





Optimization of Computer Aided English Translation Teaching Model Based on OBE Concept

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Abstract. The existing English translation teaching model is outdated and fails to keep pace with the development of The Times, which makes students' learning out of step with the needs of society. Therefore, to better research this problem and based on the related concept of Outcome Based Education (OBE), the relevant technology of deep learning in computer is used to assist, so as to optimize the relevant teaching model of English translation, the optimization results can well meet the relevant requirements of English translation education and teaching. The results show that: in view of the relevant needs of the country and society on the development of education, the development of the whole translation industry and the corresponding vocational needs under the social background are further explored, through the formulation of feasible development orientation and development goals, so as to further improve the English translation teaching of students. Based on educational philosophy of OBE, an English translation examination question bank can be established with the help of computer-aided processing technology, which can be optimized from the aspects of test question source, test question source, knowledge distribution and difficulty degree. The model of English translation teaching should enable students to have a deep understanding of the ever-changing theoretical knowledge of translation. Under the guidance of OBE concept, the application of computer aided technology can better promote the optimization and development of English translation major, and provide relevant theoretical basis for the OBE concept to play a role in other aspects.

Keywords: Outcome Based Education (OBE); computer; deep learning; translation; model optimization

DOI: <https://doi.org/10.14733/cadaps.2022.S7.100-110>

1 INTRODUCTION

English translation education mainly includes the translation of professional English and basic English. The development of professional English translation is mainly to effectively improve students' English skills and knowledge in the basic stage, so basic English translation is the premise. The main purpose of strengthening and extending professional English courses is as follows: on the one hand, it can improve students' professional English communication ability; On the other hand, they can highlight their advantages in future work through their own language ability. In the study of professional English translation, to reflect the main role of this course as a language work, it is necessary to formulate a complete teaching system by integrating professional knowledge with it. At the same time, as a bridge between professional English and basic English, the main purpose is to cultivate professional ability.

Therefore, for the concept of Outcome Based Education (OBE), many scholars have conducted relevant studies as follows: Considering the influence of cross-disciplines and based on the relevant theory of Outcome Based Education, Mitra and Gupta [1] used cloud computing analysis method to study the influence of teaching reform on physical and physical migration, and then optimizes the traditional student evaluation system and model by combining relevant theories and methods of cloud computing, so that students can be more targeted in learning. So as to achieve the objectivity, accuracy and integrity of the evaluation of students. The idea of Outcome Based Education is a student-centered research method and thinking, to explore the application prospect of the theory in relevant specific disciplines, Yasmin and Yasmeen [2] adopt the quasi-experimental research method to analyze the effectiveness of the teaching model in learning under the OBE concept. The research shows that the Outcome Based Education has a good application in specific disciplines, and its results can promote students' learning enthusiasm to a certain extent, making the relevant evaluation method more conducive to students' learning and growth. Based on design and research of OBE's related concept, Ram [3] choose to use the revised Bloom classification research methods for students to study and analysis of related courses, adopt the method of test to validate the revised model, the results show that the model can well reflect the student's performance in the learning process, and it can predict the low related to students. Thirumoorthy and Muneeswaran [4] proposed a new admissions system based on the concept of Outcome Based Education (OBE) to determine the best course outcomes for students, which has good applications in student exams, projects and other assessments. Tan et al. [5] verified the accuracy of OBE methods in providing students' abilities by using more robust experimental studies and larger sample sizes. Outcome Based Education can not only be used in students' basic learning education, but also play a certain role in students' medical education, Morcke et al. [6] systematically explained the research background, research content and relevant research model of Outcome Based Education. This method is introduced into the field of medical education, so as to realize the in-depth study of medical education. The results show that this method can make students have a more clear and direct understanding of medical education. The concept of Outcome Based Education (OBE) plays an important role in many aspects and has achieved a series of important results. Therefore, to explore the influence of English translation teaching mode on students, a new model is constructed with the help of computer computing and the relevant theories and contents of deep learning. The model can optimize the original English translation model, and it shows that this model can better meet students' demand for English translation. This research can lay a solid foundation for the application of Outcome Based Education (OBE) in other fields.

2 CONCEPT OF OBE

2.1 Introduction to OBE Concept

To meet the challenge of the new industrial revolution to higher engineering education, and to adapt to the rise of public accountability system, people pay more attention to the return of education input and actual output. In this context, Outcome Based Education (OBE), as an advanced educational concept, was put forward by Spady in 1981, and gained people's attention and recognition, OBE concept has become the mainstream concept of educational reform in the United States, Britain, Canada and other countries [7]. The evaluation system of OBE concept is to first establish the relevant curriculum objectives, then test the relevant results, performance and evaluation methods, and finally establish a new optimization mode through the feedback of the existing problems, so as to achieve the optimization and design of education-related content. The details are shown in Figure 1.

