



Impact of Teacher's Communication Skills on University Students' Academic Performance in STEM Subjects

Samina Yasmin¹, Dr. Asif Jamil², Abdul Ghafoor³

Abstract

The current study aimed to examine the impact of teacher's Communication Skills on University Students' academic performance in STEM Subjects. Quantitative method was used and therefore survey research design was employed. Five (05) public sector universities of Khyber Pakhtunkhwa were selected. All teachers (335) and students (5019) were constituted the target population. A sample of 271 (83 teachers and 288 teachers) were selected through stratified sampling method. A questionnaire was administered for data collection. Teachers' Communication scale was used to assess the teachers' communication skills whereas Students' academic performance was obtained from their last CGPA. Content Validity Indic (CVI) was applied to assess the content validity through experts and Cronbach's Alpha was used to measure the reliability of the instrument. Pearson product Moment Correlation and Linear regression was used. The study concluded that significant impact of teachers' communication skills on the students' academic performance in STEM Subjects. The study recommended that teachers may train in different competencies such as planning, assessment strategies and communication skills.

Keywords: Verbal Communication, Non-Verbal Communication, Academic performance

1. Introduction

The standard of higher education institutions affects economic growth of the country. The main advancement of higher education is the production of skilled individuals in various fields, including science, technology, and industry. According to the findings, emerging nations need more higher education institutions to boost their economic development. Additionally, the research looked at how established and emerging states differed in terms of the quality of their graduates (Arshad, 2012). As a result of realizing how important HEIs are to a nation's economic development, the Pakistani government has taken significant strides to elevate universities and raise the standard of higher education. In order to achieve this goal, the UGC was replaced in 2002 by the Higher Education Commission (HEC), which was also given increased authority. In order to handle the rising student population, new colleges were founded, which resulted in more graduates being prepared and supplying the market with skilled workers. In addition, the establishment of institutions in the private sector has also improved the standard of higher education by giving graduates access to amenities. As a result of the competition created by the establishment of both public and private colleges, a new era of higher education has begun (Arshad, 2016). Since students are seen as the main stakeholders in higher education institutions, every university is working hard to satisfy the community, especially the students, by offering them a conducive learning environment, better facilities, and a highly skilled teaching staff. In order to further the goals of the stakeholders and raise the standing and reputation of the institutions, the role of student happiness is therefore seen as crucial and important (Weerasinghe & Fernando, 2017). According to Lo (2010), university-provided learning facilities are closely linked to the way that students study. The learning atmosphere, educational tools, and teaching staff are all of the highest calibre. Due to the intense competition among universities, the administration of HEIs is becoming increasingly concerned with the issue of educational quality and student satisfaction. The supply of courses and instruction is thought to be the primary priority for student satisfaction. Moreover, students' performance also links the teachers' competency like their communication skill. Any institution's success depends critically on the competency of its teachers. Additionally, one of the elements that raise students' level of satisfaction is teacher's competency like communication skill. Competency is referred to as a specific degree of skill, knowledge, and attitude required of a teacher in a given subject area. To put it another way, the essential characteristics of competency are neatness, fluency, creativity, and flexibility (Latip al., 2020). The present study aimed to investigate the impact of teacher's Communication Skills on University Students academic performance in STEM Subject. The objectives of the study were:-

- To examine the relationship of Teacher's communication skills (verbal and non-verbal) with academic performance in STEM subjects.
- To find out the impact of Teacher's communication skills (verbal and non-verbal) on students academic performance in STEM subjects.

¹ Corresponding Author, PhD Scholar, Department of Teacher Education, Qurtuba University of Science and Information Technology, D.I.Khan , Khyber PakhtunKhwa, Pakistan, saminayasmine507@gmail.com

² Professor, Department of Teacher Education, Qurtuba University of Science and Information Technology, D.I.Khan , Khyber PakhtunKhwa, Pakistan, asifjamil72@hotmail.com

³ PhD Scholar, Department of Teacher Education, Qurtuba University of Science and Information Technology, D.I.Khan , Khyber PakhtunKhwa, Pakistan, ag.dikhan.82@gmail.com

