

*Mediating Effect of Metacognitive Awareness on the Sense of Efficacy of  
Pre-service Educators*

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**Abstract**

The pre-service educator preparation period is crucial in developing the competencies for highly effective educators who succeed in the classroom. In this regard, pre-service educators' metacognitive awareness and sense of efficacy beliefs about their profession remain critical determinants of their success in teaching. Developing pre-service educators' metacognitive awareness can promote their sense of efficacy when faced with challenges in their future profession. This presentation reports on part of a larger quantitative study on the relationship between metacognitive awareness, teaching perspectives, and sense of efficacy of pre-service educators. The aim of this presentation is therefore to investigate the mediating effect of metacognitive awareness on the sense of efficacy of pre-service educators. The study adopted a quantitative research approach, underpinned by post-positivism paradigm. A sample of 683 pre-service educators completed the Metacognitive Awareness Inventory for Teachers (MAIT) and the Teachers' Sense of Efficacy Scale (TSES). The Social Packages for the Social Sciences (SPSS) was used to analyze data. The correlation between the latent variables was examined using structural equation modelling (SEM). The results of the study indicate a significant correlation between the variables of metacognitive awareness and sense of efficacy. This suggests that the results from individual profiles on the MAIT and TSES could inform pre-service educators about their underlying teaching assumptions, consequently, this could improve their teaching practices.

Keywords: Metacognitive Awareness, Sense of Efficacy, Structural Equation Modelling, Pre-service Educators

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## Introduction

Pre-service education plays a crucial role in the education system. The purpose of the study was to investigate the mediating effect of metacognitive awareness on the sense of efficacy of pre-service educators. Metacognitive awareness enables educators to reflect on their thinking processes, while a strong sense of efficacy supports confidence in their teaching abilities. Metacognitive awareness and educators' sense of efficacy beliefs plays a major role in the teaching and learning process. Therefore, encouraging pre-service educators to develop metacognitive skills is essential for fostering these beliefs, equipping them to create successful learning environments and thrive in professional practice. To ensure that students are successful in the learning environment, educators should begin by encouraging students to engage in activities that will enhance their metacognitive awareness and foster a sense of efficacy beliefs. Therefore, it is important to encourage pre-service educators to practice metacognitive skills, this will prepare them for the work environment.

## Metacognitive Awareness

The conceptualisation of metacognition is popularly attributed to the 1970s pioneering work of John Flavell (1979). This conceptualization suggests that metacognition involves the ability to regulate cognitive processes during learning. Metacognition is understood to be a process of encoding information, organizing it, and then selecting the information needed by scanning it and then controlling that information in the memory (Flavell, 1979). Hence, Özçakmak et al. (2021) indicate that metacognition is a higher order cognitive ability because it evolves in relation to an individual's self-knowledge and abilities in learning how to learn. Meanwhile, metacognitive awareness refers to the individuals' awareness of their own learning strategies and how and when to successfully apply them (Harrison & Vallin, 2018). Therefore, metacognitive awareness reveals what one knows about his own cognition (Özçakmak et al., 2021). In its simplest sense, cognitive awareness is an individual's awareness of his own thinking styles and knowing how to acquire systematic thinking skills.

Metacognition as a construct consist of two main elements: Knowledge of cognition and regulation of cognition (Schraw & Dennison, 1994; Kallio *et al.*, 2018). Knowledge of cognition (the extent to which the learner knows), includes declarative, procedural, and conditional knowledge of cognition (Sperling et al., 2002). *Declarative knowledge* refers to how individuals learn and what influences their performance, *procedural knowledge* refers to the different strategies and procedures that can be used to solve problems, and *conditional knowledge* refers to when and how to use these strategies. *Regulation of cognition* refers to one's ability to plan, implement, monitor, and evaluate learning processes (Schraw & Dennison, 1994). Planning relates to the process of activating prior knowledge, setting goals, and selecting appropriate strategies, monitoring relates to the process of checking how well the learning processes and strategies used are, and evaluation relates to the process which involves reflecting on the outcomes of the learning process.

## Sense of Efficacy

In the 1970s, Albert Bandura, a scholar of social cognition theories, first defined the concept of sense of efficacy as the "conviction that one can successfully execute the behaviour required to produce certain outcomes" Bandura (1997, p. 193). This conceptualization underscores the idea that individuals are unlikely to engage in challenging tasks unless they possess a belief in their ability to achieve desired outcomes. In essence, sense of efficacy

pertains to the beliefs individuals hold about their capacity to perform specific tasks. Within the domain of teaching, the construct of sense of efficacy is further refined to refer to educators' "beliefs in their capabilities to perform specific teaching tasks at a specific level of quality in a specific situation" Dellinger et al. (2008, p. 752). This definition emphasizes the fact that sense of efficacy beliefs is context specific, suggesting that they are limited by the demands of tasks or environments. Consequently, individuals may exhibit varying levels of efficacy across different tasks or situational contexts.

