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RESEARCH PAPER

Relationship between Teachers' Motivational Support and Students' Achievement in Science Subjects at Secondary School Level

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ABSTRACT

This study aimed to investigate the perceptions of secondary school science students regarding their teachers' motivational support and its relationship with their academic achievement in science subjects in district Bannu, Khyber Pakhtunkhwa. Science subjects are often seen as challenging and require substantial effort from students. A correlational research design was employed for this study. The sample consisted of 1,030 10th-grade students selected through a stratified sampling technique. Data were collected using an instrument that included demographic information, science subject marks, and items assessing students' perceptions of their teachers' motivational support. The findings revealed a significant positive correlation between perceived teacher motivational support and students' academic achievement in science subjects. Students who reported higher levels of teacher-provided motivational support tended to achieve better academic results in their science courses. The study recommends that science teachers implement and consistently use effective motivational strategies to enhance their students' academic performance. Understanding and applying motivation within the classroom context is essential for improving student outcomes and fostering greater participation in science-related fields.

KEYWORDS Academic Achievement, Learning Outcomes, Motivation, Science Subjects, Secondary Education

Introduction

The professional role teachers have been considered as a very important factor in the development of the students. Teachers who plan and effectively use teaching techniques play an important role in motivating students (Guvene, 2015). Actually, good academic interaction between students and teachers are the key factors that account for effective teaching and learning. Lin (2012) described motivation as an individual's inner desires that are already present in him or that are reflected in getting new knowledge. Cavas (2011) specified that the role of motivational level is a major factor that can contribute to students' attitude. It is therefore, considered that students with better motivational opportunities may perform better. Williams and Williams (2011) also pointed out that motivation plays a very important role in enhancing students' interest in learning. It is, therefore, a general perception that students with high motivation are more likely to learn better and, ultimately, to get better results. O'Shea (2006) identified five common components of teacher support. Both high-performance students and those with low results have identified teachers' support as those teachers who:

- Provide extra help outside of normal class time
- Maintain high academic and behavioral standards
- Provide relevant lesson for real-world applications
- Participation in the personal lives of students, especially when personal problems jeopardize academic performance or general well-being
- Present lesson designed to take into account the circumstances of the individual or individual learning styles

Zakaria and Nordin (2008) discussed that there is a significant effect of anxiety in science subject like mathematics on their motivation, such as students with low anxiety level perform better than moderate anxiety level and similarly moderate level students perform better than high-level anxiety. Self-determination theory describes the characteristics and conditions that must exist for meeting with factors for flourishing in the classroom. Classroom motivations are fulfilled as students interact with teachers and peers, involve themselves in the learning, and perceive support these social partners (Wakefield, 2016). Therefore, it is believed that motivation is intrinsic to the person because all human beings have innated psychological needs. These basic pedagogical needs are autonomy, competence, and relatedness. The need for relatedness is linked to the desire to interact, be connected and experience the care of other people (Deci & Ryan, 2002). Our daily actions and activities involve other peoples and through this, we consider our self in the feeling of belonging. When activities meet these basic psychological needs, they are considered as an intrinsically motivating force (Skinner & Pitzer, 2012). Therefore, when students perceive the support of their teacher and class fellows. It is theorized that a student will be involved in learning. Wakefield (2016) developed a conceptual framework and show it as a reciprocal process i.e. teacher support consisted of authority, competence, and relatedness accompanied by peer support produce agentic engagement which ultimately boosts achievement.

The most important aim of secondary education is to develop student knowledge, competency, and interest in contemporary subjects like science. Quality education cannot only be achieved by setting high discipline and curriculum but effective teaching, as well as motivation, can play an important role in the academic success of the student. The conducive learning environment is also essential for rising students' mental state that will help them in gaining their academics since very little has been done in finding the perceived motivational support of the teacher and its influence on student achievement in science, so this important area was undertaken to add to the body of knowledge.

