Construction Scheme in English Teaching Platform of CAD Course

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Abstract. ELT (English Language Teaching) is often limited by class hours, teaching places and teaching materials, so it is difficult to create a good English language environment and improve students' all-round skills in listening, speaking, reading, writing and translation. More and more learners and teachers use the Internet as a medium of communication and one of the important sources of educational resources. Through research, this paper verified that after the implementation of ELT platform of CAD course, the average rate of improving practical skills through deep learning technology was 77%, the average rate of stimulating learning interest after implementation was 83%, and the average rate of discussion and exchange before and after implementation was 85%. Compared with the data before implementation, the data after implementation is in a better state. In this paper, the application of deep learning technology in the ELT platform of CAD course is analyzed. Teaching under the ELT platform of CAD course can enrich the form and content of ELT, expand the English teaching space, fully stimulate learners' learning enthusiasm, and make learners carry out mobile learning.

1   INTRODUCTION

In recent years, the Ministry of Education has paid more and more attention to the teaching quality of colleges and universities. It can be seen from the selection and recognition of the "Famous Teachers of Colleges and Universities Award" held every three years. Whether students can be encouraged to communicate in English in ELT is very important. The rapid development of computer technology and the popularity of the Internet have created opportunities for college English learning and teaching. Because ELT is often limited by the class hours, teaching places and teaching materials, it is difficult to create a good English language environment, and it is difficult to improve students' all-round skills in listening, speaking, reading, writing and translating. More

and more learners and teachers regard the network as a medium of communication and an important source of educational resources [1]. Among many teaching reform contents, bilingual teaching or all ELT in professional courses and professional basic courses is one of the highlights of the reform. Traditional education is undergoing profound changes due to the development of information technology. Modern educational information technology updates the educational concept, enriches the educational content, and makes the channels for people to obtain knowledge more diverse. There is a clear difference between the current teaching concept and the traditional education concept. It has changed from training students' learning ability to stimulating their innovative thinking, and is committed to training all students to be excellent talents who can solve problems independently [2]. It is particularly necessary to build an ELT platform for CAD courses. It not only helps students to have a more balanced practical ability in English listening, speaking, reading, writing and translating, but also promotes the transformation of domestic students from examinees to high-quality talents with both professional knowledge and English application ability. It is an effective way to cultivate compound international engineering and technical talents with international competitiveness in the new era [3]. CAD course ELT takes language communication as a medium. At present, ELT pays attention to the situational and personalized nature of the classroom and the cultivation of learners' cross-cultural ability and communication ability. By using modern education information technology, it is necessary to explore the path of current CAD course ELT platform and promote learners' in-depth learning of English. In terms of grouping and task allocation, teachers should group students according to their differences and complementarities, and the strength of the group should be balanced. After understanding the advantages and characteristics of each student, teachers should assign appropriate tasks according to their actual situation, so that each student can participate in the learning [4].

As we all know, English words are not independent of each other, and different words can show completely different meanings when combined. Because different students have different understanding depth of vocabulary, teachers should objectively analyze students' application of vocabulary. For frequently occurring high-frequency vocabulary, teachers should appropriately increase the frequency of explanation and make it the focus of teaching [5]. How to position the full ELT of professional courses in theory and practice and provide implementation plans for further promoting the full ELT reform in colleges and universities is what everyone is exploring. Therefore, this paper analyzes the application of deep learning technology in the ELT platform of CAD courses, conducts teaching under the ELT platform of CAD courses, and researches can enrich the form and content of ELT, expand the teaching space of English, fully stimulate the learning enthusiasm of learners, and enable learners to carry out mobile learning.

The innovation points of this paper are as follows:

(1) This paper puts forward a plan for the construction of English teaching materials for CAD courses. The key points, difficulties and other knowledge of each basic unit in the CAD course are provided to students in the form of question answers, so that students can solve problems themselves when they encounter problems in actual practice; Video explanation, video mode of classroom teaching, and English proficiency are uneven. When selecting textbooks, the original English textbooks with simple and fluent language should be used as the main teaching reference to avoid randomness in the discipline and differences in language expression.

