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Correlation between Students' Aptitude and their Academic Achievement at Secondary School Level in Khanewal District

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Abstract: *Students' aptitude is an important factor that determines the students' success in the summative assessment. Similarly, teachers play an important role in the development of scientific attitudes in the personality of students. The main objective of this study was to find out the relationship between students' aptitude and their academic performance at the secondary level. In the same way, it was also investigated what the role of teachers in developing the students' personality attitudes is. The population of this study was the secondary school teachers in district Khanewal. The sample of this study was 200 teachers selected through convenience sampling. The sample was selected in a proportional way on the basis of various demographics so that the findings of this research study may be generalized to various variables. In order to collect primary data survey method was applied. The findings of this study revealed that there was a significant difference in the perception of male and female teachers regarding students' aptitude.*

Key Words: Students' Aptitude, Academic Achievement, Secondary Level

Introduction

Aptitude is the result of a complex interaction of inherited and environmental factors that result in predispositions or talents (Arya Saurabh, 2013). Scientific aptitude is another example of skill existing in the talented group to such a much higher degree than its likely expression in adult success," Certain, but not all, qualities shared by persons who thrive later in scientific effort may be identified to some degree. The Scientific Aptitude Test (SAT) is designed to assess a person's prospective ability to follow a course of study in science-related disciplines (Gupta, 2014). Scientific aptitude testing, when paired with other relevant information, would go a long way toward preventing significant waste of human and material resources by placing people in areas and lines of work where they are most likely to be productive (Adeyemi & Adeyemi, 2014).

Academic achievement is very important, especially in today's educational environment. Accomplishment is emphasized in schools from the very beginning of formal schooling. As a result, a key duty of the educational system at the school level is to set the scene for young accomplishment (Adesoji & Oginni, 2012). In the sphere of science and technology, a mathematical breakthrough is regarded as the barometer. Math is the father of all sciences, and it has a special place in the school curriculum (Singh Surjit, 2013). Mathematics

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is seen as a vehicle for teaching a kid to think, reason, analyze, and speak rationally, which applies to any topic that requires analysis and reasoning. Math achievement aids in the development of quantitative skills in learners, who then conduct experiments with numbers and forms of geometry, formulate hypotheses and test them, generalize the findings with proof, make decisions using Mathematics, develop precision, rational and analytical thinking, reasoning, problem-solving competence, positive attitudes, and aesthetic sense. Achievement is the result of the interplay of three factors: aptitude, preparedness, and learning opportunity. Math is the foundation of the Science and Technical Education Pyramid, on which the whole superstructure of technological advancement is constructed. Mathematics is the cornerstone of the huge superstructure of science and technical education, which is essential for our economic growth, social structure modernization, and democratic institutions to operate effectively. Scientific progress and technological advancements are evergreen buzzwords in all nations across the world (Foxcroft & Roodt, 2013). In the aforementioned cases, mathematics plays a significant role. The Scientific Aptitude includes an open mind, the ability to reason rationally and dispassionately, the willingness to recognize facts, no matter how uncomfortable or distasteful they may be, and ultimately, an understanding of one's own reasoning power's limitations. The development of a society devoid of poverty, starvation, disease, and other ills like violence, exploitation, and oppression is another goal of scientific and mathematical ability and performance. Economic and natural progress can only be achieved with the help of mathematicians (Bray & Spaulding, 2014).

Rao (2013) did a study on 'Scientific Attitude, Scientific Aptitude, and Accomplishment' to determine the levels of these three among secondary school pupils who have an average scientific attitude, scientific aptitude, and achievement in Biology. There is a considerable positive association between scientific attitude, scientific aptitude, and biological achievement. Ramsay (2008) states women's intrinsic Mathematics and Science aptitude separates Scientists" and discovered that the low percentage of high-achieving women in Mathematics and Science is partially due to a lack of natural aptitude for such disciplines. 'Sex variations in innate aptitude for Mathematics and Science: A critical Review,' performed (Rohde et al., 2007). Males are more diverse in their cognitive ability, according to the study's results, and so predominate at the higher levels of mathematical talent. Gender similarities in mathematics and science were investigated by (Brinch and Galloway, 2011). The study's main conclusions were that boys and girls have comparable psychological features and cognitive capacities, necessitating a focus on aspects other than gender to assist females in Mathematical and Scientific Career paths. Gender disparities in mathematical problem-solving patterns were researched by Corengia et al. (2013) and the main conclusions were that there are gender variations in mathematical problem-solving that favor men. Strategy utilization is discovered to be connected to cognitive ability, as well as psychological qualities, and mediated by experience and education, as a reflection of distinct patterns in mathematical problem solving across genders.

