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Research on the Teaching Promotion Strategy of Accounting Course in Higher Vocational Colleges Based on the Analysis of Emotional Data of Course Feedback

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Abstract. In view of the current situation that the research on Hybrid Teaching of accounting courses in higher vocational colleges is mostly from the perspective of concept, teaching design and teaching effect, while the research on the internal factors of the teaching process and curriculum evaluation feedback is relatively less, this paper first designs a data crawling program for online courses based on python3.9.10, and uses China MOOC as the object of data crawling to obtain the evaluation data of the target course, and then uses the combination of regular replacement and manual screening to clean the meaningless words, symbols and retrograde data, and then uses the NLPIR Chinese word segmentation toolkit of the Chinese Academy of Sciences to process Chinese text words. After word segmentation, it completes the construction of a knowledge driven multilingual sentiment analysis model, which obtains the context by word embedding. Word vector representation, Different semantic information acquisition methods are used to extract a variety of semantic information contained in the text itself, and then the feature information is fused through the double interactive attention mechanism, so as to realize the coordination and optimization of feature information between aspect words and context information. Finally, a simulation experiment is designed to classify 19837 effective curriculum reviews through the emotion classification model, and obtain the emotional word cloud of curriculum evaluation, and then give the corresponding curriculum improvement strategies.

Keywords: accounting courses, blended teaching, course feedback, affective analysis model

1 Introduction

With the vigorous development of Internet and artificial intelligence technology, education and teaching are also constantly integrated with artificial intelligence, online resources and Internet technology. In the Internet era, because the traditional teaching mode relies more on Teachers' own quality and teaching ability, and the curriculum resources involved in the curriculum content are solidified and backward, hybrid teaching has become the development trend of modern education. Blended teaching has not only teachers' offline teaching, but also flexible, rich and concrete online course resources, so it has become an important focus of teaching reform. In order to better provide a reliable reform plan for the current accounting specialty education and teaching, we should first deeply understand the specific application of Blended Teaching in the current accounting specialty teaching in higher vocational colleges, further analyze the existing teaching drawbacks, explore the causes of defects in the teaching process, and put forward targeted curriculum improvement countermeasures, so as to improve the implementation details of Blended Teaching in the course teaching, in order to achieve the effect of all-round improvement of teaching effect, so as to further improve the training quality of Higher Vocational economics and management talents [1].

The original intention of hybrid teaching mode is to improve the quality of education and teaching and cultivate high-quality professionals. Since the concept was put forward, many research results have been produced. At present, the research related to hybrid teaching is mostly from the perspective of teaching concept, teaching design and teaching effect. Less attention has been paid to the internal factors that affect the teaching effect in the process of Hybrid Teaching and the direct feedback of course learners after learning the course. Therefore, based

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on the previous research results, this paper investigates and analyzes the application status of Blended Teaching in accounting courses of economics and management majors in higher vocational colleges, and deeply formulates scientific curriculum promotion strategies on the basis of analyzing the application status, so as to provide reference data and feasible solutions for the application and practice of blended teaching in the future [2].

Blended teaching relies on the development of Internet technology, and the quality of blended teaching also determines the teaching effect and the quality of talent training. Therefore, this paper analyzes how to dynamically adjust the teaching content and teaching methods of the course according to the real-time evaluation and feedback results of the course content in the process of learning, and puts forward countermeasures to improve the online and offline blended teaching mode, improve the current situation of Blended Teaching in higher vocational schools, promote the development of practical application of blended teaching, and provide more accurate improvement schemes for improving the teaching quality [3].

After the online course resources enter the public course resource platform, there will be a large number of visitors and students to watch and study. At the same time, the online resources will open the course interaction link in the fixed plate. The interaction link is mainly based on the course comments of visitors and students. The comments contain the learners' subjective feelings about the course content. The learners' course comment information can effectively reflect the students' intuitive feelings about the quality of teaching. Therefore, the accurate analysis of learners' emotions is of positive significance to the development of educational technology in the improvement of course content [4].

At the same time, with the continuous development of online learning platforms and the accumulation of time, the scale of course review data is increasing. It is difficult to process a large number of review data by relying on the manual browsing and query method of staff, and the processing efficiency is very low. Moreover, due to the subjective factors of staff participation, it is easy to lead to the inaccurate analysis results, which makes it difficult to analyze the correlation between course reviews and teachers, courses and other information, and to extract topics and contents of interest to students. Therefore, emotion analysis technology for course feedback arises at the historic moment. The analysis of user comments in online course resource learning usually depends on emotion analysis. Emotional analysis of course comments and mining their emotional tendencies help to further summarize learners' learning rules, and in practical application, help to deeply mine learners' reasonable needs, carry out personalized resource allocation according to learners' learning needs and learning status, improve learners' learning effect, and improve teaching quality [5].

