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Gender Differences in Primary Teachers' Metacognitive Awareness

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Abstract

Metacognition involves reflecting on one's own thinking processes, and the aim of the present study was to evaluate primary teachers' levels of metacognitive awareness across different genders. Additionally, the study assessed the impact of teacher training on metacognitive awareness, comparing trained and untrained primary teachers by gender. The study sample included 79 primary school teachers from the Murshidabad district in West Bengal. Data was collected using the Metacognitive Awareness Inventory for Teachers (2011) and analysed using statistical techniques, including Mean, Standard Deviation (SD), and F-values. The results indicated that there were no significant differences in metacognitive awareness between male and female primary teachers overall. However, notable differences were found between trained male and female teachers in terms of their overall metacognitive awareness and in the monitoring subscale. For untrained primary teachers, significant differences were observed between genders in overall metacognitive awareness, as well as in the subscales of conditional knowledge and planning.

Introduction

Critical thinking is integral to daily decision-making and problem-solving. Today's youth should cultivate these abilities to tackle future challenges (Adeyemi, 2012; Murawski, 2014). Critical thinking is closely linked to metacognition, often described as 'thinking about thinking' or 'cognition of cognition'. Metacognitive awareness encompasses the planning, monitoring, assessing, and evaluating of one's cognitive activities (Chick, 2013). Given that cognitive growth predominantly occurs during the primary stage, childhood is crucial for cognitive development. Vygotsky

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(1978) noted that children begin private self-talk when they struggle with self-direction and guidance. This self-reflection, a key metacognitive process, aids children in developing their learning and cognitive abilities.

Metacognitive awareness involves an individual's understanding of their own thinking processes, strategies for problem-solving, and learning. Flavell (1979) introduced the concept of 'metacognition' as awareness and control over one's cognitive processes during learning. He identified three subtypes of metacognitive awareness: awareness of knowledge, thinking, and thinking strategies. Knowledge awareness pertains to understanding what one knows, doesn't know, and wants to learn. Thinking awareness involves awareness of one's thought processes, while thinking strategy awareness describes how one approaches learning. According to Dhyani and Maikhuri (2018), metacognition includes operational control over cognitive tasks such as reading, learning, and problem-solving. Effective metacognitive activities include planning, monitoring, and evaluating learning tasks.

Education plays a crucial role in fostering metacognitive skills, allowing students to engage actively in their learning processes. It involves organising, monitoring, assessing, and evaluating one's learning. Understanding how people learn, identifying their learning needs, and developing and implementing solutions are essential components of this process.

Metacognition encompasses both knowledge and regulation of cognitive processes. It includes declarative, procedural, and conditional knowledge, while regulation involves planning, monitoring, and evaluation. In the classroom, teachers' metacognitive awareness is crucial for enhancing pedagogical practices and understanding students' cognitive abilities (Mahdavi & Zade, 2014; Nordin & Yunus, 2020). High metacognitive awareness among teachers correlates with greater teaching competency and effectiveness in imparting knowledge and skills (Gopinath, 2014). To improve students' academic performance, both pre-service and in-service teachers should receive training in broad metacognitive awareness (Okoza & Aluede, 2013). Skilled teachers with strong metacognitive skills can significantly influence students' development. Therefore, teachers' metacognitive awareness is vital for refining pedagogical practices and enhancing teaching outcomes (Jaleel & Premachandran, 2016; Liliana & Lavinia, 2011; Nordin & Yunus, 2020).

Review of Literature

Several studies highlight the significance of metacognitive awareness in enhancing academic success. For instance, research by Okoza and Aluede (2013), Jaleel and Premachandran (2016), Dhyani and Maikhuari (2018), and Ozcakmak et al. (2021) demonstrates that students' awareness of their metacognitive

processes contributes to their academic achievement. Hughes (2017) also noted that metacognitive awareness aids teachers in understanding their students better and tailoring their instructional strategies accordingly. Applying metacognitive principles can improve the teaching–learning process (Nordin & Yunus, 2020).