Literature Review

Teaching is indeed a human activity that is unique, inventive, rational, and human. It is regarded to be the hardest of all arts and disciplines to master. As a consequence, teaching is a complex, thoughtful, and subtle process. The instructor's personality has a big influence on the teaching-learning process. Academic scores are often used to evaluate a teacher's efficiency and effectiveness. Personality traits, on the other hand, are not taken into consideration in academics, casting doubt on the importance put on academic grades (Arya Saurabh, 2013). There has been very little research done on anxiety and how it affects academic performance, particularly in teacher preparation programs. The more anxious a student is, the worse his or her scores

will be in statistics, mathematics, and medicine, according to a study that found a negative and substantial correlation between test anxiety and academic performance. Students in the arts and sciences experienced significantly different levels of anxiety, according to previous research, and this worry is associated with low academic achievement (Brinch & Galloway, 2011). It has been shown that academic success has a negative relationship with anxiety, emotional maturity, and social maturity, whereas academic success has a negative relationship with anxiety (Rao, 2013). A study of anxiety levels found a substantial difference between male and female successful (passing) scientific students, but not a difference between male and female failed students (Gupta, Vandana, 2014). The levels of anxiety among youngsters in rural and urban areas, as well as between boys and girls, varied dramatically (Singh Surjit, 2013). In both private and public institutions, it was also discovered that there is no substantial difference in Academic Anxiety between male and female Xth grade pupils (Dhull Jitendra, 2013). The mean academic anxiety score for boys and girls did not vary substantially, but the mean score for girls was bigger than the boys', indicating that females had more academic anxiety than men (Kanchan Bala, 2014).

In recent years, studies on the elements that influence student performance have dominated study. This is because learning or education objectives can only be met when students are doing well, as shown by their academic accomplishments. Researchers and educators are continually working to study multiple variables that impact economic performance. Parents, schools, instructors, learning resources, and student traits such as emotional intelligence, interest, curiosity, and aptitude have all been linked to subject performance in studies. In their research, Hunt (2014) found that students' aptitude is a determinant of bad performance. They complained that studies hadn't given enough attention to kids' abilities instead of focusing on instructors, schools, and the learning environment as factors contributing to low performance. According to (Tasleema & Hamid 2012), the development of students' talents (aptitudes) should be prioritized since it has a strong and beneficial impact on problem-solving, which is linked to effective learning and high accomplishment. However, in this research, the aptitudes of interest are numeric and verbal. Specific cognitive aptitudes, also known as aptitudes, are a subset of GMA that aims to provide a unified assessment of a single aptitude (Foxcroft & Roodt, 2013). After a specific amount of training and/or practice, a person's aptitude refers to their ability to acquire a particular level of skill or ability (Byars & Rue, 2011). Cognitive ability tests (CATs) evaluate specific mental talents including linguistic, mathematical, and arithmetic skills, as well as reasoning capacity (Foxcroft & Roodt, 2013).

Objectives of the Study

1) To determine the significant difference between gender groups of teachers regarding students' aptitude.
2) To examine the significant difference between the subject group of teachers regarding students' aptitude.
3) To investigate the relationship between students' aptitude and their academic achievement at the secondary level.

Research Methodology

This study was based on quantitative research. The main objective of this study was to find out the relationship between students' aptitude and their academic performance at the secondary level. The population of this research study was SSTs in district Khanewal, whereas 200 (Male=100, Female= 100) respondents were selected as a sample. A sample is a subset of a population selected to participate in a study; it is a percentage of the entire population chosen to participate in the research endeavor. Krejcie and Morgan (1970) proposed to target the sample size from a limited target population due to the small target population of school teachers. The self-administered questionnaire was used for students' aptitude where the academic achievement was besieged the

numerical date of the students' results. The data was collected through a survey method by using five points 1. SDA to 5. SA Likert scale. The descriptive survey is a method of gathering information to answer questions about the present state of the study's topic. To explore this research used, a descriptive survey methodology. Through a simple questionnaire, the descriptive survey methodology collects and reflects the current state of affairs. The face and content validity were measured with the help of some experts who also checked the reliability of the questionnaire by using CronbachS' Alpha, which was greater than 0.7. The statistical Package for Social Sciences (SPSS) was applied to analyze the research questions through Descriptive and inferential statistics.

