

On the Implementation Difficulties of Assessing Course Objective Attainment based on Outcome-Based Education

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Abstract

This paper investigates the difficulties in implementing assessment of course objective attainment. Through a questionnaire survey, it was found that teachers face practical difficulties in five aspects: understanding of the concept of Outcome-Based Education (OBE), setting course objectives, designing assessment components, calculating achievement status, and providing feedback and improvement. The paper analyzes the reasons for these difficulties and puts forward measures to overcome them.

Keywords: outcome-based education, course objective attainment, assessment

1. Introduction

Outcome Based Education (OBE) is an educational approach that focuses on defining specific learning outcomes or goals that students are expected to achieve by the end of a course or program. A revival of OBE began in the 1980s (Spady 1988, 1994), it can help students gain a deeper level of learning experience, enhance their motivation and sense of achievement, and lay a good foundation for their future career development. Given the issues with traditional curriculum assessment, many universities are gradually implementing Outcome-Based Education (OBE) principles for assessing curriculum objectives. This evaluation approach emphasizes examining and evaluating the educational process and its outcomes from an outcome-oriented perspective. The OBE concept highlights the results and outputs of education, specifically learning outcomes, rather than solely focusing on the teaching process itself. It requires clearly defined curriculum objectives and the design of teaching activities and assessment methods based on these objectives to ensure that students can achieve these predetermined learning outcomes.

2. Overview of the OBE Concept

OBE focuses on learning outcomes and presents a clear departure from traditional teacher-centered, process-driven educational approaches (Pekar & Pudelko, 2016). The fundamental principle of OBE is to tailor the design, implementation, and evaluation of educational activities around the anticipated learning achievements that students can attain (Biggs, 1996). This concept emerged from a critical examination of the effectiveness and equity within traditional education (Spady, 1994). In the 1980s, the education sector began a quest for more efficient teaching methodologies to tackle the disparities in learning outcomes and the absence of targeted instructional methods (Stufflebeam, 1988). Spady (1988) was among the pioneers of the OBE concept, stressing the importance of education concentrating on students attaining the projected learning outcomes rather than just focusing on instructional processes and delivering content (Spady, 1988). Post the introduction of the OBE concept, numerous countries and regions have initiated trials with the OBE framework across various educational levels and subjects (Gurukkal, 2020). The theory of "constructive alignment" put forward by Biggs and Tang (2011) (Biggs & Tang, 2011) establishes a theoretical foundation for the implementation of OBE in higher education, highlighting its utilization to bolster learning achievements. In the realm of medical education, Harden (2002) (Harden, 2002) outlined particular strategies for executing the OBE educational model, encompassing innovative curriculum design, structuring of learning activities, and assessment methods, offering crucial insights for the reform of medical education. The execution of OBE has resulted in advancements in educational quality and the introduction of innovative teaching approaches (Karakose, 2016). Studies by Adams and DeFleur (2006) (Adams & DeFleur, 2006) suggest that OBE not only enhances students' learning outcomes but also reinforces the fairness and adaptability of education, thereby catering to diverse learning needs. OBE signifies not only a transformation in educational frameworks but also signifies a profound analysis and quest for educational quality and

effectiveness. The evolution and utilization of OBE underscore the pivotal role of educational innovation in fostering learning equity and elevating educational outcomes.

3. Implementation Steps for Course Evaluation based on the OBE Concept

The specific steps for implementing the evaluation process of course goal achievement based on the OBE concept are as follows (Choi & Park, 2018):

Establish course objectives: Clearly define the goals and expected outcomes of the course, ensuring that the objectives align with student needs. Translate course objectives into quantifiable and measurable learning outcomes for subsequent evaluation.

Design assessment tasks and criteria and conduct evaluations: Design assessment tools, including tests, assignments, projects, etc., ensuring that these tools comprehensively assess students' knowledge, skills, and attitudes. Set clear assessment criteria, including target achievement standards and grading criteria. Assess students at appropriate intervals to ensure coverage of all course objectives.

Collect, calculate, and analyze data on course goal achievement: Collect evaluation data, including students' answers, work, practical performances, etc. Calculate and analyze students' performance based on the assessment criteria and tools to determine whether they have achieved the course objectives.