Among the related research results, Yan Zehai of Yunnan Normal University, using the questionnaire survey method, selected teachers and students from five vocational colleges to carry out the blended teaching efficiency survey. The survey found that the students who participated in the blended teaching had higher expectations for the blended teaching than the students who did not participate in the blended teaching. The blended teaching mode was more popular among the students with excellent grades and the underachievers, which was far from the traditional curriculum cognition, and provided a new idea for the curriculum improvement [6].

Xieyaya, in view of the current situation that the content of technical practice courses is too much and the class hours are compressed, designed a "student-centered" hierarchical and classified teaching, responded to the "Internet+education" policy, built an online and offline hybrid teaching mode of "three dimensions, four levels and six links" by introducing the boppps mode and using the superstar learning app, innovated the course teaching process and optimized the evaluation mechanism, and cultivated students' autonomous learning while improving the effectiveness of the classroom [7].

Yangruiping, with the "intermediate financial accounting" course team, aimed at the traditional offline teaching problems such as students' low enthusiasm for autonomous learning and single assessment method [8], designed the overall program of Hybrid Teaching from five aspects: teaching philosophy and teaching ability, teaching resource development, teaching assessment, teaching mode and scoring standard, and achieved the application effect in practice. Summarizing the existing research results of related courses in hybrid teaching, this paper analyzes and data mining the course comments of learners' participation in online teaching in the process of online and offline Hybrid Teaching of economics and management accounting courses in higher vocational colleges, and then analyzes how to improve learners' learning efficiency and course quality. The work done is as follows:

1) First of all, it breaks away from the limitations of traditional search engines in course evaluation, designs a data crawling program for online courses based on python3.9.10, and takes Chinese MOOC as the object of data crawling;

2) For the meaningless and emotionless evaluation data in the evaluation data, the method of combining regular replacement and manual screening is used to clean the data, and then the nlpir Chinese word segmentation toolkit of the Academy of Sciences is used for Chinese text word segmentation;

3) A knowledge driven multi semantic sentiment analysis model is designed. The model obtains the vector representation of context words through word embedding, and then extracts a variety of semantic information contained in the text itself through different semantic information acquisition methods. Then the feature information is fused through the double interactive attention mechanism, so as to realize the coordination and optimization of feature information between aspect words and context information;

4) Finally, a simulation experiment is designed to classify 22397 effective course reviews through the emotion classification model, obtain the word cloud of course evaluation, and then give the corresponding curriculum improvement strategies.

2 Analysis of the Current Situation of Online Teaching of Accounting Courses

Summarizing the experience of online teaching of accounting courses, the current accounting courses have the following deficiencies:

1) The effectiveness of online teaching needs to be improved. Students' evaluations of the online teaching effectiveness of various sections in accounting courses show that the teaching effectiveness of core courses such as "Accounting for Major Economic Transactions" and "Preparation of Financial Reports" is relatively low. From the perspective of the school, there are deficiencies in the management and supervision of online resources and teaching forms. At the same time, it still adheres to traditional teaching thinking, fails to fully integrate and enrich teaching resources that adapt to the new situation, and lacks effective guidance for new teaching models. Therefore, neither students, teachers, nor the school have achieved ideal teaching results in the current online teaching.

2) There are obvious deficiencies in online teaching resources. Currently, most of the course resources focus on theoretical explanations, while practical aspects such as case analysis and extracurricular expansion are less covered. Meanwhile, the teaching content mainly consists of abstract concepts (like "double-entry bookkeeping") and idealized examples, with little coverage of complex situations in real business accounting (such as handling defective bills, adjusting period expenses, and tax planning). For instance, when teaching "accounts receivable", it only stays at the level of explaining accounting entries, without delving into practical scenarios such as dealing with delayed payments from customers or adjusting the bad debt provision ratio.

In addition, due to factors such as the approval process for funds, public vocational colleges often lack in-depth refinement and detailed optimization of course resources when developing online teaching materials. This results in a monotonous course format, mainly consisting of recorded lectures or course resources generated through screen recording software with PPT explanations at the core, lacking vividness and interactivity. During the learning process, students can only passively watch videos and have difficulty asking questions in real time, which may lead to long-term accumulation of misunderstandings about professional content. Moreover, teachers cannot adjust the teaching pace in a timely manner based on students' feedback.

3) The update speed of online resources lags behind. National tax and fee reform policies are frequently adjusted, but the teaching cases in the course have not been updated in a timely manner. This is mainly reflected in the following two aspects:

Firstly, accounting policies and standards have a certain degree of lag. For instance, the implementation details of the Stamp Duty Law changed in 2023 and new policies for VAT reduction and exemption for small and micro enterprises were introduced in 2024. However, many courses still use old policy cases from two to three years ago for teaching. Additionally, the new revenue standard (CAS 14) and the new lease standard (CAS 21) have been in effect for several years, but some online courses still explain revenue recognition and lease entries based on the old standards. With the launch of the fourth phase of the Golden Tax Project, the focus of enterprise tax audits has shifted to "governing taxes through data", but few related courses cover new content such as the compliance of electronic invoices and tax risk early warning.

