed "below average" was 6 (1.0%), percentage of the students who performed "average" was 79 (12.9%), the percentage of the students who performed "good" was 258 (42.2%), the percentage of the students who performed "very good" was 244 (39.9%) and the percentage of the students who performed "excellent" was 24 (3.9%). Hence, it was concluded that majority of the female had medium level and majority of the male students had high level of attitude toward science at elementary school level.

Among the students who possessed low level of attitude, 3 (6.4%) of the students performed "below-average", 18 (38.8%) performance of the students was "average", 17 (36.2%) performance of the students was "good", 8 (17.0%) performance of the students was "very good" and 1 (2.1%) of the students showed excellent performance in their exam. Hence, the conclusion was made that the majority of the students who possessed "high level" of attitude performed "excellent", majority of the students who possessed "medium level" of attitude performed "good" and majority of the students who possessed "low level" of attitude toward science performed "average" in science exam.

Table 4
Independent sample t-test for analysis to difference in students' level of perception about science as regards to their gender

Gender	***N***	***M***	***S.D***	***t***	***df***	***Sig***
Male	577	47.53	6.123	5.497	1,164	.000
Female	589	45.67	5.402			

The table below showed that the table value 1.960 was less than the calculated *t*-value 5.497 while *p*-value .05 was greater than the calculated sig. value (.000) which demonstrated that there was a significant difference in the level of students' perception about science regarding their group of gender. Hence, the conclusion was made that female and male students had the different level of perception about science.

To know about which gender (male or female) of students had which level of perception about science, *chi*-square was used.

Table 5
Comparison of students' level of perception about science regarding their group of gender

Gender	Count in %age	Level of perception about science			Total
		Low	Medium	High	
Male	Count	45	256	**276**	577
	% within Gender	7.8%	44.4%	**47.8%**	100.0%
	% within level of perception	49.5%	40.6%	**62.0%**	49.5%
	% of Total	3.9%	22.0%	**23.7%**	49.5%
Female	Count	46	**374**	169	589
	% within Gender	7.8%	**63.5%**	28.7%	100.0%
	% within level of perception	50.5%	**59.4%**	38.0%	50.5%
	% of Total	3.9%	**32.1%**	14.5%	50.5%
Total	Count	91	630	445	1,166
	% within Gender	7.8%	54.0%	38.2%	100.0%
	% within level of perception	100.0%	100.0%	100.0%	100.0%
	% of Total	7.8%	54.0%	38.2%	100.0%

This table exposed the difference in the level of students' perception about science regarding their group of gender. Within male, 7.8% (45) of the male students had low, 256 (44.4%) had medium, and 276 (47.8%) of the male students had high level of perception about science while within female, 46 (7.8%) of the female students had low, 374 (63.5%) had medium, and 169 (28.7%) of the female students had high level of perception about science. It was concluded that majority of the male had high level and majority of the female students had medium level of perception about science.

Conclusion

The aim of the present research was to find out relationship between students' attitude toward science and achievement in district Gujrat, tehsil Sarai Alamgir. After analysis it was found that the students possessing high level of attitude performed "excellent", majority of the students possessing medium level of attitude performed "good" and majority of the students possessing low level of attitude toward science performed "average" in science. It was also found that male and female students had the different level of perception about science. Majority of the male had high level and majority of the female students had medium level of perception about science.

Recommendations

Keeping in view of the above mentioned all research findings and conclusions, the below mentioned recommendations were stated to increase the level of students' perception and attitude about science. During the curriculum development of science the curriculum developer should understand the need of the students which motivate the students for learning science. Moreover administration should provide proper science lab at elementary school level also in which student do experiment which motivate them to learn science in more interesting way. Teachers should provide proper training of teaching science so that they should appropriately adopt instructional techniques which will be suitable for learners to increase interest and will enjoy in what is being taught and learnt in the class.

References

Ali, M.S., & Awan, A.S (2013). Attitude towards Science and its Relationship with Students' Achievement in Science. *Interdisciplinary Journal of Contemporary Research in Business 4*(10), 707-718

Blalock, C. L., Lichtenstein, M. J., Owen, S., Pruski, L., Marshall, C., & Toepperwein, M. (2008). In pursuit of validity: A comprehensive review of science attitude instruments 1935–2005. *International Journal of Science Education, 30*(7), 961-977.

Crawley, (2014). An integrated model of attitude and affect. *Journal of Business Research, 58*(4),83-93

Gardner, S., T. (2012). The gender gap in science attitudes, parental and peer influences: Changes between 2015-16 and 2018-19. *Public Understanding of Science*, *10*(1), 171-182

Greenfield, D. B., Jirout, J., Dominguez, X., Greenberg, A., Maier, M., & Fuccillo, J. (2009). Science in the preschool classroom: A programmatic research agenda to improve science readiness. *Early Education and Development, 20*(2), 238-264.

Minshra, H., S. (2013). *Beliefs. Attitudes, and Human Affairs*, Belmont, CA: *Brooks/Cole.*

Oliver, M., & Venville, G. (2011). An exploratory case study of Olympiad students' attitudes towards and passion for science. *International journal of science education, 33*(16), 2295-2322.

Osborne, J., Simon, S., & Collins, S. (2003). Attitudes towards science: A review of the literature and its implications. *International journal of science education, 25*(9), 1049-1079.

Ramsden, J. M. (1998). Mission impossible?: Can anything be done about attitudes to science?. *International Journal of Science Education, 20*(2), 125-137.

Schibeci, R. A. (2014). Attitudes to science: An update. *Studies in Science Education, 11*(1), 26-59.

Weinburgh, M., Silva, C., Smith, K. H., Groulx, J., & Nettles, J. (2015). The intersection of inquiry-based science and language: Preparing teachers for ELL classrooms. *Journal of Science Teacher Education, 25*(5), 519-541.

Willets, L., Mooney, P., & Blagden, N. (2014). Social climate in learning disability services. *Journal of Intellectual Disabilities and Offending Behaviour, 10*(1), 71-82