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To cite this article: Li Ruolan and Liu Guangyong 2020 IOP Conf. Ser.: Earth Environ. Sci. 510 062027

View the article online for updates and enhancements.
Research on the Current Situation and Countermeasures of English Teaching in Vocational Colleges in the Era of Big Data

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Abstract. This paper discusses the characteristics of big data and status of it in the field of English teaching, expounds the problems existing in current English teaching in vocational education, and analyses the ways to realize the optimal allocation of teaching resources, the transformation of teachers' functions and roles, the development of individualized students and the teaching environment on the basis of big data. It aims to integrate classroom teaching with practical situations, truly transform students' knowledge into practical English application skills and better serve their major.

1. Characteristics of big data
As modern information technologies such as mobile communication, cloud computing, sensors, and the language networking are developing rapidly, human society has entered the era of big data. The "Outline for the Promotion of Big Data Development" issued by the State Council puts forward that "big data is a collection of data characterized by large capacity, multiple types, fast access speed, and high application value" [1]. To put it simply, big data is to screen and analyze massive amounts of fragmented information in a timely manner, and finally summarize and sort out the information we need.

Big data affects the development of all walks of life, and of course it also has an important impact on the advancement of education information and modernization. Under the traditional mode, English education, especially English education in vocational and technical colleges, has many problems in teaching materials, teachers' functions, individual students and evaluation system. Therefore, in the era of big data, English education in vocational and technical colleges should make full use of the convenience brought by big data, realizing the optimal allocation of teaching resources, the transformation of teachers' functions and roles, the development of individualized students and the teaching environment. By this, it can make students of vocational education change their attitude of resistance toward English and finally realize the unification of their English proficiency and their employment development in a real sense.
2. Problems of English teaching in vocational and technical schools
In the teaching mode, teaching content, teachers, students, and teaching environment are the four key factors that affect teaching outcomes. There are many problems in the four key elements of English teaching in vocational and technical colleges. These problems directly or indirectly affect and restrict the improvement of students' comprehensive English ability.

In terms of the content of the textbook, the textbook is the main basis for teaching, which is compiled and selected according to the teaching syllabus and actual needs. At present, the English in vocational and technical colleges mainly uses unified teaching materials. Although there are supporting teaching materials such as exercises, the reference book and PPT, the content tends to be single and the amount of information is not large enough. It can only be supported as a framework of learning content, and it cannot well realize individualized teaching and implement the idea of teaching students in accordance with their aptitude for each major.

In terms of teachers, English teachers are faced with three major problems. Firstly, the number of students in public courses is large (usually 80-100 students in a large class), and students’ English foundation is uneven. Due to the above disadvantages, English teaching mainly adopts the teaching mode of "the teacher speaks-students listen", which cannot well mobilize students' learning enthusiasm and English practical ability. Secondly, with a large number of students, teachers need to spend a lot of time and energy to review the homework, resulting in a long review cycle, which makes the evaluation lose its timeliness and pertinence. Thirdly, English teachers are partial to liberal arts, lack of information technology knowledge, and the process of accepting and promoting the auxiliary teaching means provided by information technology is relatively long. Table 1 is the questionnaire survey results of 68 front-line teachers and students of two classes. It can be seen from the table that the problems faced by teachers in the teaching process are quite prominent. Among them, 82.4% of teachers think that "the immediate evaluation is difficult to implement", and "students' acceptance ability in advanced English is uneven" and "classroom management is difficult" are as high as 75% and 69.1%, respectively. At the same time, 49% of the respondents believe that teachers' teaching methods of information technology are backward, which to some extent affects students' learning enthusiasm and acceptance.

