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Relationship Between Teacher Factors and Student Achievement: A Correlational Study of Secondary Schools

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Teachers always played a significant role in the intellectual and moral development of students by using various techniques, assessments, and methods to improve student achievement in school's subjects. This study therefore focuses on the effect of teacher factors, such as assessment interval, communication language, the distance of residence, and the teacher's personal characteristics (gender, age, academic and professional qualification, designation, experience, and in-service training) on the 9th grade students' achievement in three subjects (English, Chemistry, and Mathematics at secondary level). The population of the study is comprised of all "public sector" secondary schools, male and female teachers, and boy and girl students. A total number of 16 secondary schools (eight for boys and eight for girls), 114 secondary school teachers (66 males and 48 females), and 2,404 students (1,400 boys and 1,004 girls) were selected through purposive sampling techniques. Multiple statistical procedures, Spearman and Pearson correlation, mean, and standard deviation were employed to obtain stronger validity to the study. The results of the study identify weak and negative weak relationship between most of the teacher factors and student achievement in three subjects but the relationship between students' background and learning achievement in all three subjects were found positively correlated.

Keywords: academic and professional qualification, in-service training, assessment interval, communication language, teaching methods

Introduction

Learning is an instinct of living creatures. In human beings, the process of learning starts with their birth. Students' learning achievement has always been an issue of great concern for teachers, parents, school administrative bodies, educational policy makers, and students themselves. More importantly, parents concern about their children's outcomes, which is common throughout the world. "Many studies showed that achievement is dependent and affected by a number of other independent, moderate, and intervening variables, whereas, many other direct and indirect factors are also involved" (Murnane & Steele, 1991). In student achievement, a teacher's role has been very pivotal. Ferguson (1991) identified that "The examination score of the students are greatly influenced by the good teacher" (p. 465). Ediger and Rao (2005) noticed that "As teachers always monitor and assess the students, teacher observation proved to be a good tool for assessing student achievement" (p. 12). According to Perrot (1982), teaching is a respectable profession and effective

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teaching is always being important for producing the desired outcomes. Good teaching is important and helpful in multiple ways as students differ from one another and make betterment in learning opportunities for these differences (Ediger & Rao, 2005).

> Many studies conducted in the area of student achievement suggested that a number of factors (previous schooling, parents' educational background, family income, students' self-motivation, students' age, learning preferences, and entry qualification of students) affect student performance at school, college, and even university level. (Ali, Haider, Munir, Khan, & Ahmed, 2013)

Salfi and Saeed (2007) found that "A large number of factors affect the achievement or success interaction of students" (p. 607). A teacher's academic and professional qualification, experience, age, assessment interval, training, and many other factors all affect students' learning discourse and all should function properly for the quality of education. In many research studies, the effect of teachers' qualifications on students' learning achievement has been estimated and several efforts were made to know whether teachers' qualifications putting under the category of independent variables might have any direct or indirect effect on student achievement.

Warwick and Riemers (1992) found that teachers' qualifications and content knowledge showed a positive relationship with student achievement. Many studies noticed that teachers' academic and professional qualifications had a significant effect on student achievement (Khan & Shah, 2002; Habib, Shah, & Khawaja, 2004). Anyone's explanation of supporting this idea of school level effects of teachers' qualifications is that teachers continuously learned from one another, so any negative effect associated with low-quality teachers might be minimized if other fellows are cooperative having valuable knowledge and expertise. According to Ballou and Spark (1997), a great number of researchers showed that without proper and continuous learning of teachers, instructors, and school employees, no one can attain high level of achievement. Duncombe and Armour (2004) stated that in teaching profession, providing high-quality teachers with higher qualification is more important than anything else and it can only be possible by providing them professional preparation and working condition.

A teacher's qualification showed the educational attainments of the teacher. Many studies have examined which qualification of teachers positively related to student achievement. Teachers having a higher qualification or have an advanced degree in their teaching subject has a positive effect on student achievement (Rice, 2003). Ingersoll (1999) described that the good source to improve student achievement is the provision of highly qualified teachers and the major reason of students' low-quality achievement is that a large number of school teachers are not well qualified. Harland and Kinder (1997) suggested that in student achievement, well qualified teachers always develop significant difference and their students were impartial, tolerant, adoptable, and challenging.

Among the teacher-related factors affecting student achievement, teachers' qualifications are not only the single factor, many other factors also played an important role in student achievement.

> Many researchers proved that there is a positive relationship between student achievement and teachers' qualifications, but the teaching force quality is not only governed by the qualification, many other factors, like teaching skills, pedagogical knowledge, experience, training, assessment interval, dedication, and commitment to the profession also have a great influence on the performance of students. (Henke, Chen, Geis, & Knepper, 2000)

The commitment and dedication of teachers for their teaching profession is also an important affective component in teacher development.

