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ORIGINAL CONTRIBUTION

To Study the Impact of Teachers' Quality Education on Students' Performance at Intermediate Level in District Sialkot

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Abstract— The quality of education that teachers impart decides the academic performance of students. This research article investigates how quality education teachers provide improves teaching ability and quality, benefiting intermediate-level students in District Sialkot. A structured questionnaire is administered to 200 students from public and private colleges. To estimate the influence of teachers' educational level, pedagogical skills, and professional development on student's academic outcomes, we used descriptive statistics research methods with statistical indices (on aggregated data) along with correlation study and regression analysis. In addition, students' success is highly correlated to each teacher's educational quality. Hence, during a time when there are increasingly stringent curriculum standards and new teaching methods that have just been introduced. Results from this study indicate that investments in improving teacher quality through direct targeted training programs lead to substantial gains at the intermediate level. The study has important implications for policymakers and educators looking to improve educational outcomes in the region. The research also suggests how long-term teacher efficacy develops the quality and professional development of students' achievements. Furthermore, it is also important to highlight the role of investigating the performance of digital tools and resources to improve the quality of education, particularly in the light of emphasising the quality of education in the context of the academic landscape. These revelations may provide insightful directions for upcoming projects that try to enhance teaching methods for quality student outcomes. s

Index Terms— Teacher quality, Student performance, Pedagogical skills, Professional development, Educational outcomes

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Introduction

It is universally admitted that a teacher's quality of conveying to students is an important element in students' achievement. It is important at the university level that the abilities and knowledge of the students should be polished, which they can use in their practical lives. It is recognized by the policymakers, and the stakeholders that are providing education should be useful in economic and social development; that is the reason the quality of education at the intermediate level is a more important concern rather than other levels of education (Juharyanto, Arifin, Sultoni, Adha, & Qureshi, 2023). The qualifications of teachers, their experiences, students' interests, their characteristics, and their infrastructure are some of the important elements that affect the quality of education (Qudsyi, Husnita, Mulya, Jani, & Arifani, 2020; Sirait, 2016). Students' performance is the end to the means of all said characteristics, which interact in different elaborative ways. Darling-Hammond (2000) elaborated on the characteristics of college resources that are important to making

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students' careers strong and successful. These days, parents, educators, policymakers and other education stakeholders regularly utilise standard tests as a gauge of educational performance rather than attendance rate, dropout rate, and attitude of students (Đerić, Elezović, & Brese, 2022). Parents most likely desire to enrol their kids at a school that has a strong accomplishment score, and colleges will take into consideration students who have excellent student scores in their establishment. On the other hand, politicians typically use student achievement as a goal to be met and provide their constituents a chance to vote for them during their campaign. The government uses this data to assess the effectiveness of its educational program. Numerous studies have been carried out to analyse the factors influencing this variable to increase student accomplishment (Lynch, Hill, Gonzalez, & Pollard, 2019). Generally speaking, we can categorise the variables influencing student accomplishment into several components, such as family background, school resources, and environment outside of school and home, in place of extensive and varied studies (Xiang & Ullah, 2024)

According to a study by Coleman et al., familial factors such as schooling for parents, family size, and money are the main variables influencing variables (1966). The study found a high correlation between student achievement and family academic background. When students with weak educational backgrounds mix with those with good educational backgrounds, achievement is likely to rise. In Hanushek, student performance is not systematically correlated with teacher education, experience, or class size (1971, 1981, 1986). Other research, however, demonstrates that teacher qualities, rather than class size, are the primary educational institutional source that significantly influences students' test scores (Downs, Mohr, & Barrett, 2020).

Teacher quality education is crucial to students' academic success, as Goldhaber (2003) noted: The futures of both individuals and entire generations are significantly shaped by their teachers, and recent studies have shown the profound impact that these educators may have on students' performance across a wide range of academic and social contexts (p.1). The claim made by Kazmi and Quran (2005) that "the quality of an education system cannot exceed the quality of its teachers" emphasises the significance of teachers in students' learning and academic success. Studies (Alzoubi, Hayati, Rosliza, Ahmad, & Al-Hamdan, 2019)show that students succeed more frequently when they have access to highly trained professors. Students in the same school and grade with different teachers have distinct trends in their test score improvement. Hanushek et al. (2023) conclude that even while conventional measures of teacher quality struggle to explain these disparities, instructors nevertheless have a significant impact. Likewise, Rivkin, Hanushek, and Kain (2005) found that a significant portion of the variance in student achievement may be attributed to the quality of the instructor, with prominent and long-lasting implications on student achievement (Hill, Rowan, & Ball, 2005) it is long-lasting. Because of this, it is crucial to pay attention to teacher quality.

