EFFECT OF METACOGNITIVE INTERVENTION STRATEGIES IN ENHANCING RESILIENCE AMONG PRE-SERVICE TEACHERS

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Abstract:

The arena of metacognition has been studied in various disciplines including education, psychology, positive psychology, and neuroscience, however, research studies have yet to address the role of metacognition in enhancing resilience. Thus, the present study explored how metacognitive intervention strategies enhance resilience among pre-service teachers. The understanding of resilience may act as a catalyst for pre-service teachers to overcome difficulties during and after their training period. An experimental method with a single group design was employed in this study and the sample was 20 pre-service teachers undertaking the Bachelor of Education course at Alagappa University College of Education, Alagappa University, Karaikudi, Sivagangai district, Tamil Nadu, India. The convenience sampling technique was utilized for this study. A metacognitive awareness questionnaire constructed and

validated by the researcher and research supervisor with a Cronbach's alpha reliability of the present sample is 0.72 and a Resilience Appraisal Scale (RAS) developed by Johnson et al., 2010 with Cronbach's alpha reliability of the present sample is 0.75 were used for data collection. Results revealed that metacognitive intervention strategies influence the resilience of pre-service teachers and considerable improvement present in resilience among pre-service teachers after the experimentation period. Future research needs to focus on various dimensions of resilience for extensive knowledge and survey research would encourage measuring these constructs in the larger sample.

Keywords:

Metacognition, Resilience, Pre-Service Teachers, Intervention Strategies

1. Introduction

Metacognition and resilience are the major constructs focused on educational research. The line of research studies revealed that metacognitive awareness is highly related to motivation, the effectiveness of teaching, and the academic achievement of pre-service teachers, and resilience acts as the precursor for mental health.

1.1. Metacognition

Metacognition is the process of knowing about knowledge and thinking about thinking (Mcinerney,2013). Metacognition refers to cognition about cognition or knowing and learning (Hofer & Sinatra,2010). Human metacognition entails identifying, interpreting, and communicating small signs suggesting whether current thinking and behavior are correct (Heyes et. al., 2020). There are several ways to categorize metacognition, including metacognitive experience, metacognitive regulation, and metacognitive knowledge (Flavell, 1979). The learner can monitor, manage, and control their thought processes with the use of their metacognitive ability(Patterson,2011). To maximize learning, student teachers must cultivate self-assurance, self-efficacy, reflective thinking, and diverse thinking. Early in human life, core metacognition occurs, enabling a person to automatically evaluate and manage their cognition (Goupil & Kouider,2019). The effectiveness of their written assignment tasks is influenced by the student teachers' metacognitive abilities (Ali et. al., 2020). The metacognition of B.Ed students' academic achievement is highly correlated (Kavitha & Uma, 2020). Students engage in metacognition through thinking-aloud techniques (Siddiqui et. al., 2020). B.Ed students' metacognition does not differ based on their gender (Kaur et. al., 2018). The nature of the school has a considerable impact on the metacognition of the teachers (Periasamy,2021). For male and

female student teachers, metacognitive awareness is strongly related to teaching and teaching competence (Sahoo et.al., 2021). Effective intrapersonal decision-making in a variety of circumstances is facilitated by metacognition and also assisting the individual in recognizing our mistakes, metacognition maintains the seamless operation of continuous thinking and behavior (Rabbitt,1966). Metacognition governs the formation of executive functions (Bryce et.al.,2015; Spiess et.al.,2016). Metacognition helps to find out the inattention and metacognitive monitoring pivotal for effective working memory (Adam & Vogel,2017).

The object level and the metalevel are represented by Nelson and Narens' (1994) model of metacognition. One's thinking is referred to as the object level. Cognitive techniques are applied at the object level to assist the learner in achieving a specific objective. 'Thinking about thinking' happens at the meta-level.

