Measuring Gender Differences in Students' Interest towards Different Contexts of Physics at Higher Secondary Level

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KEY WORDS

Students' interest, Physics, Higher Secondary, Gender

ABSTRACT

This paper addresses students' interest in physics in relation to different demographic variables. It examines the relationship between the students' achievement in different context of physics. It carried a quantitative research design. The population of the study was all the students studying in higher secondary schools of both public and private sectors situated in Lahore city. A sample of 500 students was selected conveniently from both the sectors. The instruments used for the study were self-developed questionnaire and ROSE FIN questionnaire (adopted). Instruments were piloted to check the validity and reliability. For data analysis, independent sample t-test, Pearson r and regression analysis were used to find out the interests of the students across different contexts of physics. Results revealed that there is no difference between both the genders in the context of physics except fantasy context. Boys fantasized the situation more than girls and they did not show any interest in astronomical context and technological context. The outcome of boys and girls was same in the School of Physics context. The students gaining education from public institutions were good in their concepts as compared to the private school students because private institutions just focused on brilliant minds but public institutions gave equal attention to all students.

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Introduction

Today we are living in the age of science and technology. Scientific inventions and discoveries have revolutionized our lives. Science is nothing but knowledge that obtained through observation, reading, experimentation and realization. It is systematic and verified. A careful analysis of the history of the progress of science reveals that theory and experiment forms the foundation of growth and development of science (Trivedi & Sharma, 2013).

As a science, physics plays an important role in explaining the events that occur in the universe. In all events around us can be found in physical laws and principles. The development in physics in 20th century is extremely successful. It also gives benefit to the other basic and applied sciences (Ajzen, 2011). Physics facilitates human beings in every field of life (Kaya & Boyuk, 2011). Teaching and learning of physics is continuously evolving with the changing world conditions. Creation of new learning media also continuously improves educational programs and various methods and techniques which can be used according to the content for teaching of physics (Stack, 2007). There is a long tradition to the study of student interest, behaviour, achievement, and attitudes toward physics. Interest can be seen as a medium supporting learning processes and the quality of learning as per modern psychological theories (Krapp, 2015).

Interest in physics can be seen as a psychological construct that emerges from students' interaction with (physical) objects and phenomena and explanations of them and with physics as a school subject. There is a long tradition in the examination of gender differences when looking at students' interests and attitudes towards science, their study behavior and achievements. Osborne's (2003) comprehensive literature survey shows that one of the main motivators for gender-related research in science education is the fact that there are few girls in technical and science-related occupations, but more qualified personnel are needed. In addition, the numbers of pupils in general who choose science courses in school appears to be decreasing. To solve these problems, different kinds of interventions projects have been launched to increase the number of girls who select science subjects, especially physics (Hoffman, 2012). Increasing the number of girls in science (and technology) has been seen as a solution to ensure productivity and the economic future of nations. This has been considered as an international problem. Equal opportunity legislation has provided an additional reason to increase female participation (Osborne, 2003). Thus, increasing the number of people in nontraditional occupations (e.g. girls in technology and boys in nurturing jobs such as nursing) has been seen as a way to develop a more equal society (Badri, 2016; Juuti, Matti, Lavonen, Uitto, Byman & Veijo, 2004).

Wodzinski (2007) states that teachers' organization of instruction in Physics is predominately related to the learning demands of boys; this may cause that girls feel rather insecure in physics lessons and perceive physics as a "feared" school subject. This may also have an impact on the girls' underestimation of their learning achievement in physics. In contrast, boys have a tendency to overestimate their learning achievement. Nevertheless, girls are often interested in physics (Hoffman, 2012) but their interest in physics is more context-related and depends on activating instructional methods such as experiments and group work. It has also been found that the participation of girls increases significantly when instructional topics are taught with respect to all day life topics such as, for example, medical topics and functioning of a human body. To explain why there are differences in emotional experiences of boys and girls in Physics (and other science school subjects); psychological, biological and social theories may be mentioned. One of the approaches which have pertained for quite a long time explains that gender differences regarding emotions may be explained by the different level of the boys' and girls' cognitive skills (Kunter, Baumert, & Köller, 2007).

