



# Construction and Application of Digital College English Teaching Resources on the Basis of Data Mining

Xiaomin Yang<sup>(✉)</sup>

Guilin University School of Language and Literature, Guangxi 541002, China  
25871095@qq.com

**Abstract.** The arrival of the digital era has brought many challenges and changes to traditional teaching models, teaching methods, and teaching resources in higher education. Among them, the construction and application of digital educational resources has also become an important trend in the future development of higher education. This article mainly introduces the construction and application of digital college English teaching resources based on data mining. In terms of the construction of teaching resources, this paper uses the method based on data mining technology to analyze and process a large number of student learning data and teacher teaching data within a certain period of time, mine the patterns and rules of student learning, and establish knowledge expressions, Knowledge graph and curriculum knowledge trees related to the curriculum; In terms of application, online teaching platforms are used to provide students with rich and diverse digital teaching resources, allowing them to achieve targeted learning through various social learning methods such as independent learning, autonomous dialogue, and group discussions. Practice has proven that digital college English teaching resources based on data mining can better serve the teaching practice of higher education. On the one hand, this teaching resource makes students' learning more targeted and personalized, which is not only conducive to interaction between teachers and students, but also helps to improve students' English learning efficiency; On the other hand, this teaching resource can provide data support and reference for teachers' teaching practice, so as to better grasp students' learning situation and teaching progress, and achieve optimization and improvement of the teaching process. In summary, the digital college English teaching resources proposed in this article based on data mining are a feasible and effective teaching model teaching. Based on this model, we can continuously optimize teaching content, methods, and management, further improve the and quality of English teaching, and lay a solid students' English and career development.

**Keywords:** Data mining · Digitization · teaching resource

## 1 Introduction

In the universities has continued to expand, and universities with more than 10,000 people are not a few. On the other hand, the digital construction of colleges and universities has also made certain progress. The campus network has been initially established. If these data are not effectively developed and utilized, they may become a burden or even rubbish. The digital resource library for college English teaching is the basis and guarantee for effectively applying modern information technology in teaching, promoting teaching reform, and improving teaching quality [1], but for the digital campus, there is a lack of systematic research, which is worthy of our further discussion and research, so that data can truly become a school's resources, and use it to provide services for the school's own business decision-making and strategic development.

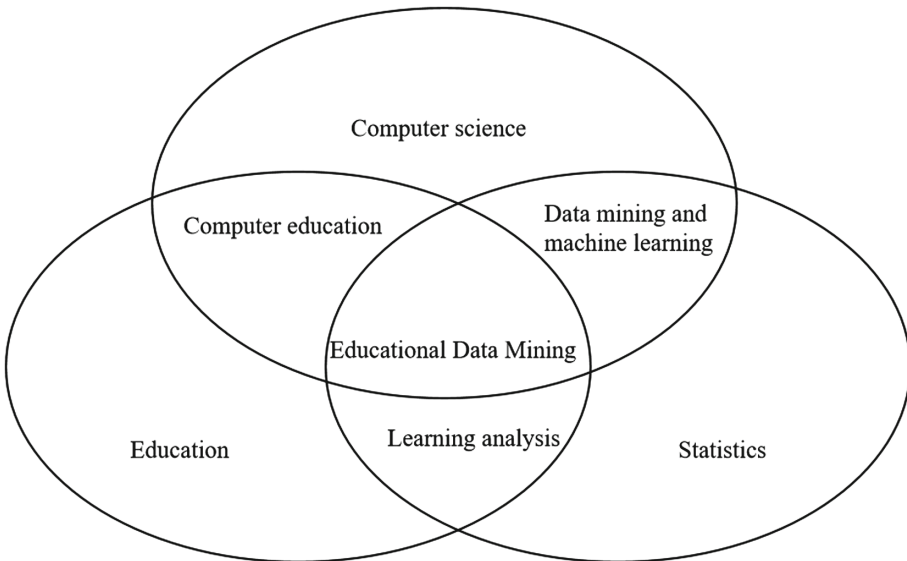
One of the difficulties in the development of resource database is how to make the framework design and implementation function of resource database more suitable for teachers and students and better serve teaching [2].

