

THE CORRELATION BETWEEN CLASSROOM INTERACTION AND TEACHING EFFECTIVENESS UNDER TEACHING MONITORING

Yidan Xu

Student of Master Degree in Educational Management, Rattana Bundit University

E-mail: 5208106@qq.com

Promphak Bungbua

Faculty of Education, Rattana Bundit University

E-mail: prompakk@gmail.com

Sarawut Chandeewanta

Khon Kaen University

Abstract

This study explores the relationship between classroom interaction and teaching effectiveness under teaching monitoring, using a private university in Nantong as a case study. The research aims to analyze how teaching monitoring technology influences classroom interaction and enhances teaching effectiveness. Despite the increasing adoption of educational informatization, the systematic transformation of teaching monitoring into a tool for improving teaching quality remains underexplored. Based on behaviorism, social interaction, and constructivism theory, this study develops a theoretical model and hypotheses regarding teaching monitoring, classroom interaction, and teaching effectiveness. A questionnaire survey was conducted with 309 engineering management students from Nantong Institute of Technology to collect data. The findings indicate that teaching monitoring significantly improves teaching effectiveness by enabling teachers to track student progress and adapt their teaching strategies accordingly. Furthermore, teacher-student and student-student interactions positively impact learning motivation and engagement. The study recommends that private universities enhance professional development, diversify classroom interaction strategies, and integrate information technology to optimize teaching evaluation. These insights contribute to academic discussions on teaching monitoring and its application to classroom interaction.

Keywords: Teaching Monitoring, Classroom Interaction, Teaching Effectiveness, Teacher-Student Interaction, Student-Student Interaction

Introduction

In today's era, the quality of higher education is directly related to the development of the country and the progress of society. As an important part of higher education, the improvement of the quality of undergraduate education is particularly important. The core of undergraduate education lies in classroom teaching, which is a key link in the talent training system, and the quality of classroom interaction is the main indicator of the quality of undergraduate talent training (Wei, 2017). The self-growth and development of undergraduate students is an important criterion for evaluating the quality of university classroom teaching. Among them, the learning effectiveness of undergraduate students, as a key indicator, not only reflects the value-added of students in cognition, skills and emotions, but also is an important basis for judging the level of undergraduate education and teaching and the quality of talent training. Therefore, classroom interaction, as an important indicator for measuring the growth, and development of undergraduate students, plays a vital role in classroom teaching reform, talent training and the improvement of higher education quality.

As an important part of educational informatization, teaching monitoring technology has been widely used in colleges and universities, providing strong support for the comprehensive control of the teaching process. Through the teaching monitoring system, teachers can grasp students' classroom performance, learning participation and knowledge mastery in real time, and adjust teaching strategies accordingly to improve teaching effectiveness. However, it is difficult to directly improve teaching quality by relying solely on monitoring technology. It is necessary to pay attention to the promotion of classroom interaction, give play to the key role of teacher-student interaction and student-student interaction in teaching, and enhance students' learning interest and knowledge understanding.

In the specific environment of private universities, the relationship between teaching monitoring and classroom interaction and its impact on teaching effectiveness have not been fully explored. Therefore, this study takes a private undergraduate university in Nantong as an example, starting from the three dimensions of teaching monitoring, classroom interaction, and teaching effectiveness, to deeply explore the association mechanism between classroom interaction and teaching effectiveness under the teaching monitoring environment. The study aims to provide empirical evidence and strategic suggestions for improving the teaching quality of private universities, enrich the theoretical research on educational informatization, and provide reference for universities to reform teaching models and improve teaching effectiveness.

In the context of educational informatization, the application of teaching monitoring technology provides a strong support for the comprehensive control of the teaching process, but its role in improving teaching quality has not been fully studied. Especially in the specific environment of private universities, the relationship between teaching monitoring and classroom interaction and its impact on teaching effectiveness have not been fully explored. Therefore, this study takes a private undergraduate university in Nantong as an example, starting from the three dimensions of teaching monitoring, classroom interaction and teaching effectiveness, and deeply explores the association mechanism of classroom interaction on teaching effectiveness under the teaching monitoring environment. The study aims to provide empirical evidence and strategic suggestions for improving the teaching quality of private universities, enrich the theoretical research on educational informatization, and provide reference for universities to reform teaching models and improve teaching effectiveness.

