Enhancing Teaching Effectiveness: The Significance of Subject Matter Proficiency in Alignment with Pakistan's National Professional Standards for Teachers

Farhat Perveen
PhD Education Scholar, Faculty of Education, University of Sindh, Jamshoro, Sindh, Pakistan.
Email: blinkingglaxy@gmail.com

Sabir Hussain
PhD Scholar, Department of Educational Training, The Islamia University of Bahawalpur, Punjab, Pakistan.
Email: sabirjanmarri@gmail.com

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Abstract

For the purpose of raising the standard of education across the country, Pakistan has instituted the STEP program to augment teacher training. Funded by USAID and developed with assistance from UNESCO, this program is being carried out by the Policy and Planning Wing of the Ministry of Education. Strengthening Teacher Education in Pakistan (STEP) aims to raise the bar for all educators in the country. Along with collaborators from every province in Pakistan, it developed and implemented the Professional Standards for Teachers (PST). It is possible to adapt and expand the requirements of these professional standards to include in-service teachers and educator programs, even though they were originally developed for pre-service teachers. For educators, there is a set of ten educational standards. Priority one among these is expertise in the relevant field, such as Subject Matter Proficiency. Examining how well educators understand their subjects was the primary goal of this research. The national professional standards served as the basis for the development of an observational checklist for this study, which included nineteen items. Teachers instructing biology classes in Hyderabad district secondary schools made up the study's population. Statistics tools like percentage, mean, and frequency were used to analyze the data. Most educators recognize the significance of subject-matter expertise in light of national professional standards for educators, according to the study results.

Keywords: Subject Matter Knowledge, Content Knowledge, National Professional Standards.

Background of the Study

Pakistan has launched the STEP program to raise the bar for all educators in the country. The Education Ministry's Policy and Planning Division has been working on this project with

funding from USAID and assistance from UNESCO (Shakir & Adeeb, 2014). Professional Standards for Teachers were introduced by the STEP in collaboration with partners from each province of Pakistan. Even though these standards are primarily for future educators, they can be adjusted and applied to current educators as well (Hina, 2017). Acquiring the knowledge, abilities, and mindsets necessary to carry out a specific task effectively is the overarching goal of the regulations. It fails to elaborate on what is necessary for success and instead provides a laundry list of tasks (Shakir & Lodhi, 2016). Also, they are meant to display the activities and performance of a company. To ensure that students and groups have access to high-quality educational opportunities, the standards lay out the information and practices that educators must have (National Research Council, 2000). Utilizing institutional success metrics allows one to gauge the extent to which quality expectations are met. The government of Pakistan has made an effort to improve the effectiveness of schools by raising the bar for teacher accreditation. The 2010 National Education Strategy has served as a crucial lynchpin (Shakir & Adeeb, 2014). Keeping things uniform calls for professional development standards and an effective system for recognizing institutions and programs that provide teacher education. The work of model teachers and other students is a component of a larger global movement toward quality control in many areas of human endeavor. Its function in the program and its effects on students' learning are monitored by the quality control of schooling analysis (Khizar et al., 2019). All province representatives formally adopted these guidelines in 2008 at a National Steering Committee meeting (Tariq et al., 2020).

National Professional Standards for Teachers in Pakistan

The ten Professional Standards for Teachers in Pakistan are stated as follows:
Standard I Subject matter knowledge
Standard II Human growth and development
Standard III Knowledge of Islamic ethical values/ social life skills
Standard IV Instructional planning and strategies
Standard V Assessment
Standard VI Learning environment
Standard VII Effective communication and proficient use of information communication technologies
Standard VIII Collaboration and partnerships
Standard IX Continuous professional development and code of conduct
Standard X Teaching of English as a second/foreign language (ESL/EFL) (Government of Pakistan, 2009, Chapter 4)

The standards mentioned above are divided into three parts. The first part, "knowledge and understanding," describes the subject matter that a teacher should already be familiar with. The second part, "dispositions," explains the behaviors, attitudes, and values that a teacher is expected to have. Lastly, "performances" discusses the skills that a teacher should possess. According to Ullah et al. (2022), it lays out the skills and responsibilities that educators should have.