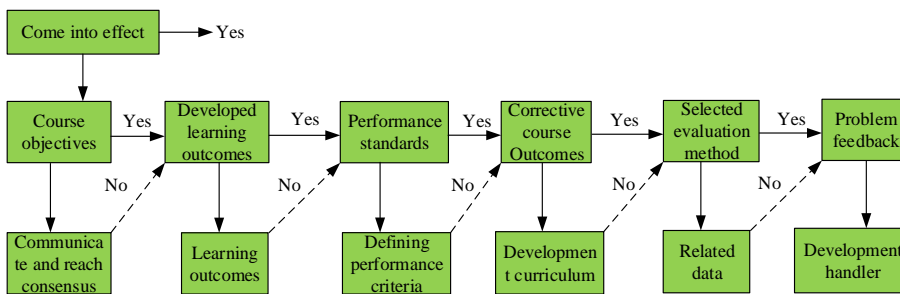


Figure 1: Evaluation flow chart of OBE concept.

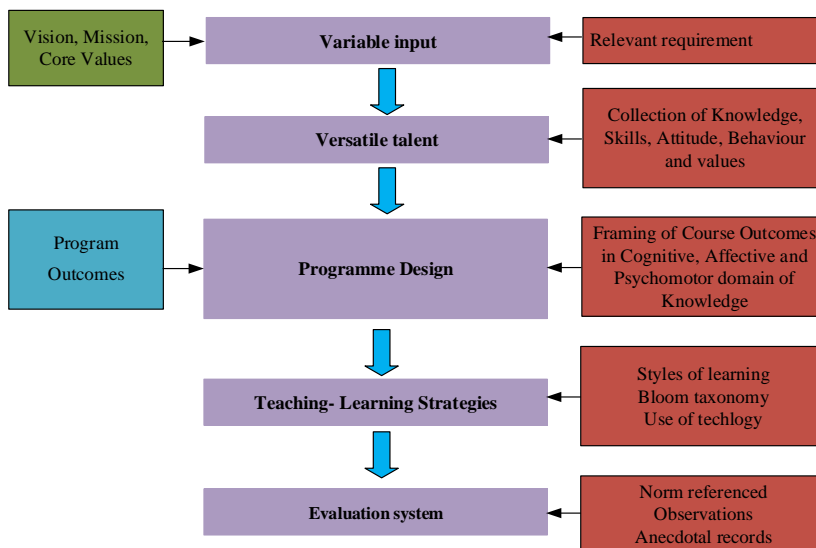


Figure 2: Process of OBE.

OBE is a new educational concept, which is guided by students' learning results. Students can obtain learning results through independent learning. This concept focuses on judging the learning

results of students, emphasizing the role of students in the reality after learning, the concept not only paying attention to the specific content of students' learning knowledge, but also paying more attention to the influence of learning on students. According to the final results, this concept can guide the design of the course. After a period of learning, students should show what they have learned, which can trigger teachers to enrich teaching content and optimize teaching methods, and promote the coordination between the study and the evaluation of teaching strategies, the OBE process is shown in Figure 2.

2.2 Principles of the OBE Concept

Outcome based education is a change from the goal-based and input-oriented education structure, in this educational structure, project outcomes are measured quantitatively through direct and indirect assessment tools. Previous educational structures relied on projects and goals, where goals were determined by top-down desires and were less dependent on an iterative process through analysis [8]. The previous research object is too single, resulting in a large deviation between the research results and the actual situation, and poor guidance to the student evaluation system. Therefore, it is necessary to adopt relevant theories to conduct comprehensive and detailed research on the research object, so that the research results are basically consistent with the actual content. Thus, model analysis can be used to predict and evaluate students and guide students' learning. The substantial structure based on OBE concept mainly includes core competence, substantial elements, level 1 module courses and subject construction, the details are shown in Figure 3.

