



# Construction of a Multi-dimensional Evaluation Platform for College English Writing Based on Big Data

Jinying Xu<sup>(✉)</sup>

Shandong Xiehe University, Ji Nan 250109, Shan Dong, China  
2021564326@dlytc.edu.cn

**Abstract.** With the development of modern data information technology, it has been widely used in various industries and many fields of the whole society. Education informationization, as the focus of China's current education reform, has been gradually carried out throughout the country. And multidimensional evaluation platform for college English writing based on big data is the data information technology combined with the practical teaching, a new way to platform can improve the quality of evaluation of English writing, improve students' English writing ability and interest in learning, can also promote the combination of college English teaching and knowledge application practice, to achieve "by writing to learn, to learn to write in combination with" purpose. Relying on the multi-dimensional evaluation platform of English writing can cultivate students' ability of independent learning and consciousness of lifelong learning.

**Keywords:** college English writing · multi-dimensional evaluation system · big data technology

## 1 Introduction

As the main international language in the world today, English is an important way for us to build connections with the world. And English teaching also occupies a very important position in China's teaching system, from kindergarten, primary school to graduate students, doctors, all stages of education will cover English teaching. English writing is one of the four basic skills of English listening, speaking, reading and writing. It is a manifestation of the comprehensive ability of English learners. It is a key component of English teaching [1]. As an indispensable part of college English teaching, college English writing is also a key stage for students' learning and application, as well as for students' employment and further study. Its importance is self-evident. However, recent studies have found that the scoring rate of the writing part of the National English Test for College Students in recent years is the lowest among all sub-items, which reflects that the teaching and practice of English writing need to be adjusted and reformed urgently.

## 2 The Problems of College English Writing

According to the teaching requirements of college English courses issued by the Ministry of Education, the main tasks of college English courses for contemporary college students are five practical English communicative abilities and comprehensive application skills: listening, speaking, reading, writing and translating. According to the survey, most students' writing ability generally lags behind other aspects of English learning, which affects the improvement of college students' comprehensive English ability [2]. More and more teachers and universities have realized the existing problems in the teaching and practice of English writing and are trying to make changes in various ways. This paper is also based on this purpose to solve the problem of college English writing, for the reasons of college English writing, there are the following two points.

### 2.1 English Writing Evaluation System is Lacking

The current college English teaching situation, much less in the college English teachers, students, and college English teaching throughout the whole university career college students, both learning and examination of the term, or the national college students' English level test, and even college graduates work and the entrance examination, is inseparable from the English teacher's teaching and counseling. Therefore, English teachers have a heavy teaching task, and it is impossible for them to give timely and targeted writing evaluation to all their classmates. The traditional writing evaluation only relies on English teachers, who spend a lot of time and energy to correct students' writing, and can only focus on the result grading and pointing out the wrong vocabulary and grammar in the text. The evaluation method is general, and English teachers give less feedback to students. In addition, it takes a long time for English teachers to read and correct papers, which makes it impossible to timely explain and correct errors. As a result, college students only pay attention to scores in English writing practice, and fail to improve and improve themselves according to teachers' feedback.

### 2.2 Lack of English Writing Skills

At present, the English writing level of college students is low, and the vocabulary, grammar and sentence logic are seriously affected by Chinese, resulting in many mistakes, empty content and lack of logic in writing articles. Due to the lack of special learning and training in English writing, with the purpose of "writing for the sake of writing", they often apply the template and structure of English writing models deeply and ignore the real expression and meaning function of English writing. If this goes on for a long time, college students gradually lose interest in English writing, and have fear of English writing, which leads to the deficiency of college English independent learning ability and independent writing ability, and gradually lose enthusiasm for English learning, which seriously affects the learning effect of college students in English.

To solve the above problems, this paper proposes to construct a multi-dimensional evaluation platform for college English writing based on big data to help contemporary college students solve the dilemma of college English writing. Relying on the core advantages of big data information technology in data capture, data analysis and processing,

and data storage, the paper integrates and constructs a multi-dimensional writing evaluation standard system, and adjusts the current traditional writing evaluation strategies. In the process of English writing evaluation, we should play the role of evaluation subjects in various ways to improve the evaluation effect, so as to realize the improvement of college students' English writing level, improve their interest and autonomy in English learning, and finally realize the reform of college English teaching model.

