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**RESEARCH PAPER**

**Metacognitive Awareness and Reading Comprehension: Association across Gender and Sector**

Dr. Tariq Hussain <sup>1</sup> Dr. Aroona Hashmi <sup>2</sup> Fazilat Mehboob <sup>3</sup>

1. Assistant Professor, IER, University of the Punjab, Lahore, Punjab, Pakistan
2. Assistant Professor, IER, University of the Punjab, Lahore, Punjab, Pakistan
3. M. Phil Scholar, IER, University of the Punjab, Lahore, Punjab, Pakistan

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**Corresponding  
Author**

tariqedu71@yahoo.com

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**ABSTRACT**

The researcher undertook this study to ascertain the prospective teachers' metacognitive awareness, their reading comprehension level, and the correlation between them at the university level. 600 participants from different universities of Lahore were selected as a sample. Data was gathered through a modified MAI and a reading comprehension test. Analysis was done through different statistical analysis techniques. The results showed that prospective teachers demonstrate a high level of metacognitive awareness and reading comprehension. However, there was no significant variance in metacognitive awareness and reading comprehension based on gender and sector. Correlation analysis showed that a significant moderate positive relationship is present between metacognitive awareness and reading comprehension. It is encouraged that programs and workshops aiming to impart metacognitive awareness in teachers of the future may be added into the teacher training curriculum. Additionally, it is suggested that instructors should make a conscious effort to create class environments that may prove helpful in nurturing and promoting metacognitive awareness and reading comprehension in prospective teachers as it may prove vital for their careers as a teacher

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**Introduction**

The science of learning is complex especially when it deals with language learning and comprehension. It not only deals with how students learn but also how to improve their learning. An important aspect of this is the phenomenon of metacognition, learners' awareness of the way they process information, and their control over it (Meltzer, Pollica, & Barzillai, 2007). Jaleel (2016) defines it in more detail as a regulating system that aids a learner in understanding and controlling

his or her own cognitive function. Metacognition has great importance in countries like Pakistan where most students at the university level are bilingual.

A careful review of the literature shows that by teaching proper use of metacognitive strategies and skills, students' reading comprehension can be improved. These skills can be developed during the teaching-learning process by assigning different relevant tasks to students as assignments and presentations. Moreover, Siddique and Akhtar (2004) declared that instilling metacognitive skills in prospective teachers is one of the vital aims of teacher training. These skills help them to appropriately deal with problems that may arise during classroom teaching period.

In Pakistan, many prospective teachers speak English as a second or even third language. In order to successfully use it as a tool of instruction, they must have a strong grip on it. Pressley and Afflerbach (1995), found that unsuccessful readers utilized fewer strategies than successful readers. Numerous research studies have determined that effective usage of metacognitive skills correlates with fluent reading.

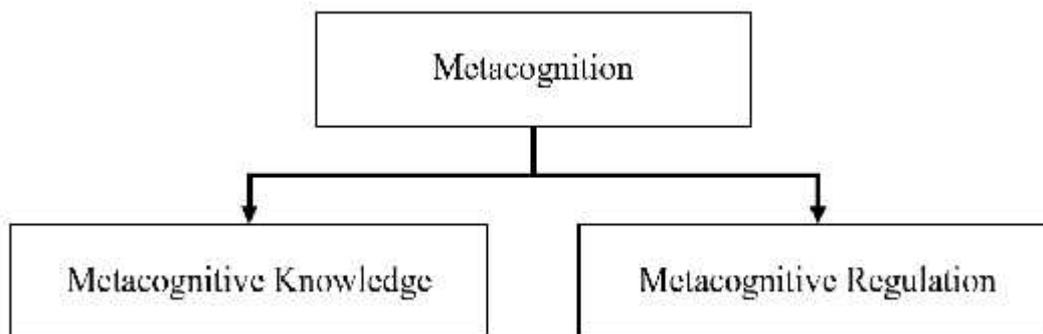
Keeping in view the discussion so far, the researcher attempted to determine metacognitive awareness of prospective teachers and its relationship with their level of reading comprehension. Although studies have been conducted internationally on these particular variables and the correlation between them, the researcher feels the need to conduct this study in Pakistan to better understand the variables involved and the role of geographical context.