It is suggested that teachers' own metacognitive awareness plays a critical role in refining pedagogical practices (Memnun & Akkaya, 2009; Jaleel & Premachandran, 2016; Dhyani & Maikhuari, 2018; Ozcakmak et al., 2021; Periasamy, 2021). Mahdavi and Zade (2014) argue that metacognition enhances classroom pedagogical practices by addressing student schemas, knowledge techniques, and the contexts in which these methods are applied. Thus, metacognitive awareness is fundamental to effective teaching and learning (Mahdavi & Zade, 2014). A teacher's metacognitive ability is crucial for fostering students' metacognitive development, particularly at the primary level (Jaleel & Premachandran, 2016). Memnun and Akkaya (2009) suggested that teachers significantly contribute to the development of students' metacognitive awareness during the primary stage.

Research findings on the differences in metacognitive awareness across various factors show diverse results. Jaleel and Premachandran (2016) found no gender, location, or type of school management differences in secondary school students' metacognitive awareness. Similarly, Memnun and Akkaya (2009) reported no gender differences in metacognition among primary teacher trainees, although differences were noted in class teachers' metacognitive awareness across different grade levels. Ozcakmak et al. (2021) observed that academic success positively influences the degree of metacognitive awareness in pre-service teachers, with no significant impact from gender. Asyari and Rosa (2022) also found no gender differences in metacognitive awareness among prospective teachers. Johan et al. (2017) reported no significant differences in metacognition based on gender, age, academic qualifications, teaching subject, or experience among primary teachers. Cihanoglu (2012) found no significant differences in metacognitive awareness among student teachers based on various factors like type of Teacher Education College, degrees, or location.

In contrast, Duman and Semerci (2019) reported significant differences in metacognitive awareness among prospective teachers across several sub-dimensions, positively affecting their development. Periasamy (2021) noted differences in teachers' metacognition based on the nature of their schools. Garzon et al. (2020) observed notable differences in metacognitive development related to educational attainment but found no statistically significant gender differences.

Given the limited studies on the metacognitive awareness of in-service primary school teachers, the current study aims to explore this area

further, focusing on primary teachers' metacognitive awareness and its implications for teaching practices.

Objective

1. To compare the level of metacognitive awareness among primary teachers across genders
2. To compare the level of metacognitive awareness among trained primary teachers across genders
3. To compare the level of metacognitive awareness among untrained primary teachers across genders

Hypotheses

1. Male and female primary teachers would not differ significantly in metacognitive awareness as a whole and across all subscales.
2. Trained male and female primary teachers would not differ significantly in metacognitive awareness as a whole and across all subscales.
3. Untrained male and female primary teachers would not differ significantly in metacognitive awareness as a whole and across all subscales.

Delimitation

1. The study was delimited to Murshidabad district of West Bengal.
2. The study was limited to primary teachers of private schools.

Methodology

Sample

The investigators employed the descriptive survey method for this study, which was conducted with 79 primary school teachers from the Murshidabad district of West Bengal. The sample consisted of 44 male and 35 female primary school teachers. Detailed descriptions of the sample are provided in Table 1.

Table 1
Sample Descriptions

	Male	Female	Total
Trained primary teachers	18	6	24
Untrained primary teachers	26	29	55
Grand Total	44	35	79

Tools Used

The researcher assessed the teachers' level of metacognitive awareness using the Metacognitive Awareness Inventory for Teachers (Balcikanli, 2011). This inventory consists of 24 statements divided into six domains: declarative knowledge, procedural knowledge, conditional knowledge, planning, monitoring, and evaluating, with four items per domain.

Reliability of the inventory was confirmed through Cronbach's Alpha, which ranged from 0.79 to 0.85. Validity was established based on expert opinions. Responses were

scored using a 5-point Likert scale, where 1 indicated 'strongly disagree', 2 represented 'disagreement', 3 was for 'neutral opinion', 4 denoted 'agree', and 5 stood for 'strongly agree'. Data scoring was performed according to the guidelines provided in the inventory manual.

Statistical Techniques Used

To achieve the study's objectives, the investigators computed the F-value to compare metacognitive awareness among male and female primary teachers, both trained and untrained, as well as overall. The analysis was conducted using SPSS version 20.

Data Collection Procedure

The data were collected during the Teachers Orientation Camp-22 for Unaided Private School Teachers, organised by the National Council for Unaided School Organisation at A.M. Teachers Training Institute, Sajurmore, Murshidabad, West Bengal, on 26 March 2022. The event saw participation from approximately 109 primary school teachers from various unaided private schools in the Murshidabad district. As resource persons for the orientation program, the investigators requested all attendees to complete the Metacognitive Awareness Inventory for Teachers. By the end of the day, 79 completed inventories were returned, resulting in a final sample size of 79 primary school teachers for the study.