### **3 Building a Multi-dimensional Evaluation System for College English Writing Based on Big Data Technology**

#### **3.1 Application Characteristics of Big Data Platform**

Big Data refers to the data set composed of huge amount, complex structure and various types of data. It is a massive, high-growth rate and diversified information asset that requires a new processing mode to have stronger decision-making power, insight discovery power and process optimization ability [3]. In current social life, every one of us is both a producer and a beneficiary of big data.

##### **3.1.1 The Data Sample Covers a Wide Range**

Using big data technology, we can easily obtain more data information, no matter structural, semi-structural or non-structural data, can be included in the data sample, no longer need to obtain data through sample collection as before. The English writing content of college students and the evaluation content of English writing are typical unstructured data. We rely on the powerful analytical and processing ability of big data technology to process the unstructured data, which can actually reflect the evaluation results of English writing.

##### **3.1.2 Diverse Data and Information**

Massive data information under big data technology is convenient to capture, but huge information data is extremely rich and diverse, and the captured data information will change with time. And the function of data storage of the large data is particularly prominent, the cloud database can be an unlimited expansion of data storage, multi-dimensional evaluating platform for college English writing to provide enough data to support, help us establish English writing the whole evaluation system, improve the accuracy of the evaluation platform for evaluation of English writing and objectivity.

##### **3.1.3 Association of Data**

Big data technology relies on a strong ability to organize and analyze data, showing us the correlation between data and information. This can replace the rapid carding and screening of complex data information, and reflect the valuable data information in a centralized manner. That is to say, in the multidimensional evaluation platform of language writing, various evaluation dimensions can be integrated for unified processing of writing.

### **3.2 Multidimensional Evaluation System Based on Big Data**

The multi-dimensional evaluation platform of college English writing based on big data makes the evaluation of college English writing more effective, rich and specific. In the system, the traditional single evaluation subject -- English teacher is transformed into a multi-dimensional evaluation subject, that is, automatic evaluation by the system, self-evaluation by students, mutual evaluation by students and evaluation by teachers. The evaluation of English writing is not just a written form, and the system can support phonetic evaluation and symbolic evaluation. The evaluation object is no longer only for the writing composition, the system can be extended to the writing process and the stage of writing conception and outline setting.

#### **3.2.1 System Automatic Evaluation**

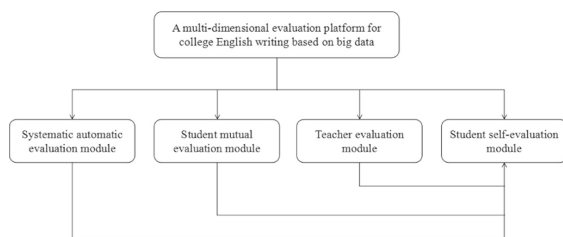
The core of the multi-dimensional evaluation platform for college English writing is evaluation feedback. This shows that feedback is the key to the improvement of college English writing ability, which can affect students' learning effect and learning interest in college English. The multi-dimensional evaluation platform of college English writing based on big data technology can timely evaluate students' English writing content and give some suggestions for modification of basic content, such as spelling mistakes, punctuation errors, formatting errors, grammar errors and so on. The system automatically evaluates the timeliness of such evaluation feedback, can not be separated from the data organization, analysis, screening and invocation of big data technology. The system can track the process of students' English writing effectively, but the system can't deal with the logical structure and coherence of the article.

#### **3.2.2 Students Mutual**

The multi-dimensional evaluation platform of college English writing based on big data builds the function of students' mutual evaluation, in the process of English writing evaluation, it can effectively relieve the sense of pressure and tension of evaluation, and eliminate the anxiety and tension of students caused by the traditional evaluation system. In the system, students can set up various simulation areas in the system, similar to the usual study group, in which students can evaluate and feedback each other's writing. On the one hand, to evaluate English writing from the perspective of classmates can better understand each other in terms of writing ideas and starting points and enrich the content of evaluation. On the other hand, peer review promotes discussion and exchange in a common atmosphere, allows more views and ideas to meet and collider, and stimulates people's enthusiasm for English writing and college English learning. With the support of big data technology, the spatial distance between authors and reviewers can be narrowed more timely and effectively to improve the evaluation effect.

#### **3.2.3 The Teacher Evaluation**

The multi-dimensional evaluation platform of college English writing based on big data cannot be separated from the evaluation of English teachers. The evaluation of English teachers still represents the authority and standard. In the system, teacher evaluation



**Fig. 1.** Multi-dimensional evaluation system of college English writing based on big data

not only covers all aspects of the traditional evaluation process, but also presents good and excellent compositions to facilitate the common learning and progress of other students. In addition, the system also provides the real-time broadcast function of teacher evaluation, that is, teachers can simultaneously broadcast or record videos of their own evaluation process to upload, so that more students can realize how to pay attention to and improve their English writing shortcomings from the perspective of teachers or readers [4]. Based on the technology of big data platform, English teachers integrate English writing and English teaching in a good way, and realize the innovative reform of English writing and college English teaching.

