

Research on Blended Teaching Evaluation System in Higher Vocational Education Based on SOLO Taxonomy

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Abstract: On the basis of introducing the present situation of blended teaching evaluation in higher vocational colleges and SOLO taxonomy, this paper analyzes the principles and influencing factors of the construction of blended teaching evaluation system in higher vocational colleges. Based on SOLO taxonomy, it then discusses the methods and strategies of evaluation on four levels (such as: unistructural; multi-structural; relational and extended abstract.) of blended teaching in higher vocational colleges.

1. Introduction

1.1. The Present Situation of Blended Teaching Evaluation in Higher Vocational Education

Blended learning, which combines traditional teaching advantages with E-learning advantages, has become the new normal of higher vocational education reform in the post-epidemic era. Reasonable evaluation of mixed teaching is the key to the smooth development of blended teaching. However, the present situation of the blended teaching evaluation system in higher vocational colleges is that the proportion of summative evaluation is too large and the tendency of quantification is obvious, the summative evaluation takes a large proportion and tends to be quantified obviously, formative assessment is often equated with recording students' attendance, homework completion, classroom performance and in-class test results. The assessment method is relatively single, mainly teachers' assessment, and there is no clear qualitative assessment description, there is no timely, detailed and targeted evaluation of feedback, which cannot play a real role in teaching evaluation.

1.2. SOLO Taxonomy

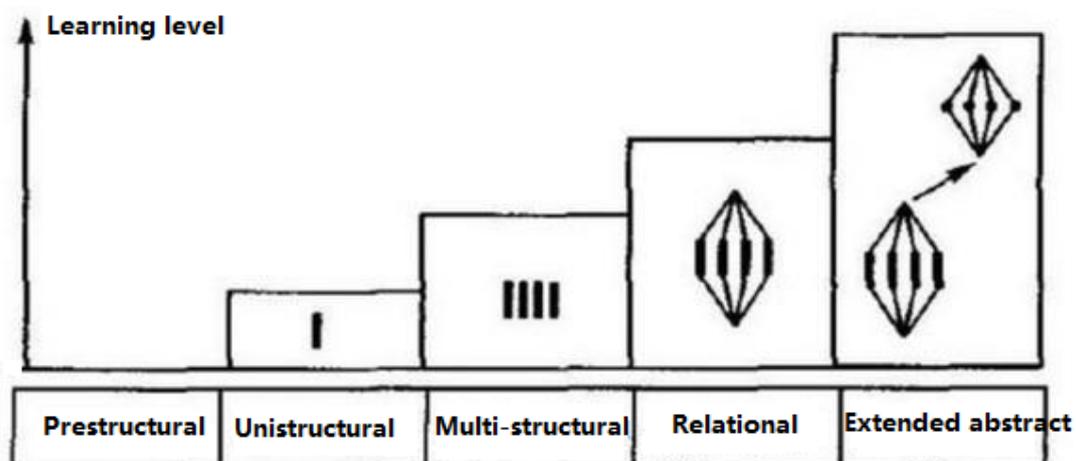


Figure 1 Five levels of Structure of Observable Learning Outcomes.

SOLO (Structure of the Observed Learning Outcome) is an English description of “Structure of

Observed Learning Outcome”, which is proposed by professors Biggs and Collis of the University of Hong Kong in their book “Assessment of Learning quality: Structure of Observed Learning Outcome”, Biggs believes that knowledge is perceived at different levels or at different stages of thought, which can be observed in the structure of thinking that occurs when questions are answered or learning results are presented, therefore, it is called “Structure of observable learning outcomes”. SOLO divides the learning outcomes into five levels [1], as shown in Figure 1.

SOLO taxonomy, as a mature evaluation theory, pays attention to the qualitative evaluation of students' learning quality, which combines the learning process with the learning results. This theory analyzes the students' thinking mode, which is helpful to improve the students' interest in learning and learning efficiency.

2. The Principles of Constructing the Evaluation Index System

2.1. Comprehensive

The principle of comprehensiveness means that the evaluation index of mixed teaching in higher vocational colleges should include the whole process of teaching before, during and after class.

