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A Study on The Role of Yoga and Mindfulness in Enhancing Cognitive Functions, Self-Efficacy, and Teaching Competency Among B.Ed. Trainees

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Abstract

In recent years, there has been growing recognition of the importance of holistic development in teacher education, particularly the integration of cognitive, emotional, and behavioural competencies. This study investigates the impact of yoga and mindfulness practices on the cognitive functions, self-efficacy, and teaching competency of B.Ed. trainees. Drawing on theoretical frameworks related to multiple intelligences and psychosocial development, the study explores how consistent engagement in yoga and mindfulness enhances attention, memory, emotional regulation, and confidence in pedagogical tasks. A sample of teacher trainees from select teacher education institutions participated in a structured yoga and mindfulness intervention over eight weeks. Pre- and post-intervention assessments were conducted using validated tools measuring cognitive performance, self-efficacy levels, and teaching competency. The findings reveal a statistically significant improvement in cognitive flexibility, working memory, and instructional confidence among the experimental group, indicating the potential of yoga-based interventions in teacher training curricula. The study emphasizes the relevance of mind-body practices in fostering well-rounded, competent, and emotionally resilient educators, with implications for curriculum design, teacher training policy, and future research in educational psychology.

keywords

Yoga and Mindfulness, Cognitive Functions, Self-Efficacy, Teaching Competency

Introduction

In an era marked by increasing academic demands and emotional stress, the cognitive and emotional preparedness of future educators has become a matter of urgent concern. B.Ed. trainees are expected not only to master pedagogical strategies but also to exhibit high levels of cognitive flexibility, self-efficacy, and social-emotional competence. Yoga and mindfulness, rooted in Indian tradition and supported by contemporary neurocognitive research, have shown promising benefits in improving attention, memory, emotional regulation, and stress resilience. While these practices have been widely adopted in schools and therapeutic settings, their potential in teacher education remains underexplored, especially in the Indian context.

Research Question

How do yoga and mindfulness practices influence cognitive functions, self-efficacy, and teaching competency among B.Ed. trainees?

Objective of the Study

- To examine the effect of yoga and mindfulness on cognitive functions of B.Ed. trainees.
- To assess the relationship between improved cognitive function and self-efficacy.
- To evaluate the impact of these practices on the overall teaching competency of the trainees.

- To suggest the integration of yoga-based interventions into teacher education programs.

Significance of the Study

This study is significant as it bridges cognitive psychology, educational training, and Indian wellness practices. By identifying non-pharmacological, low-cost interventions to enhance teacher preparedness, the findings may influence policy makers, curriculum designers, and teacher educators. The integration of yoga and mindfulness could serve as a sustainable model to foster emotionally balanced and cognitively strong educators, directly impacting classroom effectiveness and student outcomes.

Scope of the Study

The study focuses on B.Ed. trainees in select colleges within Kerala, involving a controlled yoga-mindfulness intervention spanning 6 to 8 weeks. The scope is limited to measurable changes in cognitive functioning (such as attention and memory), perceived self-efficacy, and observable teaching competency post-intervention.

- The study is limited to a specific geographic and cultural setting, which may affect generalizability.
- Cognitive function is assessed through standardized tools, which may not capture all dimensions of mental performance.
- Variability in participant engagement with yoga/mindfulness practices may influence outcomes.
- The short duration of the intervention may limit the observation of long-term effects.

Review of Literature

1. Overview

Cognitive development, self-efficacy, and teaching competency are foundational constructs in educational psychology. Over the last two decades, research has increasingly focused on the role of alternative and integrative practices such as yoga and mindfulness in enhancing these constructs. Studies have shown that mindfulness-based interventions improve cognitive flexibility, executive function, and emotional regulation (Tang et al., 2007). Similarly, yoga is found to boost concentration, working memory, and intrinsic motivation (Rangan et al., 2017). However, literature focusing on B.Ed. trainees and the educational application of these practices remains limited, particularly in the Indian context.

2. Theoretical Framework

This study is grounded in the following theoretical underpinnings:

- **Howard Gardner's Theory of Multiple Intelligences (1983):** Yoga supports the development of intrapersonal and bodily-kinesthetics intelligences, which are critical in the teaching profession.
- **Bandura's Self-Efficacy Theory (1977):** Mindfulness enhances perceived control over one's actions and emotional state, leading to higher self-efficacy.
- **Cognitive Load Theory (Sweller, 1988):** Yoga and mindfulness help reduce extraneous cognitive load by promoting clarity and focus, thereby improving mental processing.
- **Neuroplasticity Theory:** Research suggests that consistent mindfulness practices may induce positive neurobiological changes in brain regions associated with attention and memory.