### 3.2.4 Self-evaluation of Students

The multi-dimensional evaluation platform of college English writing based on big data also provides students' self-evaluation function. After automatic evaluation, mutual evaluation and teacher evaluation, college students have a deeper understanding of their own English writing, and have gained more evaluation experience. In the process of students' self-evaluation, students conduct self-examination, self-modification and self-reflection, and make clear where the problems appear in each joint of their writing; At the same time, students can make a comprehensive evaluation of their own compositions from both the author and the reader, so as to know their own shortcomings, improve and enhance their English writing ability in time, and finally realize the English learning mode of evaluation, feedback and improvement. Figure 1 shows the multi-dimensional evaluation system of college English writing based on big data.

## 4 Construction of a Multi-dimensional Evaluation Platform for College English Writing Based on Big Data

The multi-dimensional evaluation platform for college English writing based on big data is designed based on JAVA EE technology and SSM framework. Business data is analyzed based on distributed file system and big data computing framework Spark [5]. This platform adopts the B/S architecture, that is, no matter teachers or students, they only need to access the terminal with any network connection in the form of a browser to log in and use. Therefore, the design of this platform has low requirements on the configuration of the client side, and it can be easily used on the computer side or the mobile device side without limitation of time and place. The multi-dimensional

**Table 1.** Multi-dimensional evaluation platform architecture of college English writing based on big data

Eclipse	Sqoop	Spark	Hive	BCharts
		Hadoop		MySQL
Linux system				

evaluation platform architecture of college English writing based on big data is shown in Table 1.

#### 4.1 Platform Function

The multi-dimensional evaluation platform for college English writing based on big data mainly includes three functional areas: data collection, data analysis and data result display.

##### 4.1.1 Data Collection and Storage of English Writing Process

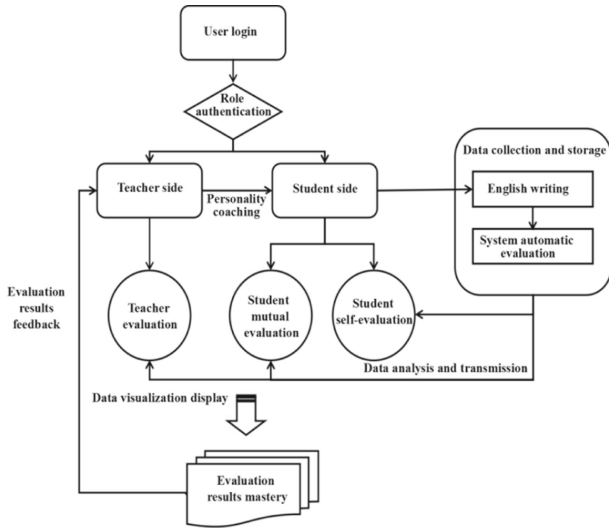
The process of English writing and the resulting composition are the sample scope of data collection. As a result, the data structure includes both structured and unstructured data, as well as semi-structured data generated by partial access to the site. These data cannot be stored, analyzed and called with traditional data tools, while big data technology can store data information in the data cluster of distributed system. Implement the classification and organization of complex data information.

##### 4.1.2 Data Analysis and Evaluation of English Writing

The evaluation platform calls Spark to analyze the collected data, which can be used to comprehensively obtain the writing habits, writing styles, frequently used words and sentence patterns, common mistakes, writing time and many other data information, such a variety of auxiliary information and the system automatic evaluation, teacher evaluation, student evaluation and self-evaluation information are integrated to build the overall evaluation model of students' English writing. Strong ability of data capture and statistical analysis depends on big data technology, which enables students to fully understand all the information content and important parameters of their English writing, and deeply discover their own shortcomings and points worthy of improvement. At the same time, it also helps English teachers to reduce their workload and realize comprehensive and effective evaluation learning.

