

EFFECT OF EDUCATORS SUBJECT-MATTER EXPERTISE ON THEIR INSTRUCTIONAL QUALITY

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ABSTRACT

The purpose of this study was to examine the effect of educators subject-matter expertise on their instructional quality. The objective of the study were: i) To measure the level of educators' subject-matter expertise, ii) To determine the instructional quality of educators in secondary schools & iii) To examine the effect of educators' subject-matter expertise on their instructional quality. The current study was quantitative in nature, and a cross sectional survey was used for data collection. All the secondary school teachers (335) of Kotli AJ&K were the population of the study. The sample of the study was 176 secondary school teachers. The sample size was selected by following the guidelines in Krejcie and Morgan's table 1970. The sample was chosen by using simple random sampling technique. The researcher used self-developed questionnaire as a research tool for the study. The reliability of instrument was measured through Cronbach's Alpha and the value was .767. The researchers collected data personally. The data were analyzed by using Statistical Package for Social Science Software (SPSS). The researchers applied mean score and Linear Regression for the analysis of data. The results indicated that teachers have moderate subject-matter expertise and generally good instructional quality, with subject-matter expertise having a significant positive effect on instructional quality. It is recommended that educational authorities may strengthen teachers' subject-matter expertise through targeted professional development to enhance instructional quality and teaching effectiveness.

Keywords: Subject-matter expertise, Instructional Quality

1. INTRODUCTION

The quality of teaching continues to be one of the most vital elements affecting student learning results. Among various factors influencing teaching effectiveness, educators' subject-matter expertise (SME) and their thorough understanding of the content have consistently been a focus in educational research. Education philosophers, particularly Shulman (1986), contended that mastery of content serves as the

essential basis for developing pedagogical approaches. If teachers do not understand what they are teaching they may struggle to explain ideas answer students questions or create good learning experiences. Teachers need to know their subjects and be able to share that knowledge in a way that makes sense to students. This is a part of being a good teacher because it helps them teach clearly and accurately and fix any misconceptions students may have.

Teachers knowledge of their subjects includes understanding the material and being able to present it in a way that works in the classroom. When teachers know their subjects well they can help students learn effectively. This means that it has an impact on how well students absorb what is being taught. Effective teachers leverage the information that they possess and create lessons that are understandable. They can also explain anything that the students do not understand, making it easier for the students to grasp the information that is being taught. Teachers who are knowledgeable enough in their areas are able to explain complex topics, make connections between topics, and customize the content according to varying student needs (Darling-Hammond et al., 2020).

Educational effectiveness studies show that one of the most critical aspects that influence students' learning outcomes is the subject-matter knowledge of educators. Teachers who know their fields very well can provide more effective lessons, ask more difficult questions, and encourage critical thinking among the students. This is related to the pedagogical content knowledge (PCK) concept that combines the teachers' understanding of the content and their teaching methods (Shulman, 1986; Krauss et al., 2020). In case the teacher does not know enough about his or her discipline, he or she will just be reading from textbooks, leaving no room for understanding concepts and inquiry. Another benefit is that it improves classroom management and teaching confidence.

Teachers having better subject expertise can engage students better, answer questions more competently, and lead class discussions confidently. Such confidence can increase students' respect towards their teacher and improve their motivation, engagement, and academic performance. Recent studies have shown that teachers who have expertise in specific areas can teach efficiently, create good teacher-student relationships, and provide a better learning environment (Chan & Yung, 2021).

IQ refers to the effectiveness of a teacher's ability to conduct classes, involve learners in processes, structure content, and evaluate comprehension. Numerous studies have revealed that differences in teaching efficacy tend to be associated with

teacher training and knowledge in particular disciplines (Darling-Hammond, 2000). Teachers working in diverse settings usually attend classes without adequate training and different educational background. One popular framework that explains teaching quality focuses on the differentiation between cognitive activation, classroom management, and an encouraging environment. Cognitive activation involves teaching methods that help learners develop critical thinking, assessment, and problem-solving skills instead of memorizing content. Classroom management refers to a well-organized, structured environment that allows learners to focus on acquiring knowledge, while the encouraging environment implies establishing healthy relationships between educators and learners and providing necessary support to learners. Teacher competence is strongly correlated with their knowledge, especially pedagogical content knowledge (PCK). This involves combining expertise in the discipline with effective instructional strategies. Teachers with good PCK skills can deliver content through various means, predict student errors, and adapt instructional strategies to meet diverse learner needs. Also, formative assessments like asking questions, providing feedback, and continuously monitoring the growth of learners are viewed as vital components of good instruction. These elements provide guidance on how to teach and facilitate the success of learners (Black & Wiliam, 2018; Hattie, 2023).