### **Literature Review**

Flavell (1976), one of the first metacognition researchers, introduced the term metacognition. He defined it as a person's awareness of his cognitive activities and products (Flavell, 1976). He also called it "thinking about thinking" (Flavell, 1979).

According to Jaleel (2016), this phenomenon is most commonly studied in literature as two distinct areas. Flavell outlined them as:

1. Metacognitive knowledge (awareness of thoughts)
2. Metacognitive regulation (ability to govern thought processes).



*Figure 1: Division of metacognition into its distinct areas.*

Readers with adequate comprehension employ various reading strategies to effectively reach their goals. Additionally, they are aware of what should be done, and what strategy to put into action (Cogmen, 2008). Numerous pieces of research point to the fact that students' learning can be enhanced through metacognitive skills (Hacker, 1998; Baird, 1998as cited by Conner, 2007).

The relationship between metacognitive awareness and reading comprehension has been investigated by Baker and Brown 1984; Garner 1987; Pressley and Afflerbach 2005. These researchers revealed insight regarding the existence of a relationship between metacognitive awareness and reading comprehension. Furthermore, considerable research studies have also examined this correlation in the recent years.

Batang (2015) investigated the relation between metacognitive strategies awareness and reading comprehension levels of prospective secondary teachers. Results revealed that the reading comprehension level had a significant relationship with Metacognitive strategies ( $r = .76$ ).

Rastegar, Kermani, and Khabir (2017) explored the relationship between EFL learners' meta-cognitive strategies and their reading comprehension scores among Iranian students. The findings revealed a significant positive relationship between the two variables of interest ( $r = .65, p < .001$ ).

Although a number of studies exist in the literature, not all of the results are consistent. Moreover, there is a lack of evidence in the Pakistani context. The researcher hopes to provide some clues that may add to the cumulative knowledge of this phenomenon.

## Material and Methods

### Research design

The researcher adopted the quantitative approach with the co-relational design to answer the research questions presented above.

### Population and Sample

For this study, the population included all the students enrolled in Masters, B.S.Ed. (Hons), and BS (Hons) programs in the discipline of Education (session 2017-2019 & 2017-2021). These students were divided into private and public sector universities of Lahore, Pakistan.

The sample was carefully chosen via multistage sampling. Firstly, the researcher randomly selected four universities from Lahore. In the second stage, the researcher located the discipline of Education in each of those selected universities. In the third stage, all the classes of university students studying in the masters' degree program were selected. Lastly, convenience sampling technique was used to select prospective teachers from each class. Ultimately, 600 students in total made up the sample of the study.

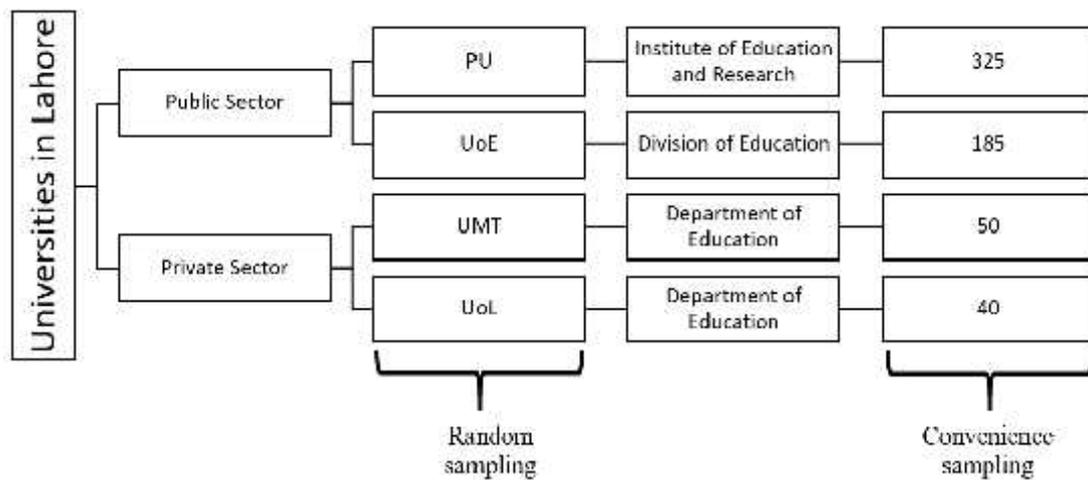


Figure 2: Summary of the sampling process

**Table 1**  
Distribution of Sample by Demographic Variables

Characteristics		N	%
Gender	Male	239	39.8
	Female	361	60.2
Sector	Public	510	85
	Private	90	15
University	University of the Punjab (PU)	300	50

