

Evaluation of online courses from the perspectives of both learners and administrators

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Abstract. The user reviews of online courses reflect the learners' evaluation of the courses, and the teaching rating standards reflect the administrators' evaluation of the courses. To evaluate courses more comprehensively, this paper proposes an online course evaluation method based on both learner and administrator perspectives. Firstly, based on the user-generated content of online courses, the affective dictionary and LDA topic model are used to determine the focus and weight of learners' attention to the courses. Secondly, according to the scoring criteria of several teaching competitions, the emphasis and weight of administrators' attention to curriculum evaluation are determined. Finally, the paper analyzes the similarities and differences of curriculum evaluation from dual perspectives and puts forward some suggestions for curriculum development and construction.

1. Introduction

The development of online education provides learners with the opportunity to learn online courses. At present, online courses are no longer limited to a fixed time and place and can meet the learning needs of anytime, anywhere, unlimited playback and independent selection of teachers, and have become an important learning tool for learners.

For school education, the opening of online courses enables schools to share educational resources; At the same time, teachers can improve the construction of online courses, and all kinds of online courses can enrich teachers' own knowledge reserves, so schools also begin to pay attention to the construction of online courses.

Many scholars have researched online courses. Means, B.^[1] et al. evaluated the effects of online and blended learning through a comprehensive analysis of massive literature, and summarized the achievements and limitations of online learning. By analyzing the changing behavior of online learners and teachers since the 21st century, Bawa, P.^[2] explores the key reasons for the high attrition rate in online courses and explores solutions to improve retention. Kebritchi, M.^[3] et al. used the Cooper framework to review the literature, point out the problems related to learners, teachers, and content development in online courses, and propose solutions. Castro, M.D.B. and Tumibay, G.M.^[4] used a meta-analysis to review the literature and on this basis established the ADDLE framework to identify different processes and activities for designing and developing online learning courses at higher education institutions.

There are also studies on the effectiveness and satisfaction of online courses. Kaufman and Heather^[5] analyzed the predictors of learner success and satisfaction

with online learning. Tang, T^[6] et al. examined the effectiveness of various online teaching models and compared the proposed combination of online and flipped learning models with other online and traditional models. Hromalikova^[7] et al. reviews the research on students' satisfaction with online courses, including the impact and evaluation of user reviews on course satisfaction. Huei-Chuan Wei and Chien Chou^[8] established a structural model to determine whether e-learning perception and e-learning readiness affect students' e-learning performance and course satisfaction. Gopal, R^[9], et al. showed that teacher quality, curriculum design, timely feedback, and expectations for students have a positive impact on students' satisfaction, and students' satisfaction further has a positive impact on students' performance.

For a course, learners are the audience of the course, and administrators are the supervisors of the course. Whether the two roles have different curriculum requirements and how to verify them is not involved in the current research, which is also the issue to be studied in this paper. Therefore, this paper takes online courses as the main research object, based on user comments, and uses data mining to understand the indicators and weights of learners' concerns from the perspective of learners. At the same time, according to the teaching score file, the important indicators and weights of administrators' evaluation of online courses are analyzed, and the similarities and differences between the two perspectives in course evaluation are compared, to further propose suggestions and improvement measures for online courses.

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2. Curriculum evaluation from the learner's perspective

This paper collects comments and bullet screens of logistics management courses on MOOC and B station as materials for learners to evaluate courses and establishes an evaluation method of logistics management online courses based on course comments.

2.1. Method framework

2.1.1 Data collection and processing

On the online course platform, I used Python and other network data acquisition tools to obtain user comments and bullet screens of logistics management courses. After data cleaning, the Chinese word segmentation database is used to segment the collected data.

2.1.2 Topic extraction

The Gensim module under Python is used to build the LDA topic model, and the topic and subject words are extracted by analyzing the comments and bullet screens posted by users. In this model, the topic is generally a noun, which represents the specific aspects that users pay attention to in online courses in logistics management. There are also adverbs, and adjectives, which are used to modify the emotional description of the subject.

2.1.3 Emotion analysis

The sentiment analysis of online courses in logistics management is coarse-grained sentiment analysis, that is, the sentiment analysis technology based on a sentiment dictionary is used to get the subject words, emotion words, and corresponding scores contained in each comment. On this basis, the comments whose overall score is greater than or equal to 1 are regarded as positive emotion comments, and those whose overall score is less than or equal to -1 are regarded as negative emotion comments. At the same time, the dictionary matching method is used to match the emotion words, to determine the emotion tendency of each word.