Yu, R., & Singh, K. (2016) identified in his longitudinal study that students influenced indirectly through teacher support in mathematics achievement as students' self-efficacy and interest showed direct influence. They further pointed out that students having prior high achievement were more likely to perceive a higher level of teacher support. There is a considerable amount of research on how the relationship between students and teachers affect the quality of students' motivation and classroom learning experience (Davis, 2003), (Hyman & Perone, 1998), (Klem & Connell, 2004). Goodenow (1993) noted that the strength of motivational support decreases significantly from sixth to eighth and it was more closely related to motivation for girls as compared to boys. Pajares & Valiante (2001) conceptualized that motivation and achievement of students i.e. girls are good in language and boys are superiors in science subjects on the bases of their gender is stereo typed. In line with Chang (2016) among brilliant forms of teacher's help in emotional guidance is of the most commonly studied factors of teacher support. Emotional support has often been measured with student's perceptions of teacher caring. Edwards (2009) studied the effect of supporting positive teacher behavior on the

academic achievement of reading in elementary school in southeastern North Caroline. Educational and contextual factors did not show any positive effect on students' performance in reading. Students' performance is a dependent variable that occurs due to the acquisition of knowledge, skills, and attitudes of the teaching completed with useful resources.

It is therefore, demands excellent coaching and support, a reality as argued by Dornyei (2001) who emphasized that in most cases productive schooling rest on teaching force. At the core of quality education, teacher performance can be measured by the students' performance (Adair, 2009, Guvenc, 2015). Among many variables, those predict students' performance as an output, motivation of teacher can also play an important role in this regard. Therefore, more research is needed on other contexts and educational levels before arriving at general conclusions about what the teacher can do often in different ways to support the student's interest.

Literature Review

It is a little bit difficult to define teacher support construct, however the review of literature until now has provided evidence that teachers who support and develop the sense of self-efficacy through the effective application of motivational strategies and the maintenance of high expectations of academic achievement, needed for student results (Reeva & Jang, 2006). The teacher's support measures the amount of help, concern and friendship which the teacher directs students. Students are interested to know that their teachers take interests in their success and care about them (Woodard, 2004). When they get appreciations, this act of teachers helps in developing a conducive learning environment that energies the students' motivation and hard work (Goodenow, 1993). Recalling Brophy (2004) results that strong interpersonal relationship with students is perhaps the most effective motivational strategy available to teachers to promote student learning. Deiro (2005) suggested that relationship are not only essential tools to improve student motivation, but the most effective strategy for overcoming the environmental factors that may have a negative impact on students' learning is interpersonal relations. Formal interaction between students and teachers mostly occurs in classroom, there is evidence that students who experience informal interaction tend to be more motivated, engaged and actively involved in the learning process (Komarraju, Musulkin, & Bhattacharya, 2010). Attention is now given to students' perceptions of being the beneficiary of these thoughtful and supportive relationships.

Student Perception of Teacher Support

The motive of encouragement is to create a situation in which students are willing to work with interest and enthusiasm. The attitude of any student towards a certain task can determine failure or success. Giving students an assignment of their interest in the classroom is a best way to encourage them. In this way, students will consider it a privilege rather than a burden and they will work hard to make it sure along with other students. Koch (1999) pointed out that a well-qualified and highly motivated teacher can understand the needs of students that ultimately improve the quality of education. Duke and Sessoms (1991) conducted a study to consider the effects of students' perceptions of their teacher support and collected data from students studying in those institutions that are engaged in serving academically disadvantaged students. Major students' perceptions identified as recognition of individual learning differences among students, behaving respectfully and friendly with students and having high expectations for students. Treating students with respect was identified as the most significant factor in teacher effectiveness, regardless of their academic ability. The most significant attributes

of an effective teacher are being caring and helpful for their students. Even perceiving the teacher as supportive is positively related to asking for help with schoolwork, when needed (Newman and Schwager, 1993). It is necessary for a teacher to keep the students active and on task, but allowing students to manage some of the activities in the classroom is actually a great way to keep them engaged and motivated. For example, allowing students for selection of an assignment in which they are interested may give them a sense of control and a way to motivate them.