The quality of education is a serious concern in AJ&K due to disparities in teacher preparation, absence of professional development opportunities, and uneven distribution of school materials between urban and rural areas. In most schools, teacher expertise in the subject greatly impacts their ability to deliver content, teach concepts, and create meaningful learning experiences for the students. A teacher with adequate knowledge about the subject will be more likely to give correct explanations, offer relevant illustrations, clear any confusion among learners, and adapt instructional strategies to meet diverse needs. In AJ&K, where traditional modes of learning such as rote learning are practiced by some organizations, an improvement in teachers'

expertise regarding subject matter may result in a better student-focused and conceptual way of teaching. It is, therefore, essential to conduct research on the impact of teachers' knowledge on the quality of their teaching to identify weaknesses in their skill set.

2. Objectives of the Study

1. To measure the level of educators' subject-matter expertise.
2. To determine the instructional quality of educators in secondary schools.
3. To examine the effect of educators' subject-matter expertise on their instructional quality.

3. Research Questions

1. What is the level of educators' subject-matter expertise?
2. What is the level of educators' instructional quality?

4. Research Hypothesis

H₀1: there is no significant effect of educators' subject matter expertise on their instructional quality.

5. Literature Review of the Study

5.1 Subject-Matter Expertise

According to Shulman (1986), a teacher should have subject knowledge and Pedagogical Content Knowledge (PCK) in order to deliver successful lessons. Subject matter expertise allows educators to give an explanation of topics, present accurate examples, and solve misunderstandings. The studies conducted by Hill, Rowan, & Ball (2005) confirm that high subject knowledge level positively affects teachers' performance. Subject-matter expertise is associated with the depth, precision, and organization of knowledge held by educators concerning different subjects they teach. It is considered as an important part of successful teaching because it allows communicating information, answering students' questions, and relating concepts from various disciplines. Teachers with profound subject-matter expertise feel more confident in delivering instructions and designing meaningful learning activities. The research conducted by Darling-Hammond et al.

(2020) confirms that proficiency in subject matter greatly determines educators' choice of teaching methods and practices.

Subject-matter expertise is highly related to Pedagogical Content Knowledge (PCK). The latter implies an integrated understanding of content knowledge with teaching abilities. According to Shulman (1986), successful teaching includes not only subject matter expertise but also skills that allow teachers to deliver this material in a way understandable for students.

This proves that subject knowledge is not an isolated process but works along with teaching methods to improve the educational outcomes. Researches show that there is always a correlation between teachers' knowledge of the subject and success rates of their students. Trained teachers who teach subjects according to their specialization result in better student performance compared to untrained educators who are forced to teach a subject that is not within their domain. Especially in cases of mathematics and science, knowledge about the concept becomes very important. According to the research of Baumert et al. (2010), teachers' subject matter knowledge had a direct effect on the performance of students and plays a significant part in educational achievements.

Subject-matter knowledge also improves the effectiveness of instruction and promotes cognitive processes among students during class discussions. The teachers having excellent subject knowledge make students participate actively through well-designed exercises that promote cognitive activities among students. Educators proficient in subject matters ask complex questions and help the class understand the problems. However, a poor understanding of the subject leads to less challenging questions and a method of learning which focuses only on rote learning.

Knowledge in the subject area of the teacher contributes to better evaluations of students' performance by the teacher. A highly proficient teacher can construct an accurate evaluation, understand student responses, and give constructive feedback. Questioning and feedback strategies in formative assessment work best when the subject matter knowledge of the teacher is

sound. As a result, teachers are able to diagnose problems in the student learning process and use appropriate measures that will improve the quality of education (Black & Wiliam, 2018).

Proficiency in the subject helps establish teacher credibility and creates trust between the learner and the educator. In addition, students view highly proficient teachers as experts who should be trusted and who can teach something valuable. Students' engagement and positive attitude toward the subject are influenced by the degree of trust towards the teacher. Therefore, proficiency in a subject affects both educational and motivational outcomes (Hattie, 2023).

As education systems become more modernized, there has been an increase in the relevance of subject matter knowledge due to shifting towards interdisciplinary learning and competency-based approaches. Teachers are expected to draw on knowledge across multiple disciplines and implement this knowledge in practice. This demands not only a thorough but also a flexible understanding of the subject and the ability to adapt the teaching process to different learners. Hence, increasing teachers' knowledge in subjects remains a key priority for improving the quality of instruction and achieving better educational outcomes globally (Darling-Hammond et al., 2020).

