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Original Paper

Empirical Analysis of Teacher Behaviors Impact on Students' Metacognitive Strategy Selection in Higher Education

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Abstract

This study conducts an empirical evaluation of how teacher behaviors impact on students' metacognitive strategy selection in higher education. It defines metacognitive strategies and investigates the impact of different teaching behaviors on their application by students. Utilizing quantitative and qualitative methods, such as surveys and interviews, the research identifies a notable correlation between teacher practices and student use of metacognitive strategies. The findings provide key insights into pedagogical processes and suggest actionable strategies for educational practice and policy development.

Keywords

higher education, teacher behavior, metacognitive strategies, empirical analysis

1. Introduction

In higher education, educators' behavior significantly influences students' learning pathways, affecting both knowledge transmission and the shaping of cognitive and strategic approaches in learning environments. This impact is notably evident in the development of metacognitive strategies, essential for students' academic success and largely shaped by teacher conduct.

Educational psychology advancements have led to a heightened focus on the link between educator behaviors and student outcomes, particularly in the context of metacognitive strategy selection. Metacognitive strategies, vital for planning, monitoring, and evaluating learning, are crucial for students managing their education independently, a key distinction from compulsory education.

Metacognitive knowledge involves understanding cognitive processes, strategies, and self-assessment capabilities, while metacognitive skills entail the ability to monitor, regulate, and adjust cognitive activities during learning, including goal-setting, strategy planning, and post-learning reflection.

The evolving higher education landscape, enriched by diverse pedagogical methods and technological integration, necessitates examining the influence of educator behavior on student learning strategies. This study seeks to investigate this relationship in higher education, aiming to categorize educator behavior patterns, assess their impact on students' metacognitive strategy choices, explore student responses to these behaviors, and ultimately propose recommendations for enhancing teaching practices and policy development to support metacognitive skill advancement.

2. Methodology

2.1 Research Design

This study employs a mixed-methods approach, integrating both quantitative and qualitative research methodologies, to thoroughly examine the relationship between teacher behavior and student selection of metacognitive strategies in higher education. The investigation commences with a questionnaire-based data collection to quantify the correlation between teacher behaviors and students' choice of metacognitive strategies. This is followed by in-depth interviews and case studies to provide a deeper interpretive layer to the survey findings.

2.2 Data Collection

2.2.1 Questionnaire Development

The survey questionnaire is designed based on theories related to metacognitive strategies. It includes queries about teachers' teaching styles, interaction methods, feedback, and assessment, aiming to infer potential issues in teacher practices and to determine their impact. The drafted questions include:

A. For students:

S1. I am adept at creating specific learning plans.

S2. I understand the overall course outline and plan.

S3. I am aware of my learning level.

S4. I preview the material before class.

S5. I conduct self-assessment after class.

S6. I am skilled at analyzing problems and assessing tests.

S7. I can compensate for issues independently.

B. For teachers:

T1. I inform students of the specific learning plan for the semester.

T2. I explain the course outline and plan at the beginning of the term.

T3. I tailor teaching according to students' learning levels.

T4. I check and provide feedback on students' preparatory work.

T5. I assign homework after classes.

T6. I provide feedback on students' assignments.

T7. I guide students in analyzing test papers.

T8. I assist students in self-study.

Each question is rated on a scale of 1 to 5, where 1 indicates strong disagreement and 5 indicates strong agreement with the described situation. The higher the score, the greater the degree of agreement.

2.2.2 Survey Implementation

A sample of some students and teachers from three higher education institutions is selected to complete the survey, gathering data on their perception of teacher behavior and their own use of metacognitive strategies. Interviews and observations are conducted to collect feedback on the behavior of students and teachers. The interviews focus on specific teaching behaviors of teachers, students' responses to these behaviors, and how these factors influence their choice of metacognitive strategies.

2.2.3 Analysis Method

Statistical analysis software is utilized for data processing. The primary analytical methods include descriptive statistics, correlation analysis, and regression analysis to determine the degree and direction of association between teacher behavior and student metacognitive strategy selection. Interview recordings are transcribed, and through a coding process, key themes and patterns are identified to deepen the understanding of the quantitative results.