Table 1. Current Situation of English Teaching in Vocational Colleges

| difficulties in teaching                                      | number | percentage |
|--------------------------------------------------------------|--------|------------|
| **teaching**                                                 |        |            |
| students’ acceptance ability is uneven                       | 51     | 75%        |
| immediate evaluation is difficult to implement               | 56     | 82.4%      |
| classroom management is difficult                            | 47     | 69.1%      |
| **teaching and learning**                                    |        |            |
| teaching and learning enthusiasm is not high                  | 78     | 53.8%      |
| the teaching methods of information technology are backward   | 71     | 49%        |
| lack of listening and speaking ability, afraid to communicate with people | 95     | 65.5%      |

In terms of students, students in vocational and technical colleges have three characteristics. Firstly, their English foundation is poor and English level is uneven. Students cannot effectively listen to lectures and grasp the key points in class. Secondly, their ability of independent learning is weak and their consciousness of active learning is insufficient, unable to effectively select learning resources suitable for their own level in the situation without guidance. Thirdly, their motivation of learning English focuses on passing the exam, so they only pays attention to the knowledge points during the learning process, but ignores the listening and speaking ability and the humanistic knowledge involved in the language. As shown in Table 1 "lack of listening and speaking ability "and "learning enthusiasm is not high" become more prominent problems. Among these two aspects, the former is the biggest difficulty to students. It reaches up to 65.5%.
In terms of learning environment, first of all, learning is only limited to classroom learning, and there is no resource database related to the learning content of the text, so it is difficult to realize the extension of learning from classroom to extracurricular. Secondly, there is no evaluation system that supports the comprehensive evaluation of students. The school pays more attention to the result evaluation rather than to the process evaluation, which is not conducive to grasp the real level of students, nor is it conducive for students' application of what they have learned in daily life.

3. Solutions and countermeasures provided by big data

3.1 Reform of textbook content under the era of big data

Under the background of the high development of information technology, the two characteristics of the big data, the large information capacity and multiple types, have helped to solve the problems that the content of the textbook tends to be single and lacks pertinence. For the first problem, vocational and technical colleges can use big data to collect texts, audios, videos and exercises related to textbooks, and construct an English teaching database to integrate English learning resources so that students can take classes anywhere at any time. This promotes the extension and consolidation of the knowledge learned in the class. At the same time, the database can provide many resources to simulate the real situation for students to practice English, which helps strengthen and consolidate students’ practical application ability of English in the situational practice, realizing the transformation from knowledge acquisition to ability acquisition. For the lack of pertinence in the content of textbooks, frontline teachers should not fully adhere to the teaching materials. Instead, under the guiding role of the textbook, English teachers in vocational and technical schools should collect more learning materials suitable for the students' English foundation, major and cognitive style differences through the online platform, and design different specific situations to meet students' personalized learning needs and improve their interest and efficiency in English learning.

3.2 Transformation and promotion of English teachers under the era of big data

3.2.1 The change of vocational English teachers' roles with the help of big data. Due to the large number of students in a class and their uneven English proficiency, traditional English teaching is mainly carried out in the teacher-centered mode of "teacher speaks-student listen". In the era before the advent of network big data, this teaching mode is an effective way of large class teaching, which can transfer knowledge and tasks to a large number of students. However, this kind of teaching mode lacks the interaction between teachers and students, and students are in a passive position of accepting knowledge. The degree of knowledge absorption and the ability to transform knowledge into actual language application are not ideal, and it is difficult to truly transform language input into language output. Therefore, the phenomenon of "dumb English" is relatively serious. The advent of the era of big data has solved this problem. Firstly, Teachers use resources provided by big data to provide teaching content and teaching focus to students in the mode of audio and video [2]. Relevant background knowledge is also put forward in the form of question links, so as to facilitate students to consult independently and extend classroom learning to extracurricular activities. Secondly, teachers can also make micro-lessons with the help of big data technology to decompose knowledge points into interesting knowledge modules and give them to students through the network platform or mobile terminals. Students can independently accomplish learning tasks and realize the value of subjects. This method can help students feel less anxious in learning and improve their interest in learning and learning efficiency. In addition, teachers can also use flipped classroom to cultivate students' practical English skills. Before class, students are guided to collect relevant English teaching materials by using resources provided by big data. In class, the discussion topics are designed for group discussion and group representatives for presentation are selected in class. This method promotes more students participate in the teaching process actively and helps the large class realize the feasibility of effective discussion, which make students not only acquire knowledge but also exercise their actual language
ability. With the help of the big data, the traditional teacher-centered teaching mode is broken and the student-centered teaching mode is transformed. The English teacher is transformed from the authority and leader of the English class to the organizer and instructor, while the students become the main body and operator of the teaching activities.