Recent research, however, found only small or rather declining differences between boys and girls regarding their cognitive skills and achievement in Physics and other science school subjects (Schille, 2013). These gender differences are also been observed in career selection. Keeves and Kotte (2002) examined the students from ten different countries and explored that males consistently held more favorable attitudes toward science than females, even though females were more interested in school and school learning in general. In this same sample of students, males also indicated that science was easy rather than difficult to learn, whereas female students were less positive about the ease of learning science. They also explored that males are enrolled more in science subjects in secondary school than females. Biology was the only area where the number of female students exceeded the number of male students enrolled. They reported that, at ages 10, 14, and 18, male students had higher achievement in chemistry, earth science, and physics (Jones, 1999).

Research has shown that students study and learn physics more effectively and choose physics courses in upper secondary school if they are interested in the subject. Interest-based motivation to learn has positive effects both on studying processes and on the quantity and quality of learning outcomes. On a positive note, recent research shows that the proportion of high school graduates who will have taken at least one course of physics prior to graduation continues to grow (American Institute of Physics, 2014). According to new research Cambridge Occupational Analysis (COA, 2014) reported that numbers of females are increasing from last seven years than from male students in STEM subject of university courses. The development of positive attitudes toward science (physics), scientists, and learning science, which has always been an objective of science education, is increasingly a subject of concern (Badri, 2016).

The present study investigates the students' interest in different context of physics in relation to gender at higher secondary level. Factors affecting students' attitudes toward science in general include gender, personality traits, structural variables, and curriculum variables. One important goal in the development of physics education has been to bridge the gender gap in physics. Girls are often seen as an untapped resource (Bottiaa, Stearns, Mickelsonb, Moller & Valentino, 2015; Osborne & Collins 2001; Osborne, 2003). The most significant is gender, as Gardner (1975) stated. Many studies (Francis & Greer 2011; Jones et al., 2000) have reported that males have more positive attitudes toward science than females. In principle, two possible approaches to take when aiming to increase the number of girls involved in physics have been suggested. The first is to change girls' attitudes, interests, or behaviors. An example of this would be to conduct a marketing campaign advertising the technology industry for increasing the perceived attractiveness of the field. The second approach is to change the content or context, the idea being that learning should be made more interesting (Biklen & Pollard, 2001).

Some studies found no statistically significant gender differences. They published a wide-ranging review of the gender issues related to students' attitudes toward science subjects. Ormerod and Duckworth (1975) indicated the importance of distinguishing between the physical and biological sciences with respect to gender differences in attitudes toward science. They also stated that "there are clear differences in the nature of boys and girls' scientific interests, with boys expressing relatively greater interest in physical science activities, while girls bare interested in biological and social science topics" (p. 243). Osborne (2003) showed that there is still a bias against physical sciences held by girls, suggesting that at an individual level, majority of girls still choose not to do physical science as soon as they can (p. 1064). Many studies confirm that girls seem to be generally more negative to school of science. It is not merely a question of science as a broad knowledge field or the discrete subjects being distasteful, but children also experience the content in different ways, and these experiences change because of societal development. In a study conducted in the UK, Breakwell and Beardsell, (2003), shows that liking science is related to gender self-image and to gender stereotypes among adolescents. The results show that those girls who liked science less appeared to exclude the perceived in-group deviant from their gender in-group. Despite the so-called masculine image of science, these effects were not significantly stronger among girls than among boys. In the present study, we focus on Abu Dhabi secondary school students' interests (median age 15) with regard to certain content and contexts in physics courses.

Although context-based approach is increasingly popular, there has been little research on the impact of the context-based approach on either teachers' practices or students' experiences of physics. There are eight studies carried out to overcome the lack of research in the field of physics. In addition to students' experiences of context-based physics classes, it is also important to take physics teachers‟ views who are the real implementers of the new approach. Recently, education systems pay more attention to the results of TIMSS and PISA examinations which are common exams done in most countries. And it has been found that there is a positive correlation between the exam results and the curriculum. Because the exams include real-life problems, it is important to design the curriculum by considering context-driven problems or topics. To make the curriculum involved in the context-based approach, the vital element is teacher factor. Unless teachers follow the reforms in education, it is difficult to expect teachers to apply context-based approach in their classrooms. In other words, because teachers tend not to use the new approach and not to give up using the traditional approach, teachers have to be given in-service education and they should be informed about the reforms, so their professional development should be cared (Duit, Widodo, & Wodzinski, 2007). TIMSS and PISA examinations include real-life problems, so many educators complain about the results of the exams, but still there are few studies concerning context-based assessments. Two of the studies in the review were done to point out this issue and they used context-based problems in their studies. Although the importance of having scientifically literate citizens is often mentioned in science education papers claimed that since the 1970s, teaching programs in science, technology and society for science and engineering have faded away at many universities and have been replaced by courses in economic and commercial aspects, or entrepreneurship and/or ethical and philosophical issues. When the context-based science curriculums are taken into consideration, it is seen that most of them are prepared for secondary school students. There is not yet any program designed for tertiary science teaching and Kpiebaya (2012) points out this issue in his study. So, it is important to consider tertiary science education and to form new programs in tertiary level according to context-based approach (Temmuz, 2014).