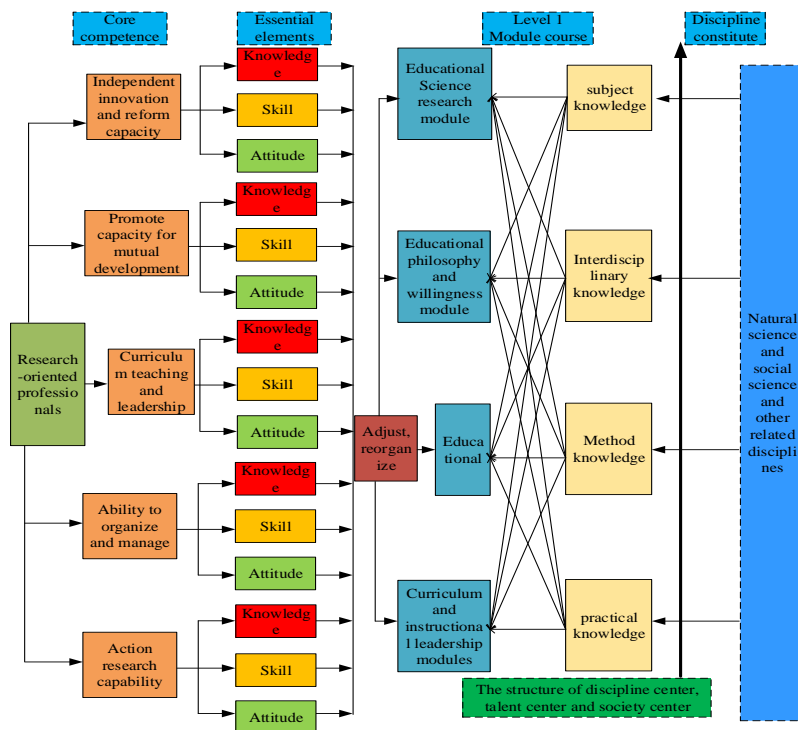


Figure 3: Substantial structure of OBE.

3 COMPUTER-ASSISTED

3.1 Deep Learning

Deep learning is composed of multiple neural network models, which include input layer, neuron layer and output layer. Each layer of network has different functions and is responsible for different tasks [9]. The deep network structure is shown in Figure 4. The neural networks commonly used are as follows:

(1) Deep neural network (DNN): it has more than two layers of network and can store more parameters by increasing the number of layers, which can make the model more accurate.

(2) Recurrent neural network (RNN): it can process data with sequential features and recognize text data with sequential and semantic information.

(3) Convolutional neural network (CNN): it is a multi-layer neural network, mainly including three structures of convolution, activation and pooling. It is often used to process image data for image recognition.

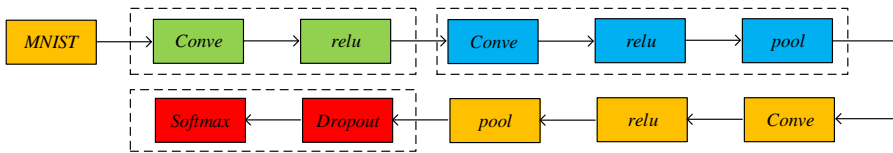


Figure 4: Deep network structure diagram.

Where the Conv is convolution layer; Pool indicates the pooling layer. Dropout is randomly selecting hidden layers of neurons during training; The Softmax function is the output layer function.

3.2 Principles of Deep Learning

In MDP, state changes and rewards depend only on the current state and action. MDP contains two kinds of value functions, namely, state value function (V) and state action value function (Q). The state value function starts from state, and the policy reward value obtained by using the policy is shown as follows:

$$v_{\pi}(s) = E[G_t | S_{t=s}] \quad (1)$$

This method can be further broken down into current reward and successor states:

$$v_{\pi}(s) = E_{\pi}[R_{t+1} + \gamma V(S_{t+1}) | S_{t=s}] \quad (2)$$

To find the optimal value function, we can use the existing recursive relation:

$$v_{\pi^*}(s) = v_{\pi^*}(s) = \sum_{a \in A} \pi_{\pi^*}(a | s) q_{\pi^*}(s | a) = \max_a q_{\pi^*}(s | a) = \max_a q_{\pi^*}(s | a) \quad (3)$$

$$q_{\pi^*}(s | a) = R(s | a) + \gamma \sum_{s' \in S} p_{ss'}^a V_{\pi^*}(s')$$

3.3 Computer Research Content

Reinforcement learning methods are mainly divided into four typical reinforcement learning frameworks include value-based Q-learning, policy-based Policy Gradient, value-based DQN, and value-based DDPG.

