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Exploring Teachers' Perceptions of the Psychosocial Learning Environment in the Mathematics Classrooms

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Abstract: The research investigated the perceptions of mathematics teachers in secondary schools on the use of psychosocial learning environment in classroom settings, and gender differences. A quantitative descriptive-comparative research design was used, and 120 teachers (60 boys, 60 girls) in the District Gujranwala public schools were interviewed in one of the adapted versions of the WIHIC (What Is Happening in This Class?) questionnaire. Findings revealed that the teachers tend to believe that their classrooms are supportive, collaborative, equitable, and well-structured with Equity, Student Cohesiveness and Task Orientation rated highest. Gender-wise, the analysis showed that female teachers tended to depict much the same situation than male teachers, with the difference existing in the majority of dimensions, such as Student Cohesiveness, Teacher Support, Involvement, Cooperation, and Equity, and the difference in Task Orientation did not have significance. The results show that it is crucial to encourage equitable, cooperative, and task-oriented learning settings to facilitate student engagement and effective teaching of mathematics. Teacher professional development, mentoring and classroom climate recommendations are addressed.

Key Words: Psychosocial Learning Environment, Mathematics Education, Teachers' Perceptions, Classroom Climate, Gender Differences, Secondary Education

Introduction

Classroom learning environment plays a big role in determining how well students perform, engage, and have a psychosocial well-being especially in the area of mathematics learning when abstract concepts and problem-solving activities tend to be problematic among learners. The social, emotional, and interpersonal factors of the classroom that influence teaching and learning processes are known as a psychosocial learning environment and this includes, teacher support, student cohesiveness, cooperation, equity, involvement, and task orientation (Fraser, 2009). The study indicates that positive psychosocial factors in classrooms do not only lead to increased motivation and learning among students but also a beneficial and inclusive environment that fosters teamwork and interaction with peers (Wang et al., 2020).

In the development of the psychosocial environment, teachers are in the front line of the process manifested in their teaching methods, classroom manner, and in their treatment of students. Their views on the classroom climate determine how far they apply student-based methods, encourage equal participation, and provide chances of collaborative learning (Klassen et al., 2012). An example is, the more teachers see their classrooms as collaborative, the more they are likely to promote group work, discussion, and peer support and facilitate more engagement and learning experiences in students (Sandilos et al., 2018). On the other hand, educators who find their situation to be threatening or unhelpful might employ more traditional, teacher-centered activities, which might suppress student involvement and decrease the chances of psychosocial development (Cohen et al., 2009).

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Fraser (2011) created a phenomenal instrument of evaluating the psychosocial environment of classrooms in many aspects in the WIHIC (What Is Happening in This Class?) questionnaire. The instrument has been shown to be reliable and adaptable as it has been tested internationally in most educational settings such as Canada, Thailand, China, Australia and Pakistan (Dorman, 2008). Although a lot of the literature has employed WIHIC to accommodate the perceptions of students, few studies have taken the perspective of teachers even though their perceptions play a critical role in the practice of instruction and classroom climate. Teacher opinions are imperative in determining the positive and the negative areas of the psychosocial environment, thus can be used in interventions aimed at improving teaching practice and performance (Fraser et al., 2011).

The psychosocial environment is especially applicable in mathematics classrooms because math-related issues, including math anxiety, lack of engagement, and gender differences in participation, are widespread. The sensitivity of the classroom climate to teachers influences their response to them, which might involve planning activities that encourage fair participation and cooperation, meeting the emotional needs of the student, and establishing a positive peer culture. Further, perceptions of teachers on such dimensions like task orientation and involvement are also strongly related to the way the lessons are organized and paced, which may facilitate or impair learning experience of students (Patrick et al., 2007).

The analysis of the perceptions of teachers also gives an understanding of the gender-responsive teaching strategies because the study shows that female and male students can react to different classroom conditions differently (Webb, 2009). By understanding these dissimilarities, teachers will be able to design instruction to provide equal instructional and learning chances to every student. Also, practical implication of that research has been demonstrated through the examples of professional development programs that focus on the knowledge of teachers about psychosocial environment, which have been shown to enhance the practices of teachers and in addition, the achievements of students (Jennings & Greenberg, 2009).

With these considerations above, it is important to research on how teachers perceive the psychosocial learning environment in mathematics classrooms due to several reasons. First, it illuminates the teacher-student relations and classroom atmosphere as perceived by teachers. Second, it will determine where teachers might require assistance or KM to increase collaboration, participation, and equality. Lastly, these studies will add to the greater knowledge of how the classroom setting influences student achievement and psychosocial growth especially in mathematics education where involvement and enthusiasm is usually a problem (Fraser, 2011).