Tschannen-Moran and Hoy (2001) proposed a framework of sense of efficacy in teaching comprising the following three core dimensions of sense of efficacy: sense of efficacy in student engagement (SE-SE), sense of efficacy in instructional strategies (SE-IS), and sense of efficacy in classroom management (SE-CM). Studies that have focussed on educators' sense of efficacy have defined SE as beliefs related to educators' effectiveness in students engagement, instructional strategies, and classroom management (Hoy & Spero, 2005; Tsouloupas et al., 2010; Cocca & Cocca, 2022).

Sense of efficacy in Student Engagement addresses educators' "beliefs about the emotional and cognitive support they can give their students and about their ability to motivate student learning" (Ainley & Carstens, 2018, p. 51).

Sense of efficacy in Instructional Strategies refers to educators' "beliefs as to whether or not they can use alternative teaching practices, assessment strategies, and explanations" (Ainley & Carstens, 2018, p. 51).

Sense of efficacy in Classroom Management refers to educators' "beliefs about their ability to establish an orderly learning environment and, therefore, effectively manage disruptive student behaviour" (Ainley & Carstens, 2018, p. 51).

## **Empirical Investigation**

The study utilised the post-positivism paradigm and a quantitative research approach. The population for the study entailed pre-service educators who had registered for a Bachelor of Education degree in the Foundation Phase, Senior Phase, and the Further Education and Training Phase. Data was collected through a close ended online questionnaire, the metacognitive Awareness Inventory for Teachers (MAIT) and the Teachers' Sense of Efficacy Scale.

The Metacognitive Awareness Inventory for Teachers Balcikanli (2011) consists of 24 items divided into six subscales: declarative knowledge, procedural knowledge, conditional knowledge, planning, monitoring, and evaluating. Each one of the 24 items is scored on an agree-disagree scale (Strongly agree, Agree, Neutral, Disagree, and Strongly disagree). The table below depicts the inter-item correlation means and the Cronbach Alpha values of the MAIT.

Table 1: Summary of Inter-item Correlation Means, and the Cronbach Alpha Values for the Metacognitive Awareness for Teachers Inventory

Variable	Perspective	Inter-item correlation means	Cronbach Alpha
Metacognitive Knowledge	Declarative knowledge	0,304	0,636
	Procedural knowledge	0,317	0,645
	Conditional knowledge	0,291	0,620
Metacognitive regulation	Planning	0,329	0,654
	Monitoring	0,319	0,651
	Evaluation	0,363	0,694

The results presented in Table 1 above illustrate that the inter-item correlation means for metacognitive knowledge ranges between 0,291 and 0,317, whilst the inter-item correlation means for metacognitive regulation ranges between 0,319 and 0,363. Meanwhile, the overall inter-item correlation means for MAIT items ranges between 0,291 and 0,363. This suggests that the items for the metacognitive awareness inventory are well correlated and can be used for further analysis. The Cronbach Alpha reliabilities for MAIT are as follows, 0,620 – 0,645 (metacognitive knowledge) and 0,651 – 0,694 (metacognitive regulation). The overall Cronbach's Alpha ranges between 0,620 (metacognitive knowledge-conditional and 0,694 (metacognitive regulation-evaluation), indicating Cronbach Alpha values equal to 0,70. According to Gil-Gómez et al. (2017), this implies a high level of consistency of the inventory.

Teachers' Sense of Efficacy Scale was developed by (Tschannen-Moran & Hoy, 2007). The long version of TSES has 24 items, whilst the short version has 12 items. For this study, the short (12-item version) was used to collect data. The two versions represent three distinct, but related factors associated with teaching: Student Engagement, Instructional Strategies, and Classroom Management. Each of the items is scored on a rating scale, ranging from 1 (Not at all), 2 (Very little), 3 (Somewhat), 4 (Quite a bit), and 5 (A great deal). The table below depicts the inter-item correlation means and the Cronbach Alpha values of the TSES.

Table 2: Summary of Inter-item Correlation Means, and the Cronbach Alpha Values for the Sense of Efficacy Scale

Perspective	Inter-item correlation means	Cronbach Alpha
Student Engagement	0,389	0,695
Instructional Strategies	0,477	0,783
Classroom Management	0,438	0,756

The results presented in the above table show the inter-item correlation means of 0,389 for student engagement, 0,477 for instructional strategies, and 0,438 for classroom management. The overall inter-item correlation means for TSES ranges between 0,389 and 0,477. This indicates that the items for the sense of efficacy scale are well correlated and can be used for further analysis. The TSES's Cronbach's Alpha reliabilities are as follows: 0,695 (student engagement); 0,783 (instructional strategies); and 0,756 (classroom management), indicating

Cronbach Alpha values greater than 0,70. According to Gil-Gómez et al. (2017), this implies a high level of consistency of the scale.