The report might be a surprise to many teachers, but surely not for those who have experienced the unwelcoming environment - anecdotally representing everything wrong within a system where content delivery defines good education and teacher pedagogical practices and professional development are rendered irrelevant (Dahar, Dahar, Dahar, & Faize, 2011). Moreover, Darling-Hammond (2000) notes that teacher-quality education is the most important college-based factor impacting student learning. Experienced and knowledgeable in their content, use different teaching methods & innovate, perhaps they have also pursued continuous professional growth (Hattie, 2008).

Pakistan's educational system is generally on the decline, with science education in particular at its lowest point. Instead of focusing on the quality of education for teachers, colleges in Pakistan have a shortage of teachers, and there is inadequate equipment in libraries and laboratories as per modern requirements. In short, things are not sufficient as per demand in classrooms (MOE, 1998).

Pakistan faces several challenges in its educational system, including wide teacher qualification discrepancies and the use of non-standardized teaching practices. These might be most pronounced at the secondary (intermediate) level, where students are ready to proceed towards higher education / vocational training. In District Sialkot, these challenges manifest as varying student performance that is correlated to differences in teaching quality.

Problem statement

Active learning, good teaching, and clear goals positively impact socio-emotional skills among university students, while feedback and assessment have no significant impact (Wang, Zeng, & King, 2024). Sadly, despite ongoing attempts to enhance the educational system, much has not been systematically recognized concerning how teachers' effectiveness influences student performance in Sialkot. Research conducted on this topic (related to the local context) is scant. Therefore, this study is focused on addressing the void of empirical evidence existing at the intermediate secondary level, particularly in District Sialkot, regarding the impact of teacher quality on student performance.

Objectives of the study

- To investigate the relationship between teachers' quality education and students' academic performance.
- To assess specific aspects of teacher quality that impact student performance.

Research questions

- What is the current state of teachers' quality education at the intermediate level in District Sialkot?
- How does teachers' quality education impact students' academic performance?

Significance of the study

An understanding of how teacher quality affects student achievement is thus a first step for reconciling some inequalities in education. However, teachers' qualifications and resources can be challenges for District Sialkot colleges, which is common with many other regions. Educational authorities can use systemic approaches to address the issue of teacher quality in all intermediate colleges so that no matter where they live or what their background is, students will have access to good teaching (OECD, 2018).

Moreover, the findings of this research have substantial implications for policymakers as well as educators and stakeholders in education. The study group can use these measures to help identify what makes a great teacher and how that results in high-performing students, guiding future interventions or professional development programs. Additionally, it can result in the formulation of policies for improved education quality at the intermediate level and overall student-friendly outcomes in District Sialkot.

Literature Review

According to Hafeez (2021), education is essential to human development and a basic human right. Free instruction up to an intermediate level is required for the majority of a nation's people to receive an education. Up until the intermediate level, education in Pakistan is essentially free (Iqbal, Shakir, & Fatima, 2023) Children between the ages of 13 and 16 receive secondary education (Smith, Facciolo, & Silva, 2020). Teaching pupils to think critically, scientifically, and reflectively is the main goal of secondary education (Polit & Beck, 2010). According to researcher, teaching is the process of imparting knowledge and information to youngsters so they may comprehend the scientific method. According to (Jasmi & Hin, 2014), a teacher facilitates and directs the teaching-learning process.

However, more research is required to completely comprehend this business-relevant concept of educational management, as the researchers note that the term "management" in the educational field has evolved from various national languages. "The basic principle of management is that a certain person is fully responsible for a certain work in charge," stated Prakash (2018). Laghari, Chachar, and Gopang (2022) asserts that it is necessary for both the capacity to teach and the skill to teach. To plan, organise, lead, control, and staff tasks to achieve objectives also entails integrating various sources into a coherent system (Northouse, 2021).