The professional qualification of a teacher makes sure that the individual has the required knowledge and skills to instruct students. Moreover, it is curved to save parents and students from harm by pointing out which teacher does have and does not have required qualities to teach students. “Professional qualification of teachers also put an impact on student achievement, because professionally qualified teachers can teach and guide skillfully as compared to less professionally qualified teachers” (Ashton, Crocker, & Olejnik, 1986, p. 8). In every profession, practitioners must possess a license in order to start practice, but unluckily, no such compulsion is placed within the education profession, thus, due to this reason, unprofessional persons are legally employed as teachers.

Many researches showed that a large number of teaching standards supporters claimed that professional qualification and academic specialization were positively associated with increased gain in student achievement while the opponents declared that the available researches did not support this assertion. Many recent work stated that professional qualification of teachers do not have any effect on student achievement, but do raise hurdles, preventing qualified candidates from entering into this profession (Ballou & Podgursky, 2000). The same finding was found in the study of Rowan, Correnti, and Miller (2002), in which a small scale research was conducted on the impact of teachers’ professional qualification on the achievement of elementary school students and results revealed no discernable effect.

Among the teacher-related factors, teachers’ academic and professional qualification affects student achievement; teachers’ professional development or in-service training also significantly contributes, because the trained ones can instruct skillfully and better known the art of effective teaching as compared to the untrained. Laczko-Kerr (2002) identified that teachers’ in-service training mainly related to the opportunities provided to practicing teachers to enhance their skills, knowledge, and innovative approaches to improve their instructional effectiveness in the classroom situation. Frykholm (1998) viewed that complex challenges involved in education process, such as diversity of student population, innovation in technologies, and rigorous academic standards in the teaching-learning process, arise the need of continuous in-service training. Ruhela and Singh (1990) pointed out the need of teacher training in a teacher’s career that the success of any school directly relate to the availability of qualified and trained teachers, so teachers should make responsible for professional development.

In many studies, need was felt to increase the concept of in-service training required for continuous development and participatory learning of teachers. The importance of professional development was obvious in the report of the European Commission (2000), in which, 16 indicators of quality teaching were discussed and training was among one of them. Carpenter and Fennema (1992) suggested that in-service training rooted in subject matter and student learning focused put a significant effect on student performance. As many studies indicated that teachers’ in-service training can improve student achievement when it caters to the needs of students’ subject matter learning, instructional practices, and their understanding of content of knowledge. Several recent researches noticed that students’ higher level of achievement directly associated with teachers’ participation opportunities in sustained professional growth grounded in content-specific pedagogy (Wayne & Young, 2003). There is a common assumption that when trained teachers teach students, their performance gets better, because these teachers are always considered an important key factor in the education environment. The major difference between trained and untrained teachers in terms of imparting their duties is the confidence teachers gained during training, they know very well that they are disseminating knowledge for the sake of knowledge.

In the view of Croninger and Rathbun (2003), teachers' qualifications, in-service or professional training, and experience all are very important for student achievement, but among all these factors, teaching experience plays a more important role for student achievement. Many researches expressed that a teacher's years of experience positively relates to student learning gain. Wenglinsky (2002) found that "Many studies have been agreed in finding positive correlation between students' high level of achievement and teaching experience" (p. 45). In different studies, teachers' five or more than five years of experience were proved effective in teaching while less or in-experienced proved to have a negative effect on student achievement.

More teaching experience thought to be more effective for student achievement. Hanushek, Rivkin, and Kain (2005) also supported this concept that "Students taught by experienced teachers perform better than students of inexperienced teachers" (p. 24). Darling-Hammond (2000) found the relationship between teaching experience and student achievement that there was no significant difference between the performance of students taught by teachers who had less than five years and more than five years of experience. Pedagogical knowledge or knowledge about the different teaching methods equips teachers with numerous techniques associated with efficient teaching focusing on students' learning outcome. Denton and Lacina (1984) also in favour of that the positive relationship was found between teachers' knowledge of teaching strategies and student performance in examinations. Many educational experts believed that 5-8 years are required to acquire the knowledge of teaching methodology to reach the expert stage. Deep knowledge of teaching strategies has always been associated with better lesson planning and implementation in the classroom (Berliner, 1988; Shearer, 2001).

