QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES
ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 02 (2025)

SURGE FOR QUALITY EDUCATION; RELATIONSHIP OF METACOGNITION AND TEACHING QUALITY AT HIGHER EDUCATION LEVEL IN PAKISTAN

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Abstract

In this digitized and technologically growing age, the effects of teachers' metacognitive abilities on quality teaching are recognized as a critical factor in both conventional and modern instructional strategies. Metacognitive skills allow the teachers to plan lessons, monitor the teaching learning process, and evaluate their instructional approach, which is directly associated with quality teaching. This research was intended to investigate the relationship between teachers' metacognition and teaching quality. Public sector colleges of Punjab were the research population, while male and female college teachers of 12 randomly selected districts were the sample of the research. Two standardized questionnaires were used to collect data from the research participants and analyzed through various statistical techniques by using SPSS version 20. The findings of the study indicate that teachers' metacognition has a significant relationship with quality teaching. Additionally, the results highlight the positive effect of teachers' metacognition on quality teaching. Moreover, this study also reflects a demographic comparison, which revealed a significant difference in teachers' metacognition; on the contrary, no significant difference for teaching quality. Thus, the results of this study emphasize the need for an integrated teachers' training program that improves teachers' metacognitive skills and helps them to execute these skills in the real-time instructional process, which guarantees the quality teaching.

Keywords: *Teachers' metacognition, Quality teaching, Instructional approach, Integrated teachers' training program, Digitized and technologically growing age, Conventional and modern instructional strategies.*

Introduction

In contemporary research on educational research and practices, quality teaching and teachers' metacognition have become a more significant area of research. Metacognition refers to one's awareness and regulation of their own learning and thinking processes. It plays an important role in teachers' planning, monitoring, and evaluation of their instructional strategies (Flavell, 1979; Veenman, 2023). In the context of the classroom, teachers' awareness of their metacognitive abilities empowers them to make decisions about teaching methods, individualized instructional plans, reflective practices, and continuous professional development (Zohar & Ben-Ari, 2022). Besides this, quality teaching refers to the effective classroom management practices to improve the teaching and learning process (Darling-Hammond et al., 2017). Teachers with metacognitive skills possess the characteristics mentioned above as they are experts in analyzing their instructional process (Schraw & Moshman, 1995). Similarly, Teng (2022), explained that teachers' self-regulation enables them

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ISSN Online: 3006-4686, ISSN Print: 3006-4678
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to assess their teaching and make changes in it for more effectiveness. Likewise, Shen et al., (2025) argued that cognitive self-consciousness helps teachers in reflective practices and instructional decision making.

Literature indicates the positive relationship between teachers' metacognitive abilities and quality teaching. Teachers who have experienced metacognitive skills such as goal setting, reflective practices, and peer collaboration demonstrate a high level of instructional effectiveness (Mevarech et al., 2017; Syahmani et al., 2023). Moreover, professional development programs integrated with metacognitive skills predict quality teaching and students' achievement (De Santis et al., 2021). It shows the significance of teachers' awareness of metacognitive abilities. Metacognition enables teachers to continuously refine their instructional strategies according to contextual and students' needs. As the educational industry grows day by day with new pedagogical approaches, it also becomes more complex. So, fostering awareness of metacognitive abilities among teachers proved an essential factor in achieving academic excellence.

Literature Review

Quality teaching relies heavily on teachers' metacognition, which describes a person's ability to understand and control their mental functioning. Teachers' metacognitive abilities in educational settings help educators to evaluate instructional approaches, assess their performance, and adapt teaching methods for the attainment of students' learning outcomes (Arianto & Hanif, 2024; Phillips, et al., 2016). In the views of Ozturk (2017) most educators demonstrate metacognition knowledge but struggle to execute effective metacognitive teaching methods. Improving teaching quality integrated with metacognitive abilities requires professional development programs that improve teachers' competencies, which show increased proficiency.

Metacognition is thinking about thinking, which refers to control over cognitive processes. Flavell (1979) defined metacognition as the capability to monitor and control mental processes. Metacognition consists of two components: metacognitive knowledge about thinking processes combined with metacognitive regulation that reinforces planning and evaluation of learning strategies. Similarly, Schraw and Dennison (1994) explained that metacognition involved declarative, procedural, and conditional knowledge about cognition alongside planning, monitoring, and evaluation functions for cognitive regulation. Research conducted by Veenman et al. (2006) demonstrated that metacognition functions as an essential academic achievement skill that teachers can teach to students. Moreover, Efklides (2009) revealed that metacognition includes two different levels that separate immediate metacognitive experiences from sustained metacognitive knowledge systems. The teaching learning process greatly benefited from metacognition, which shows how students and teachers learn, adapt, and solve various educational problems. Khurram, et al., (2020) revealed three factors that indicate the metacognition level of teachers. These factors are cognitive strategies used, self-regulation, and cognitive self-consciousness.