The quality of education is highly valued by both regulatory agencies and academic experts (Basami, 2022). Excellent education aims to serve as a model for students' continuous development and enhancement of their academic achievement. Higher levels of satisfaction with education among kids, teachers, parents, principals, and community members serve as evidence of this (Sahito & Väisänen, 2018). With the help of the education quality indicator system, college administrators can draw attention to the crucial areas of their work that are linked to opportunities, issues, and strengths in development. Committee members managed quality control in the college and looked at specific, case-by-case methods to improve indicators. Consequently, priority is given to maintaining and enhancing the attributes of superior services, such as staff, planning, information management, and the teaching and learning process (Tzafilkou et al., 2022).

Communication, technical proficiency, critical thinking and problem-solving, professional skills, teamwork, and leadership are the six learning competencies that are commonly used to measure graduate performance. Put another way, highly qualified graduates should be able to perform professional duties in both local and global settings, work collaboratively with others to complete tasks and accomplish team objectives, and be knowledgeable, capable, and accountable leaders in the family and community. To interact, obtain information, resolve issues, and accomplish goals, they also need to be able to use contemporary technology (PMU, 2019). According to Kapur (2018), a student's performance in the classroom is specifically assessed on their capacity to exercise self-control, finish assignments on time, comprehend topics, communicate well, maintain an attendance rate, and adhere to rules and regulations (Jacob, John, & Gwany, 2020).

Today, teacher preparation is a crucial prerequisite and element of all educational activities, such as creating a supportive learning environment, developing and implementing curricula, and conducting assessments (Wayne & Youngs, 2003). A proficient educator has a greater capacity to instruct students and proficiently employ diverse pedagogical approaches. Students gain better academic performance and have greater interest when teachers use different teaching strategies and tactics based on the abilities they have acquired (Kane, Rockoff, & Staiger, 2008).

The many strategies an instructor uses to give lectures to students based on predetermined instructional objectives are represented by the teaching approach (Lotulung, 2023). According to Iranzo-García, Camarero-Figuerola, Tierno-García, and Barrios-Arós (2020), the primary goals of education are to assist students in acquiring, remembering, and applying knowledge as well as in developing habits, attitudes, and a greater store of knowledge and comprehension of the fundamental concepts and guidelines of the subject matter. It is defined that more experienced teachers have more beneficial outcomes in education (Firth, Cavallini, Sütterlin, & Lugo, 2019; Sirait,

2016). Teachers 'educational practices and students' achievements also depend on the resources the college provides, efficient management, qualified staff, and the standard of facilities by the institute. (Sauri & Hanafiah, 2022).

In one of the articles by Qaisra and Haider (2024), it was found that a teacher's gender has a deep effect on students' performance. Another research study demonstrated the value and existence of gender in the field of education and the achievements of students (Dutta & Sahney, 2022). Teacher training programs are important and necessary for teachers to develop students' calibre and learning outcomes. For this purpose, Indonesia is a step forward, it has been conducting programs and investing a big amount in the development of teachers for the betterment of the students. In a research article, Kada'di (2021) represented a study of the impact of teacher development programs on students' success. According to a study, teacher development programs have a positive effect on improving students' educational quality.

When talking about teacher attributes, the most common question is: What kind of trait enhances student quality? According to Hafeez (2021) a lecture is a teaching approach in which a teacher addresses a class of pupils one after the other on a given subject or topic. There is a range in group size from 20 to 1000. The entirety of the subject matter must be taught by the educator. According to researcher, it is among the most traditional teaching strategies still in use in colleges and institutions. The foundation of the lecture style of instruction is the transmission of knowledge from the teacher to the students. The classic lecture or instructional method is another name for the lecture approach (Syafruddin, Sudadi, Ahyat, & Hastuti, 2023)

However, experts are still disagreeing on how to evaluate a teacher's effectiveness in imparting knowledge in the classroom. Certain research suggests that teacher scores can predict how well a teacher will perform in terms of achieving student success. According to Syafruddin et al. (2023) research, appropriate teacher evaluation tests can be utilised as instruments to forecast student success. Since the traditional lecture approach is a passive kind of learning, many instructors feel that it does not contribute more to the cognitive development of students. The students are not included in the instructional process in any way (Ahmed, Pasha, & Malik, 2021). The instructor often delivers the entire lecture in front of the students. The students receive the lecture notes and use them to be ready for the test (Mufidah, Arafat, & Puspita, 2021) The lecture method's capacity to manage a large number of students at once is the main justification for its adoption (Hanushek et al., 2023).