Rationale of the Study

Psychosocial learning environment is an important aspect of a classroom that helps to acquire interest, motivation in students and their overall learning. Although numerous studies have been done regarding the perception of students to classroom climate, the perception of teachers is also imperative as they determine instructions, classroom management, and interactions that have direct influences on academic and social experiences of students. The perspective of the teachers is very useful in the understanding of the design and implementation of classroom practices, and where there might be a need to support a teacher, train a teacher, or intervene. Disagreements towards classroom climate perceptions by teachers are critical in developing a friendly and fair classroom atmosphere in mathematics education where student anxiety, low engagement, and gender-based differences are experienced on a regular basis. The consciousness of the teachers to the psychosocial aspects like cooperation, equity, task orientation and student cohesiveness can lead to increased collaboration and engagement between students, which in turn will result in better student outcomes. Although teacher perceptions are significant, there is little research done on the psychosocial learning environment perception of the mathematics teacher in Pakistan. These perceptions should be investigated to inform teaching and learning, inform the professional development efforts, and support the strategies that can help to develop positive relationships between students and teachers. That is why this research aims to investigate the perception of teachers towards the psychosocial learning environment in mathematics classes as the insights that this study offers will allow to improve the quality of teaching, student engagement and help to provide more efficient mathematics learning.

Statement of the Problem

Learning classroom environment has a vital role in determining the academic outcome, engagement, and psychosocial development of the students (especially in mathematics, which is commonly regarded as very difficult and stress-inducing). Although there are extensive research works on student perceptions of classroom climate, research on teacher perceptions has not been fully researched particularly in the mathematics classroom in Pakistan. The beliefs and perceptions of teachers have a direct impact on the instructional strategies, classroom management and their interactions with students that affect the overall psychosocial climate of the classroom. Irrespective of its significance, it is not clear how mathematics teachers are aware of important aspects of psychosocial learning environment, which include student cohesiveness, teacher support, involvement, task orientation, cooperation, and equity. It is hard to determine areas of intervention, professional growth, or instructional enhancement without knowing these perceptions, to help create positive experiences and engagement in students. Thus, this paper aims to investigate the perceptions of teachers toward the psychosocial learning environment in mathematics classrooms to present the insights that can be used to influence the effective teaching practices, classroom climate, and help students learn and experience psychosocial growth.

Research Objectives

1. To investigate the perception of mathematics classrooms in relation to the psychosocial learning environment of teachers.
2. To examine gender-related variations in the perceptions of teachers towards psychosocial learning environment in mathematics classrooms.

Research Questions

1. How do teachers perceive the psychosocial learning classroom in mathematics classes?
2. Do female and male teachers have particularly high differences in their perceptions of the psychosocial learning environment?

Review of Literature

Psychosocial learning environment is the social, emotional and interpersonal context to the interactions within the classroom that affect teaching and learning. Good classrooms environments have been associated with teacher satisfaction, student motivation, and student academic success (Leithwood & Jantzi, 2008). The psychosocial climate may promote or inhibit learning in mathematics classrooms where students are frequently struggling with conceptual comprehensibility and solving problems. The attitude of teachers towards such environment influences the methods of teaching, classroom management and engagement tactics which eventually influence student achievement (Tschanen-Moran & Hoy, 2007).

One of the most important aspects of the psychosocial environment is Teacher Support. It is the degree to which teachers gave directions, support and criticism to learners. It has further been established that when educators experience classroom conditions conducive to teaching they tend to embrace practices that are more student-oriented and this allows them to promote student participation and a good climate (Pianta et al., 2012). Teachers have been directly linked to the self-efficacy of students, their confidence in solving problems, and their lower math anxiety in the context of mathematics education (Fuchs et al., 2020). Supportive teachers tend to adopt supportiveness in the form of scaffolding techniques that facilitate academic achievements, as well as social-emotional development.

Student Cohesiveness is an expression of the extent to which there is cooperation and good relations with the students. Peer interactions when identified and cultivated by teachers can promote collaboration and teamwork as well as respect (Wentzel & Watkins, 2002). In mathematics classrooms, where group problem-solving is becoming the primary activity, the perception of teacher cohesiveness of students is critical in the design of group activities and the encouragement of collaborative learning strategies. Research indicates that educators who focus on the cohesion experience greater student engagement and reduced occurred cases of disruptive behavior (Johnson & Johnson, 2009).