5.2 Instructional Quality

Instructional quality includes clarity in teaching, student involvement, organized lessons, evaluation abilities, and management of the classroom (Goe, Bell, & Little, 2008). Educators who show expertise in the subject tend to perform better in these areas as they are more adept at linking teaching methods to the content. Instructional quality is a key idea in educational research, signifying the success of teaching methods in enhancing student learning, involvement, and success. It encompasses various elements such as clear guidance, classroom management, mental involvement, and supportive learning environments. Effective teaching ensures that lessons are structured, learning objectives are clear, and students are actively involved in the educational process. Studies indicate that the quality of teaching is one of the most important

school-related elements affecting student success (Muijs et al., 2018).

One of the important models of instructional quality includes the following components: effective classroom management, cognitive engagement, and supportive context. Classrooms where instructional quality is at a high level are characterized by the effective management of the class to achieve maximum instructional minutes. Cognitive engagement refers to involving students into thinking activities. Supportive context entails building a positive relationship between teachers and students and providing them with emotional support. All these aspects contribute to creating efficient learning environments that ensure better student outcomes (Praetorius et al., 2020).

Teachers' effectiveness is closely connected with instruction quality as regards its content and methods used to deliver lessons. Teachers with good instruction quality employ different teaching methods such as inquiry, feedback, and scaffolding, which help in enhancing the performance of their students. They also customize the lesson delivery based on the abilities and requirements of the target audience. Effective teaching practices have proved to result in higher academic success of students, particularly through involving them in the learning process (Grossman et al., 2019).

One important element of quality teaching is formative assessment, in which the teacher monitors students' progress and provides them with feedback aimed at helping them make further progress. Teachers who practice effective formative assessment can determine their students' areas of strength and weakness, adapt their instruction accordingly, and stimulate greater understanding. It has been found that feedback provided in a timely manner and to the benefit of learners has positive effects on students' academic performance and motivation levels (Wiliam, 2018).

Cognitive activation has been identified as one important feature of modern instructional strategies aimed at ensuring profound learning on the part of students. Cognitive activation involves methods of teaching that develop students' critical thinking skills, their ability to solve complex problems, and their capacity to apply what they know in multiple settings. Instructors who engage

learners in critical conversations, experience-based learning, and other activities stimulating cognitive activity positively impact their achievement (Fauth et al., 2019). Technology application is also an important feature of quality instruction today. However, the success of the use of technology depends on the teachers' capacity to connect it to the learning objectives (Koehler et al., 2022). The success of teaching can be determined through the ongoing professional development of educators. Continuous professional development programs help educators improve their instructional methods, keep up-to-date with modern educational practices, and develop their skills to serve all learners. Studies have proven that continuous and collaborative professional development plays a vital role in improving the quality of teaching and student performance (Desimone & Garet, 2015).

5.3 Relationship between SME and Instructional Performance

Ball et al. (2008) indicated that teachers' mathematical proficiency for teaching was a very strong predictor of their effectiveness as instructors. Furthermore, Darling-Hammond (2000) claimed that the teacher qualification, such as knowledge in certain subjects, was highly related to both teaching quality and students' achievement. Educators' Subject-Matter Expertise (SME) and teaching effectiveness are connected directly and recognized as a crucial aspect influencing the quality of teaching and learners' achievements positively. Instructors possessing profound subject matter knowledge are able to organize lessons efficiently, deliver comprehensive explanations, and integrate different concepts in subjects. This type of knowledge increases the effectiveness of teaching and helps instructors develop meaningful experiences rather than promote rote learning. It has been proven by many researchers that teachers' subject matter knowledge has positive implications for instruction quality and learners' achievements (Baumert et al., 2010; Darling-Hammond et al., 2020).

Subject Matter Expertise of teachers influences significantly instructional styles and practices of educators. Educators who have in-depth knowledge about the taught subject are able to adjust their style of instruction depending on learners' needs and develop higher-order thinking skills and address misunderstandings among learners.

It relates to the idea of pedagogical content knowledge, which focuses on the combination of content knowledge and pedagogy for achieving higher efficiency in education. It is proven that those educators who have high levels of SME are more successful in involving their learners, making them participate actively in discussions and developing critical thinking (Shulman, 1986; Klieme et al., 2020). Subject matter expertise plays an important role in assessment procedures and feedback. Those educators who know their subject well can create valid assessments, analyze learner responses correctly, and give useful feedback that will help them improve their performance. Besides the obvious benefits it provides in terms of academic progress, this practice will create a positive educational environment and improve its efficiency. Thus, increasing subject matter expertise of educators is very important in order to increase the quality of education.