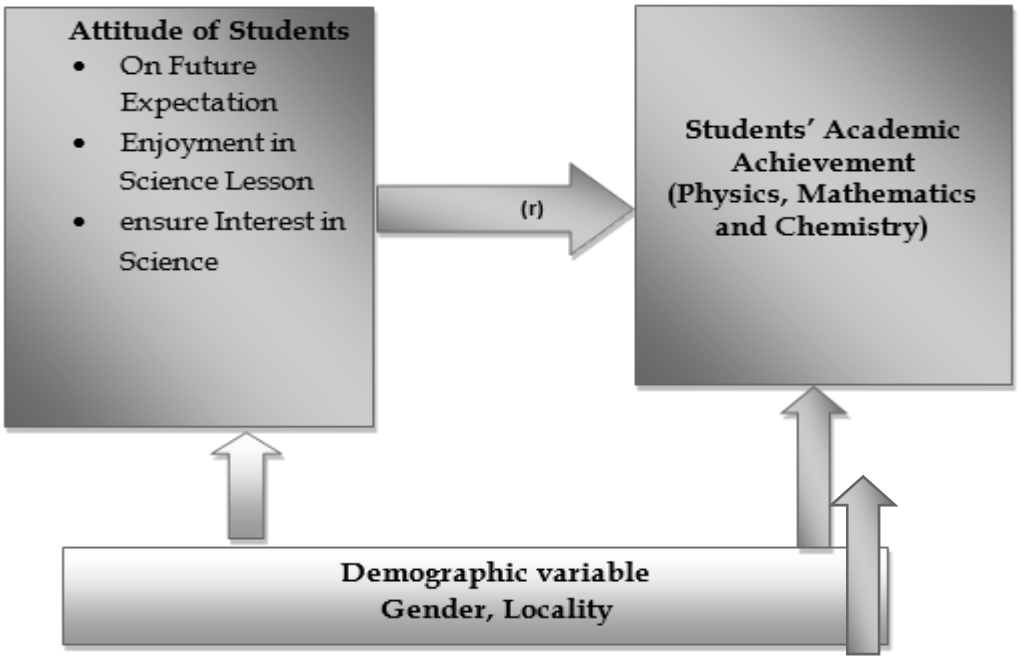

Figure 1. Conceptual framework of the study

Material and Methods

This study was conducted in Government secondary schools of district Bannu, Khyber Pakhtunkhwa. The population of the study consisted of all the students of 10th class of Government high and higher secondary schools. This population comprised of 6510 students (1579 in urban while 4931 in rural area) enrolled in grade 10th. Data were collected from 35 schools (19 boys and 16 girls' schools). The study involved 1030 students (588 boys and 442 girls) selected through stratified sampling technique. The students were also informed that their participation is voluntary and does not affect any type of performance.

Sample and Sampling Technique

The stratified random sampling technique was used to select the sample of the study. For this purpose, the whole sample was divided into two strata. Stratum one consists of urban areas schools while stratum two consist of rural areas schools of District Bannu. As schools in urban areas are less in number as compared to rural areas so disproportionate stratum sampling technique was employed, while in rural areas data was collected through simple random sampling technique.

Research Instrument

The scale consisted of demographic information and items regarding motivational support from teachers on five points Likert type scale with a range of

strongly agree to strongly disagree. The scale combined items adapted from the Fennema-Sherman Attitude scale. The instrument was made valid and reliable by pilot testing through working science teachers and 50 secondary school students. Cronbach's alpha value of the instrument was .851. Marks obtained on the subjects of science (Physics + Chemistry +Mathematics + Biology) in Board of intermediate & secondary education were collected as students' achievement in science subjects. Data of only those students were collected who appeared in the 9th class BISE exam and now studying in 10th class.

Results and Discussion

Table 1
Demographic information of study sample

	Nature of schools	No of students	Percentage
Boys	19	588	57.1
Girls	16	442	42.9
Total	35	1030	100.0

Table No. 1 shows the nature if school and number of students who participated in the study. Out of 35 schools, 19 were boys and 16 are girls' schools selected through stratified random sampling techniques. Similarly, the number of boys' and girls' students are 588 and 442 respectively.

Table 2
Descriptive Statistics

	N	Mean	SD
My teachers' want that I get all the knowledge of science that I can do.	1030	4.50	.82
My teachers motivate me on gaining maximum knowledge of science.	1030	4.48	.81
My teachers are interested in my progress in science	1030	4.46	.85
The teacher's behaviour makes me realize that I am capable of developing science.	1030	4.37	.89
My teachers believe that a person like me can demonstrate high-performance in science.	1030	4.36	.89

The above table illustrates the ranking of perceptions of students about their teachers' motivations with their means and standard deviations. The motivational support that secondary school students perceived to a high extent (M=4.50) are that their teachers want to give all the knowledge of science to them. The perceptions with the lowest mean score of (M= 4.36) also indicates that secondary school students believe that their teachers expect high performance in science.