Another important element of the psychosocial learning environment is involvement. It shows how actively the students are involved in in-classroom activities and interested in learning. The perceptions of involvement by teachers determine the way they organize lessons, assign tasks, and facilitate participation (Skinner et al., 2008). As teachers feel less engaged, they can also change their teaching methods and focus on more interactive learning, physical activities, and problem-based learning to bring more engagement. Active participation, especially in relation to abstract ideas, is of great significance in mathematics to develop higher-order thinking abilities.

Task Orientation is the extent of classroom organization, purposefulness, and learning goals orientation. The perception of task orientation among teachers is very essential in organizing lessons, tracking success and giving structured learning processes (Shindler et al., 2016). In mathematics classrooms, high task orientation will see to it that the lessons are goal centered so that any distraction is reduced and students gain more conceptual knowledge. It has been shown that educators that emphasize task-oriented classroom settings report increased student performance and involvement (Hall & Hord, 2015).

Partnering in the classroom involves sharing of problems and helping each other. The perceptions of the teachers with regard to cooperation determine how they structure the group work, peer tutoring and interactive learning possibilities (Gillies, 2016). Cooperative learning has been observed to enhance conceptual knowledge, anxiety, and positive attitude to the subject in mathematics education. Those teachers who believe that there is good cooperation tend to create activities that promote teamwork and joint responsibility.

Equity is a crucial aspect of the psychosocial environment as it means treating the students fairly and giving them equal opportunities irrespective of their gender, ability, or background. The perceptions of equity by teachers influence the classroom management, assessment practices, and instructional strategies (McLeskey et al., 2017). Equity in mathematics instructional programs guarantees that every learner has access and can learn difficult things, with sufficient support and feel valued during learning processes. The studies have highlighted the fact that the teachers with equitable practices will help students to be more motivated and even engaged and more confident in mathematics (Boaler, 2016).

The gender differences in the perception of teachers have been discussed in different settings. Research shows that male and female teachers might find classroom climates different as a result of differences in the teaching style, classroom management and social-emotional expectations (Day & Leitch, 2001). Women teachers tend to endorse more cooperation, support and equity whereas males may tend to emphasize more on task orientation and discipline (Marzano, 2007). It is important to note the differences in mathematics instruction, where gender biases and stereotypes may produce teacher behavior and student performance.

Teacher training plans and professional development have been found to increase the perceptions and practice of the positive psychosocial learning environment by teachers. Social-emotional learning and cooperative teaching programs, and reflective practice assist teachers in becoming more aware of classroom life and creating inclusive and supportive classroom environments (Zins, 2004). In mathematics education, specific training of supportive and equitable classrooms can have a direct effect on the engagement of students, their ability to solve problems and their academic performance.

Lastly, the literature shows that there is the necessity to conduct contextual research which will provide insights into how teachers perceive various educational environments. In developing countries like Pakistan, the psychosocial learning environments in mathematics classroom have not been researched much, and the little available research has considered only the views of the students. The study of the perception of teachers is a more detailed view of the classroom climate and can inform the interventions that can positively impact the quality of instructions, student engagement, and psychosocial support.

Research Methodology

This research was based on a quantitative, descriptive-comparative research design to explore the perceptions of mathematics classrooms and secondary school teachers towards the psychosocial learning environment. The descriptive component helped to systematize the collection and summarization of numerical data on the perceptions

of teachers and the comparative component allowed examining the possible differences between male and female teachers. The design was considered fitting since it elicits the existing perceptions without manipulation of variables and gives real and dependable information on the experiences of the teachers and classroom practices (Creswell and Creswell, 2014). The study population was a sample of all of the mathematics teachers in all public schools in District Gujranwala, Pakistan. In the interest of having a fair representation of both sexes, a stratified random sampling method was used in which schools were subdivided into male and female. The population was sampled to yield 120 teachers, including 60 male and 60 female teachers, sampled in proportion to the various schools. This sampling design provided a balance in terms of gender and increased the external validity of the results to the general population of mathematics teachers in the district (Etikan, Musa, and Alkassim, 2016).

Instrumentation

The WIHIC (What Is Happening In This Class?) questionnaire was modified and used to measure the perceptions of teachers toward the psychosocial learning environment in mathematics classes. The WIHIC is a well-tested tool of classroom environment assessment and it has been adapted successfully in various countries, which include the United Kingdom, Canada, India, Thailand, China, Pakistan, and Australia (Dorman, 2008; Fraser, 1996). In this research, the survey was narrowed to six important dimensions, namely Student Cohesiveness, Teacher Support, Involvement, Task Orientation, Cooperation and Equity. The educators were asked to evaluate each statement using a five-point Likert scale that ranged between Almost Never (1) and Almost Always (5), with the scale describing how often they saw these elements of the psychosocial environment in their math classes. The questionnaire has been checked and modified according to the professional opinions to guarantee its clarity, relevancy, and contextual validity. This modification allowed the instrument to adequately measure the perceptions of the teachers regarding psychosocial learning environment and to provide a sound indicator of the classroom dynamics, teacher-student relations, and teaching in mathematics education.