(2) The English teaching platform of CAD course is studied. The purpose of using ELT platform for in-depth learning CAD course is to improve students' English communication awareness through online English communication, but more importantly, we can improve their English level by cultivating their awareness. In the teaching practice, we organically combine the examination of students' learning process with the final examination, and comprehensively evaluate the students' learning achievements by weighting the average of their usual homework, classroom performance and final examination results by a certain coefficient.

2 RELATED WORK

This course mainly talks about the basic knowledge, basic theories and methods of CAD technology, with a wide range of basic knowledge and strong practical skills, including basic concepts, related software development foundation, graphic processing technology, product modeling technology, computer-aided engineering analysis method, process planning design, numerical control programming technology and so on. In recent years, CAD courses have also been incorporated into education. The following is the related research of scholars on ELT, a CAD course.

Computer aided design, manufacturing and engineering (CAD/CAM/CAE) is the pillar of today's industry, so it should be an important part of the current graduate engineer training program. However, their implementation in the university environment has certain obstacles, making it difficult to achieve. In this work, Sola et al. [6] studied the feasibility of managing teaching suggestions of such tools through project-based learning in a distance learning environment. This method has been horizontally implemented in two master's degree courses related to advanced design and manufacturing, and has been implemented through virtual machine operation product lifecycle management platform software. Recently, it has been found that many students are admitted to engineering courses without sufficient mathematical background. This is a great challenge for students to learn future engineering subjects, especially computer aided product design (CAD) and other subjects requiring mathematical background knowledge. In this project, Tang and Yu [7] developed a mobile learning platform, which aims to provide a convenient and attractive channel for students to review and learn mathematical concepts and equations needed in the classroom. The platform encourages students to learn by themselves, so that they can easily learn other engineering subjects. Two tests were conducted using the provided textbooks to understand students' mathematical performance before and after learning. In the teaching process of colleges and universities, architectural CAD is a required course of architecture and occupies a very important position. Wang and Bi [8] developed a new computer aided design (CAD) and computer integrated manufacturing CAM course. The literature on CAD/CAM curriculum design is investigated to determine the limitations of traditional teaching CAD/CAM, and the trend of manufacturing technology is discussed to determine the industry's expectations for new employees. Combining digital manufacturing theory and CAD/CAM integrated tools, a new CAD/CAM course is designed. In the past, traditional teaching activities in colleges and universities usually failed to meet the needs of training applied talents. We need to strengthen the application of mixed teaching method, which is of great help to the development of architectural CAD courses in colleges and universities. Xie et al. [9] provides a theoretical perspective on how modeling and simulation on CAD platform can be used to teach scientific concepts and inform design decisions. This paper discusses the educational significance of three recent advances in CAD technology: system integration, machine learning and computational design. To help automate the grading of CAD drawings, Younes and Bairaktarova [10] introduced a new tool that can completely automate the grading process after students submit their homework. The introduced tool is called Virtual Teaching Assistant (ViTA), which is a platform independent of CAD tools and can handle exported drawings from different CAD software with different export settings.

This paper will discuss the application of deep learning technology in ELT platform of CAD course. In the design of ELT resource library for CAD courses, it is necessary to define and establish a targeted concept suitable for vocational education. On the one hand, the teaching resource library should be based on helping students master relevant knowledge quickly, take video demonstration as the core, and realize interactive operation with the help of Internet technology. In order to meet the needs of teachers and students in teaching to the greatest extent, the design and construction of CAD course network resource library should have a clear basic unit framework, which can meet the flexible use and innovative application of teachers and teachers in teaching. Teachers' teaching philosophy and required textbooks, such as all English class handouts, all English CAD reference books and corresponding English group homework

problem sets, are essential. When preparing these textbooks, students' learning expectations and goals should be met.

