An Empirical Study on the Factors Influencing the Teaching Effectiveness of Master's Degree Courses in Higher Education

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ABSTRACT

As a high-level education in the higher education system, the guarantee of the quality of education of master's students is crucial, and the quality of course teaching is the key to the quality guarantee of talent cultivation, as well as a requirement of the current education reform and development. Based on this, this study analyzes the current situation of postgraduate course teaching through empirical research and the analysis of factors influencing the teaching effect of postgraduate students. The results show that the overall satisfaction of course teaching is high, the teaching content positively and significantly influences the course teaching effect (0.48), the teaching organization form has a positive predictive effect on the course teaching effect (0.10), and the teacher-student interaction has a significant (0.49). Based on the results of the analysis, relevant suggestions were made to improve the teaching of postgraduate courses, in order to provide new ideas for the construction of postgraduate courses. There should be a space before of 12-point and after of 30-point.

Keywords: *course teaching; master's degree; teaching effectiveness.*

1. INTRODUCTION

Since the reform and opening up, China's postgraduate education has been developing steadily and has made significant achievements that have attracted worldwide attention, and has become the main way to cultivate high-level talents and the main source of mid-career strength in all walks of life [5]. Improving the quality of postgraduate training and taking the path of connotative development are the main tasks of the reform and development of postgraduate education in China in the new era, and the learning harvest of postgraduate courses is an important indicator reflecting the teaching effectiveness of postgraduate training units and the state of training quality [6].It is of great significance to carry out the investigation of the teaching effect of postgraduate courses to improve the quality of postgraduate teaching and promote the development of postgraduate education [3]. Current research on the effectiveness of curriculum teaching has focused on studies of various subjects in primary and secondary schools and undergraduate courses, with little research on the effectiveness of postgraduate courses. In addition, there is a relative lack of quantitative research in studies about postgraduate course teaching. This study investigates the current situation of postgraduate course teaching quality from the perspectives of teaching content, teaching organisation, teacher-student interaction and teaching effectiveness, explores the main factors affecting postgraduate course teaching using structural equation modelling, and provides new ideas and suggestions for improving the quality of postgraduate education teaching with empirical research.

2. RESEARCH HYPOTHESIS

Based on the extensive literature reading, this study concludes that course content, teaching organization and teacher-student interaction have a positive and significant impact on course teaching effectiveness, and therefore the following hypotheses are proposed.

H1: There is a positive and significant influence of course teaching content on course teaching effectiveness.

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H2: Teaching organization has a positive and significant influence on the teaching effectiveness of the course.

H3: teacher-student interaction has a positive and significant effect on the effectiveness of course teaching.

3. DATA SOURCES AND STUDY DESIGN

3.1. Research tools

Based on the literature review, this study designs an evaluation index for the teaching quality of postgraduate courses. The evaluation scale includes teaching content (8 question items), teaching organisation (7 question items), teacher-student interaction (4 question items) and teaching effectiveness (4 question items) to investigate the teaching quality of postgraduate courses, including the basic information of the survey respondents with a total of 27 question items. All response items of the questionnaire were presented on a 5-point Likert scale, with 5 indicating that they fully conformed to the views expressed and 1 indicating that they did not conform at all to the views described.

3.2. Data sources

Through reading the literature, designing the questionnaire and consulting experts, the final questionnaire on postgraduate course teaching and its influencing factors was developed. The study was conducted with a random sample of master's degree students from a university in the southwest region as the main research target. In order to facilitate the recovery of a sufficient sample size, the questionnaire was distributed and collected in the form of an online questionnaire. After distributing and recovering the questionnaires, and after a series of data cleaning work such as consistency test, removal of outliers, data structure adjustment and processing [4], a total of 536 questionnaires were distributed and 501 valid questionnaires were recovered, with an effective rate of 93.5%.

3.3. Research Methodology

This study mainly used SPSS25.0 and AMOS24.0 software to process and statistically analyse the data. The main analyses were as follows: firstly, the collected data were tested for reliability, descriptive analysis and factor analysis through SPSS25.0. Secondly, structural equation models were constructed through AMOS24.0, and the model fit and path effects were analysed to explore the role of the relationship between the three main variables and to investigate the influencing factors of the teaching effectiveness of the master's degree programme.