The review of related literature expressed divisive results emerged with regards to the relationship between different teacher-related factors and student achievement. The absence of any detailed study on the secondary level in Pakistan motivates the researchers to examine the relationship between different teacher factors and student achievement. To achieve the research objectives, the following research questions were formulated against the major variables of the study:

1. What is the achievement level of the 9th grade students in the subjects of English, Chemistry, and Mathematics?
2. How much there is a relationship between the teacher factors and student achievement at the 9th grade?
3. What is the difference between student performance taught by male and female teachers?
4. What is the relationship of student scores in the three subjects?

Due to financial and time constraints, the study was delimited to: (a) public sector secondary schools of Rahim Yar Khan district; and (b) students of the 9th grade.

Method and Procedure

Population and Sample Size Selection

This research study was conducted to observe "the relationship between teacher factors and learning achievement of secondary school children in Pakistan". In order to observe the relative effectiveness of teacher factors on student achievement, the selection of a suitable research design was the first step. As the study focusing on the present situation of the problem under investigation and keeping in view the nature of study, a descriptive research design was found appropriate for this research. Gay and Airasian (2002) revealed that descriptive research was set out to describe and interpret what it is. Among different descriptive research designs, the survey research was considered to be the most suitable to extract reliable results. In research

studies, it is a widely used method to collect data ranging from physical counts and frequencies to behavioral opinions.

As the study was conducted to examine the relation between teacher factors and student achievement in Rahim Yar Khan district, which consisted of four tehsils, Rahim Yar Khan, Khan Pur, Liaquat Pur, and Sadiq Abad. The research population included all male and female secondary school teachers serving in the public sector secondary schools and all the 9th grade boy and girl students of public sector schools situated in Rahim Yar Khan district, which gave the secondary school certificate (2012) examinations by the Board of Intermediate and Secondary Education Bahawalpur.

For obtaining the truly representative sample, necessary stratification was done (see Table 1). From each tehsil, a one-fourth sample of boy-girl students and male-female teachers was selected through purposive sampling techniques. The first sample of the study consisted of a total number of 2,404 students (1,004 girls and 1,400 boys) of public sector secondary schools of Rahim Yar Khan district. The 9th grade result of three compulsory subjects (English, Chemistry, and Mathematics) was taken from the Website of the Board of Intermediate and Secondary Education Bahawalpur. The result of students who were found absent in any one of the above-mentioned subjects was excluded from the study. The second sample of the study consisted of a total number of 114 public sector secondary school teachers (66 males and 48 females) of Rahim Yar Khan district.

Table 1

The Teachers and Students' Sample Size

Type of sample	Sample size
Secondary school teacher (Male)	66
Secondary school teacher (Female)	48
Students of the 9th grade (Male)	1,400
Students of the 9th grade (Female)	1,004

Instrumentation and Data Collection

In this study, data were collected from different sources:

1. Statistical information regarding secondary schools and secondary school teachers and students enrolled in the 9th grades was taken from the office of Executive District Education Officer (EDO) Rahim Yar Khan and further confirmed from the office of Education Management Information System (EMIS) Punjab;

2. Data were collected through the Students Result Feeding Sheet (SRFS), which was designed to feed back the results of the students by obtaining their roll numbers from gazette. The annual examination results of the 9th grade secondary school students were taken from the Board of Intermediate and Secondary Education Bahawalpur for the year 2012 to know the student achievement in three subjects, English, Chemistry, and Mathematics. Haider, Latif, Akhtar, and Mushtaq (2012) explained that "The students' learning gain in English subject has been an important issue in Pakistani society, because now in Pakistan, English language is considered the second major language of instruction after Urdu at all education levels" (p. 643);

3. Considering different factors, the secondary school survey was designed to seek information from male and female secondary school teachers. A questionnaire was designed to get information, like academic and professional qualification, experience, in-service training, background, etc..

Validity and reliability. In order to ascertain the validity and reliability of the research instruments, they were developed in the light of learning outcomes after discussing with educational experts.

Pilot study. After preparation, the research instruments were administered for pilot testing before using as the finished product in the main study. For pilot testing, 10 male and 10 female secondary school teachers were selected. After obtaining their feedback, the instruments were improved with regards to content, style, format, and language so as to administer it on a large scale in sampled schools.

For data collection from the respondents, the researchers personally visited the sample schools, but in some cases, the questionnaires were sent through electronic mail with vigorous chase on the telephone. Teachers were thoroughly briefed about the procedures of filling the instrument. The collected data were decoded, evaluated, and entered in Statistical Package for Social Sciences (SPSS) Version 16 for statistical analysis.

Data Analysis

The data were analyzed separately for three subjects. Analysis was performed by using SPSS Version 16 through the computer. The main factors, such as gender, teacher factors, and subjects (English, Chemistry, and Mathematics) were analyzed.