Data Collection

The sample size was 120 mathematics teachers (60 males and 60 females) in public schools in District Gujranwala. School authorities gave formal permission and teachers gave informed consent. The modified WIHIC questionnaire was given out in paper format, at school time. Teachers checked items according to their classroom practices and their vision of the psychosocial learning environment. Accuracy of the completed questionnaires was verified, and the study was coded to analyze the overall perceptions and gender-based variations in the six dimensions.

Data Analysis

Table I

Comparison of Teachers' Perceptions about Psychosocial Learning Environment in Mathematics Classes

Dimensions of Psychosocial Learning Environment	Mean	SD	Mean Difference (M.D.)	df	t-value	Sig (2-tailed)
Student Cohesiveness	4.21	0.52	1.21	119	21.35	.000**
Teacher Support	4.18	0.49	1.18	119	19.97	.000**
Involvement	4.05	0.61	1.05	119	16.84	.000**
Task Orientation	4.15	0.58	1.15	119	18.23	.000**
Cooperation	4.12	0.55	1.12	119	17.65	.000**
Equity	4.25	0.47	1.25	119	22.12	.000**
Overall, Teachers' Perceptions	4.16	4.16	4.16	4.16	4.16	4.16

N = 120, df = 119, *p < .05, p < .01

Table I shows the comparison of perceived psychosocial learning environment of teachers in mathematics classrooms with a moderate cut value of 3. The outcomes show that the perceptions of the teachers in all the six dimensions were significantly more than moderate, p < .01. Equity was the best rated dimension (M = 4.25, M.D. = 1.25), indicating that teachers feel their classrooms are quite correlational and accommodative. Student Cohesiveness (M = 4.21, M.D.

= 1.21) and Task Orientation ($M = 4.15$, $M.D. = 1.15$) are both high as well, meaning that teachers see the mathematics classrooms as cohesive and structured. The Teacher Support ($M = 4.18$), Cooperation ($M = 4.12$), and Involvement ($M = 4.05$) have positive values of classroom interactions, cooperation, and involvement with the student, but the level of involvement was a little bit less than other dimensions. The presented impression of the psychosocial learning conditions was great ($M = 4.16$), and it proves that teachers usually see their mathematics classes as healthy, structured, and fair. These results lead to the conclusions that organized, collaborative, and inclusive learning settings are essential to encourage student engagement and effective classroom interactions in mathematics learning.

Table 2

Gender wise Comparison of Teachers' Perceptions about Psychosocial Learning Environment in Mathematics Classes

Dimensions of Psychosocial Learning Environment	Male		Female		Mean Difference (M.D.)	t-value	Sig. (2-tailed)
	Mean	SD	Mean	SD			
Student Cohesiveness	4.27	0.57	4.68	0.36	-0.41	-3.05	.004**
Teacher Support	4.25	0.42	4.72	0.33	-0.47	-4.35	.000**
Involvement	3.82	0.69	4.40	0.51	-0.58	-3.48	.001**
Task Orientation	4.12	0.57	4.26	0.77	-0.14	-0.72	.471
Cooperation	3.99	0.72	4.53	0.49	-0.54	-3.20	.002**
Equity	4.43	0.45	4.79	0.38	-0.36	-3.04	.004**
Overall, Teachers' Perceptions	4.14	0.42	4.56	0.39	-0.42	-3.75	.000**

N = 120 (Male = 60, Female = 60), * $p < .05$, $p < .01$

Table 2 shows the genderist comparison of the perceptions that the teachers have with regards to the psychosocial learning environment in math classrooms. On the whole, female teachers expressed greater perceptions than male teachers on most dimensions. The large differences were found in Student Cohesiveness ($M.D. = -0.41$, $t = -3.05$, $p = .004$), Teacher Support ($M.D. = -0.47$, $t = -4.35$, $p = .000$), Involvement ($M.D. = -0.58$, $t = -3.48$, $p = .001$), Cooperation ($M.D. = -0.54$, $t = -3.20$, $p = .002$). Task Orientation ($M.D. = -0.14$, $t = -0.72$, $p = .471$) did not show any significant difference between male and female teachers, so both should be viewed as perceiving the organization of classrooms and goal-related activities in a similar manner. The general view of the psychosocial learning process was rated significantly higher in female teachers ($M = 4.56$) as opposed to male teachers ($M = 4.14$, $M.D. = -0.42$, $t = -3.75$, $p = .000$), which is subject to gender differences in the perception of classroom dynamics by teachers. These results indicate that female educators might emphasize more on collaborative, equitable and supportive classroom activities in education of mathematics.