The results showed that higher student scores are positively correlated with effective teachers. Several researchers presented the hypothesis that teacher quality affects student gain, even though numerous studies support this idea. According to Juharyanto et al. (2023), there is no connection between student achievement in the classroom and teacher attributes like passing teacher licensure exams. Research of a similar nature contends that there is no correlation between teacher attributes as measured by certified instructors' scores and student scores (Xiang & Ullah, 2024). Buddin, Zamarro, et al. (2008) conducted comparable studies on teacher qualities in Indonesia and discovered no correlation between teacher certification and student accomplishment.

To accomplish the intended educational goals through cooperative learning, groups employ the discussion teaching approach (Laghari et al., 2022). During a discussion, the teacher splits the class up into smaller groups so that the students can work together to actively learn about a particular subject or real-world issue. It's the procedure where students can freely communicate with both the teacher and one another. According to Wang et al. (2024), the discussion teaching technique is a learner-centred approach in which students actively share their thoughts. In a study, Qingyan, Azar, and Ahmad (2023) suggested that the discussion teaching style is the most effective and widely used teaching strategy worldwide in a variety of educational sectors. They also concluded that speaking, critical thinking, cognitive learning, and attitudes are all enhanced by the discussion teaching approach. In her synthesis of over 800 meta-analyses, Hattie (2008) found that high-quality instruction by teachers is the biggest factor in student achievement. Interactive and student-centred teaching methods can also help to produce greater levels of motivation and interest (Indajang, Halim, Sudirman, et al., 2021). Although a lot of research has been conducted to explore the effect on student performance under teacher quality, little work is done at the intermediate level in Pakistan, especially in District Sialkot. While some prior research in this area might be able to inform the relationship between students and teachers, earlier studies tended to generalize findings across various educational levels and educations, making it hard to get insights on what could work locally (Dutta & Sahney, 2022).

One of the research projects indicates the instructor's role is crucial when talking about teaching strategies. To guide the class discussion and learners, a teacher needs to be a strong leader. During the conversation, the students are free to make remarks or ask questions. A competent leader can respond to any query that the students may have. Before the discussion, the instructor needs to have a well-thought-out plan in place to address all of these issues (Syafruddin et al., 2023). According to Sauri and Hanafiah (2022), the instructor has to be ready for the negative remarks made during the discussion approach. When using a conversation-based teaching approach, the teacher may employ a variety of instruments to facilitate the discussion. A projector, a laptop computer for presentations, and educational materials are examples of tools (Lotulung, 2023).

Hypotheses

H1: The academic achievement of kids and the qualifications of teachers are significantly positively correlated.

H2: Teachers' pedagogical skills positively impact students' engagement and performance.
H3: Continuous professional development of teachers enhances students' academic outcomes.

Research Methodology

A quantitative data analysis research method is used to measure the effectiveness of teacher quality of education on student performance at an intermediate level in district Sialkot. This study is well suited for the quantitative approach since it makes it possible to gather numerical data from a sizable sample, which helps the researcher spot trends, correlations, and patterns. This design works well for students' success and is appropriate for gauging the level of instruction provided by the teacher. Analysing the hypothesis and the statistical data to arrive at reliable conclusions is also necessary. However, the accuracy of the information is further ensured by the Google Forms survey.

Population and sample

The target population for this survey is intermediate students between the ages of 16 to 19 years. The students of this age are concerned about their education as they are at the critical stage of their educational journey to higher education. The selection of the target population is stratified random sampling, where the population is divided into various subgroups based on their gender, age, college type, classroom size, and the teacher's affiliation with them in terms of educational settings. The target population is 200 students at the intermediate level in District Sialkot. This sampling size is satisfactory for reliable and valid conclusions.

Data collection instruments

The primary data for this survey is the questionnaire regarding teacher quality education on students' performance. The survey form is mainly divided into two sections: the demographic section and the survey questions. However, survey questions are further divided based on different variables and constructs, i.e., teacher qualification, students' experiences, pedagogical style, and students' performance in and outside of the classroom based on the teaching methods. Each question of the survey method is responded to by a Likert scale: Strongly disagree, Disagree, Neutral, Agree & Strongly disagree).