Descriptive Data Analysis of Teacher Factors

When data analysis was performed using SPSS, the results of the study revealed that the number of male secondary school teachers (66/57.9%) is higher than the female secondary school teachers (48/42.1%). As the differences in numbers of male and female teachers were not significant, the other reason was the easy availability and willingness of male teachers to participate in the research study as compared to the female teachers. In the South Punjab region of Pakistan, due to cultural norms or family restrictions, females show reluctance to participate in any study. In this study, much effort was carried to agree those to participate in the study so that the true representation could be obtained and results of study could be fruitful for future researchers.

Teachers of three subjects, English, Chemistry, and Mathematics, were involved, who were teaching the 9th grades in secondary schools for boys and girls. It is obvious from the results that the majority of the teachers (42/36.8%) were secondary school arts teachers, as there is more trend on the arts field as compared to science, and another reason may be the ease of the arts subjects and the availability of good arts teachers, so parents prefer to opt arts subjects for their children. The number of subject specialist teachers was 37 (32.5%), but the main alarming thing was that the there was only one senior subject specialist, which showed that there was a great deficiency of most senior staff in the secondary schools of South Punjab. The number of secondary school science teachers was 34 (29.8%), which looked satisfactory but not enough as the requirement in the schools.

The highly qualified teachers had a Master of Arts (M.A.), Master of Science (M.Sc.), or Master of Education (M.Ed.) degree (21/18.4%), a number of 63 (55.2%) teachers had a M.A., M.Sc., or Bachelor of Education (B.Ed.) degree, 14 (12.2%) teachers had a Bachelor of Arts (B.A.), Bachelor of Science (B.Sc.), or M.Ed. degree, and 16 (14%) teachers had the qualification of B.A., B.Sc., or B.Ed.. From Table 2, it is evident that the teachers have more interest in obtaining professional qualification. The reason behind the higher trend of obtaining B.Ed. degree as professional qualification is the opportunities for promotion in next grades. It is good for education of Pakistan as well as South Punjab that all teachers now in schools are professional qualified. This is due to the award of additional marks for professional qualifications in educator’s recruitment

policy. It is also obvious that 34 (29.82%) teachers attended course related to pedagogy or teaching methodology in the classroom, 19 (16.66%) to class organization, and 18 (15.78%) to information and communications technology. A large portion of teachers giving importance to attend the course related to pedagogy proved that in teaching learning environment, teaching strategies or courses on teaching methodology are more suitable and lucrative than other kinds of courses.

Table 2

Descriptive Data Analysis of Teacher Factors

Category	Factors	Frequency	Percent (%)	Valid percent (%)	Cumulative percent (%)
Designation	Secondary school science teacher	34	29.80	29.80	29.80
	Secondary school arts teacher	42	36.80	36.80	66.70
	Subject specialist	37	32.50	32.50	99.10
	Senior subject specialist	1	0.90	0.90	100.00
Academic/professional qualification	M.Sc./M.A./M.Ed.	21	18.42	18.42	18.40
	M.Sc./M.A./B.Ed.	63	55.26	55.26	73.68
	B.Sc./B.A./M.Ed.	14	12.28	12.28	85.96
	B.Sc./B.A./B.Ed.	16	14.04	14.04	100.00
	M.Sc./M.A.	0	0.00	0.00	0.00
	B.Sc./B.A.	0	0.00	0.00	0.00
Training courses	Management	11	9.64	9.64	9.64
	Class organization	19	16.66	16.66	26.30
	Pedagogy	34	29.82	29.82	56.12
	Audio visual aid	9	7.89	7.89	64.01
	Computer technology	18	15.78	15.78	79.79
	Communication skills	8	7.01	7.01	86.80
	No training received	15	13.20	13.20	100.00
Experience	1-5	6	5.30	5.30	5.30
	6-10	15	13.20	13.20	18.40
	11-15	31	27.20	27.20	45.60
	16-20	25	21.90	21.90	67.50
	21-25	22	19.30	19.30	86.80
	More than 25	15	13.20	13.20	100.00
Communication language	English	25	21.90	21.90	21.90
	Urdu	78	68.40	68.40	90.40
	Punjabi	7	6.10	6.10	96.50
	Seraiki	4	3.50	3.50	100.00
Teaching method	Lecture method	5	4.40	4.40	4.40
	Demonstration method	26	22.80	22.80	27.20
	Translation method	28	24.60	24.60	51.80
	Discussion method	16	14.00	14.00	65.80
	Lecture cum demonstration	26	22.80	22.80	88.60
	Others	13	11.40	11.40	100.00

