



# Improving Students' Metacognitive Progress In Higher Education: A Research Done In The Classroom. Examining The Discrepancy Between The Theory And Practice Of Metacognition In Higher Education To Encourage Thinking About Thinking.

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## Abstract

Academic achievement is correlated with metacognition, which is the understanding and control of cognition, at all educational levels, including postsecondary education. According to a study, there is a big difference between theory and research on metacognition, and teaching practice incorporates metacognition very little. According to a survey of 72 academics, 37.5% were aware of metacognition, however they frequently placed more emphasis on cognition than control. The majority of respondents used metacognitive supporting practices (MSPs) later in their careers, but all of them included at least two MSPs in their instruction. Additionally, the study discovered that by engaging in peer-to-peer collaborative translation activities, university students developed metacognitive knowledge, strengthening their analytical reasoning and linguistic awareness.

**Keywords:** Academic achievement, Metacognition, Collaborative activities.

## Introduction:

This essay explores the difficulties educators have while delivering metacognitive training in the context of English language learning. Rigid curriculums and a lack of professional expertise make it difficult for teachers to plan and carry out metacognitive exercises. Students frequently lack experience with metacognitive training and may think it is a waste of time in educational systems such as those found in India and China. Teachers must investigate the best

ways to use metacognitive training in the classroom to change students' learning attitudes and encourage metacognitive participation.

The application of collaborative translation activities with a metacognitive focus in a general English course at a Chinese institution is described in the study. The significance of metacognition in English language education is emphasised because it replaces the conventional paradigm of language instruction, which emphasises rote learning and drilling practice, with one that is task-based and student-centred. The study looks at how students felt about and participated in a group translation exercise that was centred on their metacognitive learning, emphasising the advantages and difficulties they saw. Metacognition is the awareness and monitoring of cognitive and learning processes. A few studies have found a weak positive correlation between academic success in elementary, secondary, and university education and metacognitive abilities. Nevertheless, there is a paucity of research on instructors' pedagogical competence in teaching metacognition, with only five papers examining this topic. Investigating whether the theory-practice gap in metacognition extends to academics' teaching practices in higher education is the goal of this study.

### **Background theory: comprehending metacognition.**

Metacognition has two fundamental components: metacognitive knowledge and metacognitive strategies. Metacognition is the capacity to reason, comprehend, and regulate learning. The active monitoring and control of cognitive processes encompassing the three aspects of person, task, and strategy is known as metacognitive knowledge. According to Flavell (1979), metacognition is the understanding of variables or circumstances that influence the direction and result of cognitive endeavours. Three distinct types of metacognitive knowledge were later defined by Jacobs and Paris (1987): declarative, procedural, and conditional knowledge.

The control of thought regarding an activity's goal is referred to as metacognitive regulation or metacognitive abilities. This control, which goes by the names planning, monitoring, and evaluation, might take place before, during, or following the activity. Because metacognitive control consists of active processes rather than knowledge possession, it is also referred to as talent. Later, Flavell added "metacognitive experience," or the emotive experience connected to cognitive activity, to the definitions of metacognition that were cognition-focused. Self-regulation, or making objectives and seeing them through, and metacognition intersect with this emotive experience. In the framework of learning, self-regulation includes emotion, motivation, metacognition, and cognition. The definition of metacognition is the understanding and management of one's cognitive system; nevertheless, metacognitive experiences are frequently overlooked in favour of knowledge and control of cognition.

### **Assisting students in HE in developing their metacognition:**

Numerous studies have examined the impact of different interventions on students' academic outcomes and metacognition in higher education. According to Zohar and Barzilai (2013), the majority of these studies are observational, while a small percentage use experimental or quasi-experimental method with controls and pre- and post-measures. While acknowledging the limitations caused by variations in scientific rigour and the small effect sizes typically reported, these studies have documented improvements in students' metacognition linked to teaching strategies; we refer to these teaching strategies as "metacognitive supportive practices" (MSPs). To compile a variety of teaching techniques that support students in thinking critically about and during their undergraduate courses, we examined original research, reviews, and opinion pieces. Additionally, we looked up research on "metacognition" in

"higher education" from 2000 to the present. After excluding tactics that could not be used in a single lecture (such as flipped learning, problem-based curriculum, and IT-dependent interventions) or those that were limited to non-instructional contexts (like coaching), sixteen MSPs were found. A thematic analysis-like technique was then used to further break them into five groups (Table 1; Braun and Clarke, 2006).