3. Empirical Studies

4. Research Gaps and Controversies

- There is a lack of **India-based intervention studies** involving teacher trainees as participants.
- Most studies assess yoga or mindfulness **separately**; few explore their **combined effects**.
- **Measurement inconsistencies** exist in defining cognitive outcomes — some use subjective reports, others use standardized tools.
- Some critics argue that **mindfulness lacks cultural neutrality**, often being applied in a decontextualized Western format.
- There is limited evidence on **how long-lasting** the cognitive or behavioural benefits are post-intervention.

The review highlights strong theoretical and empirical support for the inclusion of yoga and mindfulness in teacher education. However, the scarcity of integrated, India-based studies on B.Ed. trainees underscores the need for the present research. By addressing the combined effects of these practices on cognitive function, self-efficacy, and teaching competency, the current study seeks to fill a meaningful gap in educational psychology literature.

Methodology

1. Research Design

This study employed a **quasi-experimental pre-test post-test control group design** to assess the impact of yoga and mindfulness on cognitive functions, self-efficacy, and teaching competency. A mixed-method approach was adopted, combining quantitative analysis with qualitative feedback to ensure a comprehensive understanding of the outcomes.

2. Participants

The participants were **100 B.Ed. trainees** selected through **purposive sampling** from teacher education institutions in the Palakkad district of Kerala. The sample was equally divided into an **experimental group** (n = 50) and a **control group** (n = 50). Inclusion criteria included willingness to participate in the full intervention and no prior formal training in yoga or mindfulness.

3. Data Collection Procedure

The study was conducted over a **period of 8 weeks**. The experimental group participated in a structured yoga and mindfulness program that included:

- Daily 30-minute sessions (asana, pranayama, meditation)
- Weekly group reflections on self-awareness and teaching experiences

Pre- and post-tests were administered using the following standardized tools:

- **Cognitive Function Scale** (measuring attention, working memory, and mental flexibility)
- **Teacher Self-Efficacy Scale** (adapted from Tschannen-Moran & Hoy, 2001)
- **Teaching Competency Scale** (validated by expert teacher educators)

The control group received no intervention and continued with the regular B.Ed. curriculum.

4. Data Analysis

Quantitative data were analysed using **SPSS**. The statistical techniques employed included:

- **Descriptive statistics** (mean, standard deviation)
- **Paired sample t-tests** (within-group comparison)
- **Independent sample t-tests** (between-group comparison)
- **Pearson correlation** (to examine the relationship between cognitive function, self-efficacy, and teaching competency)

Qualitative data from reflection sessions were thematically analysed to explore changes in emotional awareness and classroom behaviour.

- The tools used for data collection had **established validity and reliability**, with Cronbach's alpha values ranging from **0.78 to 0.89**.
- **Pilot testing** was conducted on a small group of B.Ed. trainees (n = 10) to ensure clarity and appropriateness of the instruments.
- The yoga and mindfulness module were designed in consultation with certified yoga instructors and educational psychologists to ensure **content validity**.
- **Triangulation** through mixed methods enhanced the overall **trustworthiness** of the study.

Results

The data were analysed to compare the pre-test and post-test scores of the experimental and control groups across three key variables: **cognitive function**, **self-efficacy**, and **teaching competency**. Descriptive and inferential statistics were used to determine the significance of the observed changes.

Table 1: Descriptive Statistics – Pre and Post Mean Scores (Experimental Group)

Variable	Pre-Test Mean	Post-Test Mean	Mean Difference
Cognitive Function	65.2	78.6	13.4
Self-Efficacy	72.3	85.1	12.8
Teaching Competency	68.9	80.4	11.5

Table 2: Independent Samples t-test – Post-Test Scores Between Groups

Variable	t-value	p-value	Significance
Cognitive Function	4.21	0.000***	Significant
Self-Efficacy	3.89	0.001***	Significant
Teaching Competency	3.67	0.002**	Significant

Significance level: *$p < 0.05$ ()*, ***$p < 0.01$ ()***

Statistical Analysis

- **Paired Sample t-Test** showed a significant improvement in all three variables for the experimental group post-intervention.
- **Independent Sample t-Test** confirmed that the experimental group scored significantly higher than the control group in post-tests.
- **Pearson Correlation Analysis** revealed:
  - A strong positive correlation between **cognitive function and self-efficacy** ($r = 0.71$, $p < 0.01$)
  - A moderate positive correlation between **self-efficacy and teaching competency** ($r = 0.65$, $p < 0.01$)
  - A strong correlation between **cognitive function and teaching competency** ($r = 0.75$, $p < 0.01$)

Discussion

1. Interpretation of Findings

The study's findings support the hypothesis that yoga and mindfulness interventions can enhance cognitive functions, self-efficacy, and teaching competency among B.Ed. trainees. The **significant increase in cognitive function** observed in the experimental group aligns with previous research indicating that yoga and mindfulness can improve attention, working memory, and mental flexibility (Roeser et al., 2013). This improvement in cognitive functions is crucial for teacher trainees, as cognitive clarity and focus are foundational for effective teaching and learning.