3. Results

This study gathered questionnaire data from 70 students across three universities, along with corresponding data from 30 teachers at each institution. The student sample exhibited an equal gender ratio of 1:1, with ages ranging from 18 to 22 years, and included diverse academic majors. The teacher sample encompassed a variety of teaching tenures and styles. The questionnaire results indicated a broad spectrum of student perceptions regarding teacher behavior, reflecting the diversity of teaching methods.

Table 1. Students' Self-Assessment of Their Own Behavior

University	S1	S2	S3	S4	S5	S6	S7	S8
A	1.3	2	2.36	2.08	2.08	1.32	1.16	1.48
B	3.2	2.9	2.76	3.5	3.2	3.12	3.04	2.96
C	1.9	2.35	2.55	2.45	2.3	1.95	2.15	2.55

Table 2. Teachers' Self-Assessment of Their Own Behavior

University	T1	T2	T3	T4	T5	T6	T7	T8
A	1.4	2.3	3.1	2.5	2.8	1.6	1.3	1.6
B	3.34	3.1	3.33	3.7	3.42	3.21	3.1	3.17
C	1.6	2	2.2	2.4	2.1	1.9	2.2	2.6

Converting the above statistical results into line graphs, a clear positive correlation between student behavior and teacher behavior is evident.

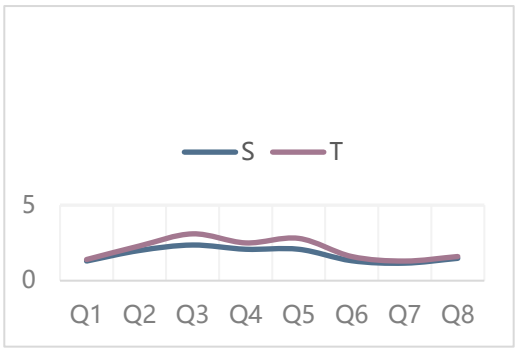

Figure 1. Correlation Graph of Teacher Behavior and Student Behavior in University A

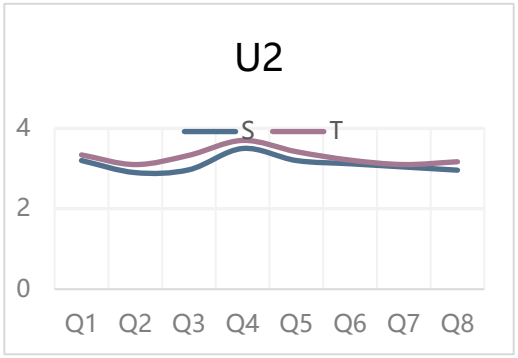

Figure 2. Correlation Graph of Teacher Behavior and Student Behavior in University B

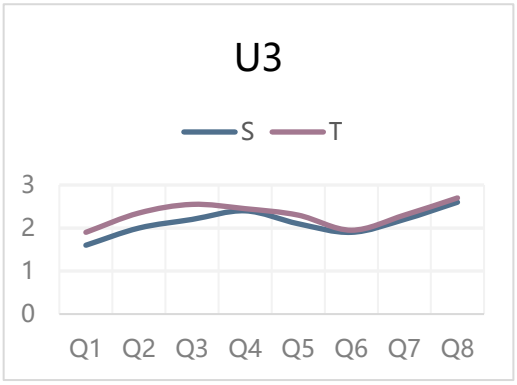

Figure 3. Correlation Graph of Teacher Behavior and Student Behavior in University C

By calculating the average conformity values of students and teachers across the three institutions, the following table was derived:

Table 3. Average Conformity Values of Student Behavior and Teacher Behavior

(UA/B/C: University, $\overline{S}$: Student Average, $\overline{T}$: Teachers Average)

	$\overline{S}$	$\overline{T}$
UA	1.72	2.08
UB	3.09	3.3
UC	2.13	2.31

The questionnaire's positive phrasing implies that higher scores reflect more engaged teacher behavior and a more active employment of metacognitive strategies by students, while lower scores point to a tendency towards passive learning and less frequent use of these strategies.