Within the first category of MSPs, or metacognition-focused learning techniques, students are expected to declare what they know and comprehend about the subject matter. It has been demonstrated that this method improves learning thereafter, especially for medical students. For instance, first-year physics students' awareness of their learning process and the importance of conceptual knowledge was enhanced when they were asked to explain their understanding while completing problems.

The examination of discipline material, frequently in a social setting, is the emphasis of the second type of discipline-focused MSPs. In quasi-experimental research in college-level chemistry, it was demonstrated that using the predict-observe-explain paradigm of scientific inquiry improved students' academic achievement. Students were later able to answer more difficult issues through group collaboration, albeit the impact magnitude was marginal. A bank of more than 300 geoscience concepts was created by McConnell et al. (2006). Students were asked a question, had a peer debate, and were then polled again. Despite not being assessed under rigorous experimental circumstances, they reported several benefits linked to the use of the Concept Test, such as improved student learning.

Metacognitive regulation is covered by two MSP categories: assessment and monitoring. In a college-level molecular biology course, Trujillo et al. (2012) employed prompts to question students' presumptions and their consequences, which reduced the number of reasoning mistakes. Using a mnemonic to aid in clinical decision-making, Chew et al. (2016) saw a substantial increase in grades compared to the control group. Evaluation was the main emphasis of the second group of MSPs that dealt with metacognitive control. Colthorpe et al. (2018) encouraged biomedical sciences students to analyse their goal-achieving and study and evaluation practices through the use of meta-learning questions. According to their quasi-experimental study, students' test scores increased by three percentage points in a statistically meaningful way, and their study habits changed, mostly for lower-performing students. The final MSP made use of strategic thinking expertise by classifying test questions and issues into Bloom's Taxonomy utilising resources like Bloom's-based Learning Activities for Students. According to Crowe and colleagues, this instrument improved the study abilities and metacognitive development of college students. Nevertheless, no research, regardless of educational level, has assessed the widespread application of such tactics related to metacognition in instructional methods.

### **The current investigation:**

According to the research reviewed above, HE is a setting where undergraduate students are expected to be accountable for their education. The small but positive correlations between academic success and metacognitive ability, as well as the findings of intervention studies suggesting that instruction incorporated into, HE teaching can enhance metacognitive ability, suggest that it is advantageous for students to be metacognitive in this setting. Despite the dearth of studies in this field, metacognition research conducted in elementary and secondary schools indicates that teachers in these settings are often ignorant of metacognition (Zohar & Barzilai, 2013). This study was the first to look at the theory-practice divide in higher education. In particular, the following were the research questions:

- How much do academics in higher education know about metacognition?
- How much do academics in higher education include metacognition in their instruction?

- Why do academics in higher education implicitly endorse metacognition in their instruction?

## Methods & Participants:

The research was carried out at a university in Calicut, Kerala, a state in India. 136 academics were invited to participate; 77 of them responded, representing a 56.7% response rate. Only the data from the 72 respondents who finished all parts were examined (Table 2). Ethical permission was obtained from the relevant review boards at both authors' institutions before data collection. Before both trial stages, subjects gave their informed permission.

### Online survey:

To assess the degree to which undergraduate instruction incorporates metacognition implicitly, a new online survey was developed. The usage and knowledge of sixteen metacognition-related skills (MSPs) were rated by the participants. A predetermined answer option was included in the questionnaire to gauge their awareness of metacognition. 'Yes' or 'vaguely' respondents were asked to explain in free writing what they understood by metacognition. The Research Core survey tools from Qualtrics were used to conduct the questionnaire, which took less than 11 minutes to complete. The purpose of the study was to comprehend how metacognition functions in actual teaching.

### Interviews:

Thirty-six out of seventy-two questionnaire respondents said they would be prepared to take part in a follow-up interview. Five were chosen on purpose to reflect a range of responders, and all five consented to an interview (Table 2). To acquire a more profound understanding of the perspectives of academics on the enhancement of students' metacognition and thinking abilities, semi-structured interviews were performed. The interview schedule was influenced by Zohar's (2006) study on the acquisition of meta-strategic information by instructors. The audio recordings of the 40–55-minute interviews were later transcribed and verified for correctness.