2. Review of Related Literature

2.1. Academic performance

Students are frequently assumed to advance to the following grade or class based on their academic performance. On closer inspection, however, it has been found to be a gauge for all future life success, directly proportional to the degree of success a person would experience in his or her actual life. According to experts, there are many ways to evaluate achievement related to educational attainments, including administering achievement tests, evaluating teachers, and consolidating performance through portfolio record assessments (Neroni et al., 2019). Yakoyama (2019) hypothesized that low academic achievement may be related to a student's belief in his own capacity to learn and achieve higher marks. The study found a relationship between a student's positive self-perception of their ability to learn academic material and their academic success. The capacity of a student to complete a task or reach a goal is referred to as student performance. Performance, according to Browning and Rigolon (2019), is a multiplicative function of aptitude and drive. As a result, students in the same classroom exhibit stark variations in their academic achievement. The majority of the time, participation in class, individual written assignments, tests, group projects, and group presentations decide a student's grade.

Internality (belief in internal control) and academic performance are positively correlated. Giunchiglia et al. (2018) asserts that the most significant factors affecting students' performance and success are their teachers' personalities and the teaching methods they employ in the classroom. In this regard, it was shown that the non-authoritarian teaching strategy was the most effective. This is because of students are more comfortable discussing their issues with the teacher and feel at ease throughout the teaching-learning process when the classroom setting is non-threatening and conducive to learning.

2.2. Communication of Teachers

A definition of communication skills is the ability to convey ideas clearly and The transmission of a message that entails a shared understanding between the contexts in which the conversation takes place can be described as having good communication skills. (Weerasinghe & Fernando, 2017). Speaking, listening, and reading are all components of effective communication. A teacher must possess advanced knowledge in each of these fields to deliver lessons effectively. Effective teachers usually make things simpler and easier to understand (Freddie Silver). For a teacher to effectively communicate knowledge, administer the classroom, and engage with students in the class, effective communication skills are crucial. Students with various ways of thinking must be taught by the teacher. A teacher must develop communication skills that encourage pupils to pursue their learning process in order to instruct in accordance with their capacity and abilities (Choi et al., 2015).

The key element in the students' academic performance is teacher's communication skill. Teacher's communication skills play a vital role in the students' progress at university. Mostly teachers use lecture method in their lectures therefore strong communication skill play a vital role in the students understanding level. Teacher's strong verbal and non-verbal communication enhances the level of understanding whereas poor communication skills create hurdles in understanding the concepts in the classroom. Students may not learn with poor communication skill of the teachers (Khan et al., 2017). Teacher's proficient use of communication creates an learning environment in the class and develop interest among the students. Moreover, strong communication skills of teachers leads towards motivation and interest among students in the subject (Naibaho, 2022).

2.3. Teacher's Competency

Competency refers to the exact degree of knowledge, abilities, and attitude required of a teacher in a given field of instruction. To put it another way, competence is the ability to accomplish a task well, which includes being organised, enthusiastic, fluent, original, and flexible. Significant amounts of knowledge do not equate to competence. The appropriate timing for competence is crucial. In order to serve a purpose, knowledge is incorporated into behaviour patterns. Adequate and sufficient performance define competence. The skills, knowledge, and values possessed by teachers, or the "teacher competencies" (plural of competency), serve as the teaching materials (Purwanto, 2022).

Teaching competence refers to the technical and professional competencies needed for a teacher to carry out their duties effectively. Competence is demonstrated by someone who is competent in that profession and is genuinely observable behaviour measured by specific indicators. Anyone who is skilled in a given profession will exhibit the same pattern of observable behaviours. Competence and performance are distinct because competence calls for "knowing" about a subject. The display of output, outcomes, and linguistic "doing" is evident. Anyone's competence cannot be determined without evaluating their performance. The teacher's overt classroom actions demonstrate their competence (Muñoz Carril et al., 2013). A skilled teacher chooses various exercises, activities, and relatively significant teaching and supplementary materials that have a favourable impact on students' learning results. The teachers, who were intelligent, devised reasonable goals and practical means of achieving those goals. The routes the teacher chooses are constantly adaptable in order to achieve the goal. The ability of the teacher to deal with the

various qualities of the students in the classroom setting depends on their awareness, attitude, and competence. The instruction, counselling, and learning activities should be based on the requirements of the students (Yan et al., 2022).