4. RESEARCH FINDINGS AND DISCUSSION

4.1. Basic information on survey respondents

Among the postgraduates who participated in the questionnaire, 55.09% of them were female, with 276; there were more postgraduates in the first year of study, with 276, accounting for 55.09%; 169 were academic and 332 were professional; a total of 12 professional categories were surveyed, 410 in humanities and 91 in science and technology. The specific data sources are shown in the table below.

Table 1: Distribution of information characteristics of the postgraduate sample.

Item	Category	Number of people	Percentage(%)
Gender	Male	225	44.91
	Female	276	55.09
Year	Postgraduate Year 1	276	55.09
	Postgraduate Year 2	138	27.54
	Postgraduate Year 3	87	17.37
Type of Master	Academic	169	33.73
	Professional	332	66.27
Professional category	Humanities	410	81.84
	Engineering	91	18.16

4.2. Data reliability and validity

The Cronbach alpha coefficient and KMO coefficient were used to test the reliability and validity of the questionnaire respectively to ensure the validity of the research data. The overall Cronbach alpha coefficient of the research data was 0.904, and the alpha coefficients of the four variables were 0.941, 0.913, 0.881 and 0.922, which were all greater than 0.8, indicating that the reliability of the questionnaire had good internal consistency and good reliability; on this basis, the validity analysis of the scale showed that the KMO value was 0.932, which was greater than 0.8. The validity of the questionnaire is good and can be subjected to validation factor analysis, and the results are shown in Table 2.

Table 2 Results of factor analysis of measurement indicators

Dimensionality	Title	1	2	3	4
Teaching content	Seminar content	0.675			
	Reasonableness of the curriculum	0.687			
	Rationalisation of compulsory and elective course offerings	0.700			
	Frontiers	0.768			
	Academic	0.751			
	Practical	0.711			
	Flexibility in content arrangement	0.661			
	Translation of research results into teaching content	0.724			
Teaching organisation	Essay writing style teaching		0.772		
	Course project assignments		0.734		
	Group Academic Discussions		0.736		
	Postgraduate participation in lectures		0.739		
	Literature reading seminars		0.724		
	Laboratory or social practice		0.718		
	Lectures by teachers		0.679		
Teacher-student interaction	Effectiveness of teacher-student interaction			0.757	
	Frequent student-teacher interaction			0.757	
	Timely feedback from teachers			0.684	
	Strong academic atmosphere			0.591	
Teaching effectiveness	Appropriate course assessment methods				0.694
	Improvement of theoretical knowledge				0.633
	Application and practical skills enhancement				0.692

Extraction method: Principal component analysis.

Rotation method: Kaiser normalised maximum variance method.

a. Rotation has converged after 7 iterations.

4.3. *Postgraduate course teaching in general*

The overall satisfaction evaluation of the teaching of master's degree courses in colleges and universities presents good. In this study, a total of four aspects of teaching content, teaching organization form, teaching interaction and teaching effect are used to understand the teaching of postgraduate courses. The differences between academic and professional postgraduate students are reflected in the curriculum of each postgraduate training unit, and the curriculum of each college can basically meet the course objectives of postgraduate students. According to the data survey, 86.82% of the students were satisfied with the teaching effect of master's degree students, indicating that the overall satisfaction of postgraduate course teaching was high.

4.3.1. Teaching content

Postgraduates are more satisfied with the content of the teaching content, with teachers being able to enrich the chapters with knowledge at the forefront of the development of the discipline (83.83%), transform scientific research results in the discipline into classroom teaching resources (86.42%), provide valuable academic works and literature resources for students' self-study outside the classroom (90.22%), explain the application of theoretical knowledge in practice (89.02%) (87.62%), and the teacher was able to adapt the teaching schedule to the students' actual situation (87.62%). A multiple response approach was also used to analyse the data, and it can be seen from Figure 1 that what is most lacking in postgraduate teaching content is practicality (64.70%), followed by personalisation (40.90%), interdisciplinarity (40.50%) and cutting edge (39.90%).

