

# Research on the Trinity Comprehensive Evaluation Model of Electromagnetic Field and Microwave Technology Course

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**Keywords:** Electromagnetic Field, Microwave, Trinity Comprehensive Evaluation

**Abstract:** with the Deepening of Education Reform, the Traditional Teaching Evaluation Model is No Longer Suitable for the Development of the Current Era. for the Major of Electronic Science and Technology and Communication Engineering, Electromagnetic Field and Microwave Technology Are the Most Important Two Courses, and Also the Important Teaching Content to Ensure the Working Effect of Students after Graduation, Which is of Great Significance to the Development of Students in the Future. in the Traditional Teaching, the Evaluation Method of Curriculum Mainly Adopts the Summative Evaluation, Which Has One Sidedness to the Evaluation of Students' Learning Effect and Its Application in the Future, and Affects Students' Actual Learning and Knowledge Mastery. the Trinity Comprehensive Evaluation Mode Proposed in This Paper Breaks the Traditional Limit of Summative Evaluation, and Adds Practical Ability and Formative Evaluation to Improve Students' Mastery.

## 1. Introduction

The Teaching Courses of Electromagnetic Field and Microwave Technology Have an Important Impact on the Future Development of Students Majoring in Electronic Science and Technology and Communication. Mastering These Two Courses Can Help Students Better Understand Their Own Knowledge and Promote Their Future Development[1]. in Addition, with the Help of the Influence in the Summative Evaluation Mode, the Content and Form of the Traditional Evaluation Can Be Comprehensively Improved, Which Can Not Only Improve the Adverse Effects of the Traditional Evaluation Mode, But Also Help Students to Carry out More in-Depth and Comprehensive Evaluation Work. Therefore, in the Teaching Process of Electromagnetic Field and Microwave Technology, the Trinity Comprehensive Evaluation Model is of Great Significance for the Future Development of Students.

## 2. Comprehensive Evaluation of Trinity

### 2.1 Formative Assessment

The practice and research of formative assessment education by bloom, an American educator, is the formative assessment, the teacher's guidance method, and the improvement of classroom education effect. It can not only improve students' sense of learning ability, promote the development of students' intelligence, and improve learning effect[2]. The purpose of formative assessment is not to raise the level and level in order to cause unfair competition and excessive learning pressure, but to help students find out the shortcomings and defects in the learning process, so as to improve the learning time. The content of formative assessment mainly includes learning ability, process impact assessment and homework. Daily learning performance daily learning

performance mainly includes attendance, classroom performance, topic discussion, etc. It mainly tests students' learning attitude, learning strategy and learning ability. There is no reason to ask for leave from school. Students who are late to leave will be deducted from the usual time. Actively participate in classroom teaching activities, actively ask questions, and actively answer teachers' questions. Process assessment focuses on teacher assessment, written test of chapter proposition and process assessment. Understand, apply and analyze the knowledge of current courses[3]. Through the process impact assessment, to achieve learning objectives, understand the problems in the learning process, under the guidance of teachers, to improve learning ability for the purpose of adjusting learning plans and improving learning methods, to judge students. The course assignment course mainly tests the learning effect of students after the course is finished, completes the assignment of teachers with the knowledge learned in the classroom, and completes the test of new knowledge through the course. Students can consult materials, assist in learning, learn their own information acquisition and analysis skills, learn knowledge and skills, exchange skills, and exercise cooperation skills when they encounter difficulties in course topics.



Fig.1 Electromagnetic Field

## 2.2 Evaluation of Practical Ability

Practical ability evaluation is a method to evaluate students' basic skills and comprehensive quality through their practical activities under the guidance of teachers. It mainly includes hardware experiment and software simulation[4]. By learning theoretical knowledge, students are required to play complete games. The main role of students and students is to complete the experimental content, provide a reasonable explanation and explain the experimental results and phenomena. The hardware experiment mainly measures the wavelength, standing wave ratio and load impedance of square waveguide. The software component, used by Genesys software, is equal to the basic analog circuit design completed by the Smith leaderboard of Japanese yen resistance, Japanese yen reactance in general, and the same reflection coefficient. Moreover, the problems of comprehensive design, simulation and practicability are combined. Practical ability evaluation enables students to master perceptual knowledge and basic skills under the guidance of theoretical knowledge, carry out theoretical teaching with practical style and independent working ability, and improve comprehensive quality.