The present study is designed to investigate the interest of students in physics. Educational settings become better when concepts are clear for significant topic Motivational concept theory also describe this. In our society, basic thinking is that different gender has different interest in sciences especially in physics but with revolution of world this context is changing and they both are taking part equally and it is necessary for the better relationship of gender which is described by situated learning theory and gender. In education and science fields, discussions of learning, development and the concept of interest plays an important role. One of the earliest theories of interest was developed by Herbart at the beginning of the nineteenth century (1806/1965), and by the beginning of the twentieth century, well-known authors were postulating that being interested was not only an important motivational condition for effective learning but was also central to people's personality and self-concept.

Contextual constructivism

Another theoretical perspective available is that of contextual constructivism that focuses on the manner in which learners use tools (physical and conceptual) to construct knowledge and understanding. It is contextual that teaching is embedded to be inseparable from that learning, and it provides a framework for the careful analysis of that context. This perspective begins with a simple representation of the interaction between a subject and an object, mediated by the use of an artifact or tool (the notion of mediated action).

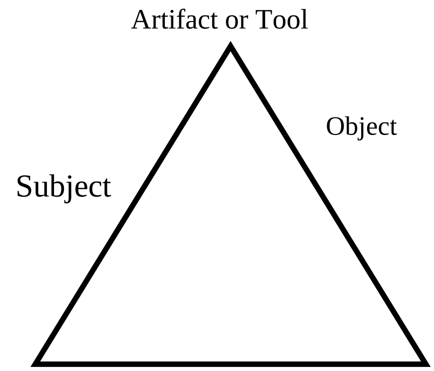

Figure 1. Framework of Contextual Constructivism

The base of the triangle represents the direct interaction between a subject and an object and the upper half represents the mediation of that interaction by a tool. This framework is useful in that it has places for the most relevant components of an interaction and the relations between those components, while remaining simple enough to be understood by non-experts (for example, physics instructors that do not specialize in PER).Thus, contextual constructivism adds the notion of frames of context (Finkelstein, 2001), shown in figure 2.