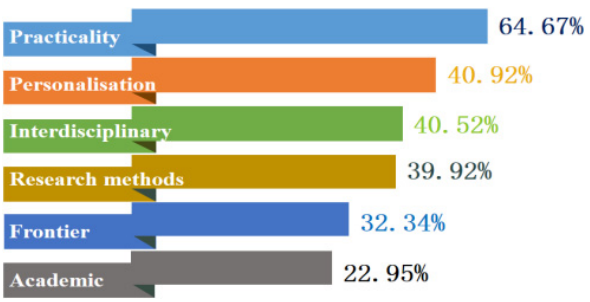

Figure 1: Aspects of teaching content that are lacking

4.3.2. Teaching organisation

The results of the analysis, shown in Figure 2, indicate that the most helpful for improving postgraduate learning are teacher lectures, laboratory or social practice and literature reading seminars. In postgraduate course teaching, there is some variation in the number of students, the size of the student body is relatively large and the expertise covered is relatively broad. Therefore, appropriate teaching methods are chosen according to the organisation of teaching activities to effectively improve the quality of course teaching.

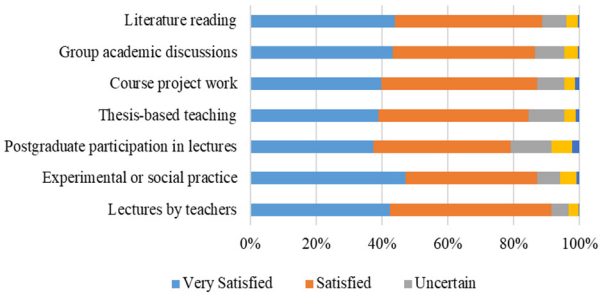

Figure 2: Organisation of teaching and learning

4.3.3. Teacher-student interaction

The results of the study show that the teaching and learning interaction sessions were good overall. As can be seen from Figure 3, the frequency of teacher-student interaction is high, with 87.02% of those who believe that interaction is frequent, in line with the needs of teaching, 86.03% of postgraduate students believe that teacher-student interaction is effective, and 79.24% of postgraduate students believe that the current academic atmosphere in the classroom is strong. Teachers are better at answering students' questions in the classroom, with 94.81% believing that teachers answer students' questions in a timely manner. The main way of teacher-student interaction in the classroom is discussion, followed by questions and answers, with only 2.79% of teachers answering students' queries. This shows that in the teaching process of professional courses, on the one hand, it is necessary to create opportunities for teachers and students to communicate and discuss, and on the other hand, it is necessary to answer students' questions in a timely manner and solve problems through the joint efforts of teachers and students, which is also a characteristic of postgraduate teaching.

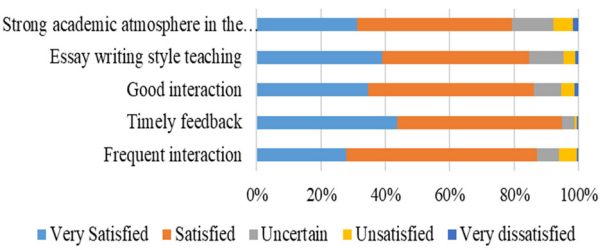

Figure 3: Analysis of teacher-student interaction

4.3.4. Teaching effectiveness

Course assessment is an important part of the construction of postgraduate professional courses, as shown in Figure 4, 41.52% of the surveyed postgraduates

accept the course assessment in a combination of ways, and only 5.39% of students accept closed-book examinations or results demonstration. 86.23% of students think that the assessment methods of professional courses are appropriate, taking into account the assessment of knowledge and ability, and attaching importance to the overall development of students. Secondly, most students believe that the study of professional courses can deepen their mastery of theoretical knowledge, improve their ability to apply knowledge and enhance their comprehensive literacy. Therefore, the assessment methods of postgraduate courses need to be further optimised and the course assessment system improved.