Table 1 Composition of Two Evaluation Modes

Project	Formative assessment			Time capability evaluation	Comprehensive ability evaluation
	Performance of daily habits	Process assessment	Homework		
Trinity evaluation model	5%	20%	10%	15%	50%
Traditional evaluation mode	-	-	-	30%	70%

## 2.3 Comprehensive Ability Evaluation

At the end of the course, it is necessary to thoroughly grasp the ability of students,

comprehensively use knowledge for testing, and at the end of the course, focus and difficulties. It includes blank questions, short answer questions and general calculation questions. Fill in blank questions and answer short questions, mainly for the evaluation of knowledge content, that is, the evaluation of basic concepts. Calculation questions examine students' ability of comprehensive analysis and problem solving.

### **3. Analysis on the Application Effect of Comprehensive Evaluation Model**

Due to the curriculum reform of electromagnetic field and micro blog technology and the integration of Trinity evaluation mode, the achievement rate of students has also been adjusted. In the past performance composition, practical ability accounted for 30%, comprehensive ability evaluation accounted for 70 points after performance ratio adjustment, formation evaluation accounted for 35%, and practical ability evaluation accounted for 15%[5]. In addition, comprehensive capacity evaluation accounts for 50%. Compared with the previous evaluation model and comprehensive evaluation model, we pay attention to the comprehensive evaluation of students. After establishing the Trinity evaluation model, in order to evaluate the comprehensive ability of students more accurately, the final examination papers of students are adjusted. By comparing the students' new academic year, we can find that under the same class capacity and examination difficulty, the overall interests of students have been greatly improved, and the failure rate has been greatly reduced. Moreover, most students' performance is in the middle level, which is directly related to the comprehensive evaluation results of students. This situation is mainly due to a new evaluation mechanism, which focuses on the formative evaluation of students, that is, the performance of students in the whole learning process. The increase of performance evaluation increases students' daily learning pressure and provides students with specific motivation for learning. The final test results are determined when there is no academic achievements. They are scattered in the whole process of students, and they are achieved for comprehensive evaluation of students' learning process and learning effect. The difficulty of evaluation is higher than the traditional evaluation model. Therefore, it is impossible to prepare students for attack in traditional learning mode. Under the new evaluation mode, students need to participate in the whole teaching activities and complete the guidance of teachers. In the form of evaluation mode, in the repeated evaluation feedback adjustment mode, teachers can judge the learning effect of students in the learning process in real time[6]. It has the effect of stimulating and adjusting learning state. At present, although the Trinity evaluation model has made some achievements, there are still some problems in its application. The results show that it is necessary to improve the failure rate of Trinity comprehensive evaluation model. Teachers need to find problems in the process of continuous guidance, adjust the achievement rate, and improve the evaluation model. On the one hand, it can stimulate students' enthusiasm for learning and improve their understanding ability. Learning ability and learning effect have been greatly improved. For example, by adding a certain degree of classroom discussion results to students' learning, students can truly understand the subjectivity of learning and the guiding role of teachers. In addition, we need to improve the effect. Based on sufficient teacher resources, teachers can adopt small class teaching mode[7]. The number of students in this teaching mode is very small. Through the interaction between students, it is very important for students to have the opportunity to express their opinions and improve their learning effect. At the same time, group discussion can be carried out, and students can actively participate in the discussion to answer questions that can improve the classroom effect[8]. The reform of the Trinity evaluation mode of electromagnetic wave and microwave technology can solve the problems of low enthusiasm and students' learning effect in the classroom to a large extent. Through the comprehensive evaluation model, it can stimulate students' enthusiasm for learning, help students to exercise, and improve the ability of learning process. Through practical application analysis, the application of Trinity evaluation mode combines the evaluation process with the actual learning process of students, forming the current situation of the combination of comprehensive evaluation and student learning guidance

#### 4. Conclusion

The reform of the Trinity evaluation mode of electromagnetic field and microwave technology course greatly solves the problems of low enthusiasm and poor effect of students, and can be used and tested in all directions[9]. This study confirms that the evaluation model promotes the combination of evaluation process and learning process, reflecting the value orientation of modeling evaluation which combines learning process with human development. Formative and additive evaluation are closely coordinated. The unified Trinity evaluation mode can fully mobilize students' enthusiasm, learning ability and greatly improve[10].

According to the above, the teaching course of electromagnetic field and microwave technology is of great significance to the development of students in the future. How to provide the teaching effect of the course is the problem most professional teachers think about at present. The development and application of the Trinity comprehensive evaluation mode, which integrates the whole learning process of students into the assessment content, can better regulate their learning behavior and improve their learning effect in daily learning. Through the active participation of students, they can better grasp the electromagnetic field and microwave technology courses.

#### Acknowledgement

This research has been financed by The PHD Scientific Research fund Project (XJNUBS1811) of Xinjiang Normal University and The Key Laboratories' Inviting public bidding Item (XJNUSYS092018B04) of Xinjiang Normal University.

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