	University of Education (UoE)	210	30
	University of Lahore (UoL)	40	6.7
	University of Management and Technology	50	8.3
Degree programs	M.A. Edu	225	37.5
	B.Ed. (Hons)	196	32.7
	B.S.Ed. (Hons)	179	29.8

Table 1 depicts the demographic information about the respondents. The total sample consisted of 600 participants. Among these, 39.8% were male and 60.2% were female. Based on sectors, respondents of Public universities (85%) made up the majority as compared to private universities (15%). Meanwhile, 50% of the prospective teachers were from PU, 30% were from UoE, 6.7% were from UoL, and 8.3% were enrolled in UMT. The ratio of participants based on degree programs is as follows: 37.5% of prospective teachers were enrolled in M.A. Education, 32.7% were in B.Ed. (Hons), and 29.8% were enrolled in B.S.Ed. (Hons).

### **Instrument**

A modified Metacognitive Awareness Inventory (MAI) and Reading Comprehension Test (RCT) were used to collect data. Schraw and Dennison, in 1994, developed the original MAI. It consisted of 52 items rated on a five-point Likert type scale. These questionnaire items were categorized into two components viz; Knowledge and Regulation. The first component "Knowledge" is classified into three main factors: Declarative Knowledge (knowledge of the self, and strategies); Procedural Knowledge (knowledge of how to use strategies); and Conditional Knowledge (knowledge of when and why to use these strategies). While, the subsequent component "Regulation" was classified into three factors: Planning (setting goals); Monitoring (learning and assessing strategies); and Evaluation (analyze accomplishments and the strategies' efficiency after learning has been accomplished).