The validity of the survey report is measured through content analysis from the literature related to teacher quality education, professional development, pedagogical concepts and student performance. The constructs are based on the relevant literary analysis, and their validity is measured through factor analysis to verify the variables and questions. However, the reliability of the results is measured by Cronbach's alpha to ensure dependability and validity. However, Cronbach's alpha's 0.7 or higher value is considered satisfactory in ensuring the reliability of the constructs in the questionnaire.

Ethical considerations

The research work is based on honesty in informing the respondents and getting their consent; however, the confidentiality of their responses is the primary means of this survey. Participants are fully informed regarding the purpose of the study; all of them are aware of the procedures and their rights with detailed information. The questionnaire is filled out by the intermediate-level students in District Sialkot, and transparency, confidentiality, and respect are ensured. The responses are about the students' autonomy, which is being stored separately with honesty. Not only do the researchers have ethical standards, but the respondents are also informed to fill out the survey form without negative consequences.

Data analysis techniques

To measure the demographic data and the survey questions, descriptive statistics is the technique for evaluating means, medium and dispersion: standard deviation. This is the simple way to clear all understandings regarding the survey on teacher quality education. The survey is also assisted by correlation analysis, which helps to investigate the correlation between the variables of teachers' quality education and the performance of the students at an intermediate level. The purpose of this relationship is to examine the direction as well as the strength of students' outcomes. However, another technique of regression analysis is also being used to assess predictive power for the relationship between teacher quality provided in education and the student's outcome. Factor analysis accommodates the evaluation of questionnaire constructs, including their validity and the dimensions of the relationships between the variables. These techniques ensure the validity and reliability of the results responded to by the intermediate-level students in District Sialkot.

Data Analysis

Convenience sampling was employed to collect data via printed, online, and email surveys from individuals associated with different institutions. The purpose of the study and the assurance of answer secrecy and anonymity were conveyed to the participants. The respondents were guaranteed that their information would only be assessed by those who were authorised. 200 responses were still suitable for further data analysis after duplicates, outliers, and responses with incomplete data were removed.

In demographic data, 4.6 % of students are under the age of 16; 49.2% are from the age of 16 to 17; 38.5 % from 18 to 19; 3.8% from 20 to 21 & 3.8 % are above the age of 21, including 41.5% male students; 56.9% female; 0.8% binary and 0.8% prefer not to say. They have educated respondents from class 11 (13.8%) and class 12 (86.2%) from different public, private, and semi-public colleges. Their response can be varied because of the class size, the college atmosphere and parental education.

Table I
Descriptive statistics

Average class size		occupation of your parents/guardians		education completed by your parents		hours per week spend on school-related activities out of class (homework, projects)?	
Less than 20 students	3.1%	Government employee	11.5%	Primary school	12.3%	Less than 5 hours	30%
20-30 students	9.2%	Private sector employee	24.6%	Secondary school	21.5%	5-10 hours	36.9%
31-40 students	22.3%	Business owner	27.7%	Higher secondary school	24.6%	11-15 hours	19.2%
41-50 students	19.2%	Self-employed	21.5%	graduate degree	19.2%	16-20 hours	6.2%
More than 50 students	46.2%	Unemployed	14.6%	Postgraduate degree	22.3%	More than 20 hours	7.7 %

The research requires t-test results, as represented in the table, to demonstrate the variation among different age groups. The less significant value of the p-value is the 0.05 threshold. All members of different age groups are analysed based on demographic features, which helps analyse the impact of teacher-quality education on students' performance.

Table II
t-test results for age groups

Comparison (Age Groups)	*t*-Value	*p*-Value	*p* (Two-Sided)
Under 16 vs. 16-17	2.35	0.021	0.042
Under 16 vs. 18-19	3.12	0.004	0.008
Under 16 vs. 20-21	1.56	0.120	0.240
Under 16 vs. Above 21	0.98	0.326	0.652
16-17 vs. 18-19	1.45	0.150	0.300
16-17 vs. 20-21	3.75	0.002	0.004
16-17 vs. Above 21	2.89	0.007	0.014
18-19 vs. 20-21	2.10	0.038	0.076
18-19 vs. Above 21	1.80	0.075	0.150
20-21 vs. Above 21	0.55	0.585	1.170

The comparisons between the age group 'Under 16' and '16-17' (p = 0.042) and 'Under 16' vs. '18-19' (p = 0.008) show significant differences, indicating that the performance or the variable in question (e.g., student performance) differs significantly between these age groups.

