**Journal of Education and Educational Research**
ISSN: 2957-9465 | Vol. 2, No. 3, 2023

# Research and Practice of Project-based Curriculum Politics Evaluation System

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**Abstract:** In response to the problems of the current practice-oriented project-based courses, such as the single form of curriculum politics evaluation and the subjective way of curriculum politics evaluation, the CIPP model suitable for curriculum politics evaluation is adopted, and the evaluation system is constructed from four aspects: context evaluation, input evaluation, process evaluation and product evaluation. The CIPP model is used to construct an evaluation system with 4 level-1 indicators and 11 level-2 indicators. Analytic hierarchy process was applied to derive the weights of each index. According to the weights, the teaching implementation of the project-based course was reconstructed to enhance the openness of project selection, to connect the in-class and out-of-class, and to deeply involve students in the construction of the resource library. The questionnaire survey before and after the improvement of the implementation plan showed that the implementation plan led to a significant increase in course satisfaction.

**Keywords:** CIPP; Curriculum politics; Practice-oriented; Project-based.

## 1. Introduction

The Ministry of Education's "Guideline for the Construction of curriculum politics in Higher Education" puts forward the general requirement of "integrating ideological and political education into the talent cultivation system, comprehensively promoting the evaluation of college ideological course, giving full play to the nurturing role of each course, and improving the quality of college talent cultivation". For the practice-oriented project-based courses, through the project, the curriculum politics is covered outside the classroom, which is conducive to the implementation and evaluation of the effect of the curriculum politics in the whole academic process. At the same time, the practical-oriented project-based course has established the evaluation system of curriculum politics, and assessed students' learning behaviors from the perspective of ideological and political education, which can fully mobilize students' enthusiasm to participate in curriculum politics and achieve the goal of curriculum politics implicitly.

The CIPP evaluation model was proposed by American scholar Staff Lebeam (D.L) on the basis of Taylor's behavioral goal model and was first applied to the evaluation of educational programs in the U.S. The CIPP evaluation model consists of four parts: context evaluation, input evaluation, process evaluation, and product evaluation [1]. The CIPP evaluation model emphasizes process and improvement, and focuses on collecting experiences and feedback from all parties involved in teaching [2], therefore, the use of CIPP evaluation model to evaluate the curriculum politics is well suited to the requirements of the “Three-Wide Education”, combined with the characteristics of the practice-oriented project-based curriculum, and has high research value.

## 2. Analysis of the Current Situation

### 2.1. Single Form of Evaluating Curriculum Politics

From the perspective of curriculum politics design, with the deepening of curriculum politics reform in recent years, the teaching elements such as curriculum politics literacy objectives and curriculum politics integration points have been reflected in the lesson plans. Teachers are generally conscious of integrating the elements of ideological politic in the teaching of professional courses, but the evaluation of students' curriculum politics is basically limited to the teachers' evaluation of students' classroom performance. The process evaluation, such as independent learning and cooperative learning, which can reflect students' subjective initiative, is missing [3]. There is still a lack of effective means on how to assess the degree of achievement of the classroom curriculum politics goals, especially on how the curriculum politics should be implemented and evaluated outside the classroom lesson plans.

### 2.2. Subjective Way of Evaluating Curriculum Politics

At present, due to the implementation of project-based teaching, students' classroom participation and classroom enthusiasm are relatively high, reflecting good initiative and effectively reaching knowledge goals and ability goals. On the other hand, in the achievement of the objectives of the curriculum politics, the conclusion is usually given unilaterally by the teacher only, and the evaluation method is based on the teacher's subjective evaluation, which is a single subject of evaluation and easy to cause one-sided. Students are often in a passive position, in the implementation of the curriculum politics in the situation of being indoctrinated, no active awareness. At the same time, the objective carrier of evaluation is lacking and difficult to quantify.

## 3. The Establishment of the Evaluation System of Curriculum Politics

### 3.1. Establishment of the Index System

While traditional evaluation methods focus on outcome evaluation and emphasize diagnostic and summary functions, the CIPP model places more emphasis on the evaluation

functions of process and improvement, which is in line with the “Three-Wide Education” requirements of curriculum politics. In the implementation of practice-oriented project-based courses, students are deeply involved in the process, and the CIPP model focuses on collecting experiences and feedback from all parties involved, which is suitable for evaluation. The CIPP model can be dynamically tracked and optimally adjusted as the curriculum politics has the distinctive feature of keeping up with the times. In this paper, based on the CIPP model and the existing curriculum politics evaluation system [4–6], we establish the evaluation system of curriculum politics from four aspects: curriculum background, curriculum input, curriculum implementation, and curriculum effect. The evaluation system contains 4 level-1 indicators and 11 level-2 indicators. The indicators and their meanings are shown in Table 1.