2.2. Case analysis

2.2.1 Data Collection

Aiming at the subject of evaluation of logistics management courses by text reviews and emotion analysis, to more accurately grasp the satisfaction of current logistics courses, this paper uses Python program and Octopus data climbing tool to collect comments and bullet boards of logistics management courses on MOOC and B platform. A total of 2052 bullet boards and 2718 course comments are collected.

2.2.2 Data processing

To ensure the accuracy of the experimental results, the original data needs to be cleaned. By using Python to remove meaningless data such as completely repeated comments, punctuation marks, and special characters, 3794 valid comments were finally obtained.

2.2.3 Data analysis

Based on data preprocessing, I started to conduct data analysis, which mainly included three aspects: word segmentation, emotion analysis, and LDA topic model.

(1) Word segmentation: This paper uses the Jieba library in Python for word segmentation processing, loads the user-defined dictionary, and adds the words related to logistics management to the Jieba word segmentation dictionary to improve the accuracy of the result. The results are shown in Table 1.

Table 1 Chinese word segmentation results

Comments	segmentation results
This kind of knowledge sharing by teachers has really benefited a lot of students invisibly To a large extent this positive externality will have a great positive impact on the future development of society	This kind of knowledge / sharing / by teachers / has /really /benefited /a lot of students /invisibly /To a large extent /this /positive externality /will have / a great positive impact /on /the future /development /of /society
Yes Sir I recommended your course to a student who wants to learn game theory yesterday and I will also study your course when I have time	Yes /Sir /I /recommended /your course /to /a /student /who wants to /learn /game theory /yesterday /and /I /will /also /study /your course /when /I /have time
Thank the teacher for sharing the course I am listening carefully	Thank /the teacher /for /sharing /the course /I /am /listening carefully

(2) Emotion analysis of text commentary: Firstly, the emotion analysis of the curriculum review is based on the emotion dictionary. Secondly, the type of comments is determined by the emotional tendency of comments. On this basis, a self-defined simple word segmentation function is set up to label the parts of speech of the words after word segmentation and extract the words containing noun classes, to know which aspects of the online course learners are satisfied with. Then, the emotional tendency of the word list is analyzed. This paper adopts the dictionary matching method to match emotion words and assigns an initial weight of 1 to each word in the positive comment emotion word list and -1 to each word in the negative comment emotion word list in the sentiment analysis words set (beta version) published by KCN.cn. To improve the effect of sentiment analysis, this paper also adds words related to the evaluation of logistics management courses to the corresponding word list.

(3) LDA topic model: The adaptive optimal LDA model based on similarity first determines the initial topic number K and uses the average cosine similarity to calculate the similarity degree of each topic. Secondly, by increasing or decreasing the K value, the lowest average cosine similarity is calculated to determine the optimal

topic number. Finally, the topic number of positive and negative comments is determined and the topic analysis is carried out. According to the optimization result of the number of topics, it is determined that the number of positive comments and negative comments are both 2, and 10 most likely words are generated under each topic, and the theme words and emotion words are divided. The results are shown in Table 2:

Table 2 Distribution of keywords in online courses

Topics	subject words	Emotional words	Affective tendency
Teaching organization	teacher, learning, explanation, knowledge	very good, like	positive
Teaching design	curriculum, content, supply chain, enrichment	okay, good	positive
Teaching content	teachers, content, curriculum	old, scripted	negative
Teaching effect	students, listening to lectures, lecture, enterprise	dull, scripted	negative

Based on the above analysis of topics and their high-frequency feature words, it can be concluded that learners focus on teaching organization, teaching design, and teaching content when conducting online learning on MOOC and B-station. By observing the distribution of subject words and corresponding emotional words, it can be seen that learners hold a positive attitude towards teaching organization and teaching content, and believe that online courses in logistics management have advantages such as good lectures by teachers and rich course content. However, learners also hold a negative attitude towards the teaching effect and teaching content, believing that some course content is too old and there is suspicion of being scripted.

To further determine the focus of learners' attention and its weight, we use word frequency statistics to determine the occurrence times of subject words and thus determine the weight of corresponding topics. Suppose there are n learner evaluation indicators, each evaluation indicator corresponds to p subject words, calculate the sum of the word frequency of p subject words, recorded as q , then the calculation formula (1) of the weight of learner evaluation indicators can be obtained:

$$C_n = q_n / Q \quad (1)$$

Where C_n represents the weight of the n th evaluation index, q_n represents the sum of the word frequency number of p subject words of the n th evaluation index, and Q represents the sum of the word frequency number of all subject words.