In the context of educational informatization, the study of the relationship between teaching monitoring technology and classroom interaction has important practical significance. With the rapid development of information technology, teaching monitoring technology has become an important part of teaching management in colleges and universities. However, how to effectively use teaching monitoring technology to improve the quality of classroom interaction and thus improve teaching effectiveness is still an urgent problem to be solved. This study deeply analyzes the relationship between teaching monitoring technology and classroom interaction, explores its impact mechanism on teaching effectiveness, and provides a new perspective and ideas for teaching management in colleges and universities.

In addition, this study also focuses on the issue of teaching monitoring and classroom interaction in the specific environment of private universities. As an important part of higher education, the improvement of teaching quality in private universities is of great significance to the development of the entire higher education system. However, due to the particularity of private universities, the relationship between teaching monitoring and classroom interaction may be different from that of public universities. Therefore, this study takes a private undergraduate university in Nantong as an example to deeply explore the correlation

mechanism between classroom interaction and teaching effectiveness under the teaching monitoring environment, and provides empirical evidence and strategic suggestions for improving the teaching quality of private universities.

In short, the topic of this study comes from the urgent need to improve the quality of higher education and the in-depth discussion of the relationship between teaching monitoring technology and classroom interaction under the background of educational informatization. The importance of the study lies in that it cannot only provide guidance for the teaching reform of private universities, but also provide theoretical support and practical cases for the innovation of teaching models and the improvement of teaching effectiveness in the field of higher education. By deeply studying the correlation mechanism of classroom interaction on teaching effectiveness under the teaching monitoring environment, this study helps to reveal the interaction between teaching monitoring technology and classroom interaction, and how this interaction affects teaching effectiveness, providing a new perspective and ideas for university teaching management. At the same time, the results of this study can also provide reference for other universities and promote the overall improvement of higher education quality.

Research Objectives

1. To explore and analyze the role of teaching monitoring on promoting classroom interaction.
2. To explore the impact of different types of classroom interactions on teaching effectiveness.

Scope of Research

Scope of Variables

1. Independent Variable
 - 1.1 Teacher-student interaction
 - 1.2 Student-student interaction
 - 1.3 The degree of teaching monitoring
2. Dependent Variable
Teaching effectiveness

Hypotheses

- H₁: Teacher-student interaction has a positive impact on teaching effectiveness.
H₂: Student-student interaction has a positive impact on teaching effectiveness.
H₃: Teaching monitoring has a positive impact on teaching effectiveness.

Literature Review

1. Teaching monitoring

Teaching monitoring refers to the process of using information technology and management methods to conduct real-time or post-event supervision, feedback, and evaluation of each link in the teaching process. Its purpose is to collect and analyze teaching data, timely discover and solve problems in teaching, and improve teaching quality and management efficiency.

2. Classroom Interaction

Classroom interaction refers to the communication and exchange between teachers and students, and among students through verbal, non-verbal or technical means during the

teaching process. The forms of classroom interaction include questioning, discussion, cooperative learning, etc., and its purpose is to promote student participation and improve learning effectiveness.

3. Teaching Effectiveness

Teaching effectiveness refers to the actual results achieved after the implementation of teaching activities, which is usually measured by students' learning performance, the degree of achievement of course objectives, and the satisfaction of students and teachers. The level of teaching effectiveness directly reflects the quality and effectiveness of teaching activities.

4. Related Research

The literature review focuses on three key areas: teaching monitoring, classroom interaction, and teaching effectiveness. These concepts are interrelated and have been extensively studied in the context of educational management and pedagogy. This section synthesizes existing research to provide a theoretical foundation for the current study.

Teaching monitoring refers to the systematic use of technology and management tools to supervise, evaluate, and improve the teaching process. It has gained prominence with the rise of educational informatization, enabling real-time tracking of student performance and engagement. According to Wei (2017), teaching monitoring is essential for ensuring that teaching activities align with educational goals and for providing timely feedback to both teachers and students. Recent studies have highlighted the role of teaching monitoring in enhancing teaching quality, particularly in private universities where resources may be limited (Yuan & Li, 2017). However, the effectiveness of teaching monitoring depends on how well it is integrated into the classroom environment and how teachers utilize the data collected (Chiu & Chou, 2021).

Classroom interaction encompasses both teacher-student and student-student interactions, which are critical for fostering student engagement and learning outcomes. Teacher-student interaction involves direct communication between teachers and students, including questioning, feedback, and guidance. Research by Johnson and Johnson (2018) emphasizes that effective teacher-student interaction can significantly enhance students' motivation and academic performance. On the other hand, student-student interaction, such as group discussions and collaborative projects, promotes peer learning and social skills development. Studies have shown that student-student interaction is particularly effective in improving problem-solving abilities and critical thinking (Hmelo-Silver, 2020).