According to this concept, feedforward and feedback loop metalevel processors keep an eye on and regulate object-level operations. This model offers a helpful description of the connection between the pre-frontal and posterior cortex, which is a part of the brain. Knowledge of cognition and management of cognition are the two parts of metacognition that have been identified. What people know about themselves and others as cognitive processors is known as metacognitive knowledge, sometimes known as metacognitive awareness. The world knowledge that is associated with humans as cognitive beings and with their variety of cognitive activities, goals, behaviors, and experiences is known as metacognitive knowledge (Flavell, 1979). What people are aware of their cognition is referred to as their knowledge of cognition. Declarative, procedural, and conditional knowledge are the three main types of metacognitive awareness that are typically included. understanding about something is referred to as having declarative knowledge, understanding how to do something is referred to as having procedural knowledge, and knowing the why and when of something is referred to as having conditional knowledge. Declarative knowledge, also known as personal knowledge, is the understanding of one's learning style and the variables that may affect cognitive function. This is accomplished using a wide range of approaches that can be used more effectively. The content, length, and kind of assignment all affect how difficult a task is perceived, and this is known as procedural knowledge (task knowledge). This type of knowledge is displayed as a strategy. People who have a high level of procedural knowledge may be able to complete tasks more automatically. (Brown,1987; Jacob & Paris,1987).

The capacity to use methods to learn information is known as conditional knowledge (strategic knowledge). Information about why and when to employ a particular tactic is referred to as conditional knowledge. It alludes to understanding the how and why of certain cognitive

processes. Metacognitive regulation is the control of cognition and the learning process through a variety of activities that aid in thought control and learning control. Planning, monitoring, managing, and evaluating students' thinking and learning processes are all skills that are governed by the regulation of cognition. Planning entails "the appropriate selection of strategies and the correct allocation of resources that affect task performance". Controlling and putting monitoring assessments into practice. Evaluating is the process of assessing a task's outcome and the effectiveness with which it was completed. Examining the results closely and assessing whether the learning meets the planned learning goals and whether the regulating mechanisms used were effective are all part of the evaluation process (Schraw &Moshman, 1995). Reevaluating one's objectives and conclusions after completing a task is another aspect of skill evaluation. Students can learn more about their abilities as readers, writers, test takers, classmates, etc. through metacognitive exercises. Finding out where one's knowledge or skill gaps are and how to close them are crucial components. It helps to actively monitor their learning techniques and resources and appraise their preparation for specific tasks and performances when they are aware of their strengths and limitations (Bransford et. al.,2000).

1.2. Resilience

Resilience is the capacity to cope with stressful circumstances and continue to function well in challenging sociocultural contexts (Johnson et. al.,2014). Although many different elements might affect resilience, interventions that focus on contextual factors and incorporate resilience programs at the school level seem to be the most crucial for creating supportive settings where teachers and their children can flourish (Kangas-Dick & O'Shaughnessy,2020). Resilience acts as a prime factor for mental health and success (Neenan,2018).

Resilience, or the capacity to overcome difficulties, is thought to be increased and developed as a result of overcoming difficult situations in the past (Masten, 2001). The retention and resilience of teachers are affected by various factors. Teachers' efficacy beliefs and attributions are considered major factors for work (Gibbs & Miller, 2014). Resilience has been acknowledged as a critical non-cognitive attribute of novice teachers (Klassen et al.,2018).In Australia, resilience is regarded as a major non-cognitive ability for the recruitment of teacher education students (Australian Institute of Teaching and School Leadership [AITSL],2015). The self-efficacy of pre-service teachers is strongly related to resilience (Yada,2021). Research studies revealed that teachers' resilience is a significant aspect related to their commitment, motivation, and retention in the profession of teaching (Brunetti,2006; Johnson et al.,2014).

According to the American Psychological Association (APA), resilience includes the process and outcome of effectively adapting to challenging life experiences. Emerging research studies revealed that resilience skills include problem-solving, goal setting, emotion regulation, and stress management, effective communication, building a social support network, practicing self-care, developing meaning and purpose in life, adopting a positive outlook, improving self-awareness, adopting effective coping strategies (Duckworth,2016; Pemberton, 2015; Southwick & Charney,2018).

1.3. Need And Significance of the Study

Resilience is a contemporary behavioral study rising to precedence. Teaching-learning is an emotional aspiration. Pre-service teachers need to face various emotion-evoking situations at the time of their teaching-learning process internally as well as externally. Growing research in the field of positive psychology revealed that resilience needs to adapt to various hard situations and to improve commitment, motivation, and effectiveness in teaching among pre-service teachers. Metacognitive strategies are teachable (Schraw,1998), so the researcher might expect that metacognitive intervention strategy for pre-service teachers is teachable as well which in turn enhances resilience. Keeping this in mind this study intends to investigate how metacognitive intervention strategies enhance the resilience of pre-service teachers.