Secondly, there are also deficiencies in the use of teaching demonstration software. Although the relevant software is updated at a relatively fast pace, some courses still use lower versions of the software, and even continue to use early tools such as Excel spreadsheets. Outdated operation software not only fails to meet the actual work requirements but also easily reduces students' interest in learning and affects the learning outcomes.

3 Acquisition and Processing of Curriculum Evaluation Data

MOOC is an online large-scale learning platform, which serves as the data source of this course evaluation data. Data acquisition methods range from the initial quantitative scoring research to the qualitative text research, from questionnaires, random interviews to the use of natural language processing technology to independently analyze the text, from focusing on the basic characteristics such as the length and number of comments to analyzing the potential emotional tendency in comments. In the emotional analysis of evaluation data, the emotional analysis model is widely used in the process of text data processing, and has been continuously improved. Due to the diversity of online comments' expressions and wide range of influence, in order to master learners' satisfaction and actual needs, improve the course design and improve the platform function, this paper expands the data acquisition channels, including but not limited to user comments obtained from microblog search online courses, online education and other keywords, Chinese University MOOC (icourse), MOOC (imooc), superstar platform, station B barrage, etc [9].

3.1 Course Evaluation Data Acquisition

In the process of data crawling, the data crawling program is designed based on the form of python3.9.10 loading library. Firstly, the network crawling technology is used to collect the course review data of Chinese University MOOC. The main purpose of using web crawling is to solve the limitations of general search engine. The crawling process can be queried according to the semantic information of comments [10]. The architecture of python3.9.10 network crawling data is shown in Fig. 1.

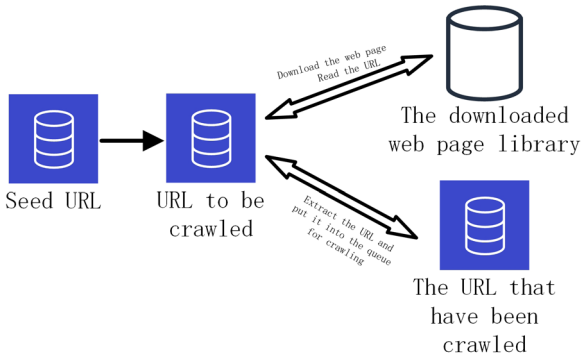

Fig. 1. Technical architecture diagram of network crawling data

First initialize the URL address, and then put the address into the task queue to be crawled. Second, read the instruction hosting address of the data to be crawled from the queue, get the host address through DNS resolution, download the web page where the address is located, and coexist in the database. Then, put these addresses into the crawled queue, parse these addresses, and finally put these addresses into the queue to be crawled.

Selenium library files in Python data crawling library have the ability to run JavaScript in web pages, and enable browsers to automatically load pages according to instructions, so as to click on Web pages, fill in information, scroll pages, and perform more operations to obtain required information. Therefore, this paper uses selenium Library of Python software for data crawling. The content that needs to be crawled includes the information of three dimensions: user name, course comment content and comment time. Irrelevant data such as likes and meaningless symbols are filtered out. The python crawling data process is shown in Fig. 2. The specific steps are as follows: first, configure the experimental environment, use 'PIP install' to download the third-party libraries of 'selsnium' and pandas from the terminal, download the driver msedgedriver.exe of the corresponding version of edge browser, and put the executable file in the python project directory. The second step is to define the collec-

tion rules, use the 'find_element' and 'find_elements' methods to find, locate and obtain qualified page elements through ID value, 'class', 'XPath' path, etc., simulate email login to obtain 'cookies' and write them into the 'cookie.txt' file, use 'cookies' to log in and refresh the page, and enter the course evaluation page in the logged in state to obtain the comment information of each page. It should be noted that 'Selenium' operates in the parent 'Frame' by default after opening the page, and cannot get the nodes in the child frame. At this time, it needs to use the 'switch_to.frame' method to switch the frame. The third step is to store the obtained information. If the data volume is large, it can be written to MySQL or saved to a remote server. If the amount of data is small, it can be saved as local files such as 'CSV', 'xlsx', 'JSON' and other formats. The amount of data obtained in this paper is not large, so it is written to the 'xlsx' file.

