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Research on Effective Teaching Evaluation Index System of Flipped Classroom for Graduate Students

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Abstract: Based on the objectives of graduate training, flipped classroom teaching process and results-oriented education concept (OBE), this study innovatively proposed a "goal-process-outcome" integrated evaluation framework for flipped classroom teaching for graduate students. On this basis, using the interview method, Delphi questionnaire method, comprehensive evaluation method and analytic hierarchy process, a set of effective teaching evaluation index system for graduate flipped classroom is constructed, which is composed of 5 first-level indicators, 14 second-level indicators and 34 third-level indicators. This evaluation index system can help teachers objectively and comprehensively evaluate the effective teaching of flipped classroom for graduate students, improve the research level and innovation ability of graduate students, and promote the in-depth development of the concept and practice of flipped classroom for graduate students.

Keywords: Postgraduate teaching; Flipped classroom; Evaluation index system

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1. Introduction

As the key to improving the national innovation strength, graduate education undertakes the dual mission of training high-end talents and scientific and technological innovation. In this context, we should actively promote the effective teaching of flipped classroom for graduate students. The concept of flipped classroom education emphasizes the central position of students in the learning process, transforming them from passive receivers of knowledge to knowledge processing subjects, and teachers into guides and facilitators of students' knowledge construction. Therefore, vigorously promoting flipped classroom teaching for graduate students is an important starting point for graduate teaching reform and education quality improvement.

Flipped classroom will turn over and reform many aspects of traditional teaching. At present, the research on the evaluation index system of effective teaching in flipped classroom for graduate students is still in the exploratory stage, and the teaching behavior of teachers and the amount of knowledge acquired by students are still the main criteria for evaluating effective teaching. In view of the lack of current research, this paper will try to build a set of flipped classroom teaching evaluation system for graduate students to help teachers improve teaching quality and improve the research level and innovation ability of graduate students.

2. Construction of evaluation index system

Based on three points, this study constructs a "goal-process-outcome" integrated evaluation framework of flipped classroom teaching for graduate students. 1. Postgraduate teaching objectives. Different from other education stages, postgraduate teaching aims to broaden academic vision, cultivate academic purports, master cutting-edge knowledge and research methods, improve academic quality and scientific research innovation ability. 2 Flipped classroom teaching process. Flipped classroom is mainly divided into three stages: pre-class knowledge self-study and self-test, classroom knowledge internalization and exploration, and after-class knowledge consolidation and expansion. 3. Outcome-Based Education. The standard of teaching evaluation is based on whether the final learning results of students have reached the training goals set at the beginning.

Based on the above evaluation framework, through on-class lectures and interviews, and three rounds of questionnaires distributed to flipped classroom research experts, graduate supervisors and graduate students, a set of effective teaching evaluation index system of flipped classroom for graduate students is constructed, which consists of 5 first-level indicators, 14 second-level indicators and 34 third-level indicators. Expert scoring method and analytic hierarchy process are used to determine the weight of each index. The evaluation index system constructed is shown in Table 1.

Table 1. Evaluation index system of effective teaching in flipped classroom for graduate students

Primary index	Secondary index	Three-level index
A1 Course design 0.21	B1 Course objective 0.532	C1 Specific learning objectives and tasks (0.289)
		C2 Learning objectives focus on cultivating postgraduate students' spirit of research exploration and innovation (0.343)
		C3 learning objectives are valuable and challenging, reflecting the cultivation of advanced thinking and ability (0.368)
	B2 Course content 0.468	C4 Focus on core concepts and fundamental theory (0.268)
		C5 supports the research direction of graduate students (0.419)
		C6 Integration into the forefront of disciplinary development and the latest research results (0.313)
A2 Study before class 0.22	B3 Study the material before class 0.256	C7 can stimulate students' learning interest and motivation (0.315)
		C8 can support the achievement of teaching goals (0.331)
		C9 Clear knowledge points and reasonable logical structure help students establish a more complete knowledge system (0.354)
	B4 Teachers prepare before class 0.299	C10 Development of resources suitable for students' self-study before class (0.367)
		C11 Preparation of tests or tasks that can test students' knowledge mastery (0.389)
		C12 Design targeted lesson plans based on feedback data analysis (0.244)
	B5 Students study by themselves before class 0.445	C13 Complete pre-course self-study with quality and quantity on time (0.296)
		C14 Complete pre-class tests or tasks on time and meet the grade assessment requirements (0.333)
		C15 Can ask scientifically valuable questions from pre-class learning (0.371)
A3 Classroom activity 0.15	B6 Teacher classroom organization 0.419	C16 is good at stimulating students' enthusiasm for inquiry, and can guide students to think about deeper questions while answering students' questions (0.244)
		C17 Pay close attention to students' classroom discussion and project practice training process, and answer questions in time (0.238)
		C18 Reasonable summary and evaluation of students' learning outcomes and discussion results (0.265)
		C19 Help students break through the important and difficult points in classroom learning (0.253)
	B7 Student knowledge inquiry 0.581	C20 Able to solve problems raised by myself and the teacher in class (0.307)
		C21 Actively report and share their learning achievements (0.216)
		C22 can innovate based on learning content (0.262)
		C23 Completing classroom tasks through teamwork (0.215)

A4 After-school consolidation 0.17	B8 After-school tutor 0.417	C24 Learning tracking through the Learning platform (0.187)
		C25 Answering questions with media tools (0.339)
		C26 Personalized support based on students' learning (0.474)
	B9 Student after-school development 0.583	C27 Knowledge induction or method sorting of learning content (0.352)
		C28 Apply knowledge to solve problems in research projects (0.381)
		C29 assignment report is complete, comprehensive and logical, and meets the requirements of grade assessment (0.267)
A5 Learning outcome 0.25	B10 Theoretical knowledge 0.17	C30 Understand and master (interpretation, classification, reasoning) course related knowledge (0.134)
	B11 Practical ability 0.223	C31 Apply concepts, theories to solve practical problems or to new situations (0.195)
	B12 Critical thinking 0.216	C32 Critical analysis and evaluation of relevant ideas and their arguments (0.204)
	B13 Creative thinking 0.359	C33 Synthesizing different perspectives, information or experiences to form new or original ideas or ideas (0.288)
	B14 Cooperative ability 0.185	C34 Ability to know oneself, understand others, and work with others (0.179)

3. Conclusions

This research innovatively proposes a "goal-process-outcome" integrated evaluation framework for flipped classroom teaching for graduate students. On this basis, a set of evaluation index system for effective flipped classroom teaching for graduate students is constructed by means of interview, Delphi questionnaire, comprehensive evaluation and analytic hierarchy process, which can help teachers improve teaching quality and improve research level and innovation ability of graduate students.

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