2.4. Indicators of teacher’s competency

Teaching competences consist of four indicators: knowledge, performance, behaviour, and consequence. The learner's success is referred to as consequence competency. The Pakistani government intends to raise the standard of instruction throughout the country. The training of teachers is essential for raising educational standards. Competencies, skills, and attitudes for teachers at different levels establish these requirements (Supriyanto et al., 2019). Pakistan is where the eleven distinct professional standards for teacher beginning training were created. These criteria included subject-matter expertise, human growth and development, familiarity with Islamic ethical principles and social life skills, instructional planning and strategy expertise, assessment, learning environments, effective communication and proficient use of information and communication technology, collaboration and partnerships, ongoing professional development, a code of conduct, and instruction of English as a second or foreign language. The researcher has provided an outline of all three competence models and national professional requirements for Pakistani teacher education. For all three types of secondary school teachers employed in Khyber Pakhtunkhwa (Pakistan), the researcher developed 8 skills connected to the teachers' roles within and outside the classroom (Aziz, 2014).

3. Conceptual Model

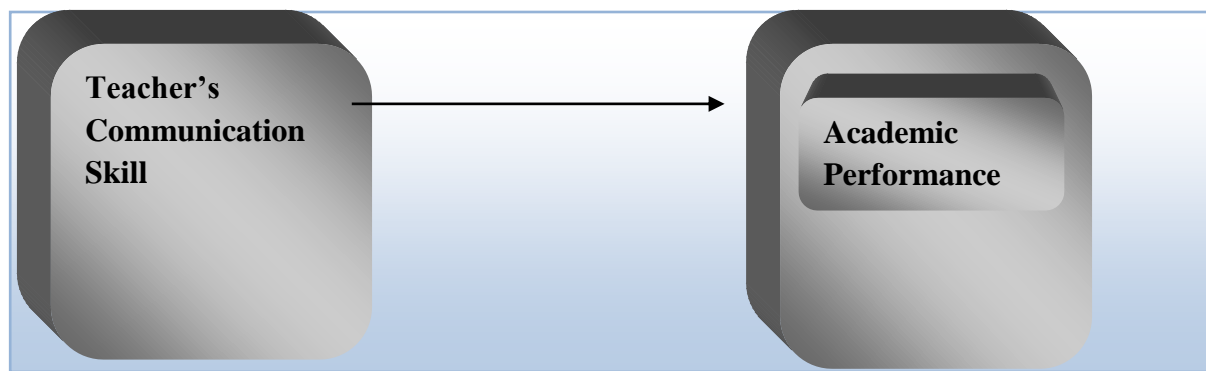


Figure 1: Conceptual Model

4. Research Methodology

Survey research design was used. Survey research is a specific form of research design where surveys are used as the main method of data collection. Surveys are employed in this study design as a tool by researchers to better understand individual or group viewpoints in relation to a specific concept or issue of interest (Sekaran & Bougie, 2016). Population comprised all the teachers (335) and students (5019) of five public universities of Khyber Pakhtunkhwa (Gomal University, D.I.Khan, University of Engineering & Technology Bannu Campus, University of Science and Technology Bannu, Khushal Khan Khattak University, Karak and University Lakki Marwat, Lakki Marwat). Researcher 371 individuals (83 teachers 288 students) were selected through stratified random sampling method. An adapted questionnaire used developed Nawaz (2016) to assess the teachers’ communication skill. The best way to measure the academic performance of students is recorded their CGPA (Jayanthi et al., 2014). In the current study, Cumulative Grade point averages (CGPA) were computed on a 4.0 scale by the students and collected from their cumulative files. Content Validity Index (CVI) used to validate the content of the questionnaire whereas Cronbach’s Alpha was used to measure the inter consistency (reliability) of the instrument. Moreover, Pearson Product Moment Correlation and linear regression was used. Table 1 shows the sample size (using Yamane (1967) formula) and score of CVI and reliability.

Table 1: sample size, score of CVI and reliability

Sample size	Research Variable	No. of items	CVI=ΣR/N	Cronbach’s Alpha
$\text{Sample (n)} = \frac{N}{1+N(e^2)}$ $\frac{5354}{1+5354(.05*.05)} = 371$	Teacher’s communication skills Scale	35	.60-.90	.834

5. Result and Discussion

Table 2: Relationship of Teacher's Verbal Communication Skill and Students' academic performance in STEM Subjects

Research variable			Teacher communication skill	verbal	Students' performance	academic
Teacher's Communication Skill	verbal	Pearson Correlation Sig. (2-tailed) Sample (n)		1		.823** .000 371

Table 2 indicates the association of Teacher's verbal Communication Skills and performance of students. The result found positive correlation between competency of teachers and performance of students ($r=.823^{**}$). The result also shows that teachers' verbal communication has significant relationship with students' performance in STEM subjects ($p=.000<.05$).