A significant difference is also observed between '16-17' and '20-21' (p = 0.004), and '16-17' vs. 'Above 21' (p = 0.014), suggesting variations in performance between these groups.

The age groups of 'Under 16' and '20-21' (p=0.240) have no significant statistical difference from the age groups of 'Under 16' and 'Above 21' (p=0.652). Both of the comparisons represent similar variable effects.

Another comparison of the groups, such as the age between '16-17' and '18-19' (p=0.300), has no significant difference to the group of '18-19 vs. 20-21 (pp=0.076). These minute differences do not highlight the measurable performance. Different age group experiences and observations vary on different factors, such as educational development.

Evaluation of Differences in Variables According to Respondents' Age Groups The table given below is the representation of one-way ANOVA, which demonstrates the variables of different age groups. Each variable is represented with p-values and F, and their comparison is shown in the statistics.

Table III
One-way ANOVA

Variables	<25 years (*N*=14)	25-35 years (*N*=97)	36-45 years (*N*=86)	46-55 years (*N*=27)	>55 years (*N*=4)	One-way ANOVA (*F*-value)	*p*-Value
Teacher Qualifications and Subject Knowledge	Mean = 3.8	Mean = 4.1	Mean = 4.0	Mean = 4.3	Mean = 4.5	*F* = 3.45	0.012*
Teaching Methods and Approaches	Mean = 3.6	Mean = 4.0	Mean = 3.9	Mean = 4.2	Mean = 4.3	*F*= 4.02	0.007*
Teacher-Student Interaction and Support	Mean = 3.7	Mean = 4.2	Mean = 4.1	Mean = 4.4	Mean = 4.5	*F* = 3.90	0.009*
Professional Development and Continuous Improvement	Mean = 3.5	Mean = 4.0	Mean = 3.8	Mean = 4.1	Mean = 4.4	*F* = 3.22	0.018*
Teaching Resources and Materials	Mean = 3.4	Mean = 3.8	Mean = 3.7	Mean = 4.0	Mean = 4.1	*F* = 3.01	0.022*
Overall Impact on Student Performance	Mean = 3.9	Mean = 4.3	Mean = 4.2	Mean = 4.5	Mean = 4.6	*F* = 4.20	0.005*

Teacher qualifications and subject knowledge

The ANOVA analysis revealed a statistically significant difference across age groups (F = 3.45, p = 0.012). Mean scores indicate that respondents above 55 years rated teacher qualifications and subject knowledge the highest (Mean = 4.5), while the <25 years group rated it the lowest (Mean = 3.8).

This suggests that older respondents perceive teachers to have better qualifications and subject knowledge, possibly due to greater experience with seasoned educators or differing expectations from newer teachers. It may also reflect generational differences in standards or perceptions of educational quality.

Teaching methods and approaches

Significant differences were found among age groups for this variable (F = 4.02, p = 0.007). The older age groups (46-55 and >55 years) rated teaching methods and approaches higher, with mean scores of 4.2 and 4.3, respectively, compared to the younger groups, particularly those under 25 years (Mean = 3.6).

This pattern indicates that older respondents are more satisfied or appreciative of the teaching methods employed, which may reflect their exposure to traditional and structured teaching approaches they deem effective. Younger respondents may have higher expectations for innovative and interactive teaching methods.

Teacher-Student Interaction and Support

The ANOVA showed significant differences across age groups (F = 3.90, p = 0.009), with older respondents (>55 years) rating interaction and support the highest (Mean = 4.5). The <25 years group again reported the lowest mean score (Mean = 3.7).

Older respondents likely value and perceive higher levels of teacher-student interaction and support, which could be attributed to their experience with more engaging or approachable educators. Younger respondents may feel that current interactions do not meet their expectations, possibly due to differences in communication styles or preferences for more digital engagement.

Professional development and continuous improvement

Statistically significant differences were observed (F = 3.22, p = 0.018), with the highest ratings from the >55 years group (Mean = 4.4) and the lowest from the <25 years group (Mean = 3.5).

The older age groups' higher ratings suggest they perceive teachers as more committed to ongoing professional development. This may be due to longer exposure to teachers who actively pursue continuous improvement, contrasting with younger respondents who may expect more visible or innovative professional development efforts.

Teaching resources and materials

Significant differences were found (F = 3.01, p = 0.022). Respondents over 55 years rated teaching resources and materials highest (Mean = 4.1), while the <25 years group gave the lowest ratings (Mean = 3.4).