Subject Matter Knowledge

An effective, competent, and qualified teacher needs to have a deep understanding of the

material (Stronge, 2018). Students will learn both complex and basic ideas from a teacher with a command of the subject matter (Alsaleh, 2020). There has been an effect on the students' learning outcomes from the mastery of the subject matter. If they have the necessary information, teachers can deliver their lessons with ease. When educators are well-versed in their fields, they are better equipped to address the diverse learning needs of their students, which in turn leads to improved student performance and classroom engagement (Barkley & Major, 2020).

However, there are numerous challenges that teachers encounter when they lack subject matter knowledge. Some educators just can't seem to know which methods work best with certain subjects. They have problems presenting the material and end up disappointing their students. When pupils ask them questions, they usually don't know the answers (Jadama, 2014). Students' learning outcomes are poor because teachers grade their work based on their own lack of subject knowledge. This professor is well-known for his extensive knowledge of the material, his excellent teaching skills, and his openness to hearing and responding to student ideas. (Barth and Timm, 2021). Teaching capability refers to the practical ability that educators must attain in its entirety, whereas capacities refer to the common knowledge, abilities, and attitudes that are necessary for professional development (Omare et al., 2020). Subject matter knowledge, pedagogical expertise, and instructional techniques are among teachers' talents. These allow them to effectively collaborate with students, colleagues, and renowned professionals in the field of education, which in turn benefits children's learning (Ibragimovich et al., 2021). According to Pakistan's National Professional Standards for Teachers (Shaukat & Chowdhury, 2021), the document covers all aspects of the subject matter and knowledge. Teachers are expected to understand the main concepts, research tools, and disciplinary framework, especially in relation to the national curriculum's criteria, and to create learning activities that ensure all students can access and benefit from the discipline's content (Markula & Aksela, 2022).

Rational of the Study

Consistency in instruction and subsequent learning is highly impacted by the educator's subject-matter comprehension. By outlining the lesson's key points and addressing any misconceptions students may have, teachers who are well-versed in their subjects are able to effectively plan and deliver lessons. Having subject knowledge goes beyond just being able to relay information. The significance of subject matter knowledge is highlighted by the fact that it is the first standard included in the document National Professional Standards for Teachers in Pakistan. It is intended to serve as a standard for attaining the necessary degree of educator for efficient instruction. The level of understanding and extensive knowledge possessed by teachers greatly impact the success of a subject's instruction. Many issues arise in the classroom when teachers lack sufficient subject matter knowledge. Teachers may fail to guide students on the right path or impart erroneous ideas due to their own limited knowledge and inaccurate information about the subject matter. On occasion, students encounter abstract concepts that defy easy explanations and necessitate the intervention of an educator to either provide alternative explanations or provide further context. Teachers struggle to clarify students' misunderstandings when this happens, which in turn causes students to misunderstand the material being taught, which has a negative impact on their learning.

Below Mentioned Objectives Were Designed for The Study

1. To highlight the importance of subject matter knowledge for effective teaching at the secondary school level in District Hyderabad.
2. To analyze the strategies for the enhancements of teachers' subject matter knowledge.
3. This research aimed to discover the current status of the teacher's subject matter knowledge in the district of Hyderabad, Sindh.

Significance of the Study

1. It would be beneficial for all parties involved to grasp the significance of this.
2. Teachers can benefit from the study's findings by expanding and modernizing their subject matter knowledge.
3. If school administrators and subject coordinators want to help students learn better at the elementary level, they should focus on enhancing teachers' subject-matter expertise.
4. The study's findings can be useful for district-level CPD assessment and evaluation program criteria-setting by elementary, secondary, and higher secondary school principals and district education officer teams.
5. Institutes for professional study could use this research as a basis for developing subject-specific professional courses, as well as for creating in-service teachers' professional development opportunities, such as short courses and training sessions.
6. The study has the potential to make a significant impact on the process of teacher accreditation.
7. The results of the study can also be useful in determining how much of an effect instructors' subject-matter expertise has on the yearly (B.I.S.E.) tests that their students take.
8. Recruitment policies and pre-service assessment criteria can be updated based on the study's results.