### Analysis:

The number and frequency of MSPs used in teaching practice were recorded for each responder by creating an "MSP score," which was determined by adding the frequency of usage for each of the 16 approaches, ranging from zero (meaning "never") to three (meaning "often"). The utilisation of the various MSP types—such as "metacognitive monitoring" or "declarative knowledge and understanding of the discipline"—was assessed using "MSP type" scores (see Table 1). The frequency of usage of MSPs within each type, ranging from zero ('never') to three ('frequently'), was added up for each responder, and the resulting "MSP type" score was divided by the total number of MSPs within each type. With SPSS, quantitative data analysis was done (version 25). Thematic analysis was used to examine the interview transcripts (Braun & Clarke, 2006). After developing and organising data-driven codes into themes, NVivo 12 (QSR International Pty Ltd) transcripts were coded to find elements associated with the study questions. Coded items were examined in light of the quantitative findings, and extracts that either provided more information or an understanding of the quantitative data were identified.

**Conclusion:**

The purpose of the study was to ascertain the level of metacognition awareness among academics in higher education (HE). The majority of participants (37.5%) stated that they had heard of metacognition, however most of them were just hazily familiar with it (16/27, 59.3%). Compared to professors in other fields, psychologists were more likely to have heard of metacognition, and female respondents were more likely than male respondents to have done so. There was no discernible difference in awareness between teaching experience and credentials.

Understanding one's thought processes is the most widely accepted definition of metacognition, and it is consistent with declarative, procedural, and conditional knowledge of cognition. Awareness of one's thoughts, which can be related to either knowledge or cognitive control, was the second most popular definition. "Thinking about thinking" was a ubiquitous definition. These results imply that academics had a rudimentary understanding of metacognition, but their focus on self-awareness rather than cognitive control points to a limited understanding of the concept.

To determine the degree to which students' metacognitive abilities were implicitly supported by methods employed in regular classroom instruction, survey participants indicated how frequently they employed each of the 16 Metacognition Supporting Tools (MSPs). In their teaching practice, all respondents reported they utilised at least two MSPs, and 10.9% said they used all 16 approaches. A 'MSP score' was employed to record the quantity and regularity of MSPs utilised in instruction. By gender or discipline, there were no appreciable differences in the total number of MSPs or the MSP score. Participants who had heard about metacognition had a considerably higher MSP score than those who had not, but not a significantly higher total number of MSPs.

**Discussion:**

The study reveals a significant theory-practice gap in higher education (HE) regarding metacognition, with most academics not familiar with it or using it in their instruction. Around one-third of the surveyed academics had heard of metacognition but knew very little about it. Definitions of metacognition by academics tend to emphasize knowledge over control of cognition, more aligning with the popular understanding of metacognition as "thinking about thinking." This gap is evident in the implicit use of metacognition-supporting practices (MSPs) in teaching practices.

The study found that academics from all scientific fields implicitly employed MSPs in their instruction, promoting students' knowledge and comprehension of the topic by highlighting previous knowledge. However, there was insufficient scaffolding to allow students to acquire transferable abilities to different learning contexts. Expert-delivered educational interventions have shown more effectiveness than non-expert-delivered ones in terms of teaching interventions, particularly metacognition treatments. Research in higher education has also revealed some marginal benefits of general pedagogical preparation for instruction, particularly for novice instructors. The lack of knowledge and use of metacognition in teaching practice in HE is indicative of a theory-practice gap in metacognition. Thought abilities were appreciated by all interviewees, albeit in the context of helping students become scientists rather than metacognitive, autonomous learners. This highlights the need for educational institutions to provide students with the tools necessary to understand how to learn and discipline-specific abilities to improve their capacity for lifelong learning. Academics with teaching qualifications or pursuing one reported considerably higher overall usage of MSPs, even though they were not essential to HE teaching qualifications. More research is needed to determine the specifics of this link. The study's primary contribution is the data it offers that

staff development and training in general teaching methods may be more effective in promoting students' metacognitive growth.

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