It is also necessary that for better professional development of teachers and making them more result-oriented, courses related to pedagogical skills and information technology should be offered on a continuous basis. If we look at age variation, the majority of the teachers in secondary schools were within the

age group of 41-45, which showed that senior teachers were carrying the 9th grades in secondary schools. The teachers held varying teaching experience, 31 (27.20%) teachers had 11-15 years of teaching experience, 25 (21.90%) had 16-20 years of teaching experience, and 22 (19.30%) had 21-25 years of teaching experience. This study indicated that the majority of the teachers had 11-15 years of experience. It was also found in the study that school teachers serving in urban secondary schools were more experienced as compared to rural secondary school teachers. When studied the teachers' residence distance from school in which they served. It was found that 76 (66.7%) teachers were residing within the area of 1-3 km, 37 (32.5%) within the area of 4-6 km, and only one (0.9%) teacher was living within the area of more than 6 km. In South Punjab, most cities are small in the area, so most of the urban schools and the teachers' residences are easily approachable.

Many studies showed that the medium of instruction has a significant effect on students' understanding in the classroom. In this study, four languages were studied. One language was English, as an international language and the mostly spoken language of Pakistani elite class and standardized schools. Now, nearly all government secondary schools have English medium sections in which whole syllabi are in the English language. Other languages were Urdu, the national language of Pakistan; Punjabi, the main language of the province of Punjab; and Seraiki, the second most spoken language of Punjab. Results indicated that 78 (68.4%) teachers used the Urdu language in class during teaching, 25 (21.90%) used English, seven (6.10%) used Punjabi, and four (3.50%) used Seraiki as the medium of instruction during classroom teaching. The local languages were mostly used in rural areas and the teachers of secondary schools situated in urban areas mostly used the Urdu language.

Figures pointed out that very little number of teachers used their local language as the communication medium with their students in the classroom. Indeed, a satisfactory number of teachers used the English language in the classroom, but the reality is, they did not speak in English throughout their lecture. They especially used English during the lecture of the English subject, and in Chemistry and Mathematics science subjects, most terminologies are in the English language and it is a common assumption that science teachers are well aware of the English language because they have learned their course in English at M.Sc level as compared to arts teachers. The teaching method of a teacher played a significant role in the teaching learning process. As the study showed that 28 (24.6%) teachers used the translation method, which is a widely used method for teaching English and Urdu subjects in Punjab, 26 (22.8%) used the demonstration method, and 26 (22.8%) used the discussion method for imparting instruction in the classroom. But, it is important to indicate that the students were more satisfied with the translation method as compared to other methods.

Assessment is considered as a key to achievement, without it, no one can know about his/her performance. Assessment provides continuous feedback to students, parents, and school administration. Results described that 65 (57%) teachers used assessment test after every three months of study and 49 (43%) used assessment test after every six months. So, we can say that most of the teachers are well conversant with the importance of achievement test. Here, the role of Punjab government is also praiseworthy to motivate teachers to take such test and preparing proper record as this kind of test has a significant effect on future performance of students. In-service training equips teachers with innovative skills and moulds them according to modern trends.

This study revealed that 34 (29.8%) teachers did not receive any such training since appointment, 24 (21.1%) received training within the period of the last six months, and 17 (14.9%) got training within the period of the last one year to five years. The majority did not receive training even the government is taking many initiatives to train their workforce in schools. Many teachers received training within the time duration of less

than six months, which was due to strict policies of government to familiarize their teachers with the new technologies and administrative techniques coming in the education sector from time to time.

Table 3 shows the mean and standard deviation of student achievement taught by the three subjects' male and female teachers. In the English subject, the mean score of the female students taught by female teachers was 37.21, which was higher than the mean score of the male students taught by male teachers (32.28). It is evident that the female students' performance taught by female teachers in the English subject was better than male teachers. In the subject of Chemistry, the situation was a little bit changed, the male students' achievement taught by male teachers (24.83) was higher than the female teachers (23.90), but this difference in the mean score showed minor better performance of male teachers as compared to the female teachers.

Table 3

Descriptive Statistics of Subject Teachers and Student Achievement

Subject	Teacher	*M*	*N*	*SD*
English	Female	37.2144	16	4.76391
	Male	32.2891	22	5.46190
	Total	34.3629	38	5.67501
Chemistry	Female	23.9094	16	5.32384
	Male	24.8318	22	3.46741
	Total	24.4434	38	4.30434
Mathematics	Male	32.2469	16	5.89522
	Female	32.3123	22	6.34708
	Total	32.2847	38	6.07907

While in Mathematics, again, female teachers seem to move forward as student achievement of the female teachers was 32.31 while that of the male teachers was 32.24. In the subject's performance, it was obvious that students of the female teachers were performing better as compared to male teachers. If we see the cumulative performance in the three subjects (English, 34.36; Chemistry, 24.44; and Mathematics, 32.28), the students' performance in the subject of English was much better than the other two subjects. It may be due to the students' inclination towards the subject or due to good teachers' efforts and strategies.