Literature Cited

Educators, according to Shakir and Lodhi (2016), should have their professional development centered around qualitative rather than quantitative measures because they are the ones actually making a difference in the classroom. It is important for educators to make an effort to grow in three areas: thinking critically, changing their attitudes, and improving their teaching methods. Until there is change at the mental and intellectual levels, it is useless to just reflect on the progress at the pedagogical stage. Their findings highlight the necessity for a performance-based teacher assessment and accreditation program in Pakistan to motivate educators to strive for excellence. Rather than rewarding senior citizens, promotions should be based on teachers' performance.

Shakir and Adeeb (2014) conducted research to develop a system for evaluating Pakistani educators. The major goal of this research was to categorize secondary school teachers' competencies using rubrics based on the five stages of PST and to identify teachers' competencies in secondary schools according to PST. More teachers are identified at the teacher development level, 29.2% at the proficient level, and 26.0% at the emerging level, according to the report. On the other hand, 13.3% were determined to have extensive teaching experience, while 6.4% were not even considered instructors.

A report on the content comprehension of elementary school teachers in district Lahore was published by Mayer and Mills (2021). This study set out to answer two main questions: (a) how well-versed in the subjects they teach elementary school students are public school teachers, and (b) how much of a disparity there is in terms of subject-matter awareness between male and female elementary school teachers. Employing a quantitative checklist, they found that the majority of elementary school teachers possessed a fair amount of knowledge and that there was a small but significant difference in the levels of subject matter awareness and overall subject matter awareness between male and female elementary school teachers. The idea that the government should hire educators based on skill standards rather than degrees was a central theme in Mayer and Mills's writings.

Kaleem (2021) looked into secondary schools in Khyber Pakhtunkhwa (southern districts), Pakistan, to determine the level of subject-matter expertise among teachers. The questionnaire was designed using a five-item Likert scale. It contained five statements that were meant to be answered by secondary school teachers in Khyber Pakhtunkhwa. They looked at six different districts and found that teachers' levels of subject area expertise varied. In their final analysis, the researchers found that secondary school teachers across Khyber Pakhtunkhwa districts possessed sufficient subject-matter expertise. One area where they fall short, though, is in making sure the material is relevant to actual life. The researchers concluded that secondary school educators in Khyber Pakhtunkhwa could benefit from holding professional development opportunities such as seminars and workshops to help them put their knowledge into practice.

Method

This research relied on a deductive method, which moves from broad to narrow conclusions. The method of deductive analysis is referred to as the top-down approach as well. Similar to the inductive approach, the deductive method leads to a conclusion based on true logic. For this analysis, we will treat each variable as a hypothesis, test them, and then draw conclusions based on the data we have. The current investigation was quantitative in character.

The instructors were the necessary population to test because the existing research focused on their evaluation. While all of these instructors are committed to the research's overarching goal, they teach at different levels and according to different standards. The research population consisted solely of secondary school biology teachers from the Hyderabad district. In order to accomplish this, we gathered data from the Hyderabad District Education Office, which is responsible for both primary and secondary education.

Table 1 Sample of the Study

Taluka	No. of Teachers	
	Male	Female
Hyderabad city	32	30
Latifabad	22	05
Qasimabad	07	35
Hyderabad Rural	17	05
Total	78	75

The preferred method for selecting the sample from the population was simple random

sampling. Since it ensures that every member of the population has an equal opportunity to be a sample, Levy and Lemeshow (2013) argued that it is the optimal sampling procedure. A confidence interval, a sample error, and the likelihood of the sample being divided evenly among the three variables are utilized in a formula to determine the size of the sample (Creswell, 2015).

The researcher created a survey using a five-point Likert scale, with options for each competency of subject matter knowledge divided into three subcategories: (a) Strongly Disagree, (b) Disagree, (c) Neutral, (d) Agree, and (e) Strongly Agree. The purpose of the survey was to emphasize the significance of teachers' subject matter knowledge of biology.