2.2. Developmental

The aim of developmental evaluation is not only to distinguish the good from the bad, but also to feedback the information in time and adjust and encourage the students to study in time, so as to achieve the expected teaching goal smoothly. The design of blended teaching evaluation index should pay attention to the sustainable development of teachers and courses as well as students' own knowledge, skills and quality.

2.3. Progressive

The hierarchical and progressive nature of teacher's instructional design is the precondition of students' effective learning, it is necessary to set up a set of scientific and reasonable advanced evaluation system which conforms to the rule of students' cognitive development and runs through the whole learning process. According to SOLO taxonomy, the blended teaching evaluation index should accord with the rule of students' self-growth, the process of knowledge acquisition from easy to difficult, from memory to understanding, and to internalization and transfer.

2.4. Vocational

Article 43 of Vocational Education Law (2022 version) states the evaluation of the quality of vocational education shall highlight the orientation of employment, use the professional ethics, technical and skill level and employment quality of educates as important indicators, and guide vocational schools in training high-quality technical and skilled talents. Therefore, the evaluation index of blended teaching evaluation should be student-centered, emphasize the evaluation of post knowledge and post skills, and pay attention to the evaluation of students' learning ability and professional ethics.

3. Influencing factors

There are many factors that affect the evaluation of blended teaching, including the leading factors of teachers teaching, the main factors of students learning, the external factors of teaching resources and environment. And they promote each other and affect the teaching quality of blended teaching. Influence the quality of mixed teaching.

3.1. Teacher-related Factors

The teaching-related factors of blended teaching are divided into three secondary indexes: teaching preparation, teaching design and teaching implementation. Teaching preparation includes the followings: teaching resources of virtual and in-person class, Student Guide List, Evaluation Form, Analysis students [2]. Teaching design includes two parts: teaching contents design and

teaching methods design. The evaluation of teaching contents is mainly concerned with these sub-indicators: whether it conforms to the curriculum standards, whether it is based on a job assignment or a professional context, and whether to implement the curriculum ideological and political education etc. The main factors to be considered in the evaluation of teaching method are: whether the teaching method conforms to the cognitive law of students from easy to difficult, from simple to complex, and whether it is student-centered. The evaluation of teaching implementation focuses on three levels of indicators, such as teachers' self-accomplishment, teaching interaction and the implementation of teaching procedures.

3.2. Student-related Factors

In the aspect of students, the factors that affect the effect of blended teaching mainly include students' original knowledge, students' motivation, learning methods and learning ability. These abilities and qualities can be continuously promoted and developed in learning.

3.3. External Factors

The external factors that affect blended teaching include not only the quantity, content and form of teaching resources in virtual and in-person class, but also the degree of compatibility with teaching requirements. Whether the teaching environment embodies the characteristics of interactivity, integrity and immersion.

4. The Application of SOLO Taxonomy

According to the requirements of the new Vocational Education Law, the evaluation of blended teaching in higher vocational colleges is oriented to the employment, and which focuses on the improvement of students' professional ethics, professional knowledge and skills. Therefore, the blended teaching evaluation of higher vocational education mainly from the knowledge acquisition, ability training and accomplishment of three aspects to evaluate the results of student learning. According to SOLO Taxonomy, we can divide student learning outcomes into four levels: On unistructural level, students have the ability to link and input knowledge and use resources. On Multi-structural level: students are able to transfer and share knowledge, acquire knowledge through tools, and possess basic personal qualities. On relational level: Students can carry out knowledge management, have strong learning ability and better personal quality and patriotism, integrity and other basic professional ethics. On extended abstract level: students can use knowledge skillfully, they have good communication and cooperation ability and good professionalism, sense of responsibility and other professional ethics.

4.1. Evaluation of Unistructural Level

According to the course standard and the requirement of the profession, the teacher divides the course into several projects or situations, and the knowledge, ability and self-cultivation to complete each project is the teaching goal of the course. Each project or work situation involves many knowledge points, the teacher deconstructs and reconstructs the knowledge points, divides into sub-knowledge points. Through the platform teachers issue micro-lecture, which explains the relevant knowledge points, design the corresponding test questions. According to the guide sheet before class, students log on to the corresponding course platform, and then they learn video or text by themselves and take tests in virtual class.