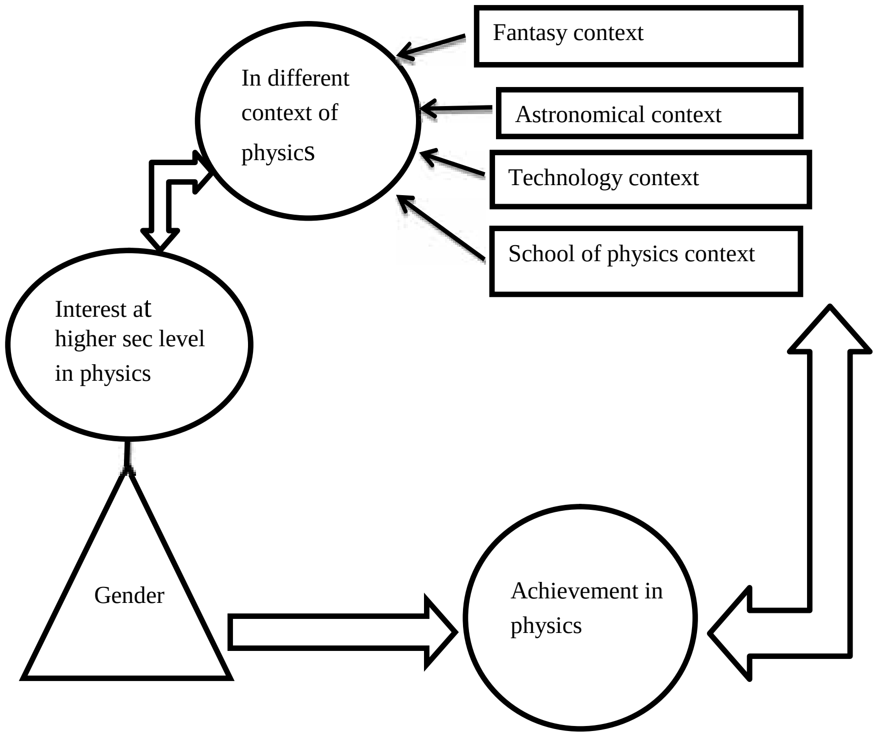

Figure 2. Conceptual Framework of the Study

Objectives of the Study

The objectives of this study were to:

1. Measure the attitude of students toward physics at higher secondary level.
2. Investigate students' interest toward different contexts of physics at higher secondary level.
3. Find out the difference between boys and girls' achievement in physics across different contexts at higher secondary level.

Significance of the Study

This study is significant for the teachers to understand the students' interest in physics related to different contexts. This study will also be helpful for the teachers to change their strategies of teaching physics. There are few studies that overlook the students' achievement and interest in science subjects and their practices. This study will help long way to detect the irrelevant content in which both boys and girls are not interested.

Researcher has stern belief that for effective physics learning we should provide students with curriculum framework and dedicated teachers.

The outcomes of this study will help stakeholder, teachers and students to focus on the problems they are facing in teaching and learning physics at higher secondary level. Students' overall interest in physics was “neutral” (neither positive nor negative), with boys showing a higher interest than girls. Precisely, the results of the study will helpful for teachers to change their teaching strategy and show that there is no major difference between boys and girls interest in physics.

Methods and Procedure

This study was conducted to determine the difference between the interest of boys and girls in the contexts of physics. The design for the present study was quantitative and survey research. The population of the present study was all the students studying in higher secondary schools of both public and private sectors situated in Lahore. A sample of 500 students was selected conveniently from both the sectors.