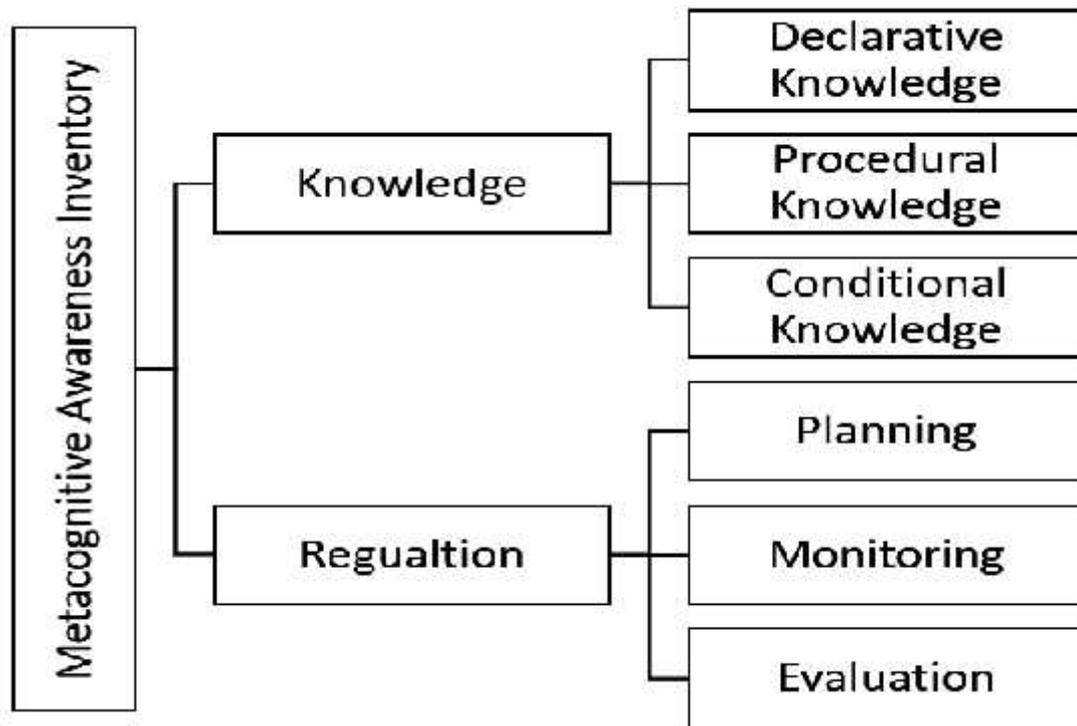


Figure 3: Structure of MAI

The reading comprehension test (RCT) was developed by the researcher for the purpose of the study. The cognitive domain of Bloom's taxonomy was consulted to select paragraphs for the test. It was a multiple-choice format, consisting of ten items, with two incorrect and one correct answer for each item. For each correct item, 0.5 points were given. The researcher used the following scale as a gauge for reading comprehension level of the participants: 0.5-1: very poor, 1.5-2: poor, 2.5-3: fair, 3.5-4: satisfactory, and 4.5-5: very satisfactory.

**Table 2**  
**Pilot Testing of the Instrument**

Factors of the scale	Item Number	A
Declarative Knowledge	1-8	0.74
Procedural Knowledge	9-12	0.76
Conditional Knowledge	13-16	0.74
Planning	17-22	0.81
Monitoring	23-25	0.64
Evaluation	26-30	0.64
Overall reliability of the scale	1-30	0.86

50 students filled the survey questionnaire for the purpose of pilot testing. Its reliability was established ( $\alpha = 0.86$ ) while, three experts from the Institute of Education and Research (IER), PU, ensured its face and content validity

**Data collection and analysis**

The researcher collected data by personal visitations to administer the survey questionnaire. Statistical Package for Social Sciences (SPSS) version 23 was used to store, organize, and analyze the data. Descriptive and inferential statistical methods have been applied to answer the research questions posed above.

**Results**

The important findings of the study are given below:

**Table 3**  
Summary Statistics for the Level of Metacognitive Awareness of Prospective Teachers

	<i>N</i>	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>
Total Score	600	1.00	5.00	3.94	.55

The results given in the table indicate that a high level of metacognitive awareness was displayed by the prospective teachers ( $M=3.94, SD=.55$ ).

**Table 4**  
Summary Statistics for Factors of Metacognitive Awareness

<b>Characteristics</b>	<i>M</i>	<i>SD</i>
Declarative Knowledge	3.9	.70
Procedural Knowledge	3.9	.60
Conditional Knowledge	4.1	.64
Planning	3.9	.62
Monitoring	3.8	.66
Evaluation	3.9	.70

Note:  $N = 600$

Factor-based analysis showed that prospective teachers showed the highest score in the level of Conditional Knowledge ( $M= 4.1, SD= 0.64$ ), as compared to the other factors: Declarative Knowledge ( $M= 3.9, SD= .70$ ), Procedural Knowledge ( $M = 3.9, SD= .60$ ), Planning ( $M= 3.9, SD=.62$ ), Monitoring ( $M= 3.8, SD= .66$ ), and Evaluation ( $M=3.9, SD= .70$ ).

**Table 5**  
Difference between Metacognitive Awareness of Male and Female Prospective Teachers

	<i>M</i>	<i>SD</i>	<i>t-value</i>	<i>Df</i>	<i>P</i>
<b>Male</b>	3.96	.52	.463	598	.644
<b>Female</b>	3.94	.57			

Note:  $N = 600$  (male = 239, female = 391)

There was no significant difference in metacognitive awareness on the basis of gender ( $t(598) = .463, p = .644$ ). However, scores of male prospective teachers ( $M=3.96, SD=.52$ ) was slightly higher than that females ( $M=3.94, SD= .57$ ).

**Table 6**  
**Difference between Metacognitive Awareness of Public and Private Sector Prospective Teachers**

Sector	<i>M</i>	<i>SD</i>	<i>t-value</i>	<i>Df</i>	<i>P</i>
Public	3.91	.56	-3.04	598	.2
Private	4.11	.46			

Note:  $N = 600$  (public = 510, private = 90)

For sectors, there was no significant difference in scores ( $t(598) = -3.04, p = .2$ ). Furthermore, prospective teachers from private sector universities showed higher metacognitive awareness ( $M = 4.11, SD = .46$ ) as compared to their public sector counterparts ( $M=3.91, SD= .56$ ).

**Table 7**  
**Descriptive Statistics for the Level of Reading Comprehension**

	Min	Max	<i>M</i>	<i>SD</i>
Total Score	1.00	5.00	3.72	.84

Note:  $N = 600$

The results given in table 7 indicate the mean scores of reading comprehension of prospective teachers with ( $M=3.72, SD=.84$ ). The respondents demonstrated a high reading comprehension level.