Provide feedback and continuous improvement based on data: Provide feedback to students on the evaluation results, helping them understand their learning status and development direction. Offer targeted suggestions and guidance, encouraging students to make progress and address any shortcomings. Adjust courses and teaching methods based on evaluation results to promote continuous improvement in student learning outcomes. Regularly assess the effectiveness of the evaluation process itself, continuously optimize the evaluation tasks and tools to ensure fairness and accuracy of the evaluation.

Through the above steps, the implementation process of evaluating course goal achievement based on the OBE concept can comprehensively assess students' performance in terms of knowledge, skills, attitudes, etc., providing effective feedback and improvement directions for teaching quality and student performance.

4. Questionnaire Survey on the Difficulty of Course Goal Achievement Evaluation Based on the OBE Concept

At the author's university and surrounding universities, teachers are currently implementing the evaluation process of course goal achievement based on the OBE concept. In this evaluation process, they are facing some practical difficulties. According to the author's understanding, these difficulties include the following aspects: understand OBE concept, determining course objectives, designing assessment tasks and criteria and conducting evaluations, collecting, calculating, and analyzing data on course goal achievement, providing feedback and continuous improvement based on data. To accurately understand the difficulties in evaluating the achievement of course goals based on the OBE concept, this study conducted a questionnaire survey on the difficulty of implementing the evaluation of course goal achievement based on the OBE concept.

4.1 Survey Purpose

The purpose of this survey is to understand the difficulties faced by full-time teachers who have already implemented the OBE concept in their courses.

4.2 Survey Participants

This survey was conducted at a general undergraduate institution in Jiangsu Province, China. To ensure that the participants are familiar with the OBE concept, the survey was conducted among full-time professional teachers who are engaged in professional course instruction in teacher education or engineering. These professionals must have obtained certification in teacher education or engineering. The courses are required to comply with OBE standards. A total of 272 questionnaires were distributed, with 256 collected, resulting in a response rate of 94.12%. Among them, 245 questionnaires were deemed valid, yielding an effective rate of 95.70%. Valid responses mean that respondents do not omit any questions, do not provide false information, and provide clear and accurate answers as required by the questions.

4.3 Questionnaire Development

To address the difficulties in evaluating course goal achievement based on the OBE concept, a questionnaire titled "Questionnaire on the Difficulty of Evaluating Course Goal Achievement Based on the OBE Concept" was developed. The questionnaire consisted of the following five survey questions:

- 1) The level of difficulty teachers encounter in understanding and interpreting the OBE concept.
- 2) The level of difficulty teachers face in designing outcome-oriented course teaching objectives.
- 3) The level of difficulty teachers experience in designing assignments, tests, and other teaching activities and assessment components based on teaching objectives.

- 4) The level of difficulty teachers encounter in calculating and analyzing evaluations of course goal achievement.
- 5) The level of difficulty teachers face in using analysis results of goal achievement for continuous teaching improvement.

The questionnaire utilized the Likert five-point scale method for coding, with options ranging from "Very Difficult" to "Very Easy" for students to select based on their actual experiences, and assigned scores sequentially from 5 to 1.

4.4 Questionnaire Reliability and Validity

4.4.1 Reliability Analysis

Using SPSS 25.0, a reliability analysis was conducted on the results of five survey questions to determine the internal consistency of the questionnaire. As shown in Table 1, the reliability coefficient of the questionnaire is 0.619, which is greater than 0.6, indicating a certain level of reliability. This suggests that the test results of this survey questionnaire have good reliability, and therefore, this questionnaire can be used in the study.

Table 1. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
0.619	0.633	5

4.4.2 Validity Analysis

Validity analysis was conducted on the questionnaire using SPSS 25.0, resulting in a Kaiser-Meyer-Olkin (KMO) value of 0.616 (see Table 2), which is greater than 0.6, and the significance level was lower than 0.01. The questionnaire also passed the Bartlett's sphericity test at a significance level of 0.05, with an approximate chi-square value of 283.122 and 10 degrees of freedom. It is considered that the survey questionnaire designed for this study has good validity.

Table 2. KMO and Bartlett's Test

KMO Measure of Sampling Adequacy		0.616
Bartlett's Test of Sphericity	Approx. Chi-Square	283.122
	Degrees of Freedom	10
	Significance	0.000

4.5 Statistical Results of the Survey

Descriptive statistics for frequency are shown in Table 3, and statistics for proportions are presented in Table 4.