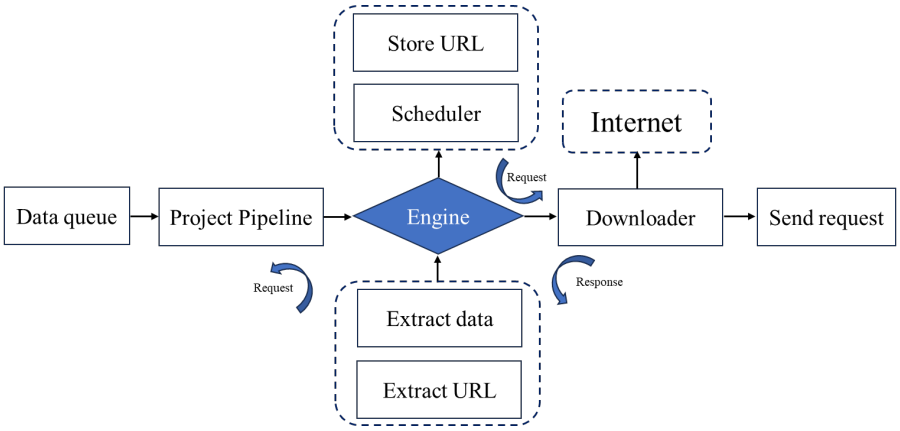

Fig. 2. Flowchart of Python command crawling data

In the process of actual data crawling operation, due to the possible protection mechanism of starting the website due to too fast access speed, too high crawling frequency, web page detection non-user login, etc., it was judged as robot login, which triggered the anti crawling mechanism of dragging the slider, login with verification code, etc., and set the waiting time by combining explicit waiting and implicit waiting. "The get'method will wait until the page is fully loaded before continuing the program. The number of times to choose is to wait for 2 seconds. In the process of page turning and crawling, the time unit is set to 15 seconds. If the specified element is not located within 15 seconds, the program will throw an exception return value. During this period, it will always poll to find the location element. Although the speed of obtaining data decreases, this mechanism ensures the smooth operation of the program.

3.2 Cleaning of Evaluation Data

The course evaluation text data released by the learning participants belongs to unstructured data. The Internet era has derived a free, open, rapidly changing and pluralistic network culture. People express their emotions in a variety of ways, which makes the content of the course evaluation review text complex and changeable. It contains some special expressions emerging from the network, such as emoticons, network hot words, facial characters, digital combinations, and a large number of invalid symbols and repeated information. The course evaluation data obtained from the previous section may have missing values, noises, outliers and other problems, which will affect the subsequent data analysis work. A large number of repeated comments will affect the frequency of words and thus affect the accuracy of the model. Meaningless text will have a negative impact on the data modeling, and noise data will interfere with the experimental results. These types of data should not be used as the input data of the model, but should be learned by the model. In order to ensure the accuracy and effectiveness of data and improve the quality of data, data preprocessing is required. The operation process is as shown in Fig. 3:

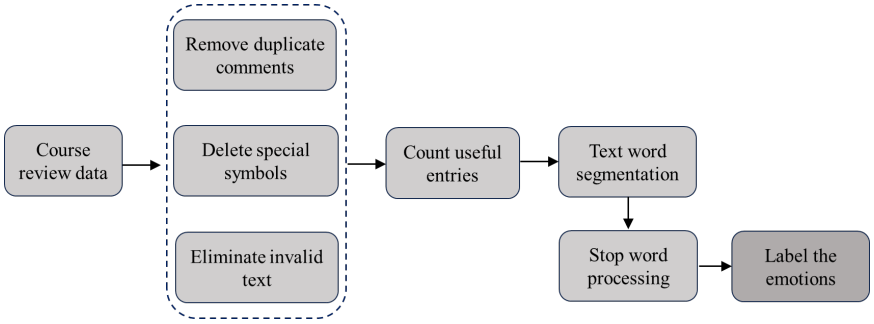

Fig. 3. Flow chart of data preprocessing

This section adopts a combination of regular replacement and manual screening to complete data preprocessing [11]. The specific steps are as follows:

The first step is to remove repeated comments: if the same user evaluates the same course for many times and the content remains the same, it is regarded as repeated comments. For the treatment of repeated comments, only the initial comments are retained, and the repeated records of the collected data are counted and deleted by using the duplicated function.

The second step is to delete special symbols. Special symbols include emoticons such as "O (^o^) O" and special characters such as ' \; ', '&', ' ¥ ' and so on. These symbols have nothing to do with the content of the comment. Use the regular method to replace these symbols with spaces.

The third step is to delete the invalid text. Invalid text has no emotional meaning. Characters that cannot represent the user's specific evaluation of something are regarded as invalid text. Meaningless sentences will seriously affect the quality of data. Using the re module in Python, replace the pure digital comments such as "666", pure punctuation comments such as "...", and single character comments such as "hhhh" with empty strings, and delete them uniformly. At the same time, delete the low-quality comments such as "ahaaha", "hahaha".