1.4. The Objectives of the Study

- To implement metacognitive intervention strategies among pre-service teachers
- To assess whether there exists any significant difference in pre- and post-assessment of resilience among pre-service teachers
- To assess the effectiveness of metacognitive intervention strategies in enhancing the resilience of pre-service teachers
- To find out the gain ratio of resilience and metacognitive intervention strategies among pre-service teachers.

1.5. Hypotheses of the Study

- Pre- and post-assessment scores of resilience do not differ among pre-service teachers.
- There is a significant increase in the gain ratio of pre- and post-assessment scores of resilience and metacognitive intervention strategies among pre-service teachers
- There is a significant influence of metacognitive intervention strategies on resilience among pre-service teachers.

1.6. Variables of the Study

The present study consists of resilience as the dependent variable and metacognitive intervention strategies as an independent variable.

2. Methodology of the Study:

The present study employed an experimental method, a single group design (Pre-assessment - Post-assessment) and the sample was 20 pre-service teachers undertaking the Bachelor of Education course at Alagappa University College of Education, Karaikudi. Sivagangai district, Tamil Nadu. The convenience sampling technique was utilized for this study. Metacognitive Intervention Strategies employed in the present study are based on previous research studies which include activities focused on planning, monitoring, and evaluation. Planning involves the suitable selection of strategies and allocation of resources for difficult situations, and monitoring involves individuals understanding and keeping track of their activities during difficult situations, Monitoring refers to an individual's awareness of understanding and performance (Schraw &Moshman, 1995) and evaluation represents appraising the end of the task. The duration of the experiment was conducted 8 weeks during college working days. Resilience Appraisal Scale (RAS) developed by Johnson et.al., 2010 measures the ability of the individual to cope with emotions, solve problems, and gain social support. Resilience Appraisal Scale (RAS) by Johnson et al., 2010 with Cronbach's alpha reliability of the present sample is 0.75 and a Metacognitive Awareness questionnaire constructed and validated by the researcher and research supervisor with a Cronbach's alpha reliability of the present sample is 0.72 were used for data collection. Statistical techniques used for this study were mean, standard deviation, t-test, effect size, and gain ratio.

2.1. Delimitation of the Study

The present study is confined only to pre-service teachers who pursue physical science as their major subject and were selected from Alagappa University College of Education, Karaikudi, Sivagangai district, Tamil Nadu.

3. Findings

3.1. Hypothesis 1: Pre- and post-assessment scores of resilience do not differ among pre-service teachers.

Table 1- *Post-Assessment Scores of Resilience Among Pre-Service Teachers*

Assessment	N	Mean	SD	Calculated 't' value	Level of significance
Pre-assessment	20	36.8	4.11	2.28	Significant
Post- Assessment	20	51.05	1.57		

(Source: Author's Own Illustration)

*Significant at 5% level

The scores indicate that pre-service teachers obtained higher mean scores in the post-assessment compared to the pre-assessment score. The mean score obtained from the pre- and post-assessment were 36.8 and 51.05 respectively resulting in a mean difference of 14.25. The results also indicate that the total score for pre-service teachers' post-assessment was significantly improved. Hence the results indicate that pre-service teachers exhibited higher levels of improvement after treatment. From the above table, the calculated 't' Value (2.28) is greater than the table value (1.96) at the 0.05 level of significance. Hence it is inferred that there is a significant difference exists between pre- and post-assessment scores of resilience among pre-service teachers.

