

Poor Performance in Grade 9 Mathematics: Students' Attributions

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Abstract

The present study investigated secondary school students' views about their poor performance in the subject of mathematics in Lahore. The study was descriptive in nature and survey research design with a qualitative approach was used. The researcher developed an open-ended questionnaire and purposively selected 40 participants (20 boys and 20 girls) from 10 secondary schools to collect the data. The thematic analysis was done to analyze the qualitative data. It was found that the students' idleness and their negative attitude towards mathematics were the main reasons for their poor performance in mathematics. Incompetency and strictness of the teachers were also the reasons for their students' poor performance in mathematics. It was recommended that counseling centers for the students may be established to overcome external and internal factors of students' failures in mathematics. Moreover, the pieces of training for pre-service and in-service mathematics teachers were also recommended.

Keywords: Secondary students, weiner's theory, views, failure, Mathematics

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Introduction

Mathematics plays a pivotal role in the progress and prosperity of individuals and societies across the world (Nyatanga & Ndudzo, 2015). It is much important for the young generation, as the advancement of all societies depends on the education and skills of their youth. Mathematics enables students to ensure a dynamic economy for nations and countries (Hoong, Kin, & Pien, 2015). Mathematics is used as a service subject for scientific and technical subjects and almost all fields (Ngussa & Mbuti, 2017; Ojose, 2011). Scientific and technical instruments have become the need of this time. Therefore, mathematics is required for all subjects in every walk of life (Başturk, 2016; Salman, Mohammad, Ogenlade, & Ayinla, 2012).

Due to the importance of mathematics highlighted above, mathematics courses should be designed to meet students' individual needs. Secondary schools should provide a feasible environment for the study of mathematics to facilitate the students and society (Saeedullah, 2014). Students with diverse backgrounds demand relevant pedagogies for affective learning (Shores & Smith, 2010). Physical, psychosocial, and environmental factors in the classrooms affect awareness and attitude towards mathematics. These factors ultimately affect the achievement of the students in mathematics (Blazar & Kraft, 2017; Makgato & Mji, 2006).

Secondary school education provides foundations for employment and further study (Guy, Cornick, & Beckford, 2015). Therefore, this level needs much attention to be investigated in developing countries like Pakistan (Government of Pakistan, 2017). Secondary education comprises grades 9 and 10 in Pakistan. It serves humanity with a dual purpose, by providing the employment opportunity and to get tertiary education. Therefore, all developed countries and developing countries need a productive secondary education system (Murmane & Ganimian, 2016). Since secondary education provides a base for tertiary education, therefore the excellence of tertiary education depends on the quality of secondary education (Feza-Piyose, 2012; Schultz, 2004).

Studies on learners' views about their failure in mathematics are insufficient in Pakistan. The researcher has been teaching mathematics and has observed students' failure in mathematics for many years. The previous results of secondary school students show a drastic situation of their failure in mathematics. Following are the results issued by the Board of Intermediate and Secondary Education Lahore.

Table 1.
Results of Grade 9 Students

Year	Pass %
2015	58.73%
2016	64.99%
2017	69.82%
2018	69.54%

Source: Gazette, Board of Intermediate and Secondary Education, Lahore

The researcher was inspired to conduct the study due to these circumstances. The objective of this study was to explore secondary students' attributions to their poor performance in mathematics.

Literature Review

The present study is based on Weiner's theory of attribution (1985). This theory helps us find internal and external factors relating to our performance and make decisions about the reasons for performance (Weiner, 2010). Weiner's theory specifically describes an explanation regarding cognitive perspective about the student's academic failures and success. According to the theory, students fail or succeed in their academics due to internal and external factors. The internal factors are the factors that come from within students. The external factors are the factors that are found in the student's environment. This study got insight from Weiner's attribution theory to explore the secondary school students' attributions about their poor performance in mathematics.

Internal factors i.e. laziness or negative perceptions about mathematics and external factors i.e. lack of human resources, teachers' nonprofessional and unethical behavior, and incompetent teachers, are the aspects of poor performance in mathematics (Benolken, 2015; Mazana & Montero, 2019; Vezzani, Vittori, & Pinto, 2018). The studies on factors of students' failure in mathematics found that the failure is due to the level of ability and lower motivation. Ability is the least factor influencing students' success and failure in mathematics (Arthur et, Oduro, & Boadi, 2014; Brodie, 2004; Erten & Burden, 2014; McMillan, 2015). There is also a relationship between the question of difficulty and

failure. Ali (2012) found that teachers are the most important factors influencing the teaching-learning process.

