

# Research on Mathematical Modeling of Long-Term Teaching Competence of University Teachers

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**Abstract:** in Recent Years, Many Scholars in China Are Concerned about the Ability of University Teachers, Most of Them Are Discussing the Ability of University Teachers as a Whole. from the Perspective of Teaching, There Are Few Results to Study the Ability of University Teachers. the Main Responsibility of University Teachers is Teaching, and They Need to Study Leadership.

## 1. Introduction

The Ability of University Teachers Refers to the Characteristics That University Teachers Must Effectively Accomplish Teaching Objectives. It Includes Knowledge, Ability, Motivation, Attitude, Value and Personal Characteristics. the Research on Teaching Chinese Teachers' Ability is Still in Early Childhood[1]. in Recent Years, the Research on the Ability of University Teachers is Very Popular, But It Can Basically Discuss the General and General Ability of University Teachers, and There is Almost No Research Results on the Ability of Teachers. We Know That the Main Responsibility of University Teachers is Teaching, So It is Necessary to Study Their Teaching Ability.

## 2. Research Methods and Ideas

In this study, literature method, Delphi method and statistical method are used. First of all, this paper introduces the existing research results. The purpose is to collect and sort out the representative literature about University Teachers' ability and teachers' ability, and to obtain the dimension and index system of University Teachers' teaching ability[2]. Therefore, in order to collect the questionnaire of University Teachers' teaching ability and get the experts' opinions and suggestions, the questionnaire was distributed to the experts in three meetings. Finally, through the statistical analysis, determine the teaching ability index system of university teachers, and build the university education ability model.

## 3. Research Process and Procedure

The construction of teaching competency model of university teachers is mainly to select the indicators of teaching competency and construct the corresponding indicator system.

### 3.1 Index Selection and Analysis

#### 3.1.1 Statistics of Index Usage Frequency

The first task is to select the ability indication system of the appropriate indicators. In order to build a reasonable teaching ability index system for university teachers, we selected 27 representative documents related to teachers' ability, and screened them, and made quantitative frequency statistics on the indicators of teachers' ability used in these documents[3]. The statistical results are as follows: six times of guidance and management ability; personal characteristics; students' love; five times of language expression; professional ability; responsibility; problem-solving ability; respect for others; multimedia utilization; professional knowledge; organizational

ability; observation ability. Four times of humor are in hard thinking, realizing three appearances of motivation, lifelong learning, communication skills, affinity, professional knowledge of subjects and education level Students, human nature characteristics, control ability, two related characteristics, realization of awareness, service level, listening skills, self-improvement, there is critical thinking. Aggressive, teamwork, theoretical knowledge of education, learning ability, good thinking, quality, theoretical knowledge, permissibility, reflection ability, information processing, realization of ambition, professional ethics, ethical feelings, emotional characteristics, leadership, cognitive characteristics, theoretical analysis ability, understanding ability, teachers' ethics, students' understanding, once information, communication skills and other people's cooperation are acquired, Dissatisfaction with politics, illiteracy and the current situation, interpersonal understanding, innovative awareness, and educational creed, relationship between examinees and examinees, cultivation of ability, professional attitude, flexibility, teaching material management ability, educational wisdom, educational strategy, health level, good relationship, reading ability, education, professional attitude, strict conditions, teaching art, desire for realization, social service awareness, innovation, etc Innovation, CSI, human interaction, and atmospheric creativity.

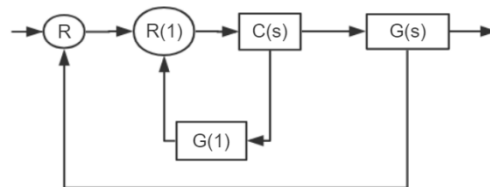


Fig.1 Equivalent Feedback Control Structure of Internal Model Control

### 3.1.2 Analysis of Index Statistical Results

The frequency of the use of indicators, the use of guidance ability, management ability, responsibility, professional knowledge, multimedia, problem-solving ability, professional ability, personal characteristics, language expression, respect for others, students' love, organizational ability, observation ability, 14 humor indicators is more than four times. These university teachers should have excellent performance of teaching ability characteristics. In addition, the frequency of almost all indicators is quite uneven[4]. Therefore, it is unscientific to only select the statistical results of the indicators of capacity, not based on facts. According to the scientific and operational principles of indexing, the following issues are considered in this study: firstly, the relevant research results that can be referenced are limited. At present, there is no teacher education index system in the study of teachers' ability. In the 27 representative literatures we collected, most of the indicators reflect the general or general ability characteristics of teachers[5]. Therefore, we need to analyze most of the education ability indicators, and select them from the general ability indicators of teachers. In addition, the existing teaching evaluation of ordinary teachers generally attaches great importance to teaching evaluation, the main content of which is only the explicit indicators such as guiding objectives, teaching style, textbook compilation, teaching effect, teaching methods and teaching guidance. The implicit indicators of individual teachers, such as personality, attitude and motivation, are often ignored. The ability index of science education needs to include the recessive index which has important influence on Teachers' education, such as educational belief, responsibility, taking care of students, self reflection, etc. Secondly, some important indicators often appear, which may be an important factor in determining whether university teachers are qualified to carry out self reflection, initiative and adaptive education. Therefore, it is necessary to consider some low-frequency or not described indicators. Thirdly, some indicators are repetitive. Among them, the teaching of educational theoretical knowledge and theoretical knowledge can be summarized as educational knowledge, the motivation of educational knowledge, the realization of consciousness and desire, which are similar indicators, can be summarized as the achievement of goals. In addition, it is necessary to clarify several indicators. For example, the ability to regulate

and control emotions can be used not only as a feature of classroom teaching ability, but also as a personal feature of teachers. Achievement desire, achievement orientation, social service consciousness and other indicators reflecting teachers' motivation are also teachers' personal characteristics. Performance. Therefore, it is necessary to consider the characteristics of index attributes when selecting indexes.