(1) Q learning

Q-Learning is a classical value - based reinforcement learning algorithm, by defining the problem as an MDP process, we can find the action selection strategy with the greatest payoff:

$$q_{\pi}(s|a) = E_{\pi} [r_{t+1} + \gamma r_{t+2} + \gamma^2 r_{t+3} + \dots | A_t = a, S_t = s] \quad (4)$$

$$q_{\pi}(s|a) = E_{\pi} [G_t | A_t = a, S_t = s]$$

where the G_t is the total discount reward starting from time t , $\gamma \in (0,1)$.

(2) Strategy gradient

Q-learning is mainly used for learning discrete value tasks and finding the optimal strategy by learning the gradient information of strategy parameters.

The specific strategy can be described as a function containing the parameter θ :

$$\pi_{\theta}(s|a) = p(a|s, \theta) \approx \pi(a|s) \quad (5)$$

The reward can be maximized by choosing an action:

$$\nabla_{\theta} J(\theta) = E_{\pi_{\theta}} [\nabla_{\theta} \log \pi_{\theta}(s, a) r] \quad (6)$$

(3) Deep Q Network (DQN)

DQN is a method that uses neural network structure to make improvement for practical problems. It can solve the reinforcement learning problems with higher dimensions and more complex problems. The DQN framework is shown in Figure 5.

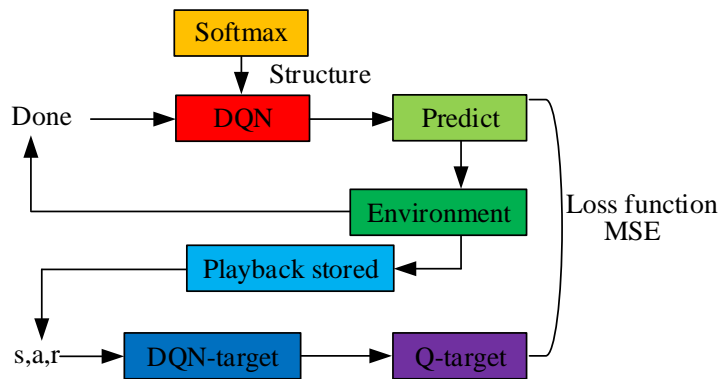


Figure 5: DQN framework.

(4) Depth deterministic strategy gradient

DDPG inherits DQN framework, in which Q-Network is used to evaluate value functions and solve continuous state space problems. The objective function of the strategy network is as follows:

$$\max_{\theta^{\mu}} J(\theta) = E_{s \sim \rho_B} [Q^{\mu, \mu}(s, \mu \theta^{\mu}(s))] \quad (7)$$

The objective function of the network is as follows:

$$\min_{\theta^Q} loss(\theta^Q) = [r(s, a, s') + \lambda Q - (s', \mu \theta^{\mu}(s'), \theta^Q) - Q(s, a, \theta^Q)]^2 \quad (8)$$

4 OPTIMIZATION OF ENGLISH TRANSLATION MODEL

4.1 Existing Deficiencies

For a long time, English translation courses have been following the traditional teaching model, teachers mechanically indoctrinate students with knowledge, and students passively accept knowledge, resulting in the lack of subjective initiative in learning. Translation teaching cannot meet students demand for translation learning, and it is difficult to cultivate translation talents needed by the society. The main problems in English translation include [10]: (1) insufficient understanding of the importance of English major; (2) Lack of compound teachers; (3) Students' English foundation is uneven; (4) Backward teaching mode. Therefore, it is necessary to reflect on the traditional translation teaching model and explore new teaching approaches. Outcome based education (BOE) has a good performance in the optimization of the structure, which provides a new perspective for the optimization of translation teaching model. By randomly selecting some samples for analysis, the optimization results of relevant models are shown in Figure 6. Compared with the original model, the new model based on THE OBE concept can better describe the change rule of samples.

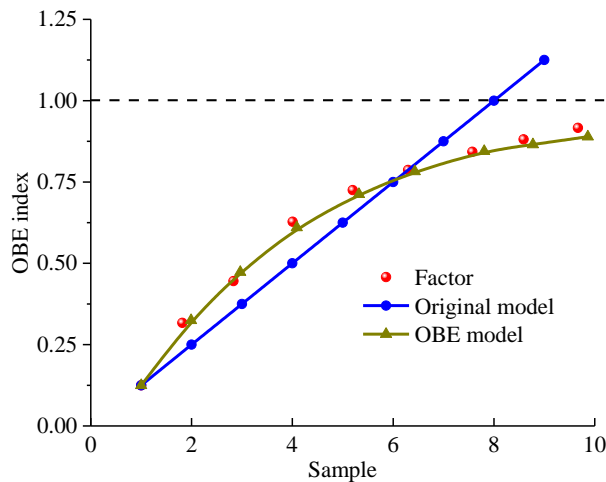


Figure 6: Comparison diagram of model optimization.