Teacher Factors and Student Achievement

One of the main research purposes was to observe the relationship between different teacher factors affecting on the learning performance of students at the 9th grade level. The following paragraphs provide the detail subject-wise.

Factors Affecting English Achievement on the 9th Grade Students

To investigate the relationship between teacher factors and student achievement in English, Spearman's ranked correlation was used, which showed weak negative correlation between student achievement and a number of teacher-related factors, like designation, communication language in classroom, pedagogical method, assessment interval, academic qualification, professional qualification, and teacher's age. The weak correlation between gender and school distance from teachers' residence had also been observed, but the significance of the test in all cases is greater than 0.01 and 0.05, so it is concluded that they do not have any significant relationship with student achievement. However, on the basis of the sample results, we may conclude about the overall population by testing the hypothesis. In the case of teachers' experience and in-service training, the

correlation coefficients are -0.093 and -0.049, significant at 0.01 and 0.05 level respectively. It showed that both these factors are negatively correlated with and have an impact on student achievement. In the case of students' background, the correlation coefficient was 0.072 and significance of the test was 0.000, which showed that backgrounds of the students had a positive impact on student performance (see Table 4).

Table 4

Relationship Between Teacher Factors and Student Achievement in English

Factors	Pearson correlation	Sig. (two-tailed)
Gender	0.039	0.059
Designation	-0.038	0.061
Communication language	-0.009	0.668
Student's background	0.072**	0.000
Pedagogical method	-0.027	0.180
Assessment interval	-0.036	0.076
Academic qualification	-0.018	0.374
Professional qualification	-0.017	0.412
Teacher's age	-0.027	0.182
Teacher's experience	-0.093**	0.000
In-service training	-0.049*	0.016
School distance	0.006	0.753

Notes. * Correlation is significant at the 0.05 level (2-tailed); ** correlation is significant at the 0.01 level (2-tailed).

Factors Affecting Chemistry Achievement on the 9th Grade Students

To investigate the relationship between teacher factors and student achievement in the subject of Chemistry, Spearman's ranked correlation was used, which showed a weak negative correlation between student achievement and a number of teacher-related factors, like gender, designation, pedagogical method, and professional qualification. The weak correlation between student performance and teacher factors were also noticed in the case of communication language used by teachers in the classroom, academic qualification, and school distance, but the significance of the test in all such cases is greater than 0.01 and 0.05 level, so providing base to did not reject the null hypothesis that they had no significant relationship with student achievement. In the case of assessment interval (-0.054), teacher's age (-0.049), teacher's experience (-0.104), and in-service training (-0.073), significant negative correlation was found and the significance of the test is smaller than 0.01 and 0.05 level, so a significant relationship was found between the factors and achievement although it is negative. Again, in the case of student's background, the correlation coefficient was 0.060 and significance of the test was 0.003, which showed that backgrounds of the students also had a positive impact on student performance in the subject of Chemistry (see Table 5).

Factors Affecting Mathematics Achievement on the 9th Grade Students

To investigate the relationship between teacher factors and student achievement in the subject of Mathematics, Spearman's ranked correlation was used, which showed weak negative correlation between student achievement and a number of teacher-related factors, like gender, designation, pedagogical method, assessment interval, and professional qualification. The weak correlation between student performance and teacher factors was also found in communication language, teacher's academic qualification, and school distance. The value of sig. (two-tailed) in all previously described cases was greater than 0.01 and 0.05, so the assertion that they had no significant relationship with student achievement is accepted (see Table 6).

Table 5

Relationship Between Teacher Factors and Student Achievement in Chemistry

Factors	Pearson correlation	Sig. (two-tailed)
Gender	-0.055	0.097
Designation	-0.034	0.096
Communication language	0.007	0.741
Student's background	0.060**	0.003
Pedagogical method	0.038	0.061
Assessment interval	-0.054**	0.008
Academic qualification	0.009	0.669
Professional qualification	-0.017	0.396
Teacher's age	-0.049*	0.015
Teacher's experience	-0.104**	0.000
In-service training	-0.073**	0.000
School distance	0.040	0.052

Notes. * Correlation is significant at the 0.05 level (2-tailed); ** correlation is significant at the 0.01 level (2-tailed).