The fourth step is to unify language fonts. Delete a few comments in pure English and Japanese, convert traditional Chinese characters into simplified ones, and unify the format of Chinese characters.

Step five is to filter the short text. Too short text generally has problems such as unclear expression, chaotic structure, sentence meaning ambiguity and so on, which can not provide too much valuable information for analysis. Therefore, the course evaluation information with less than or equal to 6 Chinese words is filtered out to ensure the validity of the following analysis data.

After the above processing, the cleaned comment text was integrated, and the records published earlier were deleted. Finally, 20218 effective comments were obtained, forming the online course comment data set required for subsequent modeling.

3.3 Word Segmentation

After cleaning, we need to segment the comment data. Unlike the grammatical format in which words are separated by spaces in English, the boundaries of "words" and "phrases" in Chinese are vague and have no formal boundaries. The words in the sentence are the smallest, independent and meaningful language units. The work of text word segmentation is to add spaces or other boundary marks in the continuous word sequence according to certain norms, and then re split into word sequences. At present, there are many mainstream Chinese text word segmentation tools, such as Jieba word segmentation, hanLP word segmentation Stanford CoreNLP word segmentation, THULAC word segmentation, LTP word segmentation, etc. This study calls the NLPIR Chinese word segmentation toolkit of the Chinese Academy of Sciences for Chinese text word segmentation through the python programming environment. At the same time, according to the actual situation of corpus word segmentation, we build a word segmentation dictionary to refine the word segmentation rules and improve the accuracy of word segmentation. Stop words refer to function words such as connectives, pronouns, prepositions and modal particles that contribute little to semantic expression. The Jieba package supports custom dictionaries and four Chinese word segmentation modes: search engine mode, full mode, pad mode and precise mode. The precise mode, whose operation mechanism is to try to segment the text at the most fine granularity, has no redundant data, and is suitable for text analysis; The operation mechanism of the paddle mode is to use the deep learning

framework training model to realize word segmentation, and the result is similar to that of the precise mode; The full mode operation mechanism can quickly identify all the words that can form words in a sentence, but it is not accurate enough because it cannot solve ambiguity; The search engine mode is based on the precise mode to re segment long words, which is the slowest and suitable for word matching in the search engine field [12].

The specific segmentation process of this paper is as follows: first, a prefix dictionary is constructed based on the statistical dictionary. Secondly, the prefix dictionary is used to segment the input course comments, and all the segmentation methods are obtained. Then, the directed acyclic graph is constructed according to the above words. Finally, the dynamic programming algorithm is used to calculate the maximum probability path from the back to the front to get the final word segmentation form [13].

Remove stop words, duplicate data, and invalid data. In this paper, the words or phrases without clear meaning, such as adverbs, prepositions, conjunctions, are removed from the comment text based on the stop list of Harbin Institute of technology, and the duplicate data and invalid data in the text are deleted through Excel filtering function and manual methods. Finally, 19837 effective course comment corpora were generated. The comment results of pretreatment are shown in Table 1:

Table 1. Processed course evaluation results

Serial number	Original course evaluation	Preprocessed data
4	They are all written knowledge. Although they are very refined, they are not life oriented enough. I don't want to make a textual research. As Xiaobai, I just want to know: 1. The way of making accounts; 2. The relevant software; 3. A set of processes that need to deal with which entity departments; is there a concise version of the practical scenario application [crying] [crying] has made a lot of notes, but the later it becomes more boring and has no sense of substitution. It's not a student for a long time, and I just want to learn some accounting applications for small businesses [laughing and crying].	Not living enough Don't want to research Introduction scenario Boring No sense of substitution
12	Where can I find courseware	Find courseware
172	Like the teacher very much, very humorous	Like humor
213	The course is a little old. The application of some subjects is different from now, but it is enough for understanding accounting.	courses old different application
569	I hate the textbook fundamentals of accounting very much. I really don't know what I'm talking about on one or two pages. I give some examples every day. The concept is not easy to understand.	Very annoying Accounting textbook Examples Concept Head and tail Not easy to understand
1921	What the teacher said was so good!!! After reading it, I felt that I understood it very well and understood it very well. Amway	Very good Understand thoroughly Strong Amway

3.4 Dataset Annotation

Each part of speech in natural language has different influence on the emotional expression of the text, so it is necessary to label the text before emotional analysis. In the aspect word tagging task, Jieba is used for part of speech tagging, 0, 1 and 2 are used to represent neutral, positive and negative emotional polarity respectively [14]. The data formats before and after processing are shown in the following Table 2:

Table 2. Processed course evaluation results

Comment	
Teacher Speak well Very detailed Is Teaching resources A little old and worn-out	[0,0,1,0,0,0,2]
Great curriculum image vivid	[1,0,1,1]
Course content Very rich Extracurricular practice Close to reality	[0,1,0,1]