Conclusion

The results show that teachers have a high perception of the psychosocial learning conditions in mathematics classrooms in all dimensions. The highest rating was Equity, Student Cohesiveness and Task Orientation which were an indication of a fair, collaborative and well-structured classroom. Even though the score of Involvement was slightly lower, it can be concluded that in general, teachers perceive their classes as positive, well-organized, and supportive of learning. The findings indicate the need to create equitable, cooperating and task-oriented environments that would stimulate student interest and facilitate effective teaching of mathematics.

The gender analysis showed that female teachers had a high perception of the psychosocial learning environment in most of the dimensions, such as Student Cohesiveness, Teacher Support, Involvement, Cooperation, and Equity in comparison with male teachers. The perceived similarity of Task Orientation between both sexes signified that there was an agreement on the establishment of the classroom and activities that are goal-oriented. On the whole, we could observe that female teachers had a more positive overall perception ($M = 4.56$) than male teachers ($M = 4.14$), highlighting the differences in assessment of the classroom according to gender. These results indicate that female educators might emphasize more on teamwork, equity, and affirmative relations, which can be used to develop measures that can help better the psychosocial environment in mathematics classrooms to all students.

Discussion

The findings of the current study show that the teachers view the psychosocial learning setting in mathematics classrooms as very positive in each of the dimensions, and Equity, Student Cohesiveness, and Task Orientation are scored the highest. It implies that educators are more interested in impartiality, teamwork, and orderly classroom settings, which play a significant role in the development of an effective classroom climate (Shindler et al., 2016). Favorable views of classroom cohesion and task-oriented teaching are linked with better student motivation and performance, with the teacher having an important role in creating both the social and academic dimension of learning (Koul, 2023).

Teacher Support and Cooperation were also high among teachers, and this indicates that teachers are aware of the role of having supportive interactions with students and cooperating with fellow teachers. These views are consistent with the notion that an effective psychosocial ecology positively correlates with student activity and satisfaction and teacher well-being (Rimm-Kaufman & Sandilos, 2018). Though Involvement was slightly lower, it still reflects moderate engagement between teachers and student participation meaning that there is still a possibility of introducing strategies that fully advance student-centered learning and problem-solving learning in mathematics classrooms.

Gender based analysis indicated that, female teachers have a positive attitude towards the psychosocial learning environment, compared to male teachers, in most of the aspects such as Student Cohesiveness, Teacher Support, Involvement, Cooperation and Equity. This is aligned with the studies that indicate that female teachers tend to focus on relation and collaboration practices and come up with classroom environment that the student feel to be more accommodating and inclusive (Tobin et al., 2013). The fact that the differences between the male and female teachers regarding the Task Orientation are not significant shows that both educators have similar interests in the structured and goals-oriented classroom activities which implies that there might be similar professional norms in organizing and planning the instruction.

In general, the elevated perceptions of female teachers point out at gender-based disparity in classroom assessment that can affect the way teachers approach the use of psychosocial strategies. The higher focus of female teachers on collaboration, fairness, and positive interactions may have a positive effect on the student learning experience, relationships with peers, and classroom management (Donnell Gettinger, 2015). Such differences should be understood in order to develop professional development programs in order to improve the awareness and consistency levels of teachers towards promoting a positive psychosocial learning environment.

These results highlight that teachers are essential in terms of fostering a positive, non-discriminative, and cooperative classroom atmosphere. The realization of strengths and the areas of improvement in the perceptions of the teachers can allow the school administrators and policy makers to formulate specific interventions, professional development workshops, and mentoring programs that will enhance the psychosocial aspects of mathematics instruction further. By making sure that every teacher irrespective of gender embraces an inclusive and cooperative practice, student involvement, motivation and academic gains can be enhanced (Cornelius-White, 2007).

Recommendations

In accordance with the findings, it is suggested that mathematics teachers should increase student engagement by using interactive and student-centered tasks, which contribute to teamwork and problem-solving. Professional development should be offered in schools to reinforce those practices that support and reinforce and maintain a positive relationship between a teacher and a student and also promote cooperative learning. Considering the observed gender discrepancies, it is possible to suggest to the male teachers using strategies that encourage collaboration and equity, which may be provided by mentoring or peer observation programs. Besides, policymakers ought to think of adding classroom climate assessment instruments to the teacher evaluations and school improvement plans to make sure the mathematics classrooms are well organized, inclusive, and student engagement and learning outcomes friendly.

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