Table 6

Relationship Between Teacher Factors and Student Achievement in Mathematics

Factors	Pearson correlation	Sig. (two-tailed)
Gender	-0.066	0.071
Designation	-0.039	0.053
Communication language	0.009	0.668
Student's background	0.062**	0.002
Pedagogical method	-0.037	0.072
Assessment interval	-0.039	0.055
Academic qualification	0.007	0.727
Professional qualification	-0.021	0.298
Teacher's age	-0.058**	0.004
Teacher's experience	-0.113**	0.000
In-service training	-0.079**	0.000
School distance	0.024	0.249

Note. ** Correlation is significant at the 0.01 level (2-tailed).

For instance, in the case of teacher's age (-0.058/0.004), teacher's experience (-0.113/0.000), and in-service training (-0.079/0.000), negative correlation was found and the significance of the test is smaller than the 0.01 alpha level. So, it is observed that a significant relationship was found between the factors and achievement although it is negative. Again, in the case of student's background, the correlation coefficient was 0.062 (0.002), which showed that the backgrounds of the students again had a positive impact on student performance in the subject of Mathematics. Many studies regarding the student's background showed that students from the middle class families were more successful and skilled as compared to other families.

The relationship was investigated between the scores of the three subjects (English, Chemistry, and Mathematics) obtained by students during exam. Pearson correlation showed a strong correlation in each of the three subjects, which were 0.894, 0.894, and 0.944 respectively (see Table 7).

In the light of the above results, it is evident that there is a negative correlation between student achievement and teacher factors, like designation, communication language in classroom, pedagogical method,

assessment interval, academic qualification, professional qualification, and teacher's age, and the weak correlation between gender and school distance from teachers' residence was observed. However, the correlation was positive between the backgrounds of the students and student achievement.

Table 7

Correlation Between English, Chemistry, and Mathematics Subject Marks

	English	Chemistry	Mathematics
English	1.000	-	-
Chemistry	0.894**	1.000	-
Math	0.894**	0.944**	1.000

Note. ** Correlation is significant at the 0.01 level (2-tailed).

Discussion and Conclusions

The main purpose of the study was to determine the relationship between teacher-related factors and learning achievement of secondary school children of Pakistan. Findings of this empirical study clearly revealed that unequal amount of male and female teachers are working in the secondary schools of Rahim Yar Khan district, and in female schools, the shortage of teachers was also observed especially in rural areas, for teachers in rural areas were also not holding a higher qualification as compared to urban school teachers. A large number of teachers working in secondary schools were secondary school arts subject specialists, while the number of secondary school science teachers was not satisfactory. Many teachers have the qualification of a Master's degree and B.Ed., but the number of teachers having Master plus M.Ed. was not looking sufficient. Most of the teachers received training related to teaching methodology, as the government mostly offers courses related to teaching-learning skills, so the number of such training receivers is more as compared to others. It has been noticed that most teachers used the Urdu language for communication in the classroom. The other languages observed in this study were not mostly used because the medium of instruction in most schools was Urdu for teaching all subjects. Most teachers used local languages for personal matter and daily affairs.

Different strategies were used to teach students at the secondary level in Pakistan. Most of the teachers preferred to teach students with the translation method, which is only helpful to instruct the subject of English. For teaching of Chemistry and Mathematics, demonstration and lecture demonstration methods are considered useful. From the use of the formative evaluation carried out by the teachers, it was obvious that most teachers and school administration were fully aware of the importance of evaluation during the study. In this study, most of the teachers working in secondary schools (both male and female) were between 30-40 years old, so they were energetic, and age factor is not bringing hurdles in their teaching. The in-service conditions were not looking feasible as the majority of the teachers were not trained or even obtained any training during their service and they were near to retire. Many of them were not willing to get training during their service tenure. So, this condition was not quite satisfactory, as a very little number of teachers received training within the last decade. Mean score of the students in the subject of English and Mathematics taught by female teachers was better than male teachers, but the mean score of Chemistry was in favour of male teachers as the boys performed better in subject. Betterment in the performance of female teachers and their students was a very good sign for Pakistani society, while the male teachers had lot of opportunities, resources, and facilities as compared to female teachers, but their performance is not satisfactory.

In this study, gender had no effect on student achievement. It did not matter whether the instructor was

male or female and student achievement was not affected by this variable. Zuzovsky (2003) found in his study that there is a positive association between female teacher's gender and student achievement when fitted in single predictor in multilevel analysis, but in other teacher level variable, gender showed negative relationship with student achievement. So, different studies were in favour of teacher's gender effect on student achinvement, while in this study, the gender effect was not significant and correlated negatively with Chemistry and Mathematics. The correlation between teachers' academic qualifications and student achievement is not significant, which showed that academic qualification of the teacher is not an indicator of students' excellence.