Although the construction of subject teaching resource database is only a small step in the modernization of education, it has already made us see the prospect of education development, spied on the way of education and learning in the information age, and inspired us to continuously study in this field, so that every new thing can play its due role [1]. The structure of this article is arranged as follows. Firstly, the construction and application of digital education resources will be sorted and analyzed. Then, the current application status and prospects of data mining technology in the field of education will be briefly described. Next, taking college English teaching as an example, we will explore the construction and application of digital educational resources based on data mining in college English teaching [3, 4]. Finally, the research achievements and contributions of this article will be summarized, and future research directions and prospects in related fields will be prospected. In the construction and digital educational resources have become an indispensable part and development of higher education. In addition to the development of digital technology, the widespread application of digital educational resources has further promoted the construction of university courses, improvement of teaching methods, and continuous improvement of students' learning experience [5, 6]. The famous President of Tsinghua University, Qiu Yong, also stated at the 2020 National Education Conference that digital educational resources will bring more profound changes to the education field. However, the development of digital education also faces certain challenges. In the process of constructing digital education resources, complex technical support and high costs are common challenges in the construction of digital education. In terms of application, the pertinence, practicality, and effectiveness of digital education resources also need to be further explored and improved. In addition, the static way of digital education resource construction can no longer meet the demand [7]. It also needs to provide more dynamic and intelligent support for the education field through Big data mining and other technical means. In order to promote the construction and application of digital education resources, data mining technology has been applied in the field of digital education. Data mining technology establishing mathematical models, analyzing and mining large amounts of data, and discovering hidden patterns and associations within the data.

## 2 Construction of Digital College English Teaching Resources

### 2.1 Challenges Facing College English Teaching

The is centered on teaching materials. Students can only obtain knowledge by listening to classroom lectures and reading books, journals, newspapers and other paper media [8–11]. However, multimedia teaching means, English learning software and campus network teaching website have not been fully developed and utilized, resulting in the deviation of teaching resources from network media and the lack of novelty and richness [12]. Paying attention to textbook reading and written expression ability, emphasizing grammar teaching, ignoring students' listening and speaking training and daily communicative English, "Campus English corner" is difficult to establish, or the effect is poor after establishment, so that many students' oral and listening levels can not meet the requirements of the outline [13]. Even if there is training in listening and speaking, it often takes meeting the requirements of the examination outline as the means and aiming at passing the examination. The result is low score and low ability. For example, many college students who have passed CET-4 and CET-6 are difficult to communicate effectively with international friends in oral English, is still dominated by teachers. The "duck feeding" passive teaching mode of teachers' speaking, students' listening and recording does not establish the concept, which leads to the fact that classroom teaching is full of teachers, lack of interaction and inactive classroom atmosphere, which affects students' enthusiasm and initiative in learning English. The main disciplines involved in shown in Fig. 1.



**Fig. 1.** Main disciplines involved in educational data mining and learning analysis

The update of English teaching methods is also one of the challenges that need to be faced in college English teaching. Although many universities have already applied various teaching methods in English teaching, such as online teaching, interactive teaching, task based teaching, etc., many universities still adopt traditional teaching models and methods, lacking a diversified English teaching system. This situation directly affects the effectiveness of English teaching and fails to meet the learning needs of students in different aspects. The diversity of student groups and needs in English teaching has also become one of the challenges faced by college English teaching. With the increasing emphasis of the country on the diversified development of higher education, the diversity and personalized needs of student groups are also increasing. Therefore, c adjusted and optimized from various aspects such, and teaching resources to different students. In short, the challenges faced by college English teaching are multifaceted. Only by carefully considering and striving to improve these challenges can we promote the continuous college English education and provide better English learning environments and conditions for students.

## 2.2 Importance of Digital Resource Construction

Which is the premise of “realizing new teaching and learning methods and changing traditional teaching structure”. It is the focus and direction of our research to dig deep into the function of resource database and make it serve for teaching to the maximum extent. The digital English teaching platform is shown in Fig. 2.

