

Deep Learning: Investigation and Analysis on the Public English Course Learning of Vocational College Students

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Abstract: Deep learning originates from the research of artificial neural network. As an important way of learning, it has become a hot issue in teaching theory and practice research in recent years. Through questionnaire, this paper investigates public English course learning of vocational college students from four dimensions: learning input, knowledge integration, transfer and application, and evaluation and reflection. Through data analysis, it puts forward the learning strategies as stimulating learning motivation, cultivating high-level thinking ability, creating active learning environment and improving teachers' deep learning. The suggestions aim to promote the deep learning of public English in higher vocational colleges and to provide supports and references in the reform of public English teaching in vocational colleges.

1. Introduction

The concept of deep learning originates from the research of artificial neural network, and its motivation is to establish and simulate the neural network of human brain for analysis and learning. In the field of education, Lorin W. Anderson expounds the view of deep learning from the cognitive dimension. In 1976, Fernce Marton and Roger saljo first put forward the two corresponding concepts of deep learning and shallow learning, pointing out that deep learning emphasizes the initiative and active participation of learners, and learners are the main participants in learning activities. In addition, the quality and effectiveness of learning ultimately depend on learners themselves [1]. Biggs (1999) believed that deep learning is driven by students' inner motivation and curiosity. The strategy of deep learning is to connect new learning knowledge with existing knowledge and experience, and to rely on the relevant life background and environment. Eric Jensen and LeAnn Nickelsen (2015) believe that deep learning is the high-level analysis and processing of new knowledge, so as to obtain the mastery of skills. The core connotation of deep learning embodies the concepts of criticism, understanding, integration, transfer, reflection, creation and other cognitive concepts in science fields. Bloom, an American scholar, divides learning objectives into six levels: knowledge, understanding, application, analysis, synthesis and evaluation [2].

Li Jiahou, Professor in Shanghai Normal University, is the first scholar to put forward the concept of deep learning in China. He believes that deep learning enables learners to critically learn new knowledge according to their own understanding, and incorporate them into the original

knowledge system, establishing new connections, and transfer existing knowledge to new situations [3]. Guo Hua (2016) believed that Deep learning refers to a meaningful learning process in which students focus on challenging learning tasks and actively participate, experience success and achieve development under the guidance of teacher [4]. Zhu Kaiqun (2017) believed that teaching for deep learning can be based on real situations and high quality issues, or on micro-inquiries and micro-projects learning [5]. Guo Hua (2020) held the view that the key feature of deep learning is the refinement and improvement of excellent teaching theory and practice is the key to ideal teaching form [6]. Horizon Report 2020 (Teaching and Learning Edition) proposes that online education is increasingly regarded as an extensible means, which can provide courses for more and more non-traditional student groups. Therefore, deep learning is a key trend to promote the application of technology in higher education.

As an important and effective way of learning, deep learning has become a hot issue of practical exploration and teaching theory research in recent years. Through CNKI literature search, the author finds that most of the research objects of current scholars are science subjects, and the research on deep learning of English is insufficient, especially the research on public English of higher vocational students. Based on the theory of deep learning, this paper makes an in-depth investigation on the current situation of Public English learning of vocational college students, aiming to understand the level of public English deep learning in vocational college students. In order to provide supports and references for the reform of higher vocational education, this paper puts forward some teaching suggestions to promote the deep learning of public English.

2. A Survey of Deep Learning

2.1. Research Design

Through the designated questionnaire, empirical investigation was carried out to understand the situation of higher vocational students' in public English deep learning, thus intended to provide practical basis for promoting public English teaching in vocational colleges and higher vocational education reform.

2.2. Research Methods

This paper uses the method of questionnaire survey to collect the data, referring to NSSE-China(Chinese version of National Survey of Student Engagement)to compile the questionnaire of deep learning level of public English for higher vocational college students.

189 questionnaires were randomly distributed to the sophomore, non-English majors in my college, 189 of which were returned, with a recovery rate of 100% and an effective rate of 100%. There were 134 girls and 55 boys, as shown in Table 1.

Table 1: Vocational Students Information

Content	Gender	
	Male	Female
person	55	134
percentage	29.10%	70.90%

The questionnaire is mainly composed of two parts. The first part is the basic information of the students. The second part is the survey of deep learning level, which mainly involves four dimensions, namely learning engagement, knowledge integration ability, transfer application ability and evaluation reflection ability. The questionnaire was scored by Likert's five level scale, with five choices from "completely disagree", "not disagree", "uncertain", "relatively agree" to "completely

agree", representing 1, 2, 3, 4 and 5 points respectively. The higher the score, the stronger the representation ability, and vice versa. Meanwhile, SPSS 22 statistical software was used to test the reliability and validity of the survey data. The results show that the Cronbach alpha coefficient of the questionnaire is 0.912, kmo is 0.952 and Bartlett is 0.000, indicating that the reliability and validity are good.