Zuzovsky (2003) also yielded the same result in his study, pointing that "In school subjects, teacher's academic qualification did not show a positive relationship with students' learning achievement" (p. 52). It was further confirmed by the study of Buddin and Zamarro (2009), which found that "Advanced level teachers' educational degrees had no bearing of students' gain" (p. 104). The effect of teachers' professional qualification on student achievement was also not significant in this study. Teachers who were more qualified academically and professionally did not revealed excellent results as compared to those less professionally sound and qualified. Buddin and Zamarro (2009) noticed that teacher quality has a considerable effect on the student achievement, but the qualification both academic and professional showed a negative correlation effect on student achievement.

In-service training was negatively correlated with student achievement in this study, which might be due to the varying time period of in-service training. Many studies indicate a positive relationship between teachers' in-service training and student achievement (Darling-Hammond, 1999; Goldhaber & Brewer, 2000; Guyton & Farokhi, 1987), and many others have different results as in this study that the relationship was not positive. Monk and King (1994) found both positive and negative effects of teacher training on student achievement. Goldhaber and Brewer (2000) found a positive relationship for Mathematics but not the same relationship for science. Rowan, Chiang, and Miller (1997) expressed a positive relationship between student achievement and teacher training. Buddin and Zamarro (2009) expressed that "Student achievement marks not significantly affected by the subject matter, basic skills, or pedagogy skills of teachers as measured on California licensure tests". Findings revealed a weak negative association between assessment intervals and student achievement in secondary school. Most of the studies revealed that teachers' continuous evaluation increased students' learning gain, as the use of formative evaluation in teaching enhanced student performance, because this activity develops the habit of timely study among students. But the negative correlation in this study regarding assessment interval might be due to the increasing period of assessment from three to nine months.

The weak negative relationship was observed between teachers' teaching experience and student achievement. But the situation was not consistent in all cases. Students taught by experienced teachers showed better outcome as compared to those taught by less experienced. Many research studies on experience and achievement had mix results. Goe and Stickler (2008) found that "The relationship between teachers' experience and students' learning achievement had mixed results" (p. 6). Goe and Stickler (2008) quoted Cavalluzzo (2004), Rockoff (2004), and Rowan et al.'s (1997) remarks that "Several researchers indicated the classroom experience positively relates with the students' gain in science subjects, specifically Mathematics". According to Klitgaard and Hall (1974) and Murnane and Phillips (1981), studies on the effect of teachers' experience and student achievement found a positive correlation between teachers' effectiveness and their years of experience, but it is not always significant or an entirely linear. As in the case of this study, the teaching experience was not positively associated with student achievement, and the reason of negative correlation may

be the lack of interest of teachers in the teaching with the passage of time.

No significant effect was found on the designation of teachers on students' learning gain. No matter the teacher was a secondary school teacher or a subject specialist or holding any other designation, only the teachers' caliber and quality bring the difference in student performance not his/her designation. No significant relationship was observed between teachers' residence distance from school and student performance, it might be possible because most teachers serving in the secondary school were near their homes and the school was in easy access for them. No significant relationship was found between communication language of teachers and learning achievement of students.

The relationship between students' backgrounds and students' learning achievement was found positive in this research. Findings of this study expressed that students belonging to established middle class and educated family background performed well as compared to those belonging to the less established and less or illiterate family background. Buddin and Zamarro (2009) also found the similar result that the socioeconomic status of parents proved to be a strong predictor of student's good performance. The same was also in the case of students with poor socioeconomic background and low parental education or uneducated, who had a low score than others. More family wealth may affect students through greater resources at home and providing more support for their children. No significant correlation or weak negative correlation was observed between teaching methodology and student achievement.

In the end of the conclusion, if we want to apply the results of this study in other geographical regions, more studies are required as teaching qualifications, the training situation, experience, and teaching methodologies are different in other regions and districts. But in all over Pakistan, ideology and curriculum are very much similar, so it may be implicit that similar results may come out from the other districts, regions, and provinces of the country. On the basis of the results emerged from this study, the exact generalization might not be suitable on the basis of small sample size. But due to similarity in results with previous studies, it might be helpful to policy makers and educational department to consider which kind of variables affects students' learning gain at the secondary level in Pakistan. It is strongly recommended that more research should be conducted on the national level in a similar pattern for proper decision making before the formulation of policies and their execution in the field.

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