4.2 Optimized Content

The optimization measures of English translation education and teaching mainly include: (1) Strengthening the construction of teachers; (2) Optimization of teaching methods; (3) Integration of interdisciplinary disciplines; (4) Pay attention to the compilation and update of courses and examination questions [11].

In terms of teaching improvement, the traditional mode is optimized based on the OBE concept and considering the relevant content of deep learning in computers, as shown in Figure 7. The optimization of teaching methods is a changing relationship from top to bottom. First, it studies the relevant needs of national education development. Second, it studies the development of the whole translation industry and its corresponding vocational needs under the social background. Moreover, as a college cultivating English translation talents, it should have its own development orientation and development goals, and finally, it should closely link the development of the school with students' career expectations; We should learn to develop two cycles in and out of school. We can use the cycle of the English translation industry outside the school to promote the development of internal education and teaching, and use the advantages of the internal

circulation of colleges and universities to lead the benign development of the whole English translation industry; Reasonable and appropriate curriculum requirements can be formulated from the training objectives of students to meet the relevant graduation requirements of students, and the curriculum system can be optimized through the setting of relevant indicators. We can feedback relevant teaching requirements through the optimization of the curriculum system, and then guide the construction of relevant indicators again, and finally achieve the purpose of optimizing English translation.

In terms of the optimization of the curriculum and test questions, based on the education philosophy of OBE, the relevant test questions are updated, and the English translation test question bank is established by using computer aided processing technology, so as to improve the quality of test questions. The following questions are mainly considered in the establishment: (1) The sources of test questions: the existing exercises, various examination papers and various questions that can be found on the Internet are good sources of questions for the test bank. (2) Composition of question types: It is very important to assign appropriate question types according to the characteristics of the course and teaching needs. It is suggested to focus on thinking ability, comprehensive ability and innovation ability of students. (3) Distribution of knowledge points: In English translation teaching, teachers can set the translation target on the cultivation of students' vocabulary translation ability and expand students' vocabulary by paying attention to the translation of words. (4) Difficulty setting: The question bank should not only consider the use of students of different levels and levels, but also consider the collocation of difficult and easy questions when composing papers.

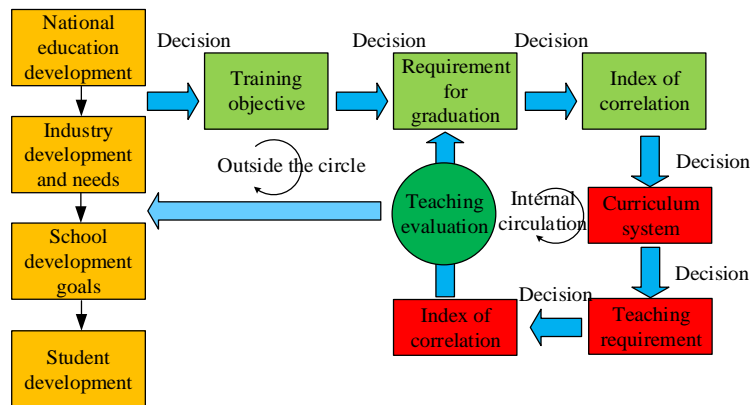


Figure 7: Flow chart of English teaching based on OBE.

4.3 Optimization Results and Analysis

Based on OBE concept, optimization mainly starts from several core competencies of future learning research results, which can be further studied and optimized. By using the method of optimization design, the setting of the first level module course is guided, so as to achieve the setting of the secondary module course. The optimization results are shown in Figure 8. The figure shows that the new model can well describe students' scores and other indicators.

English translation teaching should enable students to have a profound understanding of the ever-changing theoretical knowledge of translation, master the concept of translation more completely and concretely, and avoid students forming incorrect ideas. Under the guidance of OBE and computer aided technology, teachers can aim at cultivating students' vocabulary translation ability in English translation teaching and expand students' vocabulary at the right time. Students

have experienced the primary stage of vocabulary translation, and naturally transition to the grammar stage. Students should try their best to be faithful to the English translation of the original text. English translation requires the authentic expression of the original meaning, and at the same time, the target language readers should get the same feeling, and the fluency of the translation should be emphasized.