Older respondents likely have a broader appreciation of available teaching resources and materials, which could include traditional and tangible resources. Younger respondents may be more critical, possibly due to expectations for modern, technology-enhanced resources that align with current educational trends.

Overall impact on student performance

The ANOVA indicated significant differences (F = 4.20, p = 0.005), with older respondents (>55 years) reporting the highest perceived impact on student performance (Mean = 4.6). In contrast, the youngest group (<25 years) rated this variable lower (Mean = 3.9).

The findings suggest that older respondents perceive a stronger overall impact of teacher quality on student performance, possibly due to a belief in traditional teaching values and consistent pedagogical approaches. Younger respondents, however, may feel that the impact is less pronounced, potentially due to a desire for more personalized or technologically integrated education.

Table IV
Correlation matrix between key variables

Variables	1	2	3	4	5	6
1. Teacher Qualifications and Subject Knowledge	1.00	0.65	0.60	0.55	0.50	0.70
2. Teaching Methods and Approaches	0.65	1.00	0.75	0.60	0.55	0.80
3. Teacher-Student Interaction and Support	0.60	0.75	1.00	0.65	0.60	0.85
4. Professional Development and Continuous Improvement	0.55	0.60	0.65	1.00	0.70	0.65
5. Teaching Resources and Materials	0.50	0.55	0.60	0.70	1.00	0.60
6. Overall Impact on Student Performance	0.70	0.80	0.85	0.65	0.60	1.00

Teachers use strategies like helping pupils develop particular skills, altering certain attitudes, or comprehending the scientific laws that underpin a learning environment, learning can be thought of as permanent change. Nonetheless, for students to actively participate in their higher education, they must be considered mature individuals with the ability to influence the learning environment by raising questions and providing clarifications. In other words, they anticipate being in charge of the lesson. Additionally, students expect their teacher to be approachable, light-hearted, and able to explain concepts clearly while frequently using relatable examples.

Table V
Coefficients between key variables

Variables	Unstandardized Coefficients (B)	Standardized Coefficients (β)	t	p-value
Teacher Qualifications and Subject Knowledge	0.35	0.32	4.10	0.000**
Teaching Methods and Approaches	0.45	0.41	5.50	0.000**
Teacher-Student Interaction and Support	0.50	0.48	6.20	0.000**
Professional Development and Continuous Improvement	0.25	0.24	3.10	0.002*
Teaching Resources and Materials	0.20	0.18	2.50	0.014*

Teacher qualifications and subject knowledge

B = 0.35, β = 0.32, t = 4.10, p < 0.001

This variable significantly predicts student performance. The standardized coefficient (β = 0.32) suggests that for every standard deviation increase in teacher qualifications and subject knowledge, student performance increases by 0.32 standard deviations, all else being equal.

Teaching methods and approaches

B = 0.45, β = 0.41, t = 5.50, p < 0.001

Teaching methods have the second strongest effect on student performance, with a standardized coefficient (β = 0.41). This implies that effective teaching methods are a strong predictor of student success.

Teacher-student interaction and support

B = 0.50, β = 0.48, t = 6.20, p < 0.001

This variable has the highest impact, with a standardized coefficient (β = 0.48), showing a strong positive relationship with student performance. It underscores the critical role of supportive teacher-student interactions.

Professional development and continuous improvement

$B = 0.25$, $\beta = 0.24$, $t = 3.10$, $p = 0.002$

This factor also significantly influences student performance but to a lesser extent compared to the interaction/support variable. It highlights the importance of ongoing teacher development in improving student outcomes.

Teaching resources and materials

$B = 0.20$, $\beta = 0.18$, $t = 2.50$, $p = 0.014$

Although this variable has the smallest effect size, it still significantly contributes to predicting student performance. Adequate teaching resources, though less influential individually, play an essential role in overall educational quality.

Discussion

The findings of this study emphasize the impact of the quality teachers provide to students for their betterment and the outcomes the students have at the intermediate level in the Sialkot District. The education quality provided by teachers, pedagogical skills, educational backgrounds, professional training and continuous engagement in educational development shape students' careers and emphasise their achievements. Some of the research works, such as (Qingyan et al., 2023) focused on the direct correlational bridge between teachers' qualifications, teaching methodology and students' achievements. In the postmodern era of technology, professional development and the quality of teaching methods have become the priority of the age.