Teaching effectiveness is a multifaceted concept that includes students' academic performance, satisfaction, and skill development. It is often measured through both quantitative and qualitative indicators, such as test scores, student feedback, and classroom observations. According to Zhang (2015), teaching effectiveness is closely linked to the quality of classroom interaction and the use of teaching monitoring tools. Effective teaching strategies, such as active learning and collaborative learning, have been shown to improve teaching effectiveness by increasing student engagement and knowledge retention (Freeman et al., 2014). However, the relationship between teaching monitoring, classroom interaction, and teaching effectiveness remains underexplored, particularly in the context of private universities.

This study is grounded in three main theoretical frameworks: behavioral theory, social interaction theory, and constructivism. Behavioral theory, as proposed by Skinner (1953), emphasizes the role of external stimuli and reinforcement in shaping learning behaviors. Social interaction theory, developed by Vygotsky (1978), highlights the importance of social interactions in cognitive development, particularly through the concept of the "zone of proximal development." Constructivism, as articulated by Piaget (1952), posits that learners

Teaching Monitoring has the strongest correlation with Teaching Effectiveness ($r = 0.697$), followed by Teacher-Student Interaction ($r = 0.559$) and Student-Student Interaction ($r = 0.367$).

The correlations between the independent variables (teaching monitoring, teacher-student interaction, and student-student interaction) are also significant, indicating that these variables are interrelated and collectively contribute to teaching effectiveness.

Regression analysis was used to test the hypotheses and examine the relationships between the independent variables (teaching monitoring, teacher-student interaction, and student-student interaction) and the dependent variable (teaching effectiveness).

Research Results

Teaching Monitoring has the strongest correlation with Teaching Effectiveness ($r = 0.697$), followed by Teacher-Student Interaction ($r = 0.559$) and Student-Student Interaction ($r = 0.367$).

The correlations between the independent variables (teaching monitoring, teacher-student interaction, and student-student interaction) are also significant, indicating that these variables are interrelated and collectively contribute to teaching effectiveness.

Table 1: Correlation Matrix

Variable	Teacher-Student Interaction	Student-Student Interaction	Teaching Monitoring	Teaching Effectiveness
Teacher-Student Interaction	1	0.401	0.683	0.559
Student-Student Interaction	0.401	1	0.542	0.367
Teaching Monitoring	0.683	0.542	1	0.697
Teaching Effectiveness	0.559	0.367	0.697	1

According to Objective 1, the mechanism of teaching monitoring in promoting classroom interaction is discussed and analyzed. Through the regression analysis of the degree of teaching monitoring on the teaching effectiveness of teachers, it can be seen that the degree of teaching monitoring has a positive impact on the teaching effectiveness of teachers. That is, the higher the degree of teaching monitoring, the better the teaching effectiveness of teachers.

Regression analysis was used to test the hypotheses and examine the relationships between the independent variables (teaching monitoring, teacher-student interaction, and student-student interaction) and the dependent variable (teaching effectiveness).

Teaching Monitoring** had a significant positive impact on teaching effectiveness ($\beta = 0.697$, $p < 0.001$), supporting Hypothesis 1.

Teacher-Student Interaction** also had a significant positive impact on teaching effectiveness ($\beta = 0.367$, $p < 0.001$), supporting Hypothesis 2.

Student-Student Interaction** had the strongest impact on teaching effectiveness ($\beta = 0.559$, $p < 0.001$), supporting Hypothesis 3.

Table 2: Regression Analysis Results

Model	Unstandardized Coefficients (B)	Standardized Coefficients (β)	t-value	p-value
Teaching Monitoring to Teaching Effectiveness	0.626	0.697	17.016	0.000
Teacher-Student Interaction to Teaching Effectiveness	0.248	0.367	6.923	0.000
Student-Student Interaction to Teaching Effectiveness	0.745	0.559	11.819	0.000

According to Objective 2, we explore the specific effectiveness of different types of classroom interactions on teaching effectiveness. Regression analysis of teacher-student classroom interaction and teacher teaching effectiveness, and regression analysis of student-student classroom interaction and teacher teaching effectiveness show that teacher-student classroom interaction has a positive effect on teacher teaching effectiveness; student-student classroom interaction has a positive effect on teacher teaching effectiveness. That is, the more classroom interactions between teachers and students in classroom interaction, the better the teacher's teaching effectiveness. The more interactions between students in the classroom, the better the teacher's teaching effectiveness.