3   CONTENT AND METHOD OF DEEP LEARNING TECHNOLOGY IN ENGLISH TEACHING OF CAD COURSE

3.1   Construction Scheme of CAD Course English Teaching Materials

The development of CAD ELT is also changing with each passing day, the teaching content is constantly improved, and the edition is constantly updated. Because of the writing and distribution cycle of textbooks, the introduction of this part of the content is probably not the latest. Therefore, teachers who prepare lessons are required to be familiar with the latest version of ELT, and to teach students as new content as possible. In the teaching mode, the role of English teachers in higher vocational colleges has gradually changed from the traditional "teacher-centered" to "student-centered". Teachers need to change their ideas, return learning to students, and guide students to take the initiative to learn instead of passively receiving it. Teachers are no longer authoritative teachers of knowledge, and students should be allowed and encouraged to take the initiative to explore and question. Generally speaking, this course is equipped with relevant software operation experiments, which are often difficult to complete in class due to the limitation of class hours. First of all, textbooks are the main carrier of teaching content. In view of the foreign related textbooks for reference, the use of textbooks is mainly based on the introduction of excellent original textbooks. Vocabulary is mainly taught from pronunciation, part of speech, meaning and example sentences; The listening part is taught through the steps of "playing the tape, asking questions, students answering and explaining"; For the text, that is, the dialogue content, the meaning is translated word by word according to the content. In the process of translation, the knowledge points are summarized and some grammar, sentence patterns and collocation problems are taught. Finally, assign homework.

Knowledge of the key points and difficulties of each basic unit in the CAD course is provided to students in the form of problem answers, so that students can solve problems themselves when they encounter problems in practice; Video explanation, the video mode of classroom teaching, and the English level are uneven. When selecting textbooks, the original English textbooks with simple and fluent language should be used as the main teaching reference, so as to avoid the randomness of the subject and the differences in language expression. In the ELT of CAD course, the pre-class self-learning part is completed, and the classroom part of ELT of CAD course is actually the process of knowledge internalization through the design of various teaching links, while after-class knowledge is further deepened. Figure 1 shows the teaching process of the whole model in ELT, a CAD course.
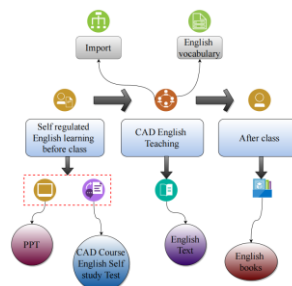

Figure 1: CAD course ELT mode flow chart.

There are often some problems in the classroom teaching of CAD ELT: the theoretical part is too boring, students are not interested, and the practical part is difficult to demonstrate on the spot, so it is easy to get a cursory effect. Therefore, the interaction between teachers and students in class is very important. The ELT content of CAD course is divided into two modules: vocabulary and text. Therefore, the learning video is also divided into three parts to make. Courseware should clearly indicate the tasks that need to be completed in autonomous learning, including first reading the syllabus to know which video and which audio to watch. The vocabulary and sentence pattern content pages of the syllabus are also distributed to students through this courseware. Different teaching videos teach different learning contents and examples of language use, and at the end of the video, students should be instructed what they want to achieve in each piece. Theoretically, when the learning rate is very low, it will not affect the final weight. However, in the training process, it is seldom fully trained, so the learning rate will affect the training performance of the network. Assume that the error function $E(\theta)$ can be approximated as a quadratic function:

$$\frac{\partial^2 E}{\partial \theta^2} \Delta\theta = \eta - \frac{\partial E}{\partial \theta} \tag{1}$$

If $\eta < \eta_0$, convergence can be guaranteed, but the training speed is slow. If $\eta = \eta_0$, only one step of training is needed to get the minimum error.

You can choose any path to calculate a total distortion:

$$D(T(N), R(M)) = d(T(n)) \tag{2}$$

Let the test voice template share N frame vector, and the reference ELT voice template share M frame vector, and let the function satisfy:

$$D(T(N), R(M)) = R(W(n)) \tag{3}$$

In this way, the shortest path can be ensured from the starting point to point (n, m), that is, the minimum distortion. At this time, the cumulative distance of this path is:

$$D(T(n), R(m)) = R(m) + \min \tag{4}$$

In this way, starting from the (1, 1) point, the optimal path can be obtained by repeated recursion until (n, m).

Then add the paths between them to get the total shortest path, and then add them up.

$$D(T(N), R(M)) = d[T(n_k)] \tag{5}$$

The number of selected minimum distortion points that meet the conditions, including:

$$D(T(m), R(m)) = R[m+1] \tag{6}$$

Although, the actual shortest path may not pass through these points, or only pass through some of these points, so the value obtained in this way will be larger than the actual value.

