

# **A Framework for Metacognitive Awareness in Problem Solving**

**Betül Barut<sup>1</sup>, Başak Barak<sup>2</sup>**

<sup>1,2</sup>Anadolu University

## **Abstract**

Metacognition refers the awareness of one's own cognitive processes and ability to monitor, regulate and evaluate these processes. Metacognition is known as one of the important predictors of academic success in many areas such as mathematics and problem solving. Since this complex phenomenon is very important in education, researchers have developed some models to explain and understand it. One of the models for metacognition is developed by Schraw and Dennison (1994). According to their model metacognition has two main components; knowledge of cognition (three subcomponents) and regulation of cognition (five subcomponents). The aim of this study is to developed a framework for metacognitive awareness in the context of mathematical problem solving by using Schraw and Dennison's (1994) *Metacognitive Awareness Inventory (MAI)*. In the study data were collected through think aloud technique and written self-reports from 20 preservice mathematics teachers. Firstly, three of the participants were asked to solve two different non-routine problems by using think aloud procedure. After that all the participants were asked to solve a different non-routine problem and then write all their actions they conducted and thoughts they had during solving the problem. The data were analyzed by the researchers based on the subcomponents of the MAI which was originally developed metacognitive awareness for one's general learning actions. The analyses yielded a framework for metacognitive awareness in mathematical problem solving with definitions and actions for each subcomponent of metacognition.

**Keywords:** knowledge of cognition, mathematics education, metacognition, preservice mathematics teachers, regulation of cognition

\*\*\* This study was supported by Anadolu University Commission of Scientific Research Projects (Project Number: SBA-2023-82).