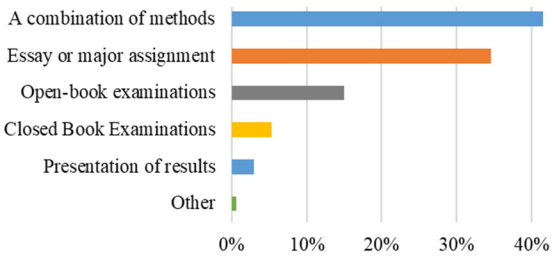

Figure 4: mmonly accepted assessment methods

5. KEY FACTORS INFLUENCING THE EFFECTIVENESS OF POSTGRADUATE COURSES

5.1. Initial model fit test

Which of these factors are the most significant influencing factors and what causal relationships exist between the influencing factors. The study used AMOS24.0 software to adapt and revise the model of postgraduate course teaching satisfaction, mainly using the maximum likelihood estimation method to fit the overall model, and obtained that all P-values were less than 0.05, and the research hypothesis was initially verified. The chi-squared freedom ratio ($\chi 2/df$) was 4.061 less than 5, meeting the criterion of fitness judgment. The goodness-of-fit results are shown in Table 3. The study used GFI, RMSEA, AGFI and IFI as the fit evaluation indicators for this study's model, with RMSEA falling short of the ideal criteria. As the results show that the initial model has a poor fit, the initial model needs to be revised.

Table 3: Structural model fit statement.

Indicators	before correction	Correction	Adaptation requirements	Model fit judgement
CMIN/DF	4.061	2.056	<3	Yes
RMSEA	0.078	0.046	<0.05	Yes
GFI	0.868	0.956	>0.9	Yes
AGFI	0.835	0.950	>0.9	Yes
IFI	0.934	0.977	>0.9	yes

The input data in the structural model exhibits a non-normal distribution, resulting in a poor model fit. In the Amos software, the Bollen-sting method was used to correct the cardinality and the Bollen-sting pvalue was used to estimate the cardinality to recalibrate the overall model fit. The modified model fit met the ideal criteria, as shown in Table 3. Overall, the fit of the hypothetical model proposed in this study to the actual observed data is in good condition and can be used to test the hypothesis theory proposed in this study.

5.2. Research hypothesis testing

The reliability test and model fit test of the above models indicated that the structural equation model could be used to validate and analyse the previous hypotheses and obtain paths with a good fit (as shown in Figure 5). The results of the hypothesis model identification are shown in Table 4, where teaching content (β=0.48, $p<0.001$), teaching organisation form (β=0.10, $p<0.001$) and teacher-student interaction (β=0.49, $p<0.001$) all have a positive impact on the teaching effectiveness of postgraduate students, and hypotheses H1, H2 and H3 are all valid.

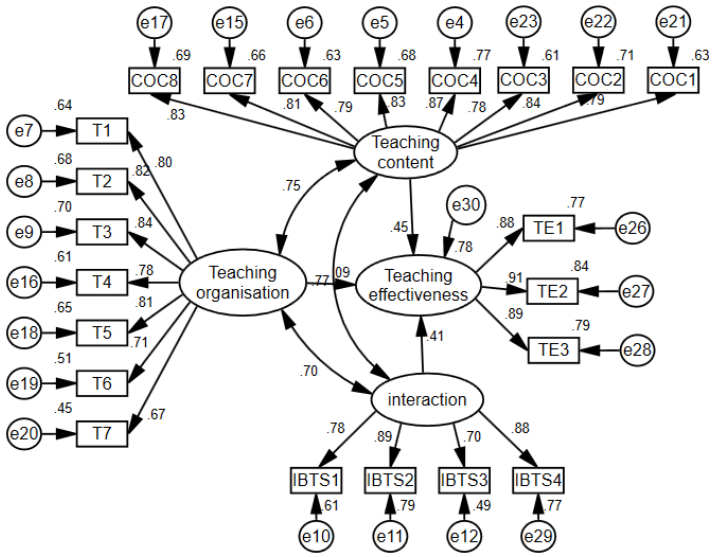

Figure5: A model of factors influencing the effectiveness of postgraduate courses

Table 4: Initial model path coefficients.

Assumptions	Estimate	S.E.	C.R.	P
H1	0.48	0.06	8.03	***
H2	0.10	0.05	1.95	***
H3	0.49	0.06	7.80	***

Note: *** indicates P<0.001

6. CONCLUSIONS AND RECOMMENDATIONS

6.1. Research findings

6.1.1. The overall teaching of the Masters programme is good

The study focuses on four aspects of teaching content, teaching organisation, teacher-student interaction and teaching effectiveness to understand the basic situation of teaching in postgraduate courses. The results show that the overall satisfaction of postgraduate course teaching is high. In terms of teaching content, teachers' teaching content can basically meet students' learning needs. In terms of course assessment, most students think that the assessment methods of professional courses are appropriate. However, there are still many shortcomings in the teaching of postgraduate courses. The teaching content lacks practicality, personalisation, interdisciplinarity and frontiers, and there is a lack of practical courses. Some students are reluctant to participate in student-teacher interaction and have little opportunity to interact with their teachers. Therefore, there is a need to strengthen the teaching content and student-teacher interaction in the postgraduate teaching process.