Interviews with students revealed a common perception: supportive and motivational feedback from teachers is crucial for effectively planning and revising their learning approaches. Notably, 67% of students acknowledged that specific feedback and guidance from teachers significantly aided in pinpointing their learning challenges and enhancing their overall learning process. The study also uncovered distinct variations in how students from different academic disciplines responded to teacher behavior. Science students, for instance, leaned towards structured and straightforward guidance, whereas arts students were more drawn to open-ended dialogues and self-directed exploration. A deeper cross-analysis showed that both the academic level and background of students play roles in shaping their views of teacher behavior and their choices in metacognitive strategies. Senior students, for example, tended to adopt more sophisticated metacognitive strategies, especially those who had been exposed to teaching styles emphasizing critical thinking.

4. Discussion

4.1 Challenges to Educational Theory

The survey demonstrates a significant correlation between teacher behavior and students' use of metacognitive strategies. Specifically, when teachers detail the semester's learning plans, students often engage in metacognitive planning, involving strategy development based on curriculum goals and cognitive tactics such as problem-solving and monitoring. Additionally, teacher feedback on preparatory work leads students to adopt metacognitive regulation strategies, while regular homework and feedback enhance their metacognitive monitoring and evaluation, prompting strategy refinement. Conversely, student adjustments in metacognitive strategies improve learning outcomes and boost teachers' sense of efficacy, promoting pedagogical enhancement.

Contrary to prevailing educational research that often blames student behaviors for learning difficulties, this study posits that these behaviors are influenced by teacher actions and the students' choice of metacognitive strategies. It suggests that issues in students' metacognitive strategies may stem from instructional errors by teachers.

Furthermore, the findings align with constructivist theories, highlighting the active role of learners in creating meaning and understanding through their knowledge, experiences, and social interactions.

4.2 Implications for Educational Practice

Our research underscores a crucial connection between enhancing students' metacognitive strategy development and refining teaching practices. To this end, we offer targeted recommendations for improving higher education:

a. Encourage educators to embrace interactive teaching approaches and integrate course elements that foster metacognitive skills.
b. Foster active learning by promoting student engagement in class discussions and group cooperative learning, which aids in peer knowledge exchange and critical thinking.
c. Utilize case studies and problem-solving techniques to bridge theoretical knowledge with practical application.
d. Instruct students in setting clear learning objectives, crafting strategic learning plans, and tracking their academic progress.
e. Embed reflective practices and self-evaluation within the curriculum to enable students to critically assess their learning approaches and outcomes.
f. Provide constructive feedback to assist students in recognizing cognitive biases and understanding challenges.
g. Utilize advanced technological resources, such as online platforms and educational tools, incorporating simulations and virtual reality to enrich the learning experience.
h. Motivate teachers to participate in professional development through workshops and training sessions, focusing on innovative teaching methodologies.
i. Advocate for peer review and classroom observation as means for collaborative learning and feedback exchange among educators.
j. Encourage students to draw connections across various disciplines, thus cultivating comprehensive and integrative thinking.
k. Design interdisciplinary projects that challenge students to apply multifaceted knowledge in addressing complex issues.
l. Urge educational policymakers to integrate training in metacognitive teaching strategies into teacher education programs and to include metacognitive skill development in course evaluation standards.

5. Conclusion and Recommendations

This study highlights the crucial link between teacher behavior and the selection of metacognitive strategies by students in higher education. Emphasizing a student-centered approach, it delves into how teachers' actions can influence students' metacognitive strategy choices, thereby underscoring the significant effect of teaching practices on learning strategies. The research aligns with constructivist

theories, championing the role of active student engagement and socio-cultural dynamics in learning. It outlines practical implications for teaching, such as embracing interactive methods, fostering active classroom participation, incorporating reflective and evaluative elements into curricula, leveraging advanced technology for enhanced learning experiences, and encouraging interdisciplinary thought. The paper concludes that effective teaching not only bolsters students' metacognitive skills but also contributes to the professional growth and effectiveness of educators.

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