The above formulas can effectively organize and manage the basic teaching units of CAD courses, making them more practical and convenient; The second is the research and development of the on-demand video demonstration system. When users select a function menu item, they will demonstrate the operation process of the function in a video way in the real or simulated environment at that time, rather than directly starting the function.

3.2 CAD Course English Teaching Platform

All-English course teaching of CAD is based on all-English PPT courseware, supplemented by writing on the blackboard, collecting several relevant videos of the actual development of domestic

and foreign enterprises, so that students can strengthen their understanding and interest in CAD technology; Combine video with group discussion and group work, give students the opportunity to practice their English oral expression and stimulate their enthusiasm for learning. Some students suggest that this edition can be used to comment on their classmates' classroom performance. For example, a topic can be set up to comment and make suggestions on English speeches that must be made in each class, which can not only save classroom time, but also help students avoid face problems. Therefore, when using the network communication function among students with strong communication desire, we should make use of our strengths and avoid weaknesses, focusing on students' interests. Therefore, based on the deep learning technology, this paper will integrate the technology platform, teaching content, learning methods and evaluation methods into the ELT process of CAD courses.

Therefore, tutors can make use of the space and convenience provided by the Internet to design different tasks that integrate listening, speaking, reading and writing skills to improve students' English skills. In the teaching, I first introduced a video related to the class content, and then taught in the following three parts: vocabulary, listening and text. Compared with the traditional teaching, the design of teaching activities has made great changes. Evaluate the students' performance and correct the problems in their performance. Figure 2 shows the structure diagram of ELT platform of CAD course.
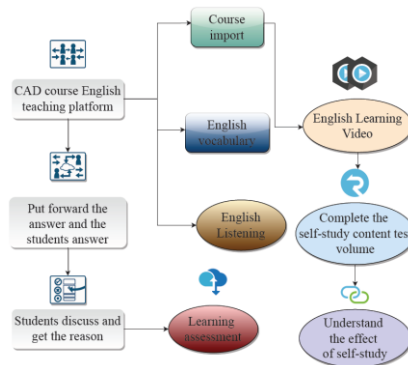

Figure 2: ELT platform of CAD course.

In the implementation of case teaching, the reverse modeling task is divided into three small tasks by combining the online teaching resource library of CAD courses, namely, completing the creation of the main cylinder, rib plate, model analysis and draft. The development of ELT platform for CAD courses, design and develop an online teaching platform to maximize the role of teaching resource library. Through the comparison between traditional teaching and CAD ELT, we can clearly see that they are very different in teaching design, which is mainly reflected in the design of teaching activities, as shown in Table 1.

	Traditional teaching	CAD Course ELT	Advantage
Hearing	Listen to the tape and ask the students to answer the questions.	The students answer the teacher's questions, and tell the teacher the answers after listening to the tape	Change students' bad habit of remembering answers without thinking, and enhance the

		for discussion, and describe the answer process.	interaction between students.
Vocabulary	The teacher explains the pronunciation of words and gives examples.	Through the game, and through the game process to correct the problem.	Improve the students' resistance to memorizing words, and comprehensively investigate the students' mastery of vocabulary meaning and pronunciation during the game.
Text	Answer and make sentences about sentence patterns and grammar.	The teacher evaluates the performance.	The investigation of students' comprehensive ability enables students to transfer from mechanical reception to a higher level of flexible application.

Table 1: Comparison of teaching methods.

The functions of online teaching platform based on deep learning include making and publishing online courses, assignment of homework, evaluation of homework, online answering, self-synchronization of teaching content, etc. We should also investigate the organizational form of the classroom and the acceptance of the teaching content. We don't have to adopt the formal questionnaire survey method, but we can flexibly use the method of communicating with students after class to get students' feedback, and adjust the teaching methods in time to get better teaching effect. The construction of the platform can benefit more students. Using the network platform to build an all-English course website can let relevant teachers in other schools and even other countries know about our English teaching content and teaching level, and constantly promote internal teachers to improve the teaching content.