Analysis and Interpretation

The obtained data from the Metacognitive Awareness Inventory for Teachers were analysed and the results were interpreted under three main subheadings, viz. gender differences and primary teachers' metacognitive awareness, gender differences and trained primary teachers' metacognitive awareness and gender differences and untrained primary teachers' metacognitive awareness.

Table 2
Gender Differences and Overall Primary Teachers' Metacognitive Awareness

Dimension	Gender	N	M	SD	F-value	Significant
Declarative Knowledge	Male	44	16.11	2.789	.665	.417
	Female	35	16.11	2.459		
Procedural Knowledge	Male	44	14.68	2.717	.948	.333
	Female	35	16.60	2.499		
Conditional Knowledge	Male	44	15.30	2.858	2.013	.160
	Female	35	17.34	2.485		
Planning	Male	44	15.55	2.628	1.791	.185
	Female	35	16.83	2.121		
Monitoring	Male	44	15.57	2.276	.057	.811
	Female	35	16.89	2.857		

Evaluating	Male	44	15.07	2.937	.198	.657
	Female	35	16.34	2.689		
Overall	Male	44	92.27	12.966	.780	.380
	Female	35	100.11	12.134		

M stands for Mean, SD for Standard Deviation, N for Number
*Significance is p<.05

1. Gender Differences and Primary Teachers' Metacognitive Awareness

According to Table 2, there were no significant differences in the mean scores of metacognitive awareness between male and female primary teachers overall (F-value = 0.780, p > 0.05) and across all subscales: declarative knowledge (F-value = 0.665, p > 0.05), procedural knowledge (F-value = 0.948, p > 0.05), conditional knowledge (F-value = 2.013, p > 0.05), planning (F-value = 1.791, p > 0.05), monitoring (F-value = 0.057, p > 0.05), and evaluating (F-value = 0.198, p > 0.05). Therefore, the null hypothesis stating that there would be no significant gender differences in metacognitive awareness is supported.

These findings align with previous studies by Memnun and Akkaya (2009), Cihanoglu (2012), Gopinath (2014), Johan et al. (2017), Ozcakmak et al. (2021), and Asyara and Rosa (2022), which reported no significant gender differences in metacognitive awareness. However, they contradict the results of Garzon et al. (2020) and Periasamy (2021), which found gender-based differences in metacognitive abilities among school teachers.

Table 3
Gender Differences and Trained Primary Teachers' Metacognitive Awareness

Dimension	Gender	N	M	SD	F-value	Significant
Declarative Knowledge	Male	18	16.11	2.423	1.938	.178
	Female	6	16.50	4.037		
Procedural Knowledge	Male	18	14.50	2.771	3.032	.096
	Female	6	14.83	4.309		
Conditional Knowledge	Male	18	15.11	2.968	2.167	.155
	Female	6	15.33	4.227		
Planning	Male	18	15.83	2.307	.759	.393
	Female	6	16.67	2.805		
Monitoring	Male	18	15.33	2.590	4.471*	.046
	Female	6	14.67	4.761		
Evaluating	Male	18	14.39	3.517	.091	.766
	Female	6	14.83	3.764		

Overall	Male	18	91.28	13.010	4.978*	.036
	Female	6	92.83	22.982		

M stands for Mean, SD for Standard Deviation, N for Number
*Significance is p<.05

2. Gender Differences and Trained Primary Teachers' Metacognitive Awareness

Table 3 indicates that there were no significant differences in the mean scores between trained male and female primary teachers for several subscales: declarative knowledge (F-value = 1.938, p > 0.05), procedural knowledge (F-value = 3.032, p > 0.05), conditional knowledge (F-value = 2.167, p > 0.05), planning (F-value = 0.759, p > 0.05), and evaluating (F-value = 0.091, p > 0.05). Consequently, the null hypothesis, which posited no significant gender differences in these areas, is upheld.