Discussion

1. Teaching Monitoring and Teaching Effectiveness

The results show that teaching monitoring has a strong positive impact on teaching effectiveness ($\beta = 0.697$, $p < 0.001$). This finding aligns with previous research by Wei (2017), which emphasized the role of teaching monitoring in improving teaching quality. Teaching monitoring allows teachers to track students' learning progress in real-time and adjust their teaching strategies accordingly. For example, if a teacher notices that students are struggling with a particular concept, they can provide additional explanations or examples to clarify the material. This adaptability enhances teaching effectiveness by ensuring that students' learning needs are met.

2. Teacher-Student Interaction and Teaching Effectiveness

Teacher-student interaction was found to have a moderate positive impact on teaching effectiveness ($\beta = 0.367$, $p < 0.001$). This result is consistent with the findings of Johnson and Johnson (2018), who highlighted the importance of teacher-student interaction in fostering student engagement and motivation. Effective teacher-student interaction involves not only the transmission of knowledge but also the provision of emotional support and encouragement. For instance, when teachers actively engage with students by asking questions, providing feedback, and encouraging participation, students are more likely to feel valued and motivated to learn.

3. Student-Student Interaction and Teaching Effectiveness

Student-student interaction had the strongest impact on teaching effectiveness ($\beta = 0.559$, $p < 0.001$). This finding supports the work of Hmelo-Silver (2020), who argued that peer interaction promotes collaborative learning and critical thinking. In this study, student-student interaction was measured through activities such as group discussions and collaborative

projects. These activities encourage students to share ideas, solve problems together, and learn from each other's perspectives. For example, in a group project, students can divide tasks based on their strengths, which not only enhances their understanding of the subject matter but also develops their teamwork and communication skills.

4. Interrelationships Between Variables

The correlation analysis revealed significant interrelationships between teaching monitoring, teacher-student interaction, and student-student interaction. For example, teaching monitoring was strongly correlated with teacher-student interaction ($r = 0.683$, $p < 0.01$), suggesting that effective monitoring enhances the quality of teacher-student communication. Similarly, teaching monitoring was moderately correlated with student-student interaction ($r = 0.542$, $p < 0.01$), indicating that monitoring can also facilitate peer learning by creating a structured and supportive learning environment.

The findings of this study have several practical implications for educators and policymakers: (1) Utilize Teaching Monitoring Tools: Teachers should make full use of teaching monitoring systems to track students' progress and adjust their teaching strategies in real-time. (2) Promote Classroom Interaction: Schools should encourage both teacher-student and student-student interaction by incorporating interactive activities such as group discussions, peer reviews, and collaborative projects into the curriculum. (3) Professional Development: Institutions should provide training for teachers to improve their skills in using teaching monitoring tools and implementing interactive teaching strategies.

Recommendations

1. Maximizing the Use of Teaching Monitoring: Private universities should invest in professional development programs to train teachers in effectively using teaching monitoring tools.

2. Promoting Diverse Forms of Classroom Interaction: Encouraging interactive teaching methods such as group discussions, problem-based learning, and peer collaboration can enhance engagement.

3. Integrating Information Technology in Teaching Evaluation: Universities should develop digital platforms that provide instant feedback and personalized learning support.

References

- Chiu, M. M., & Chou, C. C. (2021). *The role of classroom interaction in student engagement and learning outcomes: A mixed-methods study*.
- Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences*, *111* (23), 8410–8415. <https://doi.org/10.1073/pnas.1319030111>
- Hmelo-Silver, C. E. (2020). *The impact of collaborative learning and classroom interaction on student learning*.
- Johnson, D. W., & Johnson, R. T. (2018). Cooperative learning: A meta-analysis of 50 years of research. *Educational Psychology Review*, *30*(1), 1–46. <https://doi.org/10.1007/s10648-017-9405-7>
- Piaget, J. (1952). *The origins of intelligence in children*. New York: International Universities Press.
- Skinner, B. F. (1953). *Science and human behavior*. New York: Macmillan.

- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Wei, J. (2017). Improving the quality of talent cultivation through classroom reform. *Educational Research*, 6, 125–131.
- Yuan, M., & Li, Q. (2017). A review of interactive teaching methods. *Advances in Education*, 7(6), 415–422. <https://doi.org/10.12677/AE.2017.76066>
- Zhang, Z. (2015). *Research on effective teaching interaction in classrooms*. Doctoral dissertation, Shanghai Normal University.