

# International Journal of Engineering Sciences & Research Technology

(A Peer Reviewed Online Journal)

Impact Factor: 5.164



**Chief Editor**

Dr. J.B. Helonde

**Executive Editor**

Mr. Somil Mayur Shah



**INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH  
TECHNOLOGY**

**EXPLORATION AND RESEARCH ON MODE OF ACADEMIC EVALUATION  
FOR THE COURSE OF "DIGITAL FUNDAMENTAL" BASED ON THE MULTIPLE  
EVALUATIONS**

**Huan Chen<sup>\*1</sup> & Lan Zhao<sup>2</sup>**

<sup>\*1</sup>Tongji Zhejiang College, Electronics and Information Engineering, Zhejiang 314006 China

DOI: 10.5281/zenodo.1450349

**ABSTRACT**

"Digital Fundamental" is an important basic core course for electrical specialty, automation specialty, electronics specialty and other electrical specialty. In order to meet the needs of society, for Applied Undergraduate Colleges and universities, the comprehensive quality of students should be improved, especially the application skills, and the employment competitiveness of students should be enhanced. Based on the multiple evaluation model, this paper establishes an evaluation scheme which combines formative evaluation with summative evaluation, and explores the multiple evaluation model with multiple evaluation links, multiple evaluation contents and multiple evaluation methods.

**Keywords:** the course of "Digital Fundamental"; mode of academic evaluation ; the multiple evaluations

**1. PREFACE**

The "Digital Fundamental" course is one of the core courses for the professional foundation of electrical majors such as electronics, communications, computers, and electrical engineering. Its teaching is not only the granting of theoretical knowledge, but also the training of practical operating capabilities, especially for application-oriented undergraduate colleges. Applied practical skills are more important to reflect their training goals. Therefore, it is beneficial to guide the implementation and implementation of the training goals to determine a feasible course evaluation method.

The form or method of course assessment and evaluation should not only have the function of testing, identification and selection, but also reflect the guidance, feedback and motivation function of education and teaching[3]. Therefore, the important link in the course teaching reform of "digital Fundamental" is to construct a scientific and reasonable evaluation system for evaluating students' knowledge mastery, innovation ability and literacy, and to promote students' independent learning and sustainable development.

**2. ANALYSIS ON THE PRESENT SITUATION OF EVALUATION OF "DIGITAL  
FUNDAMENTAL " COURSE**

The evaluation of "digital Fundamental " Course lacks the guidance of modern education theory, especially for application-oriented undergraduate colleges, lack of reform practice activities and lack of application-oriented features. Academic evaluation in daily teaching is presented in two forms: examination and examination. Examination courses are more common, usually in the form of summative evaluation such as final closed examination. However, it failed to cover the due technical ability assessment, and the assessment content was too traditional. It usually covered the assessment of conventional basic knowledge and basic theory, and failed to involve new forms of content such as its application, problem situation, and simulation software. The assessment mode is relatively single, the final closed examination is of great importance, the results are formalized, the evaluation basis is vague, and many process evaluations(such as homework, classroom performance, etc.) score subjectivity is too strong to quantify some instant performance. To a certain extent, it inhibits the enthusiasm of students to study the course, it is difficult to stimulate students' interest in learning, and ultimately fails to reflect the technical content of the course. In short, the present situation of curriculum assessment obviously emphasizes the teaching of knowledge points and the cultivation of applied ability. Pay attention to the results of closed examination, light all kinds of process evaluation; Pay attention to the closed assessment of "exam-oriented" and the evaluation of light skills; Pay attention to screening, to judge the pros

and cons, but less ability and quality development; The importance attached to the examination diagnosis of students' learning, and the contempt for the analysis and research of the examination, led to the one-sided examination function and the low pass rate, which reflected the imperfection of the examination management system[1].