Table 2 Reliability of Questionnaire

Sr. No.	Variable	No. of items	Cronbach's α
1.	Knowledge and Understanding	11	.904
2.	Dispositions	05	.844
3.	Performance and Skills	03	.751
	Overall reliability	19	.927

According to Table 2, the eleven items in the Knowledge and Understanding section had a Cronbach's alpha of.904, the five items in the dispositions section had a Cronbach's alpha of.844, and the performance and skills section had a Cronbach's alpha of.751. Nineteen items had an overall reliability of.927.

Data Analysis

In order to determine the mean, the researcher used a test of central tendency. Central tendency measures are just numerical values that represent the distribution of scores; they are not meaningful on their own. The item responses of all participants on an instrument can be defined using this statistic, which is the most commonly used one. The researcher determined an average score for each level. Level 0 had an average score between 1.00 and 2.00, level 1 had an average score between 2.00 and 3.00, level 2 had an average score between 3.00 and 4.00, level 3 had an average score between 4.00 and 4.50, and level 4 had an average score of 4.50. The work of Shakir and Adeeb (2014) provided the basis for this mean score.

Table 3 Data Analysis (Item-wise means of questionnaire items)

Sr. No.	Item(s)	Mean	Std. Deviation
1.	Educators' familiarity with the subject's national curriculum framework	3.8393	.85481
2.	Knowledge of the subject's framework, foundational ideas, and theories held by educators	4.0357	.73434
3.	The expertise of educators regarding the steps involved in subject matter acquisition	4.1696	.73385
4.	Teachers' possession of the evolving nature of the subject	4.0982	.74688
5.	Awareness among educators of the need to be current on relevant studies	4.1429	.83674

6.	Teachers' understanding of teaching the discipline	4.2411	.64718
7.	The familiarity with which educators have recently developed ideas, theories, research findings, and national and international trends	3.6964	.85781
8.	Teachers' acquisition of in-depth knowledge of the subject	4.0179	.78249
9.	How well educators grasp the subject's interconnectedness with other disciplines	4.1071	.70208
10.	Teachers' understanding regarding the relationship of the subject with other subjects and its' usability in practical life.	4.1161	.75630
11.	Teachers' awareness of reading, writing, and arithmetic principles in the domain	3.8571	.70847
12.	Teachers' attitude toward facilitating the learners through multiple ways of construction and acquiring knowledge	3.9643	.80459
13.	The application of knowledge to real-world situations by teachers	3.9732	.78797
14.	Teachers' knowledge about students and their talent	4.1875	.71699
15.	The attitude of teachers towards students to build their self-confidence and subject matter competence	4.3125	.78306
16.	The general consensus among educators is that students in the elementary and secondary grades have the potential to excel academically.	3.8214	.95119
17.	Course material is presented by the instructor from a variety of angles, with an emphasis on the interconnectedness of all necessary disciplinary elements	3.9107	.56239
18.	Using inquiry strategies that are suitable for the subject matter while taking into account students' background knowledge	3.9732	.66387
19.	Providing real-world examples that demonstrate how the teacher has applied the material	4.2500	.65071
Overall Mean		4.03758	.75166

The importance of teachers' subject matter knowledge was evaluated using criteria from the "National Professional Standards for Teachers in Pakistan" survey, and the mean values of the questionnaire items that were administered to this end are shown in Table 3. The first item that pertains to subject matter knowledge competence is "Teacher awareness regarding the framework of the national curriculum of the subject." Table 4.24 shows that the mean value of this competency is 3.8393, which means that most teachers agree or strongly agree that teachers should have it. A mean score of 4.0357 indicates that teachers believe their students have a solid grasp of the subject's foundational ideas, theories, and structure, and they strongly advise their students to do the same. The mean value of this item was 4.1696, indicating that teachers focused more on the process of subject knowledge acquisition. The item's mean value was 4.0982, indicating that the majority of instructors agreed that the competency was pertinent to students' ability to understand the subject's dynamic nature. The mean score for item five, "teachers' knowledge regarding the need for keeping abreast of