**Table No. 8**  
**Difference between Reading Comprehension Level of Male and Female Prospective Teachers**

Gender	<i>M</i>	<i>SD</i>	<i>t-value</i>	<i>Df</i>	<i>p</i>
Male	3.70	.814	-.404	598	.687
Female	3.73	.861			

Note:  $N = 600$  (male = 239, female = 391)

No significant difference in scores were found on the basis of gender ( $t(598) = -.404, p = .687$ ). Male prospective teachers scored marginally lower ( $M=3.70, SD=.814$ ) than the female prospective teachers ( $M=3.73, SD=.861$ ).

**Table No. 9**  
**Statistical Summary of Difference between Reading Comprehension Level of Public and Private Sector Prospective Teachers**

Sector	<i>M</i>	<i>SD</i>	<i>t-value</i>	<i>Df</i>	<i>p</i>
Public	3.72	.82	.109	598	.91
Private	3.71	.91			

Note:  $N = 600$  (public = 510, private = 90)

Independent sample  $t$ -test compared the total score of reading comprehension of prospective teachers in terms of their sector. It was found that no significant difference in scores existed in the scores of public ( $M = 3.72$ ,  $SD = .82$ ) and private ( $M = 3.71$ ,  $SD = .91$ ) sector universities ( $t(598) = .109$ ,  $p = .91$ ).

**Table No. 10**  
**Statistical Summary of Relationship between Metacognitive Awareness and Reading Comprehension of Prospective Teachers**

Variable	$M$	$SD$	$R$	$p$
MCA	3.95	16.87	.058	.210
RCT	3.72	.84		

Table 10 indicates the relationship between metacognitive awareness (as measured by the Metacognitive Awareness Inventory) and reading comprehension (as measured by the Reading Comprehension Test) of prospective teachers. Pearson Product-Moment Correlation Coefficient revealed a moderate, positive correlation between the two variables ( $r = .58$ ,  $p = .21$ ).

## Discussion

The present study aimed to find the correlation of prospective teachers' metacognitive awareness with reading comprehension. This study supported Flavell's Theory of Metacognition. He, in 1979, declared that knowledge about cognition and regulation of cognition are the two components of metacognition. Enhanced reading comprehension has been found to be positively related to it. The results of the present study also support the existing literature: awareness of strengths and weaknesses in cognition allow learners to better regulate themselves for comprehending text (Sperling, Howard, Staley & Dubois, 2004). Numerous pieces of research point to the fact that students' learning can be enhanced through metacognitive skills (Hacker, 1998; Baird, 1998 as cited by Conner, 2007). In other words; students with higher metacognitive awareness have a tendency to be more successful (Coutinho, 2006).

Metacognitive awareness could be a predictor of academic as well as professional performance in the future because students who have more metacognitive awareness display better performance during their education (Brown & Cocking, 2000; Pressley & Ghatala, 1990; Garner & Alexander, 1989). These findings also back up Hartman (2001); Kuhn (2000); King (1991) and Schraw's (1998) suggestion of promoting metacognitive awareness in the classroom.

## Conclusion

The researcher aimed to examine prospective teachers' metacognitive awareness and its correlation with reading comprehension. It was revealed

through the analysis that metacognitive awareness of the respondents was high. However, no difference was found in its level on the basis of demographical variables. Furthermore, a moderate positive relationship was found between the variables of the study.

### **Recommendations**

The researcher makes the following recommendations based on the present study:

1. Teaching metacognitive skills should be made a part of the curriculum at all education levels in Pakistan.
2. Educational institutions should come up with better planning and application to promote reading so that students may be able to properly plan and monitor their comprehension performances, and evaluate their ability to handle written text.
3. Special attention should be given in the classroom to various aspects of problem-solving, along with planning and monitoring one's own work, and its evaluation to improve prospective teachers' ability to apply these skills in professional scenarios.
4. There is a great scope of research on related issues in the Pakistani context as little is done in terms of metacognition, its awareness, and in relation to reading comprehension. An experimental study comparing two groups can be conducted in the future.
5. There is a need to determine how educating students about metacognitive awareness and strategies may affect their level of reading comprehension over time. A longitudinal survey may prove invaluable in this regard.

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