Results

Table 1. Descriptive Statistics of Students' Aptitude

Statements	Mean	SD
Students' aptitude affects their performance in the class.	3.77	1.28
Students' aptitude helps in problem-solving techniques.	3.42	1.24
A student's aptitude helps in verbal ability.	3.36	1.51
Verbal reasoning facilitates the students in English.	3.20	1.54
Students do better in mathematics because of their high numerical ability.	3.22	1.38
Higher-order aptitude among students improves their IQ level.	3.13	1.43
Students' confidence is increased by aptitude towards learning.	2.99	1.53
Students' future planning is done by their aptitude.	3.31	1.38
Teachers can protect students' choice in Arts are science subjects by their aptitude.	3.19	1.40
Teachers can protect students' choice in Arts are science subjects by their aptitude.	3.18	1.41
Higher-order thinking skills are enhanced by teachers' efforts.	2.87	1.34
Aptitude is helpful to protect the learning ability of the students in a specific subject.	3.06	1.19
Aptitude test predicts students' success in a job.	3.39	1.27
Science students have a practical approach towards the subject as compared to art students at the secondary level.	3.49	1.31
Teachers create interest among students based on their aptitude.	3.70	1.28

The descriptive analysis was conducted in order to assess the existing level of the students about aptitude. The findings show that the Mean score of the statements is from 2.99 to 3.87. This means that the teachers were moderately satisfied regarding the relationship of students' aptitude with academic achievement.

Table 2. Independent Sample t-test

Variable	Category	N	M	SD	t	Sig.
Aptitude	Male	100	3.67	.71	.82	.00*
	Female	100	3.44	.87	.63	
Aptitude	Science	96	3.61	.67	.91	.06
	Arts	104	3.56	.61	.88	

Significance Level <0.05

In order to find out the significant difference between the groups (male and female) and (science and arts) participants, it was found that there was a significant difference found

between the gender group (sig=.00). Whereas the Mean score of males i.e. 3.67 was greater than females i.e. 3.44. there was not found a significant difference between the subjects of science and arts but found the difference in the Mean score of the science group i.e. 3.61 was greater than arts group i.e. 3.56.

Table 3. Pearson Correlation

Variables	Aptitude	Academic Achievement
Aptitude	1	
Academic Achievement	.387(**)	1

*** Correlation is significant at the 0.01 level (2-tailed)*

For analyzing the relationship between the variables (aptitude and academic achievement) of the study, Pearson Correlation was applied. It found that there was a moderate correlation between these variables with r=.387. It means that both the variables are positively associated with each other.

Conclusion

It was concluded that the secondary school teachers were moderately satisfied with the correlation between students' aptitude and their academic achievement at the secondary school level. Moreover, there was a significant difference found between the gender group. Furthermore, there was a positive correlation between students' aptitude and academic achievement of the students. Whereas science and art students have different aptitude levels (verbal and abstract reasoning), this difference has no impact on academic success. As a result, while there may be a considerable difference in aptitude levels between science and art students, this does not guarantee that it will affect the students' academic success. As a result, the study suggests that pupils who possess certain aptitudes or talents would do better in class. Given the influence of these factors on secondary courses, further empirical research with bigger sample size is required.

Discussion and Recommendations

According to the results, previous knowledge of a profession is essential for establishing and retaining an interest in that sector. The link between student achievement on the aptitude exam and each of the other tests (verbal and numerical tests) was substantial, as in prior research investigations. A study revealed that numerical aptitude aids in hypothesizing connections. This is corroborated by the outcomes of this study, which show that numerical ability correlates with verbal and general aptitude performance. It claimed that trainable cognitive domains such as numerical and verbal abilities might increase general aptitude performance because comparable brain capacities will affect performance in all ability test types such as numerical and verbal tests, despite the fact that this study found no significant differences in linguistic ability between male and female pupils.

Male students outperformed female pupils on numerical ability tests, and female high school students currently surpass male students in most disciplines, particularly verbal examinations. Moreover, male students fared better on general aptitude tests than female students, particularly on the quantitative subtest, although the difference was not statistically significant. As a result, there is a need for more research in this field. Student performance on verbal and numerical ability exams has the most positive significant association. This supports the discovery that a child's linguistic skill influences his or her learning in other areas. As a result, every child's ability to communicate in English is critical.