6.1.2. Teaching content, teaching organization and student-teacher interaction have a significant positive impact on the teaching effectiveness of postgraduate courses

In the teaching process of master's degree students, teaching content (0.49), teaching organization form (0.10) and teacher-student interaction (0.48) have a significant positive influence on the teaching effect of postgraduate courses, and are important influencing factors of the teaching effect of postgraduate courses. The teaching process is the activity process of teachers imparting teaching contents to students, and teachers, students and teaching contents constitute the whole of teaching, without which one is indispensable [1]. In the course teaching of postgraduate students, there are certain differences in the number of students. Paying attention to the emotional communication between teachers and students helps to harmonize the relationship between teachers and students, and improving the course system is an important part of improving the quality of postgraduate course teaching and improving the teaching effect.

6.2. Recommendations

6.2.1. Refining teaching content to suit training objectives

At the postgraduate level, teachers should focus on interdisciplinary knowledge in their lectures and cultivate students' scientific and innovative thinking. Therefore, each training unit needs to appropriately reduce the proportion of basic knowledge and increase the practical content according to the students' foundation. Practical teaching content helps to enhance students' operational skills and their ability to apply their knowledge, in order to meet the needs of modern society for talents and the

diversified forms of employment of students. The teaching content of postgraduate students should be personalised to help develop the innovative talents needed by society. In addition to this, courses can be set according to students' interests, research directions, etc. In addition, the teaching content should also increase the latest knowledge and scientific research achievements in the subject area, in line with the training objectives of postgraduates in modern society [2]. Each training unit can hold regular seminars on course teaching, involving teachers, students and others in discussing course offerings, so that the teaching content can keep up with the times.

6.2.2. Establish a two-way feedback mechanism for teachers and students to improve the efficiency of classroom interaction

Classroom teaching is a dynamic process of development. Good and effective teacher-student interaction can mobilise students' thinking, unlock their potential and promote their individual development. Teachers can also be inspired by the unique thinking of their students to continuously improve and enrich the curriculum and achieve mutual growth in teaching and learning. Teachers themselves should strengthen their behaviour and not be too lifelike, with barriers to communication between teachers and students affecting the effectiveness of teaching and learning. According to the teaching objectives and contents, teachers should flexibly adopt teaching methods that meet the characteristics of postgraduate education, such as heuristic, discussion, inquiry and case teaching, create more opportunities for interaction, pay attention to each student, strengthen the discussion and interaction between teachers and students in the teaching process, and give each other timely feedback. Support students' effective learning with the organisation of a variety of learning activities, methodological guidance, modelling of thinking and behaviour, and feedback and evaluation.

6.2.3. Strengthening the teaching force and enhancing the quality of teaching of lecturers

Strengthen the teaching team. We should insist on professors on the podium and make teaching for postgraduate students a basic requirement for professors and associate professors to ensure that they provide high-quality teaching for students. A system of teaching assistants for young teachers should be established and improved, and the training and development of young teachers should be strengthened, so that young teachers can learn advanced teaching methods, accumulate teaching experience and enhance their sense of responsibility and mission in teaching and educating students. A large number of teaching teams should be built to promote teaching seminars, improve teaching standards and promote the quality of teaching. To enhance the teaching quality of lecturers, the training units should improve the assessment and incentive mechanisms, such as overcoming the tendency to emphasise scientific research over teaching, strengthening teaching assessment work, such as rewarding excellence, encouraging teachers to use teaching methods flexibly, such as using interaction between teachers and students as a teaching tool throughout the course, so as to create a strong academic atmosphere, and at the same time enabling students to improve all aspects of their studies as well as their assessment This creates a strong academic atmosphere, while enabling students to improve their abilities in all areas through study and assessment, improving the effectiveness of teaching and enhancing student satisfaction with the course.

FUND PROJECTS

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