Mohamad (2012) found that the behavior of teachers plays an important role in students' achievements. Rohana (2010) found that the learning environment, such as physical facilities and teachers' motivation, are the main factors influencing students' academic achievements. Some researchers found that a student's effort is the central factor of success and failure in mathematics, followed by environment, question difficulty, and ability (Getahum, Adamu, Andargie, & Mebrat, 2016; House, 2006; Kahn, 2001; Vijayashree, 2011).

Sadia, Imran, Yousuf, & Parveen (2012) conducted a study to investigate the students' attribution. They found that the students could not perform well in mathematics when their teachers did not know the subject of mathematics. Students having a positive attitude towards mathematics perform better and vice versa (Saad, Adamu, & Sadiq, 2014). Teachers are the key factors to develop the student's interest in a specific study area. Teachers' words of humiliation for their students can stray them from a specific subject in the class (Kolenski, 2009).

The objective of the Study

The objective of the study was to investigate grade 9 students' attribution of their poor performance in mathematics.

Research Question

What are the grade 9 students' attributions about their poor performance in mathematics in Lahore?

Methodology

The present study was descriptive, and a survey research design with a qualitative approach was used. The researcher developed an open-ended questionnaire after the review of related literature to collect the data. Weiner's theory of attribution provides the theoretical foundation of the study. Weiner's attribution theory involves two factors of students' failure or success, internal and external factors. Therefore, both the internal and the external factors of students' failure in mathematics were included in the open-ended questions. The initial draft of the questionnaire was discussed with 4 experts in qualitative research. The

draft was modified after the discussion with the experts.

The modified draft of the questionnaire was sent to the 10 experts for its validation. The experts commented on the questionnaire to improve it. They focused to include open-ended questions relating to both the internal and the external factors causing failures in mathematics separately in the questionnaire. The expert's comments were resolved. The questionnaire was validated by the experts. The questionnaire was piloted on 10 students of the same characteristics belonging to the schools not included in the study. During piloting, it was found that there was insufficient space on the answer sheet for the participants of the study. The questionnaire was improved and finally, a validated and reliable questionnaire was developed. Sufficient space was provided on paper in the questionnaire for students to write their views in detail. The students were asked to write their views freely about their failures in the subject of mathematics.

The population of the study was secondary school students of Lahore. The purposive sampling technique was used for the selection of the schools and the students. The sample for the study comprised 40 students (20 boys & 20 girls). The sample was drawn from 10 secondary schools in Lahore using a purposive sampling technique. The number of selected schools was the same for boys and girls i.e. 5 schools for each. The researcher distributed the questionnaire personally to collect the data. The researcher did not interfere with the study participants during the writing of their views.

Data Analysis

Thematic analysis was made on the responses of participants of the study, collected through open-ended questionnaires. Themes were identified and were shifted on the coding sheet. Portions of relevant conversations were quoted. The following results emerged after thematic analysis.

Students' Laziness in Studying Mathematics

The students attributed their poor performance in mathematics to their laziness. Most of the students could not perform well in mathematics due to a lack of practice in solving mathematics questions. Some students were so frightened to solve mathematical problems that they considered

mathematics a very difficult subject. Due to this fear, they did not make any effort to study mathematics.

Respondent A described that *“I am studying due to my parents’ will; therefore, I never did my classwork or homework. I request my class fellow to write my homework and complete the written tasks given in summer vacations; I got paid services to complete summer vacation homework”*.

Students Absenteeism

The respondents of the study attributed that they failed in mathematics because of their frequent absence from school. The students attributed that they had remained absent from school twice or thrice a week. Due to this absence, they could not study mathematics properly and could not perform well in mathematics. Consequently, they failed the examination.

Shortage of Teachers

The participants of the study attributed that the shortage of specialist mathematics teachers was the reason for students’ poor performance in mathematics. Limited numbers of teachers could not teach all the students in regular school settings and in little time. They could not compensate for the students’ deficiency in mathematics.