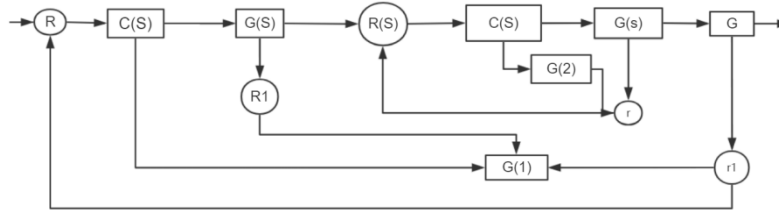


Fig.2 Double Internal Model Control Structure of Induction Motor Alternating Deviation Speed Regulation System

### 3.2 Preliminary Selection and Explanation of Index System

#### 3.2.1 First Level Indicators

Ability is generally divided into knowledge, skills, social roles, self-concept, motivation, personal characteristics and other dimensions[6]. The social function and self-concept of “what is the identity of university teachers, what kind of quality they have and why they suffer?” can be understood in the construction process of the guidance system of University Teachers' training. That's consistent with the motivation to tell. Based on this, the level of knowledge transfer, teaching ability, teaching motivation and teachers' characteristics can be regarded as the four primary indicators of university education ability.

#### 3.2.2 Two Level Index

According to the Category attribute of each dimension, some closely related sub functions can be listed, i.e. secondary indicators. This study analyzes the secondary indicators of teachers' ability from four dimensions: Teachers' knowledge, leadership ability, leadership motivation and teachers' characteristics. First, impart knowledge. Imparting knowledge refers to the sum of University Teachers' perception and reasonable knowledge results[7]. That is embodied in students' analysis and understanding. As a professional teacher, university teachers must have educational knowledge, subject knowledge and general knowledge. Educational knowledge is the basis for teachers to engage in educational work, and it is the sum of teachers' cognition, educational purpose and educational influence on educators. Disciplinary knowledge is the core of University Teachers' knowledge and education career. General knowledge is the guarantee to improve the quality of education, including the knowledge of humanities, social sciences and natural sciences. General knowledge includes many subject areas, and each teacher may not be proficient in different areas, which is a comprehensive reflection of the quality of university teachers. Knowledge teachers can not only realize the unity of knowledge, but also mobilize students' enthusiasm for learning, improve the quality of learning and guidance. University and university should combine the ability of compound with the training goal, and university teachers need to master a certain amount of general knowledge. Second, teaching ability. The teacher's ability refers to the ability that the teacher needs to complete the teacher's activities. It reflects the direct and effective psychological characteristics of the teacher's completion of the education process. Chinese scholars give various explanations to the teaching ability of university teachers. Xueti Lane pointed out that teachers' abilities mainly include teachers' foresight ability, professors' practical ability, performance ability and educational baton. Zhou Zhong said that teachers' ability mainly includes design ability, teaching guidance ability and academic examination and evaluation ability[8]. In addition, in the new century, the University Teachers' lifelong learning ability, anti shooting education ability, education ability based on network resources, creativity, activation ability, psychological consultation ability and other core abilities should have. These definitions and analyses mean that

we understand the concept and structure of faculty competence teaching. By summarizing the teaching ability of university teachers, we can summarize the content and structure of the teaching ability of university teachers. From the setting of educational objectives, the implementation of guiding activities, the use of guiding methods and the implementation of teaching methods, it should include three categories: Teachers' cognitive state, ideological state, the teaching of design ability, the teaching of implementation ability and the teaching of teaching ability. In addition, from the perspective of psychological factors and educational ability, each person's psychological characteristics can be divided into three categories: cognitive ability guidance, operational ability teaching and monitoring ability. According to the characteristics of university teachers and the requirements of the development of the times, the leadership ability of teachers should change with the development of economic society[9]. The successful completion of teachers' tasks also requires good communication ability, lifelong learning ability, information application ability and adaptability. Therefore, in terms of the selection of University Teachers' teaching ability indicators, the implementation of teaching ability and application ability, basically, content performance, mainly including language ability, speech ability, multimedia operation, classroom questioning reflecting cognitive ability, mainly reflecting design ability and education ability. In addition, adaptability and observation ability belong to the category of personal characteristics, which can be temporarily integrated into the characteristics of teachers. At the same time, good motivation skills can stimulate students' interest and potential in learning. Third, teaching motivation. Motivation is the psychological driving force for teachers to actively participate in guiding activities, which determines the guiding attitude and action teachers take

#### **4. Conclusion**

The making and application of computer model are dynamic. With the development of the whole society and culture, a new dynamic system will be formed. Therefore, the application of MOOC teaching ability mode in universities should be reformed according to the local situation, the development of schools, the needs of teachers and students, and the actual situation.

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