However, the data reveals significant gender differences in the monitoring subscale (F-value = 4.471, p < 0.05) and overall metacognitive awareness (F-value = 4.978, p < 0.05). Trained male primary teachers had higher mean scores (M = 15.33) compared to female teachers (M = 14.67) on the monitoring subscale. Conversely, female primary teachers had higher mean scores (M = 92.83) in overall metacognitive awareness compared to their male counterparts (M = 91.28).

These findings suggest that while trained female primary teachers demonstrate higher overall metacognitive awareness, they have lower scores in monitoring compared to trained male primary teachers. This results in a rejection of the null hypothesis. The results align with previous studies by Garzon et al. (2020) and Periasamy (2021), which found gender differences in metacognitive awareness among school teachers. Additionally, Duman and Semerci (2019) reported similar findings concerning prospective teachers.

Table 4
Gender Differences and Untrained Primary Teachers' Metacognitive Awareness

Dimension	Gender	N	M	SD	F-value	Significant
Declarative Knowledge	Male	26	16.12	3.064	3.943	.052
	Female	29	16.03	2.096		
Procedural Knowledge	Male	26	14.81	2.728	3.551	.065
	Female	29	16.97	1.861		
Conditional Knowledge	Male	26	15.42	2.831	4.547*	.038
	Female	29	17.76	1.806		
Planning	Male	26	15.35	2.856	4.363*	.042
	Female	29	16.86	2.013		

Monitoring	Male	26	15.73	2.070	.034	.855
	Female	29	17.34	2.143		
Evaluating	Male	26	15.54	2.420	.010	.921
	Female	29	16.66	2.380		
Overall	Male	26	92.96	13.147	5.099*	.028
	Female	29	101.62	8.411		

M stands for Mean, SD for Standard Deviation, N for Number
*Significance is p<.05

3. Gender Differences and Untrained Primary Teachers' Metacognitive Awareness

According to the data in Table 4 there were no significant variations in the mean scores between untrained male and female primary teachers for the subscales of declarative knowledge (F-value = 3.943, p>0.05), procedural knowledge (F-value = 3.551, p>0.05), monitoring (F-value = 0.034, p>0.05), and evaluating (F-value = 0.010, p>0.05). Therefore, the null hypothesis, which posited no significant gender differences in these subscales, is upheld. Significant differences were found between untrained male and female primary teachers in the subscales of conditional knowledge (F-value = 4.547, p<0.05) and planning (F-value = 4.363, p<0.05), as well as in overall metacognitive awareness (F-value = 5.099, p<0.05). Specifically, female teachers had higher mean scores in conditional knowledge (M = 17.76) compared to male teachers (M = 15.42). Female teachers also scored higher in planning (M = 16.86) compared to male teachers (M = 15.35). Overall, female teachers had higher mean scores in metacognitive awareness (M = 101.62) compared to male teachers (M = 92.96).

These results indicate that untrained female primary teachers outperform their male counterparts in conditional knowledge, planning, and overall metacognitive awareness. Consequently, the null hypothesis is rejected.

This finding is consistent with previous research by Garzon et al. (2020) and Periasamy (2021), which reported gender differences in metacognitive awareness among school teachers. Duman and Semerci (2019) also observed similar results among prospective teachers.

Suggestions

Based on the study's findings, the following suggestions can be made for administrators and researchers:

- Pre-service teacher education programmes should include metacognitive teaching strategies for prospective teachers.
- In-service teacher programmes should also be organised occasionally to improve teachers' metacognitive abilities and teach them how to raise pupils' metacognitive awareness.

- The researcher should conduct more studies on understanding and developing metacognitive awareness in classroom practices at different levels of education.

Conclusion

The paper concludes that there were no significant gender differences in primary teachers' metacognitive awareness overall or across all subscales. For trained primary teachers, no notable gender differences were found in metacognitive awareness concerning declarative knowledge, procedural knowledge, conditional knowledge, planning, and evaluating. However, differences did emerge in the monitoring subscale and overall metacognitive awareness: trained male primary teachers scored higher on the monitoring subscale, whereas trained female primary teachers demonstrated greater overall metacognitive awareness. Among untrained primary teachers, no significant gender differences were observed in declarative knowledge, procedural knowledge, monitoring, and evaluating subscales. Nonetheless, significant differences were found in overall metacognitive awareness, as well as in the subscales of conditional knowledge and planning. Untrained female primary teachers exhibited higher levels of metacognitive awareness compared to their male counterparts in these areas.

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