The results are shown in Table 3:

Table 3 The weight value of evaluation indicators from the perspective of learners

Evaluation indicators	The sum of the word frequency of the subject word	Weight
Teaching organization	1134	0.317
Teaching design	883	0.247
Teaching content	1395	0.390
Teaching effect	161	0.045

As can be seen from the above table, teaching organization, teaching design, and teaching content have a high weight and are important evaluation indicators concerned learners, while the weight of teaching effect is only 4.5%, indicating that learners pay little attention to teaching effect and have little influence on course evaluation.

3. Curriculum evaluation from the perspective of administrators

In addition to learners' evaluation of online courses, administrators' evaluation of online courses is another focus of our attention. The teaching scoring standards of various teaching competitions include the indexes and scores of course evaluation, which can reflect the administrators' attention to each dimension of the course. Due to the different naming and weights of evaluation indicators in various teaching competitions, to ensure the comprehensiveness and objectivity of teaching standards, this paper selects the scoring criteria of five teaching competitions, including the National College Teachers' Teaching Innovation Competition, the National College Young Teachers' Teaching Competition, and the National Logistics and Supply Chain Teachers' Professional Competence Competition. The frequency of occurrence of indicators and corresponding scores are counted, and the indicators with different names but the same evaluation points are summarized to obtain 9 evaluation indicators such as teaching content, teaching design, and teaching organization. Since the focus of this paper is on learners, the two evaluation indexes of video quality and defense are not included in our research scope, and 7 evaluation indexes including curriculum ideology and politics, teaching design, and teaching organization are finally obtained.

To calculate the corresponding weights of each evaluation index, the different scores of each index under the five teaching documents need to be weighted and averaged. The corresponding score of the i th evaluation index in the five teaching scoring files is set as b_{ij} , and the comprehensive score of the i th index is set as a_i . Formula (2) is the calculation formula of the initial weight of the evaluation index:

$$a_i = \left(\sum_{j=1}^5 b_{ij} \right) / m_i \quad (2)$$

Where m_i is the number of times that the i th evaluation indicator appears in the scoring criteria.

The obtained initial weights are standardized, and the final weights of 7 evaluation indicators can be obtained, as shown in Table 4:

Table 4 The final weight of evaluation indicators from the perspective of managers

Evaluation indicators	Occurrence frequency	Initial weight	Final weight
Curriculum ideology and politics	2	5	0.034
Teaching design	8	32.27	0.220
Teaching organization	4	33	0.224
Teaching effect	2	20	0.136

Teaching concept	3	15	0.102
Teaching content	3	33.4	0.227
Teaching mode	3	8.33	0.057

As can be seen from the above table, the comprehensive scores of teaching content, teaching organization, and teaching design account for 67.1% of the total score, indicating that these three indicators have the greatest impact on administrators' evaluation of logistics online courses. In other words, administrators pay most attention to these three aspects of logistics online courses. Secondly, the weight values of teaching effect and teaching concept are between 10% and 15%, indicating that these indicators have a certain impact on administrators' evaluation of online courses. The weight of curriculum ideology, politics, and teaching mode is lower than 6%, indicating that the degree of influence on curriculum evaluation is small, that is, administrators pay little attention to these indicators.

4. Curriculum evaluation from two perspectives

Based on the above analysis, we compare the dimensions and weights of the attention of learners and administrators in the form of Table 5:

Table 5 Comparison of weights of evaluation indicators from different perspectives

Evaluation indicators	Evaluation perspectives	
	learners	administrators
Curriculum ideology and politics	-	0.034
Teaching design	0.247	0.220
Teaching organization	0.317	0.224
Teaching effect	0.045	0.136
Teaching concept	-	0.102
Teaching content	0.390	0.227
Teaching mode	-	0.057

As can be seen from the above table, teaching content, teaching organization and teaching design are the evaluation indicators that learners pay the most attention to. Among them, teaching content has the highest weight (about 39%), but they pay a little attention to teaching effect and little attention to curriculum ideology and politics, teaching philosophy, and teaching mode. In addition to teaching content, teaching design, and teaching organization, administrators pay more attention to teaching effect and teaching concept and pay less attention to curriculum ideology politics, and teaching state. This shows that learners and administrators pay different attention to different dimensions when evaluating courses, in which teaching content, teaching organization, and teaching design are the common focus from the dual perspective.

Teaching content is the evaluation index that learners and administrators pay the most attention to, but the two have different emphases in this respect. Learners pay more attention to the richness and comprehensiveness of the content, that is, whether the content covers the major and difficult points of learning and whether there is an extended explanation, which is the direct basis to help learners judge whether the course meets their learning

needs. However, administrators are concerned about the academic nature of the course, the depth and breadth of teaching, and pay attention to the practicability of the course.