6. Methodology

The current study was quantitative in nature, and a cross-sectional survey was used for data collection. All the Secondary School teachers (335) of Tehsil Kotli AJ&K were the population of the study. The sample of the study was 176 secondary school teachers. The sample size was selected by following the guidelines in Krejcie and Morgan's table 1970. The sample was chosen by using simple random sampling technique. Researchers used self-developed questionnaire as a tool for the study. Cronbach alpha was used to measure reliability of instrument which was .767. The researchers collected data personally. Data were analyzed through Statistical Package for Social Sciences (SPSS) by applying mean score and Linear Regression on data.

7. Results

Following are the results of the study.

Table 01: Subject Matter Expertise

Sr. No.	Statements	Mean
1	I have a deep understanding of the subject(s) I teach.	3.50
2	I can explain complex concepts in simple terms.	3.40
3	I stay updated with recent developments in my subject area.	3.58
4	I am confident addressing students' advanced questions.	1.93
5	I can identify common misconceptions in the subject I teach.	3.75
6	I integrate real-world examples related to the subject.	2.53
7	I can connect different concepts within my subject area.	3.24
8	I am capable of designing content-rich learning materials.	3.49
9	I understand the progression of concepts within the subject curriculum.	3.28
10	I continuously work to improve my subject knowledge	3.26

Table 01 indicates the descriptive statistics of teachers' Subject Matter Expertise at the secondary level. The mean scores indicate that teachers generally agreed with most of the statements, reflecting a moderate level of subject-matter expertise. The overall pattern of mean values (mostly above 3.00) suggests that teachers possess a reasonable understanding of their subject, particularly in identifying misconceptions (M = 3.75), staying updated with recent developments

(M = 3.58), and having a deep understanding of the subject (M = 3.50). However, certain aspects seem to depict low levels of expertise on the part of the respondents. For instance, the issue concerning confidence about handling more complex questions from students receives a low average rating (M= 1.93). The aspect of incorporating more practical examples of the subject also receives a low average rating (M=2.53).

Table 02: Instructional Quality

Sr. No.	Statements	Mean
1	I prepare lessons that are well-structured and organized.	3.89
2	My explanations during lessons are clear and understandable.	3.86
3	I use appropriate teaching strategies for the topic taught.	3.76
4	I engage students actively during lessons.	3.77
5	I assess student understanding effectively.	3.88
6	I provide timely and constructive feedback.	3.86
7	I use relevant examples and illustrations.	3.94
8	I manage classroom activities efficiently.	1.60
9	I adjust instruction based on student needs.	2.91
10	My teaching methods promote deeper learning.	3.85

Table 02 illustrates the descriptive statistics of instructional quality among secondary school teachers. As reflected by the mean values, generally speaking, secondary school teachers strongly agree with most of the statements regarding instructional quality. They are very capable of using appropriate examples and illustrations (M = 3.94), having a well-prepared lesson plan (M =

3.89), evaluating the students' comprehension of lessons (M = 3.88), and explaining difficult concepts (M = 3.86). On the contrary, there are still certain areas where the teachers exhibit poor performance in their duties as educators. Classroom management, for instance, is characterized by the lowest mean value (M = 1.60), thereby implying that the teachers experience

difficulties in handling classrooms efficiently. In addition, they lack the skills of adjusting their instruction in accordance with the needs of the learners ($M = 2.91$), which implies that secondary

school teachers find it challenging to modify their teaching methods based on different types of learners.

Table 03: Linear Regression Analysis of Subject Matter Expertise and Instructional Quality

Model	Unstd. Coefficients		Std. Coefficients	t	Sig	R ²	F	Sig
	B	Std. Error	Beta					
(Constant)	.459	0.45	.613	10.239	.000	.376	104.834	.000
Subject matter expertise								

Dependent Variable: Instructional quality

Table 03 shows that a linear regression analysis was utilized to determine the influence of the independent variable subject matter expertise on predicting the dependent variable (instructional quality). This model holds significant statistical value as ($p = 0.000$). Moreover, the table depicts the value of R^2 as 0.376, which indicates that the independent variable in the model significantly represents 37.6% of the variance in instructional quality. The findings from the regression analysis showed that ($\beta = 0.613$, $p = 0.000$), subject matter expertise had a positive and significant effect on instructional quality. Hence, the null hypothesis “there is no significant effect of subject matter expertise on instructional quality” was rejected.

8. Conclusion

In conclusion, the results indicate that teachers possess a moderate level of subject-matter expertise and a generally good level of instructional quality, though certain areas such as handling advanced questions, real-world application, and classroom management require improvement. The results from the regression analysis indicate that there is indeed a significant positive relationship between subject matter knowledge and instructional quality. In other words, a good part of the variability in instructional quality can be accounted for by the variable of subject matter knowledge.

9. Recommendation

It is recommended that educational authorities may focus on strengthening teachers’ subject-matter expertise through targeted professional development programs to improve instructional quality and overall teaching effectiveness.

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