Table 3: Relationship of Teacher Non-verbal Communication skill and Students' academic Performance in STEM subjects

Research variable			Teacher communication skill	non-verbal	Students' performance
Teacher Communication	Non-verbal	Pearson Correlation Sig. (2-tailed) Sample (n)		1	.724** .000 371

Table 3 indicates the association of competency of teachers and academic performance level of students. The result found positive correlation between competency of teachers and performance of students ($r=.724^{**}$). The result also shows that teachers' competency has significant relationship with students' performance in STEM subjects ($p=.000<.05$).

Table 4: Model summary of regression out about impact of teachers' verbal communication skill on the student academic performance in STEM Subjects

Predictor	R	R ²	Adj. R ²	β	F	Sig.	D-W
Teachers' verbal communication	.823 ^a	.801	.799	.683	56.76	.000	2.19

Outcome variable: students' academic performance

Table 4 indicates the Model summary of regression out about impact of teachers' verbal communication skill on the students' performance. The result shows the value $R^2=.801$ which infer that 80.1% change in the outcome variable (students' academic performance) due to teachers' verbal communication skill. The beta (β) score shows that if a one unit changes in predictor (teachers' verbal communication skill) then .683 units (SD) change in the outcome variable (students' academic performance). The result shows no autocorrelation exist between the two variables by indicating the value of Durban Watson (2.19).

Table 5: Model summary of regression out about impact of teachers' non- verbal communication skill on the students' academic performance in STEM Subjects

Predictor	R	R ²	Adj. R ²	β	F	Sig.	D-W
Teachers' competency	.724 ^a	.691	.690	.687	49.87	.000	2.33

Outcome variable: students' academic performance

Table 5 indicates the Model summary of regression out about impact of teachers' non- verbal communication skill on the students' academic performance. The result shows the value $R^2=.691$ which infer that 69.1% change in outcome variable (students' academic performance) due to teacher's non-verbal communication skill. The beta (β) score shows that if a one unit changes in predictor (teachers' non- verbal communication skill) then 49.87 units (SD)

change in the outcome variable (students' academic performance). The result shows no autocorrelation exist between the two variables by indicating the value of Durban Watson (2.33).

6. Discussion

To find out the impact of teacher's communication skills on the university students' academic performance in STEM subjects' was key objective of the study. The result of the study shows that there is positive correlation between teacher's communication skills (both verbal and non-verbal) on the students' academic performance in STEM subjects. Same finding was drawn by Nbina (2012) who found that the intellectual prowess of the teachers is a key factor in the standard of education that students receive in the classroom. A teacher who is proficient in his field and with the communication skill to encourage and cultivate his students' latent abilities would naturally contribute. Same result was given by Khan et al. (2017) who explored that strong communication ability by increasing the level of understanding between teachers and student, the relationship between students and teachers is strengthened. For students to succeed academically, having effective communication skills is vital for both teachers and students. In other words students secured high marks when teacher are well-equipped with different professional competencies like subject matter knowledge, instructional planning and communication skills.

7. Conclusions and Recommendations

The study concluded that there is significant impact of teachers' verbal and nonverbal communication skills on and students' academic performance. Higher teachers' communication skills also enhance the students' academic progress. Teachers who are well-equipped with communication skills improve the students' performance. Higher teachers' quality in term of their academic and professional competence (verbal and non-verbal communication skill) enhances the students' academic performance in STEM subjects. The study concluded that effectiveness of a teacher's communication with pupils has a big impact on their academic performance. As a result, when instructing students, a teacher must use effective communication techniques. The main aspect influencing students' academic success is communication. The effective communication is crucial for both teachers and students in order to advance academic success particularly in STEM subject at HEIs. The study recommended that teachers may train in different competencies such as instruction planning, assessment strategies and communication skills. For this purpose, Universities and HEC may arrange workshops for newly appointed teachers and other faculty members to update their communication skills.

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