Cognitive strategies used refer to specific and planned approaches used by teachers that aid both their mental processing function and knowledge maintenance functions, as well as their problem resolution. Whiteley et al. (2025) explained that individuals who have better monitoring capabilities execute better cognitive strategies. Along with the cognitive strategies used, self-regulation is a significant aspect of teachers' metacognition that enables the learners to active planning, monitoring, and assessment of their learning strategies. These learning strategies involve goal setting, time management, maintaining motivation, and adjusting actions based on performance feedback. Moreover, Zimmerman (2002) pointed out that

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learners with high self-regulation skills are more likely to take responsibility for their learning, apply strategic action, and reflect on learning outcomes. The study of Sabaliauskas et al. (2025) revealed that educators who are experts in metacognitive abilities are more likely to improve their self-regulation skills through behavior planning, observation, and evaluation techniques, which teachers need for effective classroom management.

In addition, cognitive self-consciousness refers to the individual's awareness of their own thoughts and cognitive processes. It is directly associated with the monitoring function of metacognition. Hwang (2025) mentioned that individuals with high awareness of their cognitive abilities perform better in their academic tasks. Improving one's ability to awareness of their thinking process helps them to use more effective teaching strategies which are aligned with the goals of reflective teaching.

Moreover, a significant relationship was found in the previous research between the teachers' metacognition and quality teaching (Michalsky, 2021). Teachers who have a high awareness of their metacognitive skills are assured of quality teaching by the execution of appropriate and effective instructional strategies. Similarly, Arianto and Hanif (2024) explained that metacognitive teachers established a more adaptive classroom learning environment by continually evaluating learners' needs and adjusting their instructional practices accordingly. Likewise, Veenman (2016) described that metacognitive skills increase the decision-making abilities of teachers and enhance the deeper academic engagement of students in the classroom. Thus, the metacognitive skills of teachers play a vital role in shaping the classroom learning environment and increasing the quality of teaching. Ghonji et al. (2015) highlighted the five dimensions of quality teaching, which include lesson design, teaching skills, communication skills, expertise skills in the lesson content, and individual and occupational skills. Effective lesson planning based on structured planning and relevancy with instructional objectives, which is essential for learners' engagement and in the attainment of learning outcomes (Straessle, 2014). Besides this, pedagogical or teaching skills refer to the use of diverse and appropriate teaching methods, and reflective practices in the classroom. Chan et al., (2023) elaborated that the integration of instructional strategies and reflective practices improves teaching effectiveness. Alongside, teachers' communication skills are also significant for effective teaching. It requires active listening, increasing learners' motivation, and creating an inclusive classroom learning environment (Falcon & Leon, 2024). Expertise skills in the lesson content refer to the delivery of information which are more accurate and relevant to the learning outcomes (Shulman, 1986). In addition, individual and occupational skills are referred to as the professional attributes of the teachers. These professional characteristics include ethical behavior, continuous professional development, commitment, self-efficacy, etc. These factors are the main contributors to the quality of teaching (Aydoğan et al., 2024).

In light of the literature, it is concluded that teachers who use metacognitive skills are more efficacious in imparting instructions in class because they have an awareness and understanding of their teaching processes (Asy'ari & Ikhsan, 2019). This awareness enables teachers to become more responsive in the fulfillment of student needs (Keiler, 2018). It also helps the teachers to adapt their instructional process according to learners' needs. Thus, this study aims to examine the effect and relationship of teachers' metacognitive skills with quality teaching, with the following research objectives;

1. To evaluate the relationship between teachers' metacognition and quality teaching.
2. To assess the effect of teachers' metacognition on quality teaching.

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3. To determine the difference in teachers' metacognition and quality teaching based on demographics.

Hypotheses

Following were the hypotheses of the study;

1. Teachers' metacognition has a significant relationship with quality teaching.
2. There is a significant difference between teachers' metacognition and quality teaching across genders.
3. There is a significant difference between teachers' metacognition and quality teaching based on qualification.
4. There is a significant difference between teachers' metacognition and quality teaching based on experience.
5. Teachers' metacognition has significant effects on quality teaching.

Research Methodology

This study is descriptive and was conducted using by survey method. The population of the study was the public sector colleges of Punjab province, while 12 districts were randomly selected for the sample and data collection. For the data collection, two standardized 5-point Likert scale questionnaires were adapted. To measure the metacognitive abilities of teachers PTMAQ (Khurram et al., 2020) and Quality Teaching Questionnaire (Ghonji et al. 2015) were used. The collected data were analyzed through SPSS 20 by using appropriate statistical procedures.