new ideas," was 4.1429. The mean value for "teachers' understanding of teaching the discipline" was 4.2411. The participating teachers' lack of clarity on the competency "Teachers' ability to understand the new emerging concepts, theories, result of researches and latest trends at national and international level" was reflected in the mean value of 3.6946. The item's mean value was 4.0179, indicating that most teachers believe that their students would benefit from their extensive understanding of biology. The competency of comprehending the subject's relationship to other content areas showed nearly the same mean in Table 4.24. The average score for teachers' comprehension of the field's connections to other areas of study and practical applications was 4.1161. A mean score of 3.8571 indicated that teachers were well-versed in the domain's reading, writing, and mathematics principles. With a mean value of 3.9654, the facilitator helped students build and acquire knowledge in various ways. A central tendency value of 3.9732 was found when teachers made the knowledge applicable to real-world situations. The majority of educators (4.1875) think it's critical for educators to have a solid grasp of their students' strengths and areas of improvement. "Teacher helps students to build their self-confidence and subject matter competence" is the competency at which this item's central tendency was discovered at 4.3125. The item "teacher believes that all children and adolescents can learn at a high level and achieve success" had a central tendency of 3.8214. With a central tendency of 3.9107, an excellent educator provides students with information from a variety of angles and connects all the necessary disciplinary components. "Teacher usage of appropriate tools of inquiry according to the nature of the content, considering students' prior knowledge" had an average value of 3.9732. The central tendency was 4.2500 when a teacher provided examples of how to apply what they had learned in the classroom to real-world situations. The surveys contained a total of 19 questions, with a mean score of 4.03758. It demonstrates that, according to Pakistan's National Professional Standards for Teachers, the majority of educators support the development of these skills and knowledge and place a high value on subject area expertise.

Discussion

A teacher's skill lies in the delivery of knowledge to their students. The material covered in class does not limit itself to what is read in textbooks. Many different facets and dimensions make it up. Everything about it is covered in depth in chapter two. This study's overarching goal was to evaluate educators in Pakistan according to the National Professional Standards for Subject Matter Knowledge. To begin, the researcher used questionnaires to gauge instructors' perspectives on students' subject-matter knowledge. Teachers should know the material inside and out if they want to encourage students to make consistent connections across different subjects (da Silva-Branco et al., 2021). Considering that 74% of educators think it's important for educators to be familiar with the national curriculum framework, it's clear that these skills and standards are highly valued by educators. The majority of educators surveyed felt that students should have a firm grasp of the subject's foundational ideas, theories, and frameworks. It is crucial to have a thorough knowledge of a subject area (Smith et al., 2021), and 90% of teachers had a positive attitude toward the process of subject area knowledge acquisition. Most educators agree that keeping up with the ever-changing nature of their subjects is crucial for students from all backgrounds to succeed in the classroom.

Nearly 82% of educators value being aware of the need to stay current with new ideas. According to many educators, teachers should have knowledge of pedagogical discipline. Concerning the competency of understanding new ideas, concepts, research findings, and contemporary trends on a national and international scale, nearly 35% of the educators exhibited an indecisive attitude. Teachers should have extensive subject knowledge, according to 85 percent of teachers who agreed or strongly agreed. Teachers should be able to see how their subject relates to other areas of study, as well as to other types of content, and how that knowledge can be applied in the real world. This is a belief shared by most educators. There is a strong emphasis on teachers having a solid grasp of the domain's reading, writing, and mathematics principles; furthermore, 70% of teachers surveyed expressed their support for acquiring this competency. Among the educators surveyed, 18% expressed no firm opinion on whether or not students should be guided through a variety of strategies for knowledge construction and acquisition. Most educators believe that their job is to help students see how what they're learning applies to the actual world. According to the analysis, teachers value having a solid understanding of their students and their abilities. Teachers should assist students in developing their self-assurance and subject-matter competence; this is a competency that many teachers agree or strongly agree with. When asked whether they think all students have the potential to learn and succeed, 26% of educators said they don't care.

Conclusions

After averaging out these questions, it was concluded that most educators value subject-matter expertise in accordance with the standards laid out by the National Professional Standards.

Recommendations

1. The teacher's job is to break down the subject into manageable chunks and present it from multiple angles, making sure to cover all the necessary components.
2. Teachers should consider their students' prior knowledge when deciding on appropriate investigational tools, taking into account the nature of the content.
3. The best way to help students understand the material is for teachers to provide real-world examples.

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