Over Crowded Classes

The students attributed their low performance in mathematics is due to overcrowded classes. They could not learn mathematics in a better way due to overcrowded classes. According to students’ attribution, more than sixty students were in a class in some schools. These overcrowded classes were not equipped with an airy atmosphere. Due to the large number of students in the class, the teachers could not check their students’ homework and class tests regularly. This situation became worse in the summer season, and students felt uncomfortable.

Teachers’ Strictness

The respondents attributed their poor performance in mathematics to unethical and non-professional behaviors of their mathematics teachers. Some teachers used corporal punishment in class, and they did not

motivate their students. Participant B explained, “*Sir K always humiliated his students by saying ‘Ullu kay Pathay’ (Little owl).*” The teachers forced the students to attend tuition classes. The students could not do so as they were unable to pay tuition fees. The teachers appreciated those students who were studying in teachers’ tuition centers. The respondent “C” articulated, “*In the 9th class, sir. Z asked me to attend his tuition center; I could not do so because of my poor financial conditions. Sir Z ignored me and other students who could not attend his academy/ tuition center*”.

Incompetent Mathematics Teachers

The participants of the study attributed their failure in mathematics is due to incompetent mathematics teachers. Those teachers did not know the new concepts offered at the secondary school level. They used a formulaic strategy of selective study and do not know all the mathematical concepts given in the textbook. Participant D said, “*Sir N uses ‘Hamdard Khulasah’ or ‘Pilot’ (Helping books) to teach them mathematics. If a student asked about algorithm or reasoning of mathematical sums, Sir N snubbed him and could not satisfy*”.

Discussion

The major objective of the study was to investigate secondary school students’ views about their failures in mathematics. It was found that the student's poor performance is due to some internal factors. The students’ idleness and less interest in doing mathematics were the major internal factors for their poor performance. These attributions confirm the findings of Boruchovitch (2004), Enu, Agyman, and Nkum (2015), and Kibrislioglu (2015).

Students become frightened to put any serious effort into studying mathematics, due to the myth about the difficulty of mathematics. The participants of the study also credited their poor performance to the myth; mathematics is a naturally tough subject to understand, and hence they cannot overcome this difficulty. This attribution confirms the study of Nenty (2010) and Noraini (2006) that students revealed their poor performance to task difficulty.

The study also revealed that external factors were also the reasons for poor performance in mathematics, as were credited by the majority of the learners. One of the external factors attributed to the students was the lack of qualified mathematics teachers. The students believed that they

could not pass the subject because many of their schools lacked qualified mathematics teachers. The participants of the study attributed that their teachers could not help them solve mathematical problems due to poor teaching methods. These findings confirm the findings of Nyauwwe (2004) and Tella (2008).

However, it is interesting to note that students showed poor performance in mathematics despite well-educated teachers in some schools. The students' attribution confirmed the studies of Geary (2011), Nyauwwe (2004), and Wale (2011) that overcrowded classrooms caused their poor performance in mathematics. Similar attributions were revealed by Tshabalala and Ncube (2013).

Conclusion

After the discussion, it can be concluded that internal factors i.e students' absenteeism, laziness, and negative mental tendency to mathematics are the reason for students' poor mathematics performance. Moreover, external factors i.e. teachers' strictness towards their students, shortage of specialist teachers of mathematics, and deficiency in human resources are also the main reasons for students' poor performance in mathematics.

Recommendations

The study reveals that lack of motivation caused students' failures in mathematics. The literature also reveals that motivation plays an important role in students' academic achievement. Therefore, the students need to be motivated by their teachers, parents, and society so that their attitude towards mathematics becomes positive. Moreover, counseling centers for students should be managed by the school management to overcome students' internal factors. Counseling services can assure the students' attendance and retention.

Some students attributed their poor performance is due to their teachers' poor teaching methodologies. Improvement in the quality of mathematics teachers is highly demanded. Therefore, it is recommended that School Education Department may appoint qualified teachers and may conduct refresher courses for their continuous professional development.

Most of the participants caused their teachers' non-professional behavior and strictness to their poor performance in mathematics. The professional standards for teachers also demand that teachers behave professionally and ethically. Therefore it seems strong to recommend

that teachers should act professionally and ethically. Teachers may use student-centered teaching methods to make the learning of mathematics interesting.

Guidance and counseling services enhance professional performance as the literature also reveals. Therefore, the teachers may be provided guidance and counseling to overcome some unprofessional behaviors. Teachers' training should be arranged at the time of new curriculum implementation.

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