4 Construction of Recognition Model

This paper uses the knowledge driven of multi semantic graph revolution network (KMSGCN), which integrates semantic features at the same time, including structured semantic information, general semantic information, gating attention mechanism, prior knowledge, emotion dictionary and so on. In the process of semantic recognition, firstly, the context word vector representation is obtained by word embedding, and then a variety of semantic information contained in the text itself is extracted by different semantic information acquisition methods. At the same time, a variety of semantic information is fused to obtain a multi semantic feature representation. At the same time, the context word vector representation is introduced into the gating attention mechanism to obtain the semantic feature representation containing global dependencies. Then the three parts of feature information are fused through the double interactive attention mechanism, so as to realize the coordination and optimization of feature information between aspect words and context information. Finally, through the output layer classification, the final emotional classification representation is obtained. KMSGCN model mainly consists of six parts: context semantic feature coding, multi semantic feature representation module, knowledge driven grammatical feature representation module, gated attention representation module, multi interactive attention module and output module [15]. The structure is shown in Fig. 4.

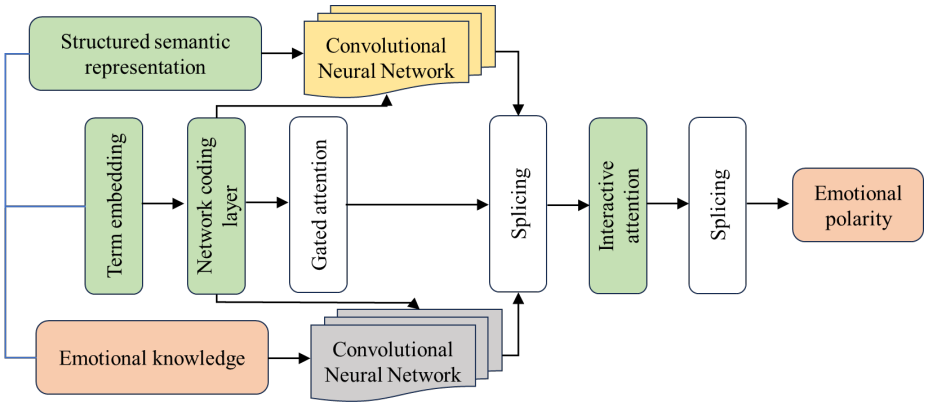

Fig. 4. KMSGCN network structure diagram

By counting the common occurrence frequency of words in the whole corpus, the global lexical graph is constructed to extract the semantic information of the text, and the structural semantic feature representation is obtained by modeling the dependency relationship between words. Each node represents the words in the corpus, and the side table shows the common occurrence frequency between words. According to all non repeating words in the corpus to form a vocabulary, the frequency of each word and context appearing simultaneously in the window is calculated, and the global co-occurrence matrix storing the co-occurrence times of each word is obtained. The formula is as follows:

$$\begin{cases} p\left(w_i, w_j\right) = \dfrac{\ln\left(p\left(w_i, w_j\right)\right)}{p\left(w_i\right) \cdot p\left(w_j\right)} \\ p\left(w_i, w_j\right) = \dfrac{N_{same}\left(w_i, w_j\right)}{C_{total}\left(w_i, w_j\right)} \end{cases} \tag{1}$$

Where, w_i and w_j are any two words in the corpus, $p(x)$ is the probability of the occurrence of a word in the sentence, and $N_{same}(w_i, w_j)$ is the number of simultaneous occurrences of w_i and w_j in the same sentence.

In the knowledge driven grammatical feature representation module, senticnet6 is used as the emotional knowledge base to construct the adjacency matrix for the input text on the dependency tree. The construction method of the matrix is as follows:

$$R\left(w_i, w_j\right)=\begin{cases}1 & w_i \text{and } w_j \text{ are interdependent}\\ 0 & \text{Not related}\end{cases} \tag{2}$$

At the same time, pay attention to specific aspect words. The elements in the aspect word adjacency matrix are calculated as follows:

$$S\left(w_i, w_j\right)=\begin{cases}1 & w_i, w_j \text{aspect words}\\ 0 & other\end{cases} \tag{3}$$

Then use the above formula to calculate the elements in the adjacency matrix after the enhancement of external emotional knowledge.

$$M\left(w_i, w_j\right)=R\left(w_i, w_j\right)\times\left[\left(score_i+score_j\right)+S\left(w_i, w_j\right)+1\right] \tag{4}$$

Where, $score_i$ and $score_j$ are the emotional weights in the identification library, and the weight interval is [−1,1]. when $score_i$ or $score_j$ is a neutral word or does not exist in the text, the value is 0. The representation of adjacency matrix can be further optimized by merging senticnet6's emotional scores. Integrating emotional knowledge into aspect words can make full use of emotional information between aspect words and context.