In order to adapt to the changes in training goals and the deepening of teaching reform, to focus on the simultaneous cultivation of core vocational skills and hard professional skills, and to promote the transition from "knowledge classroom" to "ability classroom", the "knowledge + skill + attitude" trinity multiple assessment model was introduced. Therefore, the assessment of the course "Digital Fundamental" should first be clearly evaluated to understand the students' academic situation, use this feedback information to summarize the students' learning results, and constantly revise the evaluation plan through teaching. To improve students' learning attitude, overall cognition and emotional experience, Process evaluation, summary evaluation, developmental instant evaluation and performance evaluation, and diagnostic testing need to be combined. The assessment and evaluation system emphasizes the characteristics of knowledge, ability, and quality, rather than only examining the calculation and theoretical derivation of machinery. At the same time, the assessment and evaluation system also need to comprehensively consider students' acceptance degree and learning situation from multiple angles and dimensions, and truly realize the original teaching goal of the course and the ultimate concept of ability shaping, quality development and sustainable development advocated by application-oriented undergraduate colleges[2].

### 3. ESTABLISHMENT AND PRACTICE OF MULTIPLE EVALUATION SYSTEM OF "DIGITAL FUNDAMENTAL" COURSE

For a long time, the course of "Digital Fundamental" follows the model of independent theoretical courses and experimental courses and scores separately, and adopts a final assessment and evaluation system. To a large extent, it ignores the initiative and creativity of students in the learning process, which is not conducive to the cultivation and shaping of abilities. For application-oriented undergraduate colleges, the establishment of experimental courses alone can emphasize the importance of skills development. However, for the "Digital Fundamental" course and the particularly applied course, the theoretical course assessment adopts the final assessment evaluation method. It can not reflect the technical nature of the course, nor is it enough to reflect the characteristics of the training of skilled talents in application-oriented undergraduate colleges. Therefore, this article emphasizes that even if the evaluation of theoretical courses must adopt the multi-formative assessment model, students must be assessed to master the comprehensive nature of this course. For this reason, it is particularly urgent to formulate suitable evaluation indicators, methods, and analysis of the effectiveness of the evaluation, and constantly adjust and perfect the feedback mechanism to form a dynamic. Over the years, a more scientific and reasonable, practical, multi-dimensional assessment and evaluation system has been continuously explored and gradually established for the purpose of regulating the teaching process and improving the teaching quality. Formative evaluation means that teachers use multiple opportunities to assess students' learning status in the teaching process, and use these useful diagnostic information to guide teaching, and ultimately promote students' learning progress. This paper intends to establish a scientific, reasonable and effective multi-component evaluation index system of course formation through the characteristics of the course and the goal of personnel training in digital electronic technology.

#### 3.1 Characteristics of formative multivariate evaluation system

(1) The formative multivariate evaluation is a student-centered evaluation model. In the evaluation of the theoretical course of "Digital Fundamental", practical experimental indicators have been added, and the autonomy of the evaluation subject has been used, which is manifested in paying attention to the individual reflection of students in the evaluation and respecting the individual differences and individual characteristics of students. Formative evaluation can teach students to evaluate themselves, help students form effective learning styles that meet individual characteristics, make students become masters of learning, and increase students' sense of learning effectiveness[3].

(2) Formative evaluation is a multivariate evaluation model. Its diversity is manifested in the subject of evaluation, the content of evaluation, and the evaluation standards. In the main body of evaluation, for the experimental link, a single teacher evaluation is combined with teacher evaluation, student self-evaluation, and student mutual evaluation, so that students are changed from passive subjects to active participants. The

participation of students is a major feature that distinguishes formative evaluation from terminal evaluation; In terms of the content of the evaluation, it not only evaluates the level of students' mastery of basic knowledge and learning content, but also increases the evaluation of the experimental skills of the course, with special emphasis on the assessment of the experimental skills of students in applied undergraduate colleges. This skill is included in the evaluation of the course, which reflects the characteristics of application-oriented undergraduate; It also evaluates the development and improvement of students' personal interests, attitudes, qualities, emotions, and strategies in the learning process.

(3) Formative evaluation is an open evaluation model. Its openness is manifested in questions, discussions, assignments, essays, quizzes, etc. The formative evaluation is conducted in a natural state and an open environment.