2.3. Survey Results and Analysis

2.3.1. Engagement of Vocational College Students in Public English Learning

Learning engagement refers to the effort that students put into learning and mastering knowledge. Scholars such as Jennifer and Fredricks put forward a three-dimensional theoretical framework of learning engagement, which is divided into three dimensions: behavioral, cognitive and emotional.

Table 2: Higher vocational students' Engagement in public English Learning

No.	Questions	Average score
1	I think learning English is an interesting thing	3.01
2	I prefer study for myself rather than for exams or other external reasons	3.12
3	I think it's very important to preview and review the lesson	3.04
4	I like the group discussion method used in English class	3.21
5	I spend at least 8 hours a week studying English	2.72
6	After class, I will take the initiative to look for English materials to expand the learning content	2.78
7	I can guess and analyze the meaning of English words through context	2.64

The survey data in Table 2 shows that in terms of behavioral engagement (5, 6, 7), the average time and behavioral factors of English learning engagement are between 2.64 and 2.78, which are less than 3; in terms of cognitive engagement (3, 4), the average motivation and learning strategies of English learning are between 3.04 and 3.21, which are above 3; in terms of emotional engagement (1, 2), the interest and attitude of learning English, 3.01 and 3.12 respectively, both higher than 3. This shows that in the process of English learning engagement, students' emotional engagement and cognitive engagement are higher than their behavioral engagement, and the score of learning behavioral engagement is relatively low, which indicates that students in vocational colleges have less learning time engagement, low learning initiative after class, and lack of autonomous learning ability.

2.3.2. Analysis and Integration Ability of Vocational Colleges Students in Public English Knowledge

Analysis and integration ability refers to the comparison, classification and analysis of new and old knowledge, so that the two can be organically integrated to form a new knowledge system [7]. The analysis of the dimension of integration ability is mainly based on the investigation of Vocational College Students' understanding and memory of English words, as well as the treatment of new and old English knowledge.

The survey data in Table 3 show that the average of students' understanding and memory of English words (1, 2, 3) is between 3.01 and 3.12, which indicates that students' analytical ability and deconstructive ability of English knowledge are at a general level. The average values of the new and old knowledge processing methods (4, 5) are 3.05 and 3.11, which are higher than 3, indicating that the students are relatively lack of the ability to organize the new and old knowledge

systematically. The survey results show that in the analysis and integration dimension of college English deep learning, vocational students' analysis ability and understanding and construction ability of public English knowledge are at a general level, among which the system integration ability is relatively low and needs to be further improved.

Table 3: Vocational College Students' Ability of Analyzing and Integrating Public English Knowledge

No.	Questions	Average score
1	When I learn new knowledge in English class, I will associate with the relevant knowledge I have learned	3.12
2	I will sort out the new and old knowledge after class to make it systematic	3.01
3	I prefer to memorize English words with antonyms and variants together	3.03
4	I will emphasize the understanding and construction of the meaning of knowledge in my English learning	3.11
5	In the process of doing English homework and discussion, I will use the knowledge of different disciplines	3.05

2.3.3. Transfer Ability of Vocational College Students in Public English Learning

The ability of knowledge transfer and application refers to solving new problems through the transfer and application of existing knowledge, which is the key link of deep learning [8]. Transfer application ability is mainly investigated through students' association ability to subject knowledge and knowledge of different cultures, ability to solve new problems with learned knowledge and oral English communication ability.

Table 4: Vocational College Students' Ability of Analyzing and Integrating Public English Knowledge

NO.	Questions	Average score
1	In public English learning, I will take the initiative to compare British and American culture with Chinese culture	3.12
2	In the process of learning public English, I will use what I have learned to solve new knowledge problems	3.07
3	I will take the initiative to note down difficulty or errors in public English and summarize the solutions	2.92
4	I will discuss and exchange views with my classmates after class	2.90
5	I can communicate in different ways in English	2.81

According to the survey data as shown in Table 4, the students' association ability (1) of different subject knowledge and different cultural knowledge is 3.12, the ability of using learned knowledge to solve new problems (2, 4) is 3.07 and 2.92, and the oral communication ability (5) is 2.91. The survey results show that the comprehensive application ability and practical application ability of vocational students in the process of learning public English are not high, and the students' learning ability is low. The transfer ability and practical application ability of English need to be strengthened further.

2.3.4. Vocational College Students' Evaluation and Reflection Ability in Public English Learning

Evaluation and reflection is the review and summary of the learning process, and the embodiment of higher-order thinking [9]. The evaluation and reflection ability of deep learning in this questionnaire is mainly investigated through learning summary, peer communication, self-evaluation, self reflection, knowledge query and so on.