Gate attention unit (GAU) is a kind of attention representation based on gating mechanism [16]. When the context length is long enough, its attention capacity decreases. Taking the attention and gating linear unit (GLU) as a unified layer not only brings higher computational efficiency, but also realizes a powerful attention gating mechanism, which has great potential in the field of aspect level emotion analysis. The output features of the gating unit are obtained by using the full connection layer feature representation of the hidden layer state, which is conducive to the retrieval of the text features of aspect words and context. The retrieved text feature representation is fused with the multi semantic graph convolution network module and the grammar module of the knowledge driven graph convolution network to obtain the final emotion analysis model. The control unit structure is shown in Fig. 5.

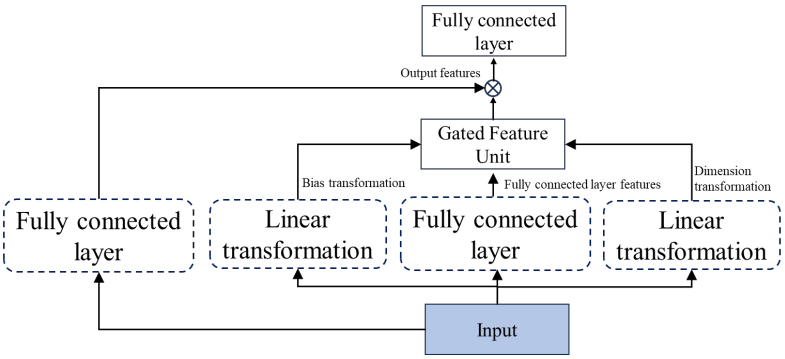

Fig. 5. Structural diagram of door control unit

In the dual interactive attention module, the semantic and grammatical relations of the text are complementary. In order to pay attention to the semantic and grammatical information of the text at the same time, after multi semantic convolution processing, the aspect word representation containing semantic features in the text is obtained, and the gated attention mechanism is used to obtain the context for interaction through learning, and the representation after semantic interaction is obtained. Similarly, the same is true for syntactic interaction. The feature vector after semantic interaction is obtained at the double interaction layer and spliced with the feature vector of syntactic interaction to obtain the final result. In the output module, the output of the dual interactive attention layer is transmitted to the full connection layer, and the final emotion classification is obtained through the 'softmax' function.

5 Experiment and Result Analysis

The operating system used in this study is windows11 system, 16GB memory, and the graphics card is NVIDIA RTX4070TI 12G. The programming language used is python3.9.10, and the environment carrying tool is VisualStudio Code 1.81.

In this section, the accuracy, F value and recall rate are used to express the performance of the algorithm. Generally speaking, the model is considered to be excellent when the accuracy rate is more than 80%, good performance can also be considered when the recall rate is more than 60%, and the model is considered to be excellent when the F1 value is more than 80%. The F value is used as the harmonic mean of accuracy and recall to comprehensively evaluate the performance of the classifier. Therefore, F value can be used as the main performance index, the calculation method is as follows:

$$Accuracy = \frac{T}{N} \tag{5}$$

$$F = 2\frac{\mathrm{Re}\,call \times \mathrm{Pr}\,escision}{\mathrm{Re}\,call + \mathrm{Pr}\,escision} \tag{6}$$

The classification results of emotions in comments are shown in Table 3.

Table 3. Results related to emotion classification

Emotion category	Accuracy	Recall	F value
Neutral	85.8%	86.2%	85.5%
Positive	87.3%	83.9%	87.1%
Negative	84.7%	84.9%	86.3%

The test set data is used to evaluate the generalization ability of the model, and the predicted results of the model are compared with the results of manual annotation in the test set. The results show that the predicted results are 90% the same as the results of manual annotation. The reason for the difference is that learners' comments on the text are more complex, with implicit meaning, antonymy and so on. But in general, the effect of the model is good.

Now, we use KMSGCN emotion classification model to classify 19837 effective curriculum reviews. A total of 12692 positive texts, accounting for 63.9%, 3079 neutral texts, accounting for 15.5%, and 4066 negative texts, accounting for 20.4%, are obtained, as shown in Fig. 6. Although the positive text is much higher than the negative text, the number of negative texts is enough to prove that there are some quality problems in online quality courses, resulting in insufficient experience for learners. Then we use Python's stylecloud library to draw a word cloud map. In this paper, we use the course evaluation of "accounting course" in the course resources to generate the word cloud of positive evaluation in the course.