### 3.2 The Establishment and Evaluation Scheme of the Formation Multiple Assessment Index

The establishment of a multivariate evaluation system for the course of "Digital Fundamental" is guided by the idea of highlighting the importance of the skills ability of applied undergraduate colleges, and the symbol country emphasizes the importance of process evaluation. In August 2018, the Ministry of Education issued the "Notice of the Ministry of Education on the Implementation of the Spirit of the National Conference on Undergraduate Education in Higher Education in New Times", which required a comprehensive rectification of the order of undergraduate education and strict process management. The "Notice" pointed out: "We must effectively strengthen the assessment of the learning process, increase the proportion of the performance of the process assessment in the total course results, strictly discipline the examination, strictly close the graduation of the export, and resolutely cancel the" clearance examination "system." [4]

The specific indicators will include regular performance(classroom attendance, classroom discipline, classroom questions, classroom discussions, classroom assignments, small papers, classroom tests), final exams, practical skills(experimental pre-study, experimental operations, experimental innovations), etc.. Among them, the usual results account for 30 %(classroom attendance, classroom discipline, classroom questions, classroom discussions account for 10 %; Classroom work, small papers accounted for 10 %; Classroom tests accounted for 10 %; ), the final exam accounted for 60 %, and the practical skills score accounted for 10 %.

### 3.3 Implementation of Formative Assessment and Information Feedback

According to the overall evaluation plan of the "digital Fundamental" course evaluation indicators, the teacher of the class informed the students of the assessment plan at the beginning of the course, and clearly stated the scoring criteria. In the assessment process, it is necessary to timely and truthfully record the evaluation basis for ready reference.

### 3.4 Advantages of Forming Dynamic Evaluation Feedback System

The rigorous and dynamic "teaching → assessment → evaluation → outcome analysis → teacher-student feedback → adjustment → teaching" teaching assessment feedback system can not only increase students' sense of learning effectiveness, but also help teachers improve teaching methods and means. Improve teaching quality and examination design[5].

In order to understand students' problems and mistakes in learning in a timely manner, and then help students make up for and correct them, and promote better teaching results, the system has reformed the final assessment and evaluation system of "one test to determine success or failure". The formation assessment system of "knowledge + skill + attitude" is established.

## 4. CONCLUSION

The formative multivariate academic evaluation system aims at the students' own vertical development. It not only pays attention to the results, but also pays attention to the process of students' growth and development. The evaluation system adopts a development perspective and aims to stimulate students' health, initiative, and all-round development. It affirms students' progress, implies students' shortcomings, and plays a good guiding role for students to make up for their achievements and grow healthily and happily.

This evaluation system respects the individual differences and individual characteristics of students, and pays attention to the students' experience in learning, and promotes the penetration of the "student-centered" ideology.



The questions, discussions, assignments, small papers, and small tests carried out for evaluation in the formative evaluation system have a positive effect on teachers' understanding of students' learning conditions, obtaining teaching information, and guiding teaching to better develop. It is also significant for students to cultivate their ability, emotional attitude and values in the learning process. The system evaluates the students' intelligence level, practical ability, cooperation spirit, enterprising spirit and personality quality to meet the teaching goals and talents training requirements, to provide support and security for the training of application-oriented talents.

## REFERENCES

- [1] XianFu Hu. Research on the Evaluation System of Higher Vocational Mathematics Curriculum Based on Credit System [J]. Journal of Changchun University of Technology: Social Science Edition, 2011,(11) : 170-172.
- [2] LiYa Wang, WenMin Zhang. Research on the Method of Higher Vocational Mathematics Assessment [J]. Education and Occupation, 2011,(3): 118-119.
- [3] Run Zhang. Research on the Promotion Mechanism of Formative Evaluation to Student Autonomy [J]. HeBei Normal University Journal: Educational Science Edition,2009,11 (9) : 99-101.
- [4] Qian Guo,ZhiQiang Yang. On Formality Evaluation and Its Enlightenment to College English Teaching and Testing, 2003,24 (005) : 103-108.
- [5] LuJuan Shen. Research on the Evaluation Method of Higher Mathematics Curriculum [J]. Education and Teaching Forum,2015,6: 210.

---

Supported by Seventh teaching reform of Tongji Zhejiang College, zhejiang, China

## CITE AN ARTICLE

Chen, Huan, and Lan Zhao. "EXPLORATION AND RESEARCH ON MODE OF ACADEMIC EVALUATION FOR THE COURSE OF 'DIGITAL FUNDAMENTAL' BASED ON THE MULTIPLE EVALUATIONS ." *INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY*, vol. 7, no. 10, pp. 16–19.