Secondly, teaching organization is the second major focus of learners and administrators. In terms of teaching organization, learners pay more attention to the experience of listening to lectures, that is, whether the teacher can explain the course in detail, with clear logic and easy to understand, to facilitate learners to grasp the knowledge points of the course, and its emphasis is "knowledge acquisition"; The administrators focus on whether the teacher is "student-centered" in teaching, focusing on inspiration and guidance and teaching interaction, and its emphasis is on "imparting knowledge".

Both perspectives pay more attention to instructional design as an evaluation index. Compared with learners, administrators are more likely to evaluate online logistics courses from an objective perspective, so they pay more attention to teaching design such as teachers' teaching arrangements and teaching objectives. Although learners are more inclined to pay attention to intuitive evaluation indicators such as "course explanation", whether the teaching arrangement is reasonable will also affect their listening feelings to a certain extent. Relatively speaking, administrators are more inclined to dig out deeper values from teachers, such as whether the "teaching design" is appropriate, to evaluate the teacher's teaching ability, to evaluate the quality of the course.

For the teaching effect, the weight value of the two is quite different, and the weight of learners in this aspect is only 4.5%, indicating that the attention to the teaching effect is not high. For administrators, the teaching effect can intuitively show the quality of the teacher's teaching and is an important basis for judging whether the course has the value of reference and promotion. Therefore, the teaching effect is also an important indicator for administrators to evaluate the course.

Learners pay very little attention to the three evaluation indicators of curriculum ideology and politics, teaching concept, and teaching mode. From the perspective of administrators, the weight value of the teaching concept is 10.4%, indicating that it has a certain impact on administrators' evaluation of online logistics courses, and it should be ensured that the index has the same level as similar courses. However, administrators pay little attention to the two indicators of curriculum ideology, politics, and teaching mode, indicating that both learners and administrators do not attach much importance to this aspect of the curriculum, that is, these indicators will hardly have an impact on the comprehensive evaluation of the curriculum, so only moderate attention should be paid to these indicators.

5. Suggestion and conclusion

Based on the differences and similarities of learners' and administrators' attention indicators to online courses in logistics management, we propose the following improvement suggestions for course providers:

The evaluation indicators that both learners and administrators focus on, such as teaching organization, teaching content, and teaching design, should be regarded as the core elements of curriculum improvement.

In terms of teaching organization, curriculum builders should make full preparation for lessons and write teaching plans to improve the rationality of teaching arrangements. In the classroom, students should be the main body, teachers should give full play to the leading role, pay attention to enlightening and guiding students, and fully stimulate students' learning initiative and creativity; Course providers should use multimedia and other diversified teaching methods in the teaching process, such as using various audio and video software to serve the course and improve the satisfaction of the course.

In terms of teaching content, through our case study, it is found that the content of logistics management courses is too theoretical, indicating that teachers pay too much attention to the explanation of theoretical knowledge while ignoring the cultivation of students' practical ability. At present, enterprises pay more attention to the ability of logistics management professionals to solve practical problems, and attach importance to the practical value brought by professional talents to the company. Therefore, curriculum builders should change the teaching concept, pay attention to the combination of theory and practice, and cultivate learners' practical ability to solve logistics problems based on enriching their theoretical knowledge, to improve the applicability of the curriculum.

In terms of teaching design, teachers are required to clarify the teaching objectives, fully understand the course content, be able to integrate, and highlight the key and difficult points of the course, and enable students to deeply understand and grasp the key content of the course; It is necessary to arrange the teaching process reasonably, to write and explain on the board in their language, step by step so that students can accept boring theoretical knowledge more easily; Course builders should fully reflect the professional characteristics of logistics management in teaching, realize the combination of theoretical knowledge and professional characteristics, so that students can apply what they learn, apply theoretical knowledge to practice, stimulate students' interest in learning, enhance students' enthusiasm for learning, enrich the teaching connotation of logistics management courses, and improve the universality of courses.

Learners do not pay much attention to the teaching effect, but administrators pay more attention to the teaching effect, which will have a certain impact on their course evaluation. Therefore, curriculum providers should pay attention to the improvement of teaching effect based on improving the above indicators. Based on teaching the content of the course, teachers should pay attention to the all-round development of students' knowledge, ability, and quality, and cultivate comprehensive talents in logistics management. In the course of teaching, we should make the voice and emotion vivid, infectious, and active classroom atmosphere, fully mobilize the enthusiasm of students, to improve course satisfaction.

From the perspectives of learners and administrators, this paper makes a comparative analysis of the similarities and differences in the attention dimensions of online courses on logistics management, which can help course providers understand the focus of attention of learners and administrators on online courses, and put forward corresponding improvement suggestions to promote course providers to effectively improve course quality, which has good practical significance.

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