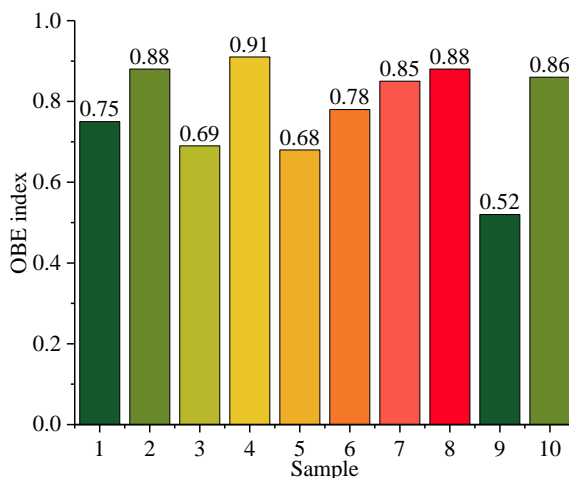


Figure 8: Optimized result.

Based on THE OBE concept and assisted by computer, the optimization of English translation model mainly includes three parts: problem introduction, off-campus course and on-campus course. Firstly, it studies the problems existing in English translation through the introduction of relevant problems. Then, based on the OBE concept, it optimizes and analyzes the implementation methods of on-campus and off-campus courses by using deep learning in computers, as shown in Figure 9:

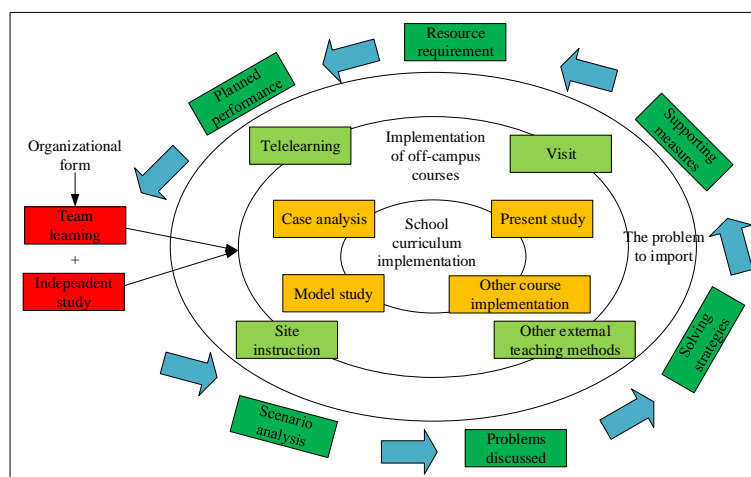


Figure 9: Implementation strategy for problem-based import learning.

With the rapid development of social progress and economy, English translation models are constantly making breakthroughs and reforms to meet the needs of social employment. Through constant exploration and innovation, more interdisciplinary talents with strong professional ability are cultivated to further optimize English translation major and corresponding models.

5 CONCLUSION

This paper focuses on the OBE concept. Deep learning in computer aided technology is used to optimize the existing English translation teaching model. The relevant conclusions are as follows:

(1) In terms of improving teaching, the traditional mode is optimized based on the OBE concept and considering the relevant content of deep learning in computers. It is mainly reflected in the research on the relevant education. In the social context, the development of the whole translation industry and the corresponding vocational needs are further explored, through the designation of feasible development orientation and development goals, so as to further improve the English translation teaching of students.

(2) From the perspective of the development of the two cycles inside and outside the school, the two cycles inside and outside the school are interdependent and related to each other. Through the cycle outside the school, the development of internal education and teaching can be promoted, and the benign development of the whole English translation industry can be led by the advantages of the internal cycle. Finally, the goal of optimizing English translation is realized.

(3) In terms of curriculum and test questions optimization, based on OBE education philosophy, translation test questions database is established with the help of computer aided processing technology, which is optimized from the sources of test questions, test sources, knowledge distribution and difficulty degree, so as to improve the quality of test questions.

(4) English translation teaching can make students to has a profound understanding of knowledge about increasingly change translation theory, under the guidance of OBE's idea, the computer aided technology is used, the teacher can put the translation in English translation teaching aiming at students' vocabulary translation ability training, so as to promote English translation and the corresponding model of further optimization.

6 ACKNOWLEDGEMENT

New Liberal Arts Research and Practice Reform Project of Anhui Quality Engineering: Multiple Evaluation of Blended Learning in College English from the Perspective of New Liberal Arts (2020wyxm042)

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