On behalf of the findings of the study, several recommendations were made. Aptitude should be measured at the time of secondary school entrance, and pupils should be guided in choosing topics based on their aptitude and students who have scientific topics as a favorite subject have higher science aptitude than

students who have subjects other than science as a favorite subject. As a result, children who enjoy science courses and have a high degree of science aptitude may be permitted to pursue science education at the secondary level. According to the results, previous knowledge of a profession is essential for establishing and retaining an interest in that sector. Furthermore, students with little aptitude for science may be denied entry into secondary science education. Otherwise, kids will not do better in science classes. This might be detrimental to the student's career. Additionally, teachers should help the students to select the subjects at the secondary level according to the students' attitudes and contents related to students' attitudes should be included in the course at the secondary level so that students may be facilitated. Students should be given opportunities to study the subjects which are related to their aptitude so that they may have a better profession in the future. Consequently, teachers should teach the students in a conceptual way so that students' quantitative verbal and other skills may be improved, which will help them in their aptitude. The next studies should be conducted in other regions of the country with other variables which enhance the academic achievement of the students at the secondary school level.

References

Adesoji, F. A., & Oginni, A. M. (2012). Students' aptitude indices as predictors of learning outcomes in chemistry. *British Journal of Arts and Social Sciences, 8*(2), 174-182.

Adeyemi, A. M., & Adeyemi, S. B. (2014). Personal factors as predictors of students' academic achievement in colleges of education in South-Western Nigeria. *Educational Research and Reviews*, *9*(4), 97–109.

Arya, S. (2013). *A study of teaching aptitude and job satisfaction of teachers in relation to the academic achievement of their students*. Unpublished Ph.D. Thesis. Bundelkand University.

Bala, K. (2014). *Study of academic anxiety achievement motivation and academic achievement motivation in relation to nonverbal intelligence and academic achievement among senior secondary school students*. Unpublished Ph.D. Thesis. Himachal Pradesh University.

Brinch, C. N., & Galloway, T. A. (2011). Schooling in adolescence raises IQ scores. *Proceedings of the National Academy of Sciences*, *109*(2), 425–430. https://doi.org/10.1073/pnas.1106077109

Byars, L.L. & Rue, L.W. (2011). *Human resource management*. (10th ed.). New York: McGraw-Hill Irwin.

Corengia, A., Pita, M., Mesurado, B., & Centeno, A. (2013). Predicting academic performance and attrition in undergraduate students. *Liberabit. Revista de Psicología, 19*(1), 101–112. http://www.redalyc.org/articulo.oa?id=68627456009

Dhull, J. (2013). *A comparative study of the achievement in science in relation to intelligence, academic anxiety and reading interest of the X class students in government and private schools of Haryana*. Unpublished Ph.D thesis.Maharshi Dayanand University.

Foxcroft, C., & Roodt, G. (2013). *Introduction to psychological assessment in the South African context*. (4th ed.). Cape Town: Oxford University Press.

Gupta, V. (2014). *Study of anxiety and mental health as function of personality sex and academic achievement*. Unpublished Ph.D. Bundelkhand University.

Hunt, E. (2014). Teaching intelligence: Why, why it is hard and perhaps how to do it. *Intelligence*, *42*, 156–165. https://doi.org/10.1016/j.intell.2013.06.018

Krejcie, R. V., & Morgan, D. W. (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement*, *30*(3), 607–610. https://doi.org/10.1177/001316447003000308.

Ramsay, T. (2008). Advantages of Multiple-Choice Aptitude Tests. http://www.ramsaycorp.com/categories/aptitude.asp

Rao, D. B. (2013). *A study of teaching aptitude, social adjustment and job satisfaction on secondary school science teachers*. Unpublished Ph.D. Thesis. Acharya Nagarjuna University

Rohde, T.E., & Thompson, L. (2007). Predicting academic achievement with cognitive ability. *Intelligence, 35*(1), 83–92. https://doi.org/10.1016/j.intell.2006.05.004

Tasleema J. & Hamid, M. M. (2012). *Teaching Aptitude of Elementary and Secondary Level Teacher Educators*. *Journal of Education and Practice, 3*(2), 67-71.