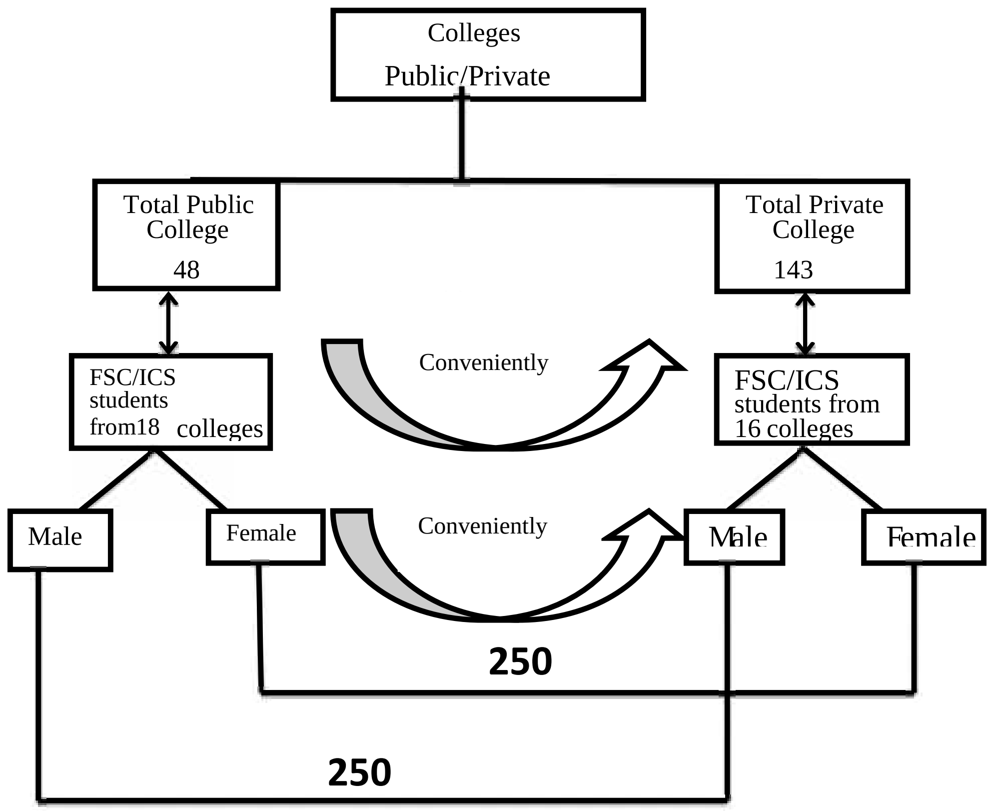

Figure 3. Sampling Design of the Study

Instrumentation

Instruments used for the present study were questionnaire and ROSE FIN instrument. ROSE FIN instrument was a Finnish-specific addition to the large *ROSE questionnaire. Keeping in view the research questions, researchers decided to split 35 items into four groups: (1) fantasy context, (2) astronomical context, (3) technology context, and (4) school physics context. This scale comprised of Liker-type scale items. Permission was sought by the researchers from the adapted instrument developer. For validation purposes the questionnaire was checked by five experts in the field of education and its validity was ensured. The instrument was piloted and its validity and reliability was ensured. In order to check reliability of research instrument, it was piloted and the reliability of different contexts was observed. Cronbach Alpha reliability values for astronomical, technology, school of physics, and fantasy contexts were 0.837, 0.769, 0.860 and 0.799 respectively. The overall reliability of the instrument was 0.876.

Data Analysis and Findings

The collected data was analyzed by using independent sample t-test, Pearson r correlation and Regression. Students' interests across various contexts of physics were analyzed with respect to different variables. The analyzed data were presented in the form of tables below.

Table 1: Gender wise Differences in Attitude Across Fantasy Context

Gender	*Girls*		*Boys*		*t*	*sig.*
	Mean	*SD*	*Mean*	*SD*		
	9.4758	2.69191	10.1520	3.21282	-2.545	.009

Table 1 shows that there was significant difference between girls and boys attitude toward fantasy context. The value of t=-2.545<1.96 (critical value) at 0.05 level of significance. From the value of $p<0.05$, it can be concluded from above table that girls and boys have significant difference in their attitude toward fantasy context.

Table 2: Gender wise Differences in Attitude Across Astronomical Context

Aspects	*Girls Mean*	*SD(g)*	*Boys Mean*	*SD(b)*	*t-value*	*Significance*
Life outside of earth	2.15	1.116	1.84	1.018	3.272	0.24
Unsolved mysteries in outer space	2.10	1.159	2.07	1.069	.248	.047
How it feels to be weightless in space?	1.79	1.019	1.78	.996	.159	.948
How to find my way and navigate by the stars?	2.16	.981	2.06	1.024	1.083	.595
Black holes, super novas and other spectacular objects in outer space	2.22	1.100	2.11	1.058	1.135	.104
Star planets and the universe	1.78	.962	1.98	1.022	-2.223	.719
How meteors, comets or asteroids may cause disaster on earth?	2.24	1.032	2.14	1.010	1.070	.656
Why the stars twinkle and the sky is blue?	1.68	.922	2.05	1.036	-4.214	.162
The star landing on the moon and the history of space exploration	2.22	1.077	2.11	1.022	1.167	.082
Rockets satellites, space travel	1.96	1.058	2.06	1.085	-.961	.585
The use of satellite for communication and other purposes.	2.06	.982	1.97	.981	1.051	.448

The summary of the independent samples t-test in the table show that there was a no significant difference between girls and boys attitude toward astronomy context for the rest of the statements except one. For the significant statement value of t=0.248<1.96(critical value) at 0.05 level of significance. The value of $p<0.05$ for unsolved mysteries of outer space, so it can be observed that girls have higher interest than boys.

Table 3. Gender wise Differences in Attitude Across Technological Context

Aspects	*Girls Mean*	*SD (g)*	*Boys Mean*	*SD (b)*	*t-value*	*Significance*
Inventions and discoveries that have changed the world.	1.75	.948	1.91	1.016	-1.748	.236
How mobile phones can send and receive messages?	1.82	1.039	2.16	1.062	-3.583	.804
How computers work?	2.06	1.076	2.16	1.096	-.981	.446
How cassette tapes, CDs and DVDs store and play sound and music?	2.18	1.078	2.26	1.115	-.759	.225
How things like radio and television work?	2.13	1.018	2.26	1.087	-1.388	.023
How electricity has affected the development of our society?	2.12	1.023	2.12	1.090	.052	.220
The use of lasers for technical purposes (CD players, bar- codes readers, etc.)	2.24	1.075	2.24	1.075	.062	.772
How to use and repair every day electrical and mechanical equipment?	2.37	1.127	2.15	1.053	2.240	.022
How petrol and diesel engine work?	2.55	1.071	2.33	1.021	3.587	.060

Table 3 shows that there were only two dimensions of the technological context that show there is significant difference among girls and boys i.e. how radio and television work and repairmen of equipment rest of the factors other are non-significant at 0.05 level of significance. It can be concluded from the table that boys have more interest in the significant statements than girls.