Table 3. Frequency Statistics

Option	Question 1	Question 2	Question 3	Question 4	Question 5
A	17	6	3	10	12
B	78	43	62	89	54
C	61	120	121	51	97
D	73	71	49	84	73
E	16	5	10	11	9
Total	245	245	245	245	245
Mean	2.97	3.11	3.00	2.99	3.05
Standard Deviation	1.077	0.798	0.817	1.026	0.928

Table 4. Proportion Statistics

Option	Question 1	Question 2	Question 3	Question 4	Question 5
A	6.9	2.4	1.2	4.1	4.9
B	31.8	17.6	25.3	36.3	22.0
C	24.9	49.0	49.4	20.8	39.6
D	29.8	29.0	20.0	34.3	29.8
E	6.5	2.0	4.1	4.5	3.7
Total	100.0	100.0	100.0	100.0	100.0

Some very intuitive results can be obtained from Table 3 and Table 4. From the perspective of means, the statistical values of the five options are all around the median. Comparing the mean values of the five options, the difficulty from high to low is as follows: Question 2 > Question 5 > Question 3 > Question 4 > Question 1. Looking at the standard deviations, Questions 1 and 4 have larger deviations, while Questions 2, 3, and 5 have relatively smaller deviations.

4.6 Summary of Statistical Results

Based on the statistical results, the following conclusions can be drawn:

- 1) The difficulty level of teachers implementing the OBE concept in teaching is generally at a moderate level.
- 2) This indicates that the greatest difficulty for teachers in implementing the OBE concept in teaching lies in setting course objectives, setting teaching activities and assessment components, and feedback and continuous improvement. The difficulty in understanding the OBE concept is relatively lower.
- 3) Opinions on the difficulty in setting course objectives, teaching activities and assessment components, feedback, and continuous improvement tend to be more concentrated.

5. Causes of the Above-Mentioned Issues

The main reasons for the emergence of the above issues are as follows:

- 1) Due to the fact that the OBE concept itself is relatively mainstream in theory, teachers have relatively less difficulty in understanding and accepting the OBE concept.
- 2) Setting course objectives involves dimensions and levels of objectives, and the objectives need to be measurable and quantifiable. This presents a certain level of difficulty for teachers, as it requires knowledge of educational objective classification systems like Bloom's taxonomy (Bloom, 1956).
- 3) Setting assessment components is limited by teaching conditions, class hours, teacher proficiency, student levels, and their active participation, and also places some demands on the workload of teachers. Therefore, it poses a certain level of difficulty.
- 4) The calculation of course objective achievements only involves simple calculations such as weighted averages, and does not require more complex statistical calculations. Teachers can easily obtain achievement values by performing basic calculations using Excel, hence they do not consider the calculations to be significantly difficult.
- 5) Feedback and continuous improvement entail some difficulty in identifying the real underlying issues. Some problems may not be easy to improve for various reasons, and there are significant differences in teachers' motivation for continuous improvement. These factors contribute to the challenges in providing feedback and ensuring continuous improvement.

6. Measures to Address the Above Issues

To address the above issues, some measures need to be taken to reduce the difficulties:

- 1) Strengthening teacher training and understanding of the OBE concept. Organize dedicated training courses or seminars to help teachers deeply understand the core concepts and practical methods of OBE; provide case studies and examples to assist teachers in better understanding and applying the OBE concept.
- 2) Guiding teachers in setting measurable course objectives. Provide guidance or templates to help teachers set measurable course objectives effectively to ensure clarity and feasibility; organize training sessions to familiarize teachers with educational objective classification systems like Bloom's taxonomy, enhancing the professional level of course objective setting.
- 3) Optimizing the setting of assessment components. Provide resource and technical support to help teachers design diverse and flexible assessment methods and tools; encourage teachers to actively participate in professional development and educational research to enhance teaching quality and workload.
- 4) Enhancing teacher training in calculation and statistical methods. Organize professional training on data analysis and statistical methods to help teachers master more complex data calculation and analysis skills; provide calculation tools and templates to simplify complex calculations, making it easier for teachers to conduct data analysis.
- 5) Promoting the establishment of feedback and continuous improvement mechanisms. Establish effective feedback mechanisms, including regular evaluation and communication sessions to help teachers promptly identify issues and areas for improvement; provide support and incentive mechanisms to encourage teachers to engage in continuous improvement and professional development, building a learning-oriented teacher team.

7. Conclusion

By implementing the above measures, teachers can better address potential difficulties in assessing course objective achievements based on the OBE concept, thereby enhancing teaching quality and effectiveness.

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