##### 4.1.3 English Writing Data Visualization

Platform will multiple evaluation results and secondary data to realize data visualization, data analysis platform based on big data technology to save the result, and in the front page with data chart, 3 d animation, virtual simulation methods such as data visualization, dynamic display, lets the student and the teacher can more intuitive see evaluation data



**Fig. 2.** The workflow of the multi-dimensional evaluation platform for college English writing based on big data

and statistical results of secondary data. To make the English writing evaluation of the complex and abstract process of several stars, and then form a direct reflection of the students' English writing level. For English teachers, data visualization is convenient for individualized guidance and intervention for different students. For students, the visualization of data information can directly see their own progress, which is beneficial to cultivate their self-confidence and sense of effectiveness in English writing and English learning.

**4.2 Platform Workflow**

The workflow of the multi-dimensional evaluation platform for college English writing based on big data is shown in Fig. 2, which is divided into six steps. The working path and method of the evaluation system for college English writing supported by big data are introduced in detail. First of all, students and teachers can log in according to different user roles on the login page. After verification, they can enter the corresponding functional interface. A super administrator for the platform setting, who can view and export the platform user management and feedback data of English writing evaluation. The workflow of the multi-dimensional evaluation platform for college English writing based on big data is as follows:

In the first step, students log on to the platform and begin to complete English writing on the platform. Data of English writing behavior will be generated in the process, including structured auxiliary data such as completion time and total number of words. There is also text content for unstructured data. Second, the platform stores data for different data structures separately. Thirdly, the evaluation platform selects the corresponding evaluation indexes and contents according to the students' writing process,

evaluates the students' English writing process, and evaluates the process automatically. In the fourth step, the platform will synchronously transfer the data information and evaluation results of the previous step to other evaluation modules by the evaluation function data engine, such as teacher evaluation module, student mutual evaluation module and self-evaluation module. To carry out a multi-dimensional comprehensive evaluation of English writing. Fifth, the platform presents and embodies the evaluation feedback information and results generated by each evaluation module in data visualization. Sixth, English teachers can provide personalized learning guidance and suggestions for students according to the evaluation feedback results of English writing, so as to help students improve their English writing ability. Students can also realize mutual assistance and progress in learning according to the evaluation feedback results, and continuously improve their English writing and English learning ability [6].

### **4.3 Advantages of a Multi-dimensional Evaluation Platform for College English Writing Based on Big Data**

The multi-dimensional evaluation platform for college English writing based on big data gets rid of the previous experiential evaluation standard, which relies entirely on the personal knowledge and feelings of English teachers. It quantifies all available contents, eliminates the interference of various human factors, and improves the scientificity and objectivity of English writing evaluation. It changes the traditional English writing evaluation subject's uniqueness and adds students to the evaluation system, which reflects the "de-neutering" characteristics of the current big data technology. The multi-dimensional evaluation platform for college English writing based on big data perfectly integrates big data technology, Internet technology, English writing and teaching, breaks the time and space limitation, and realizes diversified and collaborative education and teaching practices with the data interaction mode of "one-to-many or many-to-many".

## **5 Conclusion**

By constructing a multi-dimensional evaluation system for college English writing based on the multi-dimensional evaluation platform of college English writing based on big data, it can comprehensively promote the combination of college English teaching and knowledge application practice, and achieve the purpose of "promoting learning through writing and combining learning and writing". Relying on the multi-dimensional evaluation platform of English writing can cultivate students' ability of independent learning and consciousness of lifelong learning.

**Acknowledgment.** This article is the result of the university-level education reform project of Shandong Xiehe University. (Project name: Construction and Practice of the Ecosphere of Integration of Production and Education for Business English Majors under the Background of Vocational Education in the New Era; Project number:2020GD02).



## References

1. Chen Weihong. Research on Evaluation Model of Higher Vocational English Writing Based on Big Data [J]. Cultural and Historical Data, 2017.01.
2. Zhu Jingwei. Building a Multi-dimensional Evaluation Platform for College English Writing Based on Big Data [J]. Journal of Jinan Vocational College, 2017.06.
3. Li Zhenchao, Chen Lin, Zheng Xudong. Research on the design of developmental learning evaluation system under the concept of big data [J]. Modern educational technology. 2015.06.
4. Chang Xiao. The Construction of College English Writing Evaluation Criteria in Data Driven Context [J]. English square. 2020.02.
5. Wang Qiyuan, Gu Ruijun et al. Research on the construction of college student campus credit big data evaluation system based on Spark [J]. Computer knowledge and technology. 2019.10.
6. Shang Chao Wang, Han Meng, Liu Qingtang. Research on the Design of Online Learning Process Evaluation System under the Background of Big Data [J]. China Video Education. 2018.05.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