Data analysis

Descriptive statistics

Table 1

Frequency of respondents

Variables		College Teachers	N
Gender	Male	168	427
	Female	259	
Qualification	Master/BS	254	427
	M.Phil	147	
	PhD	26	
Teaching Experience	0-5 years	303	427
	6-10 years	86	
	11-15 years	35	
	above 15 years	3	

Table 1 demonstrated that there were 427 teachers who participated in this research process, of which the male and female teachers were 168 and 259, respectively. Moreover, among participants, teachers having qualifications of Master/BS, MPhil/MS, and PhD were respectively 254,147, and 26. Furthermore, teachers with the experience of 0-5 years are 303, 6-10 years are 86, 11-15 years are 35, and above 15 years are only three.

Inferential statistics

H1: Teachers' metacognition has a significant relationship with quality teaching.

Table 2

	N	**Mean**	**SD**	**R**	***P***
TM	426	4.16	.43	0.707**	0.000

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QT	4.28	.37

Correlation between teachers' metacognition and quality teaching

**. Correlation is significant at the 0.01 level (2-tailed). TM=Teachers' metacognition and QT=Quality Teaching

6. Table 2 presents the relationship for teachers' metacognition and quality teaching. The mean score for metacognition was 4.16 (SD = 0.43), while the mean score for quality teaching was slightly higher at 4.28 (SD = 0.43). A Pearson correlation analysis revealed a statistically significant positive relationship between metacognition and quality teaching ($r = .707$, $p < .001$). This result suggests that higher levels of metacognitive awareness among teachers are strongly associated with the quality of teaching. Thus, the hypothesis, "Teachers' metacognition has a significant relationship with quality teaching," is accepted.

H2: There is a significant difference between teachers' metacognition and quality teaching across genders.

Table 3

Difference between teachers' metacognition and classroom learning environment across gender

Variable	Gender	N	Mean	t	Sig
TM	**Male**	168	4.1526	-0.258	0.459
	Female	259	4.1635		
QT	**Male**	168	4.2529	-0.252	0.727
	Female	259	4.3034		

The mean difference is significant at the 0.05 level. TM=Teachers' Metacognition, QT=Quality Teaching

Table 3 revealed the results of gender-based differences in metacognition and quality teaching. The table shows that there is no statistically significant difference (*Sig=0.459*>0.05) was found in metacognition scores between male (M = 4.15, SD = 0.46) and female teachers (M = 4.16, SD = 0.41), t-value = -0.258, p = .797. Similarly, no significant gender difference (*Sig=0.727*>0.05) was observed in quality teaching scores (male: M = 4.25, SD = 0.44; female: M = 4.30, SD = 0.42), t-value = -1.192, p = .234. These results suggest that gender does not play a significant role in either metacognitive awareness or teaching quality. Thus, the hypothesis, "There is a significant difference between teachers' metacognition and quality teaching across genders," is not accepted.

H3: There is a significant difference between teachers' metacognition and quality teaching based on qualification.

Table 4

Difference between teachers' metacognition and quality teaching based on qualification

		Sum of Squares	df	Mean Square	F	Sig.
TM	Between Groups	1.158	2	.579	3.215	.041
	Within Groups	76.340	424	.180		
	Total	77.497	426			
QT	Between Groups	.970	2	.485	2.660	0.071
	Within Groups	77.256	424	.182		

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	Total	78.226	426

The mean difference is significant at the 0.05 level. TM=Teachers' metacognition, QT=Quality Teaching

Table 4 shows the results of the statistical analysis adopted to determine whether academic qualification levels affected metacognition or quality teaching. A statistically significant difference was found in metacognition scores across qualification groups (F= 3.215, p = .041). However, there was no significant difference in quality teaching scores (F= 2.660, p = .071). This indicates that teachers' metacognitive awareness may vary with academic qualifications, but teaching quality remains relatively unaffected. Thus, the hypothesis, "There is a significant difference between teachers' metacognition and quality teaching based on qualification," is accepted for teachers' metacognition, while not accepted for quality teaching.

H4: There is a significant difference between teachers' metacognition and quality teaching based on experience.