Table 5: Vocational Students' Evaluation and Reflection Ability in Public English

NO.	Questions	Average score
1	I will evaluate myself in the process of learning public English	3.13
2	After class, I often reflect on my own learning methods of Public English	3.02
3	I will question the reliability of the content of Public English textbooks	2.44
4	I would question the public English teacher's point of view	2.31

The survey data in Table 5 shows that students' self-assessment and reflection ability (1, 2) scores are 3.13 and 3.02, which are in the general level. The scores of critical thinking ability (3, 4) are very low, which are 2.44 and 2.31, respectively. It shows that vocational college students fully believe in the teaching content of books and teachers in the process of public English learning, that is accustomed to passive acceptance of knowledge which lack of learning ability of active inquiry and critical thinking ability in high-level.

3. Investigation Conclusion

The results of this study show that the overall level of public English learning for vocational students is general, which is manifested in the lack of participation in English learning, the low ability of analysis and integration, transfer and application of English knowledge, and the lack of self-learning ability. There is a close relationship between learner autonomy and internal driving force of learning, and there is a positive correlation between them, such as higher learning interest and stronger learning motivation opportunities to improve learners' learning initiative.

In addition, the traditional English teaching mode and teaching environment also hinder the development of students' inquiry learning ability and thinking ability of high level. The traditional teaching mode is usually centered on teachers and teaching materials, with single teaching tools, boring teaching content and dull teaching atmosphere, which ignored students' initiative and creativity in learning. The classroom is often dominated by teachers' one-way knowledge indoctrination, while students are passively accepting learning and lack of high-level cognitive learning ability. These are not conducive to the realization of learners' deep learning goals to a large extent.

4. Teaching Suggestions

4.1. Stimulating Students' Internal Driving Force in Learning

Learning motivation is the power source of effective learning and the key to promote students to achieve the goal of deep learning. In the process of teaching, English teachers need to stimulate students' learning enthusiasm and interest, guide students to increase learning investment, so as to stimulate students' learning motivation. According to the group psychological characteristics and English level of higher vocational students, the teaching process is designed to cultivate students' learning interest and thinking. Teachers can use multi-purpose teaching methods to improve teaching methods and teaching methods, such as situational-mode teaching method. By setting

simulated scenarios, students can be motivated to explore actively and interact with peers. And pay attention to guide and stimulate all participation, provide timely positive feedback and opportunities for each student to show and participate, and let them involve in it.

4.2. Cultivating Students' Higher Level Thinking Ability

High level thinking ability mainly includes the comprehensive cultivation of learning creativity, the ability to analyze and solve problems, decision-making ability, criticism and reflection ability. Teachers should study English teaching methods and do a good job in three steps: before class, in class and after class. We can arrange open-ended questions for students before class to stimulate their divergent thinking and cultivate their ability of independent thinking and problem-solving; in class, we can organize students to debate and discuss problems in groups and teams to cultivate their ability of questioning and judgment; after class, we can make students write classroom reflection and combine self-evaluation, peer evaluation and teacher evaluation So as to cultivate students' higher-order thinking ability.

4.3. Creating an Active Learning Environment for Students

Students are the main body of learning. In the process of teaching, teachers should abandon the traditional teacher-centered view and change teaching concept and design of "teacher led, student-centered", so as to create a relaxed, equal and harmonious autonomous learning environment for students. For example, we can build micro class, MOOC and other learning scaffolding for vocational college students' English learning, relying on learning together and to guide students to achieve self-learning and deep learning.

4.4. Enhance Teachers' Learning and Application of Deep Learning

The "teaching" of teachers and the "learning" of students are not isolated from each other, but a combination of the two. In order to support the deep learning of vocational college students, teachers must really understand and grasp the deep learning. Only when teachers are specialized in their studies can the organization of activities reach the depth that higher vocational students need. Therefore, it is imperative to improve the professional quality of English teachers. First of all, teachers need to improve their English subject accomplishment, conduct in-depth analysis in deep learning research materials, and accumulate their own professional knowledge. Secondly, through a variety of channels to integrate and construct knowledge, the teacher need to form a unique personal style. At the same time, teachers are required to break through the limitations of disciplines and integrate knowledge in various fields. Only by constantly improving teachers themselves can they really become supporters of higher vocational students' deep learning of public English.

5. Conclusion

Under deep learning concept, public English teaching in vocational colleges puts forward higher requirements for teachers' teaching and students' learning. Deep learning can enable students to correctly understand English learning, and also help teachers to improve English teaching. English teachers can strengthen their cognition of deep learning, respect the dominant role of students and clarify their orientation in the teaching process. Through introduced more teaching resources, English teachers can improve the design of classroom teaching and teaching evaluation system. Public English teaching under deep learning is of great significance for improving the learning efficiency of students, strengthening classroom management, and promoting the reform and

development of English education in vocational colleges.

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