3.2.2 More efficiency of assignment correction with the help of big data. English teachers should learn to use the online platform to solve the problem of long cycle and poor timeliness of assignment correction [3]. English teachers teach a wide range of content, involving vocabulary, grammar, reading, listening, speaking and writing. Evaluation on students’ vocabulary, grammar, reading and listening learning can be achieved quickly by dictation or test. For example, the software “rain classroom” is a good helper of objective questions, which can better implement immediate evaluation and feed. However, the writing needs to be read one by one, which is a heavy workload. At this time, the combination of teacher comments and online platform can improve the work efficiency of teachers, so that students can get timely feedback on the homework. For example, "Sentence Writing and Correction Network" is a good platform to help students get to know their problems on word choosing, grammar and collocation instantly after they upload their writing, and make some corrections in time. Table 2 shows that some teachers have started to use online platforms to correct compositions, although the proportion is not high, accounting for only 26.5%, but this is undoubtedly a good trend. Of course, the online platform is only an auxiliary tool. It can't completely detect the problems in terms of coherence, text structure and connection, and it requires the teachers’ comments.

Table 2. Composition Correction Methods

| composition grading methods                        | number | percentage |
|---------------------------------------------------|--------|------------|
| after-class assignment, manual correction          | 50     | 73.5%      |
| Online assignment, big data automatic correction, manual inspection | 18     | 26.5%      |

3.2.3 The improvement of vocational English teachers' information technology ability under the era of big data. Big data, with its large information capacity, rich types and openness, provides English teachers with a large number of English teaching resources, but these resources are not systematic and of uneven quality. This requires English teachers to improve their professional knowledge as well as their information technology ability, so as to effectively integrate resources, discard dross, and integrate effective resources with teaching objectives and teaching contents. First of all, teachers should improve their ability to search English education resource by participating in relevant training, learning the latest information and being able to know and use valuable English education resource websites and forums. This can not only help teachers to find reliable materials for their own teaching, but also help students to sort out the right learning materials. Secondly, English teachers should learn how to store electronic resources (such as cloud storage) [4], how to organize and save the English education resources they have searched in time, which helps to share them with students more conveniently. Finally, the English teacher should improve the ability of text editing, PPT making, teaching video (micro-class) and classroom network operation (such as rain class), so as to integrate the effective resources collected before class and use network software in class to achieve the best presentation of teaching content. In a word, only through the training provided by the school organization and the teaching platform, the mutual exchanges on using information technology between teachers and their own learning, can teachers master these technologies skillfully, so as to better integrate and process the English education resources on the network, truly make it for their own use, and highly integrate the materials with their own English teaching content.
3.3 The improvement of students' independent study under the era of big data

In the era of big data, the openness and interactivity of information provide a good environment for the cultivation of students' independent learning. Students can access knowledge anywhere and anytime via the ubiquitous web. For the students with poor foundation and unable to keep up with the classroom teaching, micro-video, relevant learning texts, audio and tests can be used for after-class tutoring [5]. When encountering problems, they can also communicate with teachers or classmates to catch up with the teaching process of the whole class in time. For good students, the learning website provided by teachers can be also used to broaden their English learning field and enhance their English ability as needed. It can be seen that the use of big data resources can to some extent achieve personalized and targeted learning.

The integration and intelligence of big data information technology can help some students with weak self-learning ability to effectively select learning resources suitable for their own level without teachers’ guidance. In the face of massive learning resources, students with poor independent learning ability can easily get lost in the ocean of information and do not know how to carry out independent learning. English teachers can analyze the students' self-selected learning resources, learning methods, learning beats, learning preferences and knowledge mastery through the big data analysis system in order to realize the understanding of students' learning at different levels and recommend learning methods, learning materials suitable for them. In addition, it is better to teach fish than to teach fish. English teacher should also guide students how to effectively apply big data to find what they need on the internet and teach students how to properly filter learning materials.