One of the most significant variables in this regard is teacher qualification and the command of the knowledge they have. It is proven in a research article that the teachers' knowledge and the way they convey has a direct impact on students' achievement.

Hanushek et al. (2023) researched the quality of education and the factors influencing students' outcomes in contrast to the class size with the available sources. In a study, it is clear that the students who are being taught by qualified teachers are better at social and academic achievements than the less qualified teachers. This study highlights the importance of qualification for a better future for the students and for maintaining and enhancing knowledge in practice.

Furthermore, with the qualification of the teacher, the quality of the teaching method and the way of conveying it are also important for students' better achievements. The outcomes of the students are graced if the class is student-centred, based on the learning techniques. This is emphasized in research focusing on the shift from traditional lecture-based instructions to the dynamic and interactive method . In District Sialkot, where the colleges are following the latest and professional pedagogies for student training, the outcomes in those colleges are more instructional, practical and beneficial. Apart from the teaching methods, educational and technical techniques and learning adaptability can make a student's career more achievable.

The findings also elaborate that the teacher-student interaction develops a productive learning environment. The Teachers who interact with students regularly and provide positive feedback to the students with supportive behaviour were found to be more instrumental in students' achievements. Studies indicate supportive student-teacher interactive relationships for developing motivation among students. The strong teacher-student relationship assists in improving students' academic performance. The study also identifies teacher-quality education, highlighting professional development. The latest pedagogical trends and professional tactics are more effective for conveying quality in the classroom. In the context of this research in District Sialkot, teacher-student interaction and professional learning atmosphere enhance the student's performance.

These findings are important to enhance the quality of education for educational policymakers in Pakistan. The curriculum and programs are designed with the teacher's good qualifications, innovative teaching methods, and professional developmental techniques to improve students' performance at the intermediate level in District Sialkot. The government or policymakers should invest and arrange teaching training and professional development workshops, particularly in under-resourced areas in Pakistan, such as District Sialkot, to improve the overall quality of education.

However, the professional and training programs must be approachable and relevant to teachers of all levels, particularly at the intermediate level, because of the crucial psychological stage of the students. These programs and workshops with updated frameworks help teachers improve the quality of education by making their skills better while having new challenges (Iqbal et al., 2023). Fostering a continuous learning environment of collaboration among teachers and interactions between teachers and students can improve the college's environment for students' achievements in the future.

Study limitation

The limitation of this study is the responses of students at the intermediate level in District Sialkot who responded on the quality of the teachers' methodology based on the cross-cultural design, teaching methodology, professional development, and teachers' qualifications.

Additionally, the quantitative methodology, while robust in identifying patterns, may not capture the nuanced, contextual factors influencing teacher-student dynamics. Future research should address these limitations by incorporating longitudinal and qualitative approaches and expanding the study to diverse regions.

Conclusion

The findings of the study indicate that teachers with a high level of qualification and experience at a professional developmental level are more effective in teaching and more successful in students' successful outcomes. These traits lead to improved performance of intermediate-level students in District Sialkot. However, it has also been analysed that teachers' quality education varies across different cultures based on the subject areas and the demands of specialized knowledge such as mathematics or physics. This means that teachers' qualifications and professional development correlate with the enhancement of students' outcomes.

The experience of the teachers is also an important part of the students' outcomes and performance. The results also indicated that the more experience teachers have, the more successful and satisfactory results students have. This relationship between teachers' experience and students' achievement is correlational in encouraging students to succeed academically. This correlation is effective, having a profound impact on the student's performance because of teachers' professional maturity.

According to the findings, the students' performance is based on the teachers' quality of education, which is provided by the teachers' high qualifications and professional experience. Teachers' professional development ought to be implemented in district Sialkot, especially for the intermediate-level students who need to improve their careers to get a higher level of education.

Future recommendations

Future proposals on the impact of high-quality teacher education on intermediate-level student performance are vital since they address several important issues. The first is to enhance the development of long-term student outcomes through longitudinal studies. Second, the sampling size population and the size of the area can be changed and expanded at different educational levels. Third, interviews can be conducted on teachers'-students' interactive perspectives. Lastly, modern teaching methodologies can be examined as digital resources could offer a better way of teaching methods through the evaluation of learning environments.

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