Table 4. Gender wise Differences in Attitude Across School of Physics Context

	Girls		*Boys*		*t-value*	*Sig.*
	Mean	*SD*	*Mean*	*SD*		
How energy can be saved or used in a more effective way?	1.97	1.012	2.10	1.095	1.357	.175
How the sunset colors the sky?	1.45	.838	1.89	1.088	-5.011	.000
Why we can see rainbows?	1.55	.842	2.03	1.069	-5.509	.000
New sources of energy from the sub, wind, tides, waves etc.	2.04	.932	2.13	1.058	-.981	.001
How the atom bomb functions?	1.94	1.051	2.08	1.117	-1.487	.181
Electricity, how it is produced and used in home	2.23	1.021	2.24	1.048	-.153	.436
Optical instrument and how they work (telescope, camera, Microscope etc.)	2.27	1.081	2.12	1.085	1.505	.946
How different musical instruments produced different sounds?	1.87	1.019	2.17	1.077	-3.203	.208
Light around us that we can't see (IR) (UV)	2.16	1.056	2.13	1.075	.349	.580
How a nuclear power plant functions?	2.19	1.163	2.03	1.051	1.627	.004

The summary of the t-table shows that there were only four significant statements sunset colours the sky, sunset, wind tides, nuclear plant function. It can be observed from the table boys have more interest in significant statements in school of physics context; for rest of statements null hypotheses Ho_6 was accepted.

Table 5: Comparison between public and private institutes on student achievement

Groups	*Numbers*	*Mean*	*SD*	*t-value*	*Significance*
Public	232	122.91	21.88	4.413	.031
Private	268	113.85	23.728	4.439	

Table 5 indicates that there was significant difference between the achievement of public and private schools. The value of t=4.413>1.96 for public and 4.439>1.96 for private (critical value) at 0.05 level of significance. The value of p= 0.031< 0.05. The public institutions students are higher achievers than private.

Table 6: Institute wise Differences in Attitude Across Fantasy Context

Groups	*Numbers*	*Mean*	*SD*	*t-value*	*Significance*
Public	232	9.8836	2.89189	.471	.644
Private	268	9.7575	3.06926	.473	

It is evident from table 6 that there was no significant difference between public and private institutes on fantasy context. The value of t=0.471<1.96 for public and 0.473<1.96 for private (critical value) at 0.05level of significance. The public and private institutes have no significant difference on fantasy context.

Table 7: Institute-wise Differences in Attitude Across Astronomical Context

Groups	*Numbers*	*Mean*	*SD*	*t-value*	*Significance*
Public	232	22.3448	5.84742	.357	.954
Private	268	22.1530	6.12257	.358	

Table 7 shows that there was no significant difference between public and private institutes in Astronomical context. The value of t=0.357<1.96 for public and 0.358<1.96 for private (critical value) at 0.05level of significance. The value of p 0.954>0.05 shows that the public and private institutes have no significant difference on Astronomical context.

Table 8: Institute-wise Differences in Attitude Across Technology Context

Groups	*Numbers*	*Mean*	*SD*	*t-value*	*Significance*
Public	232	19.9655	5.78613	2.333	.475
Private	268	18.7836	5.52876	2.325	

Table 8 shows that there was no significant difference between public and private institutes in technology context. The value of t=2.333>1.96 for public and 2.325>1.96 for private (critical value) at 0.05level of significance. The value of p=0.475>0.05.The public and private institutes have no significant difference on Technology context.

Table 9: Institute-wise Differences in Attitude Across School of Physics Context

Groups	*Numbers*	*Mean*	*SD*	*t-value*	*Significance*
Public	232	20.3621	5.71911	.297	.860
Private	268	20.2052	6.04283	.298	

Table 9 shows that there was no significant difference between public and private institutes on school of physics context. The value of t=0.297<1.96 for public and 0.298<1.96 for private (critical value) at 0.05level of significance. The value of p 0.860>0.05 shows that the public and private institutes have no significant difference on school of Physics context.