In the face of gap between in-class English learning and daily communication in real life, the era of big data provides a good solution. The characteristics of openness and interactivity of big data can realize the combination of classroom teaching and extracurricular teaching, break the space constraints of teachers and classrooms, use digital facilities to integrate the teaching environment such as listening and speaking into the real English environment, and realize human-computer interaction. Students are immersed in the real English-speaking environment, feel the pure English teaching atmosphere, truly learn from the world and develop knowledge, and turn knowledge into ability. As a good example to display the advantages of big data, the educational platform “MOOC” has enabled the teachers and students to enjoy the world's high-quality teaching resources, learn English with people from all over the world, and feel the original English culture background. Network teaching is another good example. Network teaching can set various teaching modules according to the type, such as "viewing and listening" module, "workplace industry terminology" module, "literature appreciation" module and so on. This modular learning effectively solves the gap between textbook English learning and practical application of English in daily communication, which greatly expands the students' horizons and enables them to choose more extracurricular materials according to their own learning level. With the help of information technology and big data, students' interest and learning outcome toward English have been greatly enhanced.

3.4 Improvement of teaching environment under the era of big data

Under the background of big data, English teaching resources are very rich, but it is impossible to maximize the integration of resources by teachers alone. So the vocational and technical schools should strengthen the cooperation with education institutions and data platform, build their own English teaching database, strengthen the intelligent data analysis capability and update database content frequently, so as to gradually establish and perfect the system of data collection, data analysis, data storage, teaching management and application of information to match every link of English learning including listening, speaking, reading and writing. Only though this, can schools provide a good in ubiquitous learning environment to teachers' teaching and students' self-study. In addition, schools should also establish a diversified and comprehensive evaluation system, not focusing too much on the evaluation of results but on the evaluation of students' learning process. Through the analysis of students' online learning time, learning content, learning strategies and others, the multi-dimensional analysis of students' learning attitude can be obtained to realize the scientific and comprehensive
evaluation toward students. In turn, this evaluation provides feedback for teachers to help them adjust teaching contents and teaching methods at any time and improve teaching efficiency.

4. The teaching effect
Through the tracking of four semesters, the learning effects of the two majors at different stages were recorded, as shown in Table 3 and Table 4. Table 3 shows the average scores obtained under the information technology teaching method based on big data (that is, the experimental group), while Table 4 shows the effect of adopting the traditional teaching mode (that is, the control group). In the first semester, the scores of the experimental group and the control group were generally high because students have just experienced the intensive training in English for college entrance examination. However, since the second semester, it can be seen that the experimental group has improved to different degrees in all aspects of listening, speaking, reading and writing, especially in listening and speaking.

Table 3. Average Scores of the Experimental Group in Listening, Speaking, Reading and Writing

| Cat Term | Listening (25%) | Speaking (10%) | Reading (50%) | Writing (15%) | Total  |
|----------|-----------------|----------------|---------------|---------------|--------|
| 1st term | 17.5            | 7.6            | 42.7          | 12.5          | 80.3   |
| 2nd term | 17.2            | 7.4            | 39.2          | 12.1          | 75.9   |
| 3rd term | 16.8            | 7.2            | 38.9          | 11.9          | 74.8   |
| 4th term | 17.8            | 7.8            | 40.1          | 12.1          | 77.8   |

Table 4. Average Scores of the Control Group in Listening, Speaking, Reading and Writing

| Cat Term | Listening (25%) | Speaking (10%) | Reading (50%) | Writing (15%) | Total  |
|----------|-----------------|----------------|---------------|---------------|--------|
| 1st term | 17.1            | 7.4            | 41.5          | 12.0          | 78     |
| 2nd term | 16.7            | 6.9            | 38.1          | 11.2          | 72.9   |
| 3rd term | 16.3            | 6.6            | 37.8          | 11.7          | 72.4   |
| 4th term | 16.5            | 6.8            | 38.7          | 11.8          | 73.8   |

5. Conclusion
Undeniably, the high development of information technology in the era of big data also has some problems and defects. For example, it relies too much on online resources and offline learning, but ignores the teaching of teachers. But generally speaking, the arrival of the era of big data brings new educational opportunities for vocational and technical colleges. Big data solves some of the shortcomings of traditional teaching methods with information technology. It integrates and optimizes English resources, providing teachers and students with a highly effective, free and comprehensive English learning platform to make English learning more enjoyable. It also enable students to apply what they have learned into practical use, to truly transform students’ knowledge into practical English application skills and better serve their major.

Acknowledgment
This paper is the stage results of "the 13th five-year plan of Tianjin education science" in 2016(Project No.:HE3082). The task name is "research on the application of MOOC in colleges and universities".

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