Table 3
Bivariate correlation among study variables

		1	2	3	4
1.	Gender	1.00			
2.	School Location	-.259**	1.00		
3.	Motivational support	.328**	.119**	1.00	
4.	Achievement in science	.199**	.094**	.347**	1.00

** Correlation is significant at the 0.05 level (2-tailed)

The result of the correlation analysis indicated that gender is negatively correlated with school location r = -.259, whereas all the other variables are positively correlated. The above table also depicts total score of students' perception about motivational support of teachers with academic achievement in science subjects. The value of "r" is .347, indicating that a significant positive correlation exists between two variables.

Discussion

The result of present study advocated that students who perceived greater motivational support from their teachers have greater competency in the science subjects resulting in better academic achievement. These findings are consistent with previous studies. (Rice, et al. 2013) shared the results of grade fifth and college students who received greater motivational support from their teachers, parents and friends reported better attitude and had high perceptions of their abilities in science and mathematics. Wakefield (2016) also found that teachers could promote positive teacher-student (teacher relatedness) and student-student relationship (peer relatedness) by keeping the difficulty level of the skills and understanding of the students' competence. Zakaria & Nordin (2008) found a significant low positive correlation between the motivation of matriculation students and academic achievement in mathematics. McRae (2012) study also reported that perceived teacher competence support was positively related to students' reading achievement. When a teacher provides adequate competence support by giving encouraging feedback and instructional help to students, students will exhibit positive motivation with increased competence and decreased anxiety. Wayne & Youngs (2003) reviewed related studies and concluded that students learn more from their teachers with certain characteristics. Alonzo et, al. (2007) recommended a strong emphasis on the continuous professional development of all colleagues of the teaching occupation, that shows that a teacher should be updated with the need of the students.

Teacher support is the manifestation of motivation and can be a barometer for student learning. Singh, Granville and Dika (2002) explained that the achievement of science subjects like mathematics in secondary schools could be a purpose of many interconnected variables: learner' abilities, perceptions and approaches, socioeconomic variables, influences of parents and classmates, variables related to the school. Most of them are related to home and family, so they do not come under the domain of teacher and therefore out of control. Conversely, some other variables are related to school, for instance students (a) educational participation (b) attitudes and perceptions and (c) information on the role of science / mathematics in future professional opportunities that will be influenced and likely to vary. There is no other best way of getting good work other than encouragement and motivation. Teacher can encourage students by praising their efforts publicly and sharing their success. According to academic interventions, therefore, the understanding of the role of factors such as motivation, interest, attitude and educational commitment to scientific and mathematical results has attracted great attention in recent years. This study showed a very low correlation between the location of the school and the academic performance of the science student, i.e. .094. Fredrick, Walberg and Rasher (1979) observed in their study that there is a positive correlation between positive teacher feedback and student achievement (0.22) and a negative relationship between negative teacher feedback and student achievement. (-0.08). Agbaje et al. (2014) in their study found no significant differences in the average school performance score in the performance of students of children in rural areas compared to the high school certificate. His study also revealed that there is no significant impact of geographic location on outcomes in physics, chemistry and biology. Both types of motivation i.e. extrinsic and intrinsic is a key element to move forward students in their

education. Teacher can play their role in helping the students for learning. Of course, this task is not as easy as all the students have different learning styles and it takes time and efforts to guide students in the class.

Conclusion

The overall result of the study revealed that a significant positive correlation exists between teachers' motivational support and students' achievement in science subjects. It was also concluded that from the findings of the study that students from urban areas have more positive attitude towards science subjects than rural areas. The reason behind more facilities such as well-equipped libraries and other facilities are available in schools located in urban areas.

Recommendations of the Study

- Teachers should employ motivational techniques such as positive reinforcement, goal-setting, and acknowledging student achievements to enhance students' confidence and foster a stronger interest in science subjects.
- Teachers should build relationships based on trust and mutual respect, showing a genuine interest in students' academic progress to create a positive and motivating learning environment.
- Teachers should discuss science-related career paths with students, connecting academic learning to real-world applications to inspire sustained interest in the field.
- Group projects and peer interactions should be encouraged to promote teamwork, strengthen peer relationships, and enhance student engagement in science.
- Schools should provide ongoing training for teachers focused on motivational skills, effective communication, and personalized feedback techniques to cultivate supportive classroom environments.
- Additional resources and targeted teacher training should be made available to underserved schools, ensuring equitable access to quality science education across different regions.

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