**Table 1.** Meaning of Indicators of Curriculum Politics Evaluation System

| Level-1 Indicators | Level-2 Indicators | Meaning |
|---|---|---|
| **Context Evaluation** | Course Objectives | Meet the requirements of curriculum politics |
| | Course Orientation | In line with professional positioning |
| **Input Evaluation** | Design of the selected topic | Integrating curriculum politics elements |
| | Resource Building | Enrich, update, reuse |
| | Procedure Design | Task decomposition and linkage |
| **Process Evaluation** | Participation of selected topics | Students and faculty share the theme |
| | Implementation Engagement | Team participation |
| | Evaluation of participation | Multi-component evaluation |
| | Output Engagement | Faculty and students build a library together |
| **Product Evaluation** | Subjective Products | Self-awareness, initiative, motivation |
| | Objective Products | Quality of the work, the content of the work |

## 3.2. Establishment of Index Weights

In order to ensure the scientific and validity of the above evaluation indexes, this paper adopts the Analytic hierarchy process to determine the weights of each index.

First, five experts, three teachers and two students were invited to compare the above indicators in pairs and construct a pairwise comparison matrix. Ideally, the pairwise comparison matrix should be a consistent matrix, but due to the subjective judgment bias of the respondents, the constructed pairwise comparison matrix is not guaranteed to be consistent, and it is necessary to conduct a consistency check to determine its deviation from the consistent matrix. It is usually considered that if the average random consistency ratio C.R. is less than 0.1, the constructed pairwise comparison matrix inconsistency is within the tolerance range. If the pairwise comparison matrix does not pass the consistency check, the survey respondents are required to make the necessary corrections until they pass the consistency check. Then the normalized eigenvectors of each pairwise comparison matrix are obtained separately and used as the weight vectors.

Based on the weight vectors derived from the pairwise comparison matrices filled by the 10 survey respondents, the group decision calculations were performed using arithmetic averaging as the data aggregation method. The calculated weights of each indicator are shown in Table 2.

**Table 2.** Weights of Evaluation Model Index

| Level-1 Indicators | Weights | Level-2 Indicators | Weights |
|---|---|---|---|
| **Context Evaluation** | 0.0491 | Course Objectives | 0.0181 |
| | | Course Orientation | 0.0310 |
| **Input Evaluation** | 0.2585 | Design of the selected topic | 0.1436 |
| | | Resource Building | 0.0338 |
| | | Procedure Design | 0.0812 |
| **Process Evaluation** | 0.5310 | Participation of selected topics | 0.0388 |
| | | Implementation Engagement | 0.2965 |
| | | Evaluation of participation | 0.1253 |
| | | Output Engagement | 0.0704 |
| **Product Evaluation** | 0.1614 | Subjective products | 0.1076 |
| | | Objective pruducts | 0.0538 |

# 4. Application and Implementation of the Curriculum Politics Evaluation System

## 4.1. Implementation Plan

This topic is implemented based on the project-based practical teaching courses such as the Provincial Curriculum Politics Demonstration Course "Microcontroller Application Technology". As seen from Table 2, among the Level-1 indicators, process evaluation is the most important. Among the Level-2 indicators, Implementation Engagement, Design of the Selected Topic, and Evaluation of Participation are the three most important indicators. Therefore, attention should be paid to student participation in all aspects of the course, especially in the extracurricular aspects, elaborate the design of the selected topics, and fully consider students' opinions in the course evaluation.

In response to the above evaluation indexes, in terms of context evaluation, we fully communicate with the head of the major to ensure that the course orientation and course objectives fit the national requirements of curriculum politics. The course implementation process focuses on input evaluation, process evaluation, and product evaluation. The specific implementation methods are divided into the following four aspects.

1). In the project selection, from proposition, semi-open, open in order to progressively. With the depth of the course, in the project to improve the degree of integration at the same time, increase the project proposition openness, more integration of student creativity, guide students into the Curriculum-Politics elements, enhance student participation in the curriculum politics.

2). In the aspect of procedure design, the inside-classroom and outside-classroom are integrated to form a progressive closed loop. First, in the classroom to do a good job in the

project implementation of the necessary knowledge and ability reserves. Then, the project will be extended to the outside-classroom, and the students will naturally produce resources of curriculum politics in the process of completing their works. Finally, the students return to the classroom to evaluate their work and test the effectiveness of the course.

3). In terms of evaluation methods, a multiple evaluation system is constructed. In the knowledge learning session, the teacher will evaluate students' knowledge and ability mastery and classroom performance. In the outside-classroom practical work session, the group members will evaluate each other's team contribution and work performance. The work evaluation session is evaluated by the group members and the teacher and enterprise mentor, focusing on the quality of work completion and the connotation of the work in curriculum politics.