Table 10: Relationship of Different Contexts and Students' Achievement

Contexts	*N*	*Pearson Correlation*	*Significance*
Fantasy Context and Achievement	500	-0.030	0.506
Technology Context and Achievement	500	0.104	0.019
School of Physics Context and Achievement	500	0.001	0.986
Astronomical Context and Achievement	500	0.016	0.727

Table 10 demonstrates Pearson correlation analysis that there is no significant relationship of achievement with fantasy context, school of physics context and astronomical context as the value of Pearson correlation co-efficient is not significant. This table also shows that there is significant relationship between achievement and technology context as the value of Pearson correlation co-efficient is 0.104<1 (1, 0, -1) but this relationship is significant as indicated by sig 0.019>0.05.

Table 11: Gender-wise Difference among Different Contexts and Students' Achievement

Groups	*t-value*	*P*	*SE*	*F-Ratio*
Fantasy Context	-.772	.441	.382	2.064
Astronomical context	-.087	.930	.217	
Technology context	2.717	.007	.223	
School of physics	-1.073	.284	.228	

The above table shows that regression analysis for the relationship between students' achievement is different context was statically significant, F(5.120)=2.064 was smaller than critical value=3.17 at0.1 significant level. The standard error of estimate for fantasy context was=0.382, astronomical context=0.217, Technology context=0.223, School of physics=0.228. Of the five predictors for regression analysis only technology context was significant t=2.717<0.007 presented in table 4.16. This result strengthens the previous rejection of the null hypotheses that there is no significant relationship between technology context and student achievement. Other context, Fantasy context (-0.772<0.441), Astronomical context (-0.087<0.930), School of physics context (-1.073<0.284) was not significant. Therefore, the null hypotheses Ho_{13} stating that there is no significant effect of different context of physics on students' achievement is accepted.

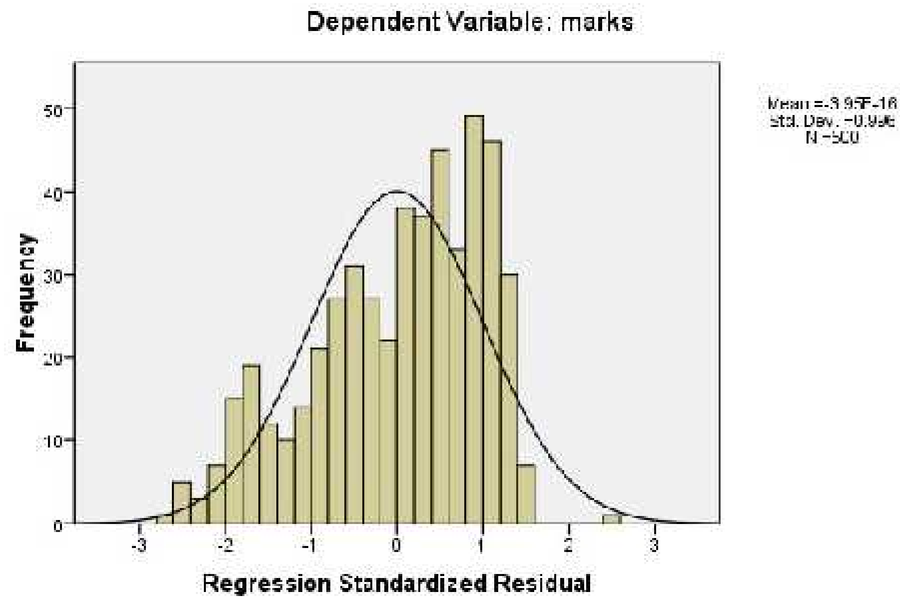

Figure 3. Distribution of Variable Marks Score Measuring Students' Frequency

Above figure shows negatively skewed distribution on the left, which shows that most of the students achieved good marks but a few did poorly, it also shows that data is continuous.