In this stage, students only need to understand the main points of the video and articles, and do not need to think deeply about the learning materials, they can complete the answer questions, and the relations between each point are not strong, therefore, the evaluation of learning outcome at this stage belongs to unistructural evaluation [3]. The teachers evaluated the students' performance by the length of time the student logged on to the platform, the progress of watching video or reading article, and the results of automatic marking. The results of the platform evaluation will be fed back to students and teachers in real time. Students can compare their learning progress, learning input and learning results with other classmates according to the results of evaluation, and then they

adjust learning strategies and methods by their advantages and disadvantages. Teachers can not only know the students' performance according to the test results analyzed by platform, but also help to supervise and motivate the students in time.

4.2. Evaluation of Multi-structural Level

On the level of multi- structural, students have the ability to transfer and share the acquired knowledge, which is an active process of constructing knowledge. In this stage, the depth and breadth of the learning content are improved step by step compared with the previous level, however, students are still unable to integrate and relate the knowledge and skills acquired through self-study, so this stage still belongs to the foundation stage of knowledge.

At this stage, students participate the following activities: firstly, to collect the relevant knowledge of the project or situation according to the requirements of the pre-class Guided Learning Plan. Secondly, to set up the Study Portfolio. Thirdly, to complete project related exercises. Lastly, to share them orally with a random group of students in class.

The place of evaluation is in-person class, and the evaluation methods are teacher evaluation and student self-evaluation, the proportion is 60% and 40% respectively. Teachers evaluate the attitude, strategies and outcomes of students learning by observing Study Portfolio, and put forward students' individualized learning plans. According to the results of the exercise, students make self-evaluation, and then further adjust learning strategies and methods so as to make the best of their strengths and avoid their weaknesses.

4.3. Evaluation of Relational Level

On the level of relational, students can manage and apply knowledge, they simulate career projects or scenarios and feel the workplace atmosphere in groups. This activity helps to train students' ability of teamwork and oral expression. This stage belongs to the transition period of shallow learning and deep learning. Students use the vocational knowledge and skills they have learned to reproduce the vocational scene, which embodies the students' learning ability, personal quality and professional ethics. Teacher evaluates the students' simulated performance in class. The key points of the evaluation are the team members' cooperation, fluency of expression, accuracy and application of knowledge and skills. Each member in the group made self-evaluation according to the degree of participation, dedication, cooperation and final performance. Then each group according to the performance of each group for inter-group evaluation. Teacher evaluation, self-evaluation and inter-group evaluation accounted for 40%, 30% and 30% respectively.

4.4. Evaluation of Extended Abstract Level

Extended Abstract level is the highest level of learning, students can transfer and innovation of knowledge in the internalization of the acquired knowledge and skills. On this level, students use deductive and inductive methods to simulate a given situation or task. The content of evaluation is the students' performance or work display. At this stage, teacher guides the students to extend the knowledge to the practical application field with the assistance of information technology. It is a complete in-depth study to arouse the students' thinking on the subject-related problems and reflect the real value of higher vocational courses. The dimensions of evaluation are: novelty of works, rationality of content, input of technology and presentation of cultural connotation. The participants in the evaluation are: Enterprise Instructors, school teachers and students, the proportion of 40%, 40% and 20% respectively.

5. Conclusion

The step-by-step model of SOLO Taxonomy theory (unistructural--multi-structural --relational--extended abstract) fully reflects the universal law of Students' acquisition of knowledge and development ability. The application of SOLO theory to the evaluation of blended teaching in higher vocational colleges is beneficial to students' acquiring post knowledge and skills, improving their professional quality and promoting the realization of higher vocational education goals.

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References

- [1] John B. Biggs, Kevin F. Collis Evaluating the Quality of Learning: The SOLO taxonomy, [M] By Gao Lingbiao and Zhang Hongyan, People's Education Press,2010. 27-32
- [2] Hong-yu Li, The Construction and Application of the Evaluation index System of Blended Teaching based on Connectivism, 2021 17-30.
- [3] Yan Zhang, The design and application of SPE evaluation model based on observable learning outcome structure in college English curriculum J. Journal of Henan Institute of Science and Technology, 2020(4) 63-67.