The positive **increase in self-efficacy** among participants is consistent with Bandura's Self-Efficacy Theory, which suggests that mindfulness practices can lead to greater emotional regulation, thereby improving confidence in teaching abilities (Bandura, 1977). B.Ed. trainees with higher self-efficacy are more likely to adopt innovative teaching strategies, persist in challenging situations, and demonstrate better classroom management (Tschannen-Moran & Hoy, 2001).

The **improvement in teaching competency** is consistent with findings from studies like those of Subramaniam & Rajeev (2020), who found that yoga-based interventions could enhance reflective thinking and emotional stability, crucial factors in teaching competency. Moreover, the correlation between **cognitive function** and **teaching competency** ($r = 0.75$) suggests that cognitive clarity is a strong predictor of effective teaching.

2. Comparison with Existing Literature

Our findings resonate with earlier studies that have shown positive outcomes of yoga and mindfulness interventions on cognitive functions and emotional well-being in educational settings (Napoli et al., 2005). However, this study extends previous research by focusing on **teacher trainees**, a population that directly impacts the quality of future generations' education. The combination of **yoga and mindfulness**, which has been studied separately, shows significant improvement in both cognitive and emotional domains, reinforcing the **holistic benefits** of integrating both practices into teacher education programs.

3. Implications for Teacher Education

This study has important implications for teacher education programs. The significant impact of yoga and mindfulness on self-efficacy and teaching competency underscores the need to integrate these practices into **teacher training curricula**. Programs that incorporate mindfulness and yoga could help trainees better manage classroom stress, enhance their focus, and develop the necessary cognitive and emotional skills to become effective educators.

4. Limitations

While the study presents promising results, several limitations must be acknowledged:

- **Generalizability**: The sample size was limited to B.Ed. trainees in Kerala, which may not fully represent other regions or educational systems.
- **Duration of the Intervention**: The 8-week intervention may not reflect long-term benefits. A follow-up study could assess the sustainability of the effects.
- **Participant Engagement**: Variability in participant adherence to the yoga and mindfulness practices could have influenced the results.

Conclusion

This study provides strong evidence that yoga and mindfulness can play a crucial role in enhancing **cognitive functions, self-efficacy, and teaching competency** among B.Ed. trainees. By fostering improved attention, emotional regulation, and cognitive clarity, these practices contribute significantly to teacher readiness and effectiveness. Given the growing pressures on teacher training programs to produce well-rounded, competent educators, integrating these practices into **teacher education** could be a transformative step toward improving overall educational quality.

Further research is needed to explore long-term effects, as well as the feasibility of implementing such interventions on a larger scale across diverse educational contexts.

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Appendices

Appendix A: Cognitive Function Scale (Pre-test and Post-test)

- **Attention Task**: A test measuring sustained attention (e.g., attention span during an activity).
- **Working Memory Task**: Participants are asked to recall and manipulate numbers in a sequence.
- **Mental Flexibility Task**: Test measuring the ability to switch between different concepts or tasks.

Note: All questions on the Cognitive Function Scale are rated on a **5-point scale**, ranging from 1 (poor) to 5 (excellent).

Appendix B: Teacher Self-Efficacy Scale (TSES)

This scale measures the participant's perceived confidence in their ability to manage a classroom, organize learning activities, and engage students effectively. The scale includes items such as:

- "I can manage classroom behaviour effectively."
- "I am confident in my ability to provide individualized support to students."
- "I can create a positive learning environment."

The items are rated from **1 (strongly disagree)** to **5 (strongly agree)**.

Appendix C: Teaching Competency Scale

This scale assesses how well the trainees perceive their ability to plan lessons, execute them, and evaluate student learning. The subscales include:

- **Lesson Planning**: Includes statements like "I can plan lessons that align with curriculum objectives."
- **Classroom Management**: "I am able to handle unexpected disruptions during a lesson."
- **Student Engagement**: "I can keep students actively involved during lessons."

Appendix D: Intervention Program Overview

- **Week 1-2**: Introduction to Yoga and Mindfulness
  - Morning sessions (15 minutes of breathing exercises, 10 minutes of stretching)
  - Daily reflection session (5-10 minutes)
- **Week 3-4**: Yoga Poses and Mental Clarity
  - Introduction to **Asanas** (Tree pose, Child's pose, Downward dog)
  - Focus on body awareness and attention control
- **Week 5-6**: Pranayama (Breathing Techniques) and Meditation
  - **Anulom Vilom** (Alternate nostril breathing)
  - Guided mindfulness meditation for emotional regulation
- **Week 7-8**: Integrated Practice
  - Combined yoga poses, pranayama, and reflective journaling
  - Weekly group discussions on the application of mindfulness in teaching