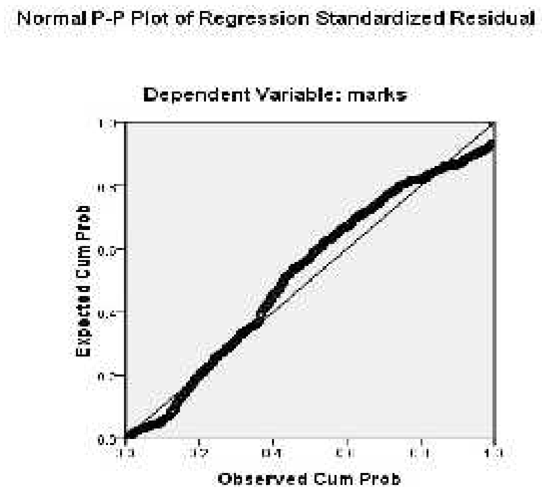

Figure 4. Difference Between the Expected Marks and Observe Marks

Figure 4 shows that there is variation between observe and expected marks. Expected result was linear but observed result shows that they are linked with each other but not linear.

Discussion

The study was aimed to investigate students' interest in physics in relation to gender. The study also examines the relationship between the student achievement and different context of physics. The data suggests that learning is critically grounded in context. Conceptual change is a more complicated process than can be captured by models which purely focus on student- and/or content-centered approaches such as the theory of accommodation of new ideas as realized by an elicit-confront resolve model. However, students said they learned the subjects more permanently, and could establish a relationship between physics and daily life with the context-based instruction. The permanence of information and adapting it to daily life is difficult with the traditional approach to learning. If we execute the physics course theoretically, we lead the students to memorization. This causes to forget the information as soon as possible. As a result, we can say students gained important cognitive outcomes as "*permanent physics learning" and "connection with physics and daily life"* with context-based approach in physics course. Study also concludes that there is no major difference in girls and boys attitude toward physics. This finding supports the findings of the Hoffmann's (2002) German survey. She emphasized that in Grade 10, only 20 % of girls and 60 % of boys found physics lessons interesting or very interesting. She pointed out that girls responded very sensitively to a change of context. In the technology context, the ratio between boys and girls was at the same level. Over 50% of the boys found physics in that context interesting or very interesting and about 17 % of girls found physics interesting or very interesting in the technical application context. On the other hand, about 34 % of girls and 31 % of boys found physics interesting or very interesting in the human being context. The results of the present study indicate that Pakistani girls and boys both responded equally towards different contexts of Physics.

It can be seen that students were interested in topics of physics about which they imagine. This study considers these critiques of research on the context-based approach in physics and examines the effects of context-based physics instruction on students' achievement. In specific context of Kerala, the gap in interest between boys and girls may be closed if physics is treated not solely as a scientific enterprise but also in its connection to our society; as individual teachers have a major effect on both overall science-interest and on specific topic related interests (Ghafoor, 2009). Results of the present study show that in fact, physics fails to attract a large proportion of students. The results suggest that particular attention should be given to curriculum development, teacher development, and use of other strategies to make students experience more engaging. The task of making physics more relevant to students presents an interesting challenge to schools.

Conclusion

It was concluded that parents' education affects the achievement of their children in a positive way. It was concluded that there is a difference of attitude of boys and girls in fantasy context. Boys fantasize more than girls, although they have no interest toward astronomical context and technological context. Improvement must be needed in context to develop interest toward astronomy. The outcome of boys and girls are same in school of physics context. The students from public institutes are good achievers than the students from private institutes because private institutes just focus on brilliant minds but public institutes give equal attention to all students and they have better experienced faculty and also have higher merit criteria for admission. The public and private institutes are not affected by fantasy context, technological context, astronomical context and school of physics context because curriculum is same at higher secondary level. There is no relationship between fantasy context, school of physics context and students' achievement. The technology context has relationship with students' achievement because in technical context is practical context and student have given more attention to learn in and understand better. Only technology context has effect on gender wise achievement.

Recommendations

On the basis of findings and conclusions of this study, following recommendations are made:

1. This study was based on student interest in different context of physics, but researchers should also evaluate their interest in other courses i.e. organic chemistry and inorganic chemistry, nuclear physics and meta-physics etc.
2. Further research may be conducted at university level to analyze the students' interest in relation to the different subject in higher education.

* *ROSE (The Relevance of Science Education) is an international project with about 40 participating countries. ROSE is organized by Svein Sjoberg and Camilla Schreiner at The University of Oslo and is supported by the Research Council of Norway. Reports and details are available at http://www.ils.uio.no/forskning/rose/*

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