## Results

To examine the relationship between the latent variables of metacognitive awareness and educators' sense of efficacy, the SEM was used. The following model (Figure 1) which is obtained from SEM, depicts the relationship between these latent variables.

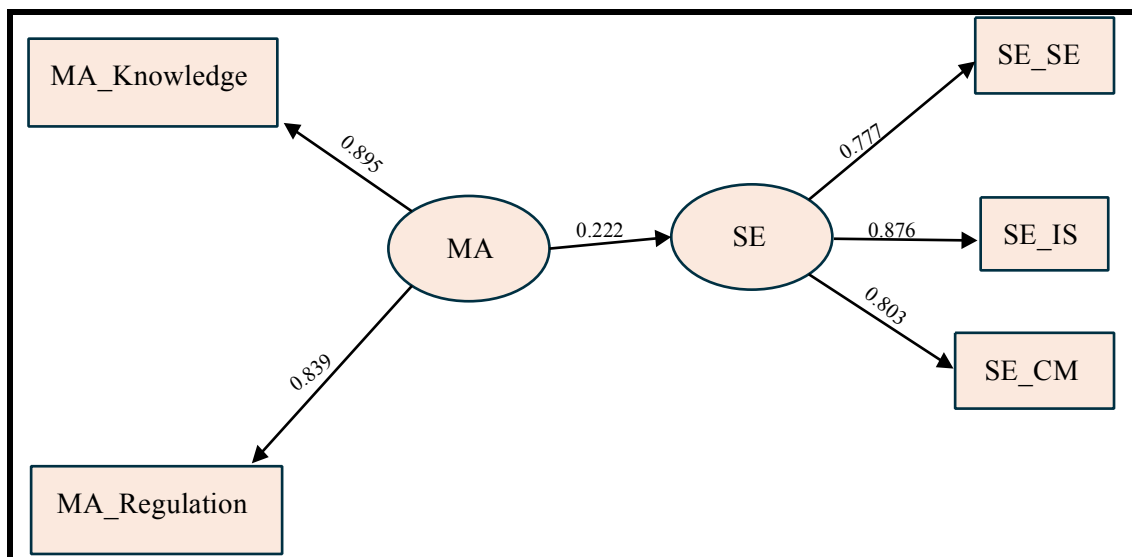


Figure 1: Structural Equation Model of Metacognitive Awareness and Sense of Efficacy Developed at One University in South Africa

The model focuses on the relationship between metacognitive awareness and educators' sense of efficacy. In this model each of the latent variables – metacognitive awareness and sense of efficacy are symbolised by ellipses (ovals). The manifest (observed) variables appear in the rectangles. Metacognitive awareness has two observed variables (Knowledge and Regulation) and sense of efficacy has three observed variables (Student Engagement, Instructional Strategies, and Classroom Management). According to Morrison et al. (2017), the relationships between the latent variables can be conceptualized as covariances, direct effects, or indirect (mediated) effects. According to Figure 1, there is a directional relationship between metacognitive awareness and sense of efficacy. This direct relationship is symbolised by a single-headed arrow. The straight arrow between MA and SE illustrates a weak prediction of (0.222) at the  $p < 0.05$ , suggesting that MA weakly predicts SE. In their studies, Aurah (2014) and Sūmen and Çalişir (2016) also have indicated a positive relationship between metacognitive awareness and educators' sense of efficacy.

### Correlations Between the Constructs of Metacognitive Awareness and Sense of Efficacy

In total, *sense of efficacy total* has a positive moderate correlation with *metacognitive awareness total* ( $r=0.432$ ;  $p < 0.01$ ).

Table 3: Correlations Between Variables of Metacognitive Awareness and Sense of Efficacy

Variables	Metacognitive knowledge	Metacognitive regulation
SE_SE	0.289**	0.308**
SE_IS	0.389**	0.360**
SE_CM	0.395**	0.355**
SE Total	0.410**	0.385**

The results presented in Table 3 confirm that there is a significant correlation between the variables of metacognitive awareness and educators' sense of efficacy.

### **Conclusion**

The results of the study indicate a significant correlation between the variables of metacognitive awareness and educators' sense of efficacy. This suggests that results from individual profiles on the MAIT and TSES, could reliably inform pre-service educators about their underlying teaching assumptions, of which they may not be aware. This may, in turn, improve their teaching practices.

The study was limited to one public University in South Africa. Respondents were recruited in 2022, just after COVID-19, and classes were conducted online. The researcher used stratified purposeful sampling which was convenient for the context and times of the pandemic. The fact that data collection was carried out during online mode of delivery suggests that there is a possibility that during face-to-face teaching, responses could be different.

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