Fig. 6. Evaluation words of accounting courses

The word cloud chart shows the differences of words in the comment text of accounting course through different sizes of fonts. The font size represents the frequency of the word in the comment text. The course improvement direction can be obtained from the frequency of words [17]. Therefore, based on the analysis of comments, the improvement scheme for the online resources of accounting course is as follows:

1) To improve the task value of students, first of all, improve the success rate of learning, so that students feel that online course resource learning can improve the learning effect. At present, some students believe that online course resources can not replace the knowledge imparted by classroom teachers, indicating that it is easier to master learning knowledge under the instruction of teachers. When students show their outstanding aspects, it will increase their success rate in completing learning tasks. Secondly, learning tasks are designed based on students' goals to improve students' learning efficiency. In addition, make students experience more positive emotionality activities in the learning process, strengthen students' internal interests, and design teaching based on students' learning interests or hobbies to enhance students' learning satisfaction when participating in online course resources learning.

2) Strengthening teachers' teaching ability, First of all, in order to better meet the needs of online teaching, teachers should continue to strengthen information technology teaching skills. Teachers should constantly improve their own quality, update teaching ideas, and strengthen the learning of information-based teaching methods in the teaching process, so as to make full use of the advantages of information technology in the learning of curriculum resources. Secondly, in order to attract students' continuous learning and positive interaction of praise, teachers should enhance their language appeal. Teachers need to be humorous, concise and comprehensive in teaching. They need to be profound, detailed and clear in explaining the content, so as to fully mobilize students' learning enthusiasm and learning engagement, so that students can learn knowledge in a relaxed and pleasant atmosphere.

3) To improve the teaching content of the course, first, integrate and optimize the online course resources according to the students' personality characteristics, so as to enhance the richness of the course content. In the construction of online course resources, it is necessary to design different forms and diversified course resources according to students' learning needs and personality characteristics, so as to effectively promote students' mastery of knowledge. Secondly, advocate the development of resources to design and update online course resources, so as to improve the novelty of course content. When carrying out online teaching, teachers should maintain the vitality and activity of curriculum resources, provide students with novel, interesting and cutting-edge scientific learning resources, help students broaden their horizons of knowledge, and realize the creation of learning resources and knowledge.

4) Design an efficient course rectification and supervision model, and build a system characterized by "data-driven, closed-loop management, and dynamic optimization". By analyzing real-time student learning data (such as homework error rates and interaction frequencies) through AI, conducting questionnaires, and evaluating teacher observations, multi-dimensional diagnostic reports are automatically generated to precisely identify problems. Establish a "feedback-rectification-recheck" closed loop. The supervision team collaborates with teachers to formulate targeted measures and set rectification deadlines. Utilize an intelligent supervision platform to track the effectiveness of rectification and continuously adjust teaching strategies and content dynamically to ensure a spiral upward trend in teaching quality and efficiency.

6 Conclusion

In view of the current situation of Hybrid Teaching of accounting courses in higher vocational colleges, this paper first designs a data crawling program for online courses based on Python3.9.10, and takes China MOOC as the object of data crawling. Then, for the evaluation data that has no practical significance and no feelings, it uses a combination of regular replacement and manual screening to clean the data. Then, it uses the NLPIR Chinese word segmentation toolkit of the Academy of Sciences to complete the Chinese text segmentation, and then completes the design of a knowledge driven multilingual sentiment analysis model. The model obtains the vector representation of context words through word embedding, and then extracts a variety of semantic information contained in the text itself through different semantic information acquisition methods, and then uses the double interactive attention mechanism. Feature information fusion, so as to realize the coordination and optimization of feature information between aspect words and context information. Finally, according to the emotional analysis, this paper gives some suggestions on online teaching of accounting course, which provides a feasible scheme for improving the teaching quality of the course.

At the same time, this study still has certain limitations, and these deficiencies will also become the key directions for further research in the future. In-depth research on online teaching of accounting in higher vocational colleges can be carried out from the following aspects:

Firstly, due to time constraints, this paper has not been able to fully incorporate student-centered survey subjects and sample data. The current analysis of the teaching situation mainly relies on other research results. Future research should further expand the sample size, broaden the research scope, and systematically collect learners' real demands for online teaching resources through scientifically designed questionnaires, so as to achieve a comprehensive analysis and evaluation of the current situation of online teaching of accounting courses in higher vocational education.

Secondly, there is still a lack of sufficient consideration on how to effectively integrate artificial intelligence technology in the design and presentation of course resources. Future research could explore the combination of tools such as machine learning, natural language processing, and big data analysis with traditional teaching content. For instance, AI could be utilized to automate the processing of financial data, intelligently identify invoice information, predict financial risks, or optimize audit processes. Additionally, case-based teaching could be employed to guide students in mastering the operation and application of intelligent financial systems (such as RPA and ERP), and to cultivate their data analysis skills and AI-assisted decision-making abilities, thereby making the course content more in line with the actual needs of accounting practices in the digital age, Integrate artificial intelligence into the curriculum system design, provide teachers and schools with a set of effective online teaching resource and course delivery plans, and further enhance the teaching effectiveness of accounting courses in higher vocational education.

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