4   ANALYSIS AND DISCUSSION OF RESULTS

The ELT model of CAD course does not exclude the summary evaluation, but takes it as a part of the comprehensive evaluation of students, so the final test was conducted in the actual experiment. Because students are generally weak in basic knowledge, students are often tired of learning in a large area in the way of knowledge teaching. It is impossible for learners to fully develop their "listening, speaking, reading and writing" ability in a short period of time. According to the principle of practical and sufficient teaching, CAD course ELT also mainly strengthens learners' "listening, speaking" ability. Therefore, a final test was taken to test the students' oral English communication ability in different situations by drawing lots. The deep learning technology has been used to compare the results of the two final exams before and after the ELT of the CAD course. The passing rate and excellent rate are shown in Figure 3 and Figure 4.
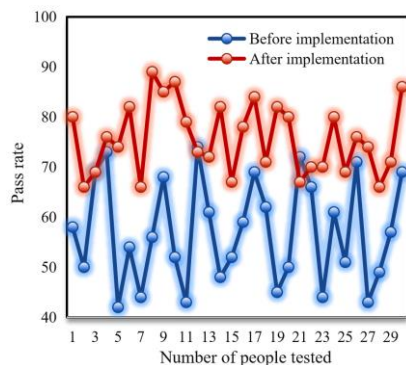
Figure 3: Comparison of pass rate before and after implementation.
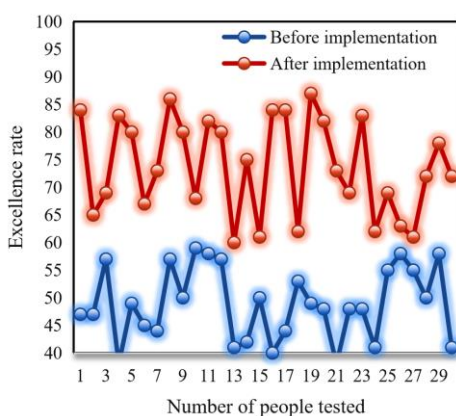

Figure 4: Comparison of excellence rate before and after implementation.

Through the analysis of the experimental results in Figure 3- Figure 4, after the application of deep learning to the CAD course ELT, the pass rate and excellent rate have been obviously improved, and the average pass rate has increased from 57% to 75%. The excellent rate increased from 49% to 74%. By comparing the results of the two final tests before and after the implementation, we can see that the application of ELT in CAD course through deep learning technology has significantly improved students' English scores, and the scores are an important indicator to reflect the teaching effect. In this sense, we can say that the application of ELT in CAD course has also improved the teaching effect.

In the ELT mode of CAD course, teacher's classroom introduction is also the key point to connect the content of self-study knowledge before class with classroom teaching activities. There is no fixed mode of classroom introduction. The methods shown in Table 2 are all common. Considering the particularity of ELT of CAD course, it is simple and clear to use video for classroom introduction, and it is also an easy introduction method to avoid taking up too much classroom time. In the introduction stage of the class, we should fully consider the students' basic knowledge of this class and the problems arising from the feedback of self-regulated learning before class, so as to conduct more targeted introduction.

Name	Implementation method

Suspense introduction method	Make use of students' lives or concerns to set suspense and lead to learning tasks.
Game import	Designing games related to the content of CAD courses allows students to interact with each other or between students and teachers, and arouses students' enthusiasm.
Video import method	Video or film related to ELT activities, raise questions related to ELT content of CAD courses, and arouse students' thinking.

Table 2: ELT import method table of CAD course.

Through the ELT platform of CAD course, the deep learning project of foreign journal reading based on teacher's guidance and students' group action is implemented. In the process of learning, we should keep abreast of students' learning situation and different learning needs, help students to adjust their learning contents and methods in time, and conduct supervision evaluation from three dimensions: evaluation content, evaluation subject and evaluation method, as shown in Table 3.

Evaluation content	Score
Homework	19%
Final test	55%
Classroom participation	27%
Certificates and awards	8%

Table 3: ELT evaluation of CAD courses.

Through Table 3, we can find out that the comprehensive English learning effect is understood through CAD classroom observation, academic performance evaluation, questionnaire survey, in-depth interview and other ways, and that students have affirmed and gradually adapted to the in-depth learning of the curriculum.