3.2. Hypothesis 2: There is a significant increase in the gain ratio of pre- and post-assessment scores of resilience and metacognitive intervention strategies among pre-service teachers.
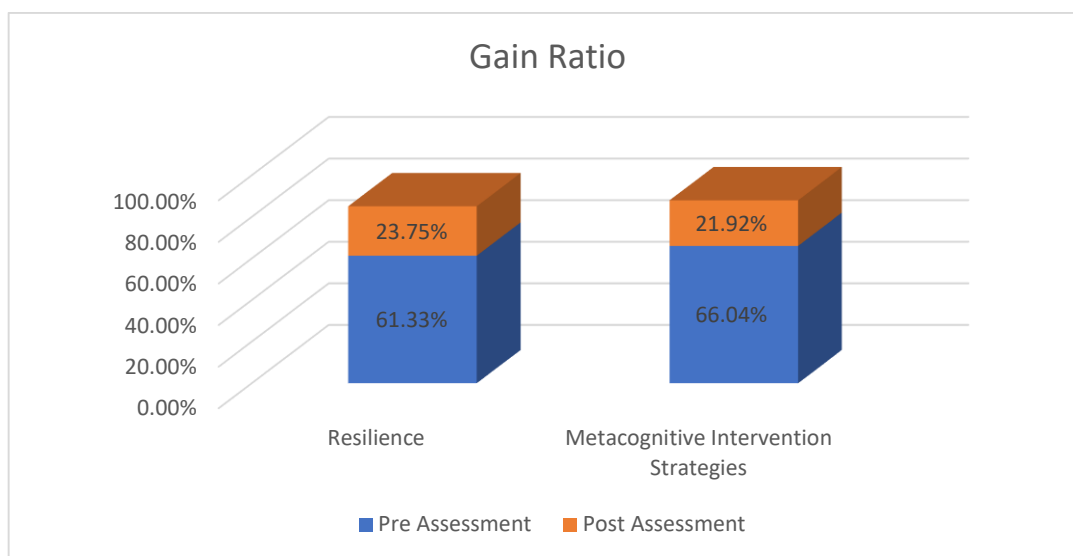
Table 2: *The gain ratio of pre- and post-assessment scores of resilience and metacognitive intervention strategies among pre-service teachers*

Assessment	Pre-assessment	Post-assessment	Gain ratio
Resilience	61.33	85.08	23.75
Metacognitive Intervention Strategies	66.04	87.96	21.92

(Source: Author's Own Illustration)

The Gain ratio indicates that there is a considerable improvement in metacognitive Strategies (21.92%) and resilience (23.75%) among pre-service teachers.

Figure 1: *The Gain Ratio Of Resilience And Metacognitive Intervention Strategies Among Pre-Service Teachers*

(Source: Author's Own Illustration)

3.3. Hypothesis 3: There is a significant influence of metacognitive intervention strategies on resilience among pre-service teachers.

Table 3:*Effect Size (D) Between Pre and Post-Assessment Scores Of Resilience Among Pre-Service Teachers*

Assessment	Mean	SD	ES(d)
Pre-assessment	20	36.8	**4.57**
Post Assessment	20	51.05	

(Source: Author's Own Illustration)

The above table shows the effect size (d)between pre- and post-assessment scores of resilience among pre-service teachers. The effect size value (d) 4.57 indicates that there is a visible difference between the pre-and post-assessment scores of resilience. It reveals that there is a significant influence of metacognitive intervention strategies on resilience among pre-service teachers.

4. Discussion

The present research findings indicate that metacognitive intervention strategies enhance resilience among pre-service teachers. The findings highlight metacognitive intervention strategies influence the resilience of pre-service teachers. In the present investigation, the researcher has found a few findings which are converted into educational implications that the major contribution to developing resilience among the pre-service teachers,

is a considered self-oriented practice in a productive way. Previous research studies revealed that the multifaceted nature of resilience is manifest in that to initiate resilience, researchers have assessed a variety of constructs such as self-efficacy, emotional intelligence, teacher-pupil relationships, work pressure, school environment and support, and student nature (Ainsworth& Oldfield, 2019). The significance of current research findings lies in unfolding a greater understanding of two constructs such as metacognition and resilience. Present research finding paves the way for new projects and facilitates research that examines the pre-service teachers' transferable skills like resilience. Future research would be needed to explore the dimensions of resilience for extensive knowledge survey research would encourage measuring these constructs in a larger sample.

5. Conclusion

Based on the research results, it can be concluded that there exists a significant difference between pre-and post-assessment scores of resilience among pre-service teachers, the significant influence of metacognitive intervention strategies occurs on resilience among pre-service teachers, and considerable improvement in the resilience of pre-service teachers through metacognitive intervention strategies. It is considered that metacognitive intervention strategies are suitable for pre-service teachers to enrich their cognitive process which facilitates enhancing their resilience.

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