Table 5

Difference between teachers' metacognition and quality teaching based on experience

		Sum of Squares	Df	Mean Square	F	Sig.
TM	Between Groups	1.837	3	.612	3.423	.017
	Within Groups	75.661	423	.179		
	Total	77.497	426			
QT	Between Groups	.334	3	.111	.604	.613
	Within Groups	77.892	423	.184		
	Total	78.226	426			

The mean difference is significant at the 0.05 level. TM=Teachers' metacognition, QT=Quality Teaching

Table 5 explained that the results of the statistical analysis were adopted to evaluate differences in metacognition and quality teaching based on teaching experience. The results showed a significant difference in metacognition (F= 3.423, p = .017), indicating that metacognitive awareness differs among teachers with varying levels of experience. However, the effect of teaching experience on quality teaching was not significant (F= 0.604, p = .613), suggesting that teaching quality may not differ substantially with years of experience. Thus, the hypothesis, "There is a significant difference between teachers' metacognition and quality teaching based on experience," is accepted for teachers' metacognition, while for quality teaching is not accepted.

H5: Teachers' metacognition has significant effects on quality teaching.

Table 6

Effect of teachers' metacognition on the classroom learning environment

Variables	N	B	t-value	R Square	Sig	SE
TM ⟶CLE	426	0.707	20.619	0.500	0.000	0.144

Note: Difference is significant at the 0.01 level (2-tailed). TM=Teachers' Metacognition, QT= Quality Teaching, and N=Number of respondents

Table 7 describes the effect of teachers' metacognition on quality teaching. The value of R-square is 0.500. The regression coefficient was also significant ($\beta = .707$, $t = 20.619$, $p < .001$), confirming that metacognitive awareness is a strong predictor of teaching effectiveness. Thus, the null hypothesis, "There is no significant effect of teachers' metacognition on quality teaching," is accepted.

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Findings

1. The results of this research suggest that teachers' metacognition has a significant relationship with quality teaching.
2. The findings also reveal that male and female teachers do not have a significant difference in their metacognitive abilities and quality teaching.
3. Results also highlighted a significant difference in teachers' metacognitive abilities but no significant difference in quality teaching on the basis of qualification.
4. The present study reports a significant difference in teachers' metacognition based on teaching experience. Besides, it also pointed out no significant difference in the quality teaching based on teaching experience.
5. The findings of the study show that teachers' metacognition significantly effects the quality teaching.

Conclusion and Discussion

This study was designed to investigate the relationship between teachers' metacognition and the quality of their teaching. Besides this, it also examines the effects of teachers' metacognitive abilities across gender, qualification, and teaching experience. The findings of the current study have significant implications for the teaching and learning process. The finding of the study suggests that significant relationship between teachers' metacognition quality teaching. This result is supported by the previous research that teachers who have awareness of their metacognitive abilities are more likely to reflect, plan, monitor, and adapt their instructional approaches, which improves the overall teaching and learning process (Tay et al., 2020; Zohar & Barzilai, 2013). Metacognitive abilities enabled the teachers to become reflective practitioners who assess the learners' needs and align their instructional strategies accordingly, which directly contributes to quality teaching. In addition, it was also revealed by the research that there is no significant difference in the metacognitive abilities of teachers across genders. This finding contradicts with previous study that mentioned a significant difference in teachers' metacognition based on gender (Liliana & Lavinia, 2011). In contrast, Wilson and Conyers (2016) support this result by mentioning gender as a less significant variable that affects the teachers' metacognition. In light of this fact, teachers' professional development, teaching standards, and expectations may help to bridge this gender gap in teachers' metacognitive abilities and quality teaching. Additionally, another finding of this research shows the significant difference in teachers' metacognition, while no significant difference in the quality of teaching on the basis of qualification. This finding recommends that teachers' higher qualifications may increase their metacognitive awareness. It may be possible due to the augmented exposure of modern pedagogical strategies. However, the no significant difference in quality teaching may reveal that only qualifications may not guarantee effective teaching. In this regard, literature emphasizes the role of continuous professional development programs and reflective teaching practices along with qualification (Bürgermeister et al. 2021). Moreover, the results of this study show a significant difference in metacognitive abilities, but no significant difference exists in quality teaching based on teaching experience. This finding reinforces the idea that experience plays a key role in teachers' ability to think and helps them to regulate their instructional strategies (Oleson & Hora, 2014). Besides this, no significant difference in quality teaching regardless of teaching experience. Novice teachers may achieve a high level of quality in their teaching if they receive strong support, effective mentoring, and instructional training. Furthermore, the results of this study highlighted the significant effect of teachers' metacognition on quality teaching. It reflects the significance of metacognitive skills in teachers' training and professional development programs. Similarly, experts suggested that

improving teachers' metacognitive abilities may lead to thoughtful, adaptive, and learner-centered pedagogical approaches which may positively effects the quality teaching as well as academic achievement (Darling-Hammond et al., 2017; Teng, 2023).

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