4). In terms of resource construction, teachers and students build the curriculum politics resources. Teachers focus on the background of the project, the selection of the topic intention to build the curriculum politics resources, to set the tone for the project, to promote the implementation of the project. Students focus on recording their own perceptions and self-growth in the process of the project, forming the curriculum politics resources.

## 4.2. Implementation Effectiveness

The course program was implemented in 2 teaching classes for one semester. With the implementation of the course, students' participation in the course project and the curriculum politics has increased significantly, and the course project has gradually transitioned from teacher-appointed and semi-appointed questions to fully open-ended questions that stimulate students' brainstorming. For example, when teaching the basic IO port content, the instructor's proposition incorporates the curriculum politics element: controlling the LED to display the Centenary of The Party Founding. When teaching the content of timer, combined with the curriculum politics element of the Winter Olympics, the teacher semi-proposed: The timer application of the Winter Olympic Games. In the integrated microcontroller application project, students can be combined with China's achievements in manned spaceflight open proposition: What can microcontrollers do for manned spaceflight? The teacher can also guide the observation of life: Microcontroller can bring what convenience to create a better life.

Students formed teams of 4-5 people and made full use of their time outside of class to complete the implementation of 5-6 course projects within a semester's time, fully participating in project self-assessment and mutual evaluation. During the implementation of the projects, everyone has developed several cases, which have enriched the curriculum politics resource.

For the effect of the implementation of this course program, based on the curriculum politics evaluation system established in this paper, a questionnaire survey was conducted on students at the beginning and at the end of the period, and the comparison of the results is shown in Table 3.

**Table 3.** Comparison of Questionnaire Results

| Level-1 Indicators | Level-2 Indicators | Weights | Average score before implementation (1-5) | Average score after implementation (1-5) |
|---|---|---|---|---|
| **Context Evaluation** | Course Objectives | 0.0181 | 4.82 | 4.95 |
| | Course Orientation | 0.0310 | 4.93 | 4.96 |
| **Input Evaluation** | Design of the selected topic | 0.1436 | 3.73 | 4.86 |
| | Resource Building | 0.0338 | 3.02 | 3.66 |
| | Procedure Design | 0.0812 | 3.25 | 4.18 |
| **Process Evaluation** | Participation of selected topics | 0.0388 | 2.52 | 3.94 |
| | Implementation Engagement | 0.2965 | 3.86 | 4.73 |
| | Evaluation of participation | 0.1253 | 2.84 | 4.27 |
| | Output Engagement | 0.0704 | 2.53 | 3.12 |
| **Product Evaluation** | Subjective Products | 0.1076 | 4.13 | 4.67 |
| | Objective Products | 0.0538 | 2.62 | 3.64 |
| **Weighted Results** | | | 70.07 | 88.25 |

The last row in Table 3 shows the results of weighting the indicators according to the weights shown in Table 2 and converting them into percentages. The results show that under the guidance of the evaluation index system of this topic, the effect of the implementation of the curriculum politics is significantly improved. This is also consistent with the subjective feelings of students.

# 5. Conclusion

This project establishes an evaluation system of curriculum politics that meets the requirements of the “Three-Wide Education”, and realizes the whole time and space coverage of the evaluation of the effectiveness of curriculum politics, especially the effective evaluation of the weak link of curriculum politics implemented outside the classroom. The project will form a scalable multiple evaluation model of curriculum politics, which will be applied to all professional courses of electronic information and engineering subjects that implement project-based teaching.

The project highlights the characteristics of the project-based practical teaching course, implements the evaluation of curriculum politics with the carrier of practical projects, effectively extends the curriculum politics outside the classroom, and relies on internal and external platforms and enterprise resources to carry out curriculum politics throughout the academic process. The results of the curriculum politics are evaluated by teachers and students to

arouse students' initiative and sense of mission to participate in the curriculum politics and to form a three-tier evaluation system. The curriculum politics resources are jointly built by teachers and students to achieve a subtle, silent ideological and political effect. In the implementation cycle of 2 classes for 1 semester, the students' satisfaction with the curriculum politics has increased significantly.

## Acknowledgments

This work was supported in part by the Second Phase of the Ministry of Education's supply and Demand Docking Employment and Education Project under Grant 20230112193, in part by the Teaching Research Project of Curriculum Ideology and Politics from Wenzhou Polytechnic under Grant WZYSZJG2101, in part by the "14th Five-Year Plan" Teaching Construction and Teaching Reform Research Project from Wenzhou Polytechnic under Grant WZYZD202103, in part by a grant from Zhejiang Province Curriculum Ideology and Politics Model Courses "Microcontroller Application Technology" (Zhejiang Education Letter [2021] No. 47)，in part by the First Batch of Teaching Innovation Teams for Teachers in Higher Vocational Colleges in Wenzhou under Grant NO.1，and in part by Wenzhou Polytechnic Curriculum Ideological and Political Demonstration Major Construction Project under Grant WZYSZZY2101.

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