In the teaching design mode of CAD course English, a questionnaire survey was conducted on 40 students through three aspects of in-depth learning technology to improve practical skills, stimulate learning interest, and discuss and exchange. The questionnaire was edited from the "questionnaire network" and released to the student group. The specific results are shown in Figure 5, Figure 6, Figure 7.

After the analysis of Figure 5, Figure 6, Figure 7, the students who have implemented the ELT of deep learning technology CAD course generally think that the teaching video is helpful for course learning, the micro-course teaching is helpful for improving practical skills, stimulating students' interest in learning, and the discussion and communication is more effective. After implementation, the average ratio of improving practical skills is 77%, the average ratio of stimulating learning interest is 83%, and the average ratio of discussion and communication before and after implementation is 85%. Compared with the data before implementation, the data after implementation is in a better state.
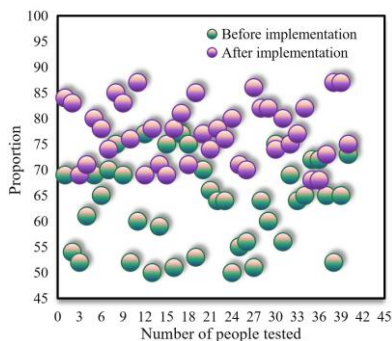
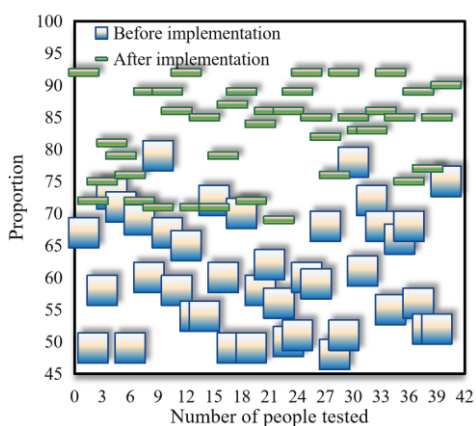**Figure 5**: Comparison of improving practical skills before and after implementation.

Figure 6: Comparison of stimulating learning interest before and after implementation.
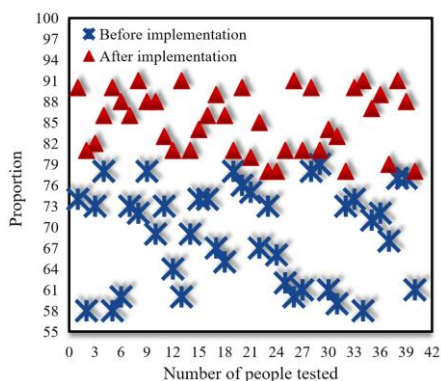

Figure 7: Comparison of discussion and communication before and after implementation.

5   CONCLUSIONS

The design of ELT platform for CAD courses follows the student-centered teaching principle. Teachers play the role of guidance and motivation. CAD course activities are mostly carried out

with problems, giving full play to students' initiative. The process of problem solving is the process of knowledge construction - knowledge transfer and application - evaluation and feedback, which also conforms to the route of in-depth learning. Such CAD courses cultivate students' learning autonomy and collaboration ability, which is more conducive to the practice of in-depth learning. In order to stimulate students' interest, teachers need to spend a lot of time to design activities, find topics that arouse students' interest but are inconvenient to discuss in face-to-face communication, comment on students' performance and guide students' group learning, etc. In this paper, the application of deep learning technology in ELT platform of CAD course has been further studied. After the implementation of ELT of CAD course through deep learning technology, students generally believe that teaching videos are helpful to course learning, micro class teaching is helpful to improve practical skills, stimulate students' interest in learning, and discussion and communication are more effective. The average proportion of improving practical skills after implementation is 77%, the average proportion of stimulating learning interest after implementation is 83%, and the average proportion of discussion and communication before and after implementation is 85%. Compared with the data before implementation, the data after implementation is in a better state. The organizational form of CAD courses and the acceptance of teaching content should also be investigated. It is not necessary to adopt the formal questionnaire survey method. Instead, it is flexible to use the method of communication with students after class to obtain students' feedback, and timely adjust the teaching methods to obtain better teaching effect.

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