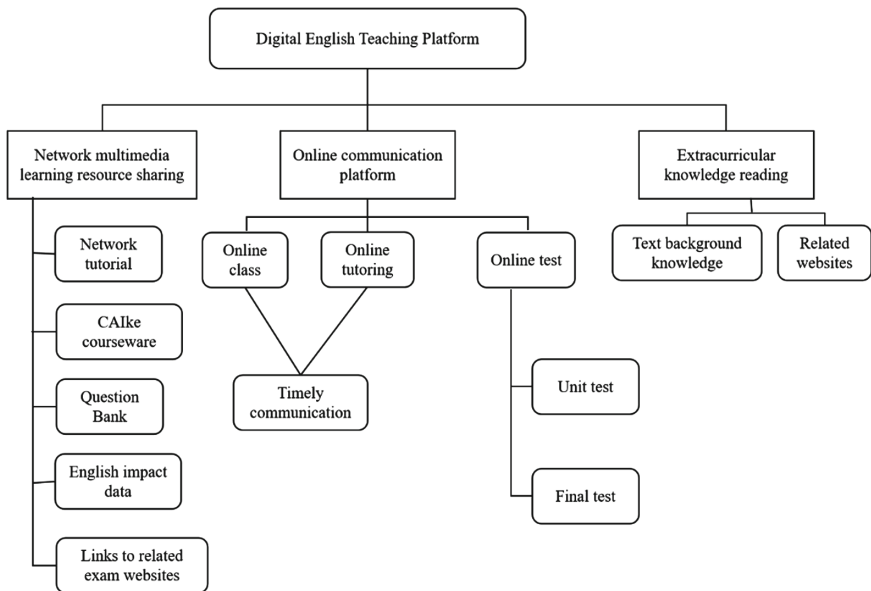


Fig. 2. Main disciplines involved in educational data mining and learning analysis

Digital resources include classroom teaching courseware, teaching background and other auxiliary materials, audio, video and picture materials, teachers’ teaching plans, teaching plans and massive resources on the Internet. Digital resources provide students with learning contents and tips in time through the network, which has reformed the tradition that students’ English learning depends entirely on classroom, changed Students can make learning goals and plans according to their own learning abilities and needs. The richness of digital resources meets, and the interest of digital resources stimulates students’ enthusiasm and motivation for learning. The reasonable application of digital resources embodies the educational concept.

### 3 Application of Digital College English Resource Database

#### 3.1 Concept and Characteristics of Database

Data warehouse should have the features of quick retrieval, permanent consistency of data, easy-to-use browsing tools, complete and reliable data, etc. The data warehouse framework is shown in Fig. 3.

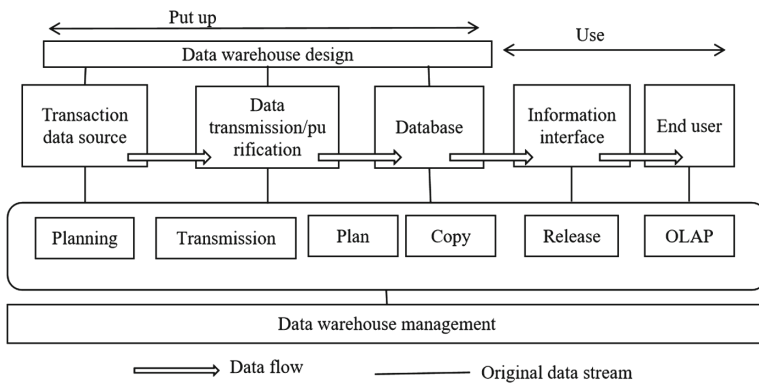


Fig. 3. Data warehouse framework

In today’s digital age, databases are role in college English teaching. A database is a system that can store and manage data. Through a database system, universities can collect and analyze students’ learning situations, provide targeted teaching plans based on their different needs, and also adjust and optimize teaching content in real-time to improve teaching effectiveness. The following is the role of a database in college English:

1. Teachers can obtain students’ learning situation through the database and analyze them in a timely manner. In college English, teachers can use databases to understand students’ learning processes and outcomes, thereby helping teachers better formulate teaching plans and plans. For example, by analyzing the evaluation results of students and data on various exam scores, teachers can identify students’ weak links and provide corresponding teaching suggestions.

2. Databases can provide students with richer learning resources: In English teaching, databases can of learning resources, such as teaching courseware, recordings, and videos. At the teachers' teaching content and students' learning content can be mutually supplemented and optimized, and on this basis, comprehensive English learning knowledge can be provided to students. By analyzing students' learning data and user preferences, teachers can continuously improve teaching resources and provide better support for students' English learning.
3. The database can provide data support for college English teaching: through the analysis of English learning business data, students' learning situation can be found, such as students' favorite Syntax error, needs for entrance examinations, students' interests and preferences, etc. The analysis of these data can help teachers and students better understand their learning situation and effectiveness, and then develop targeted teaching plans and plans English teaching.
4. The database can facilitate online interaction and easy communication: In college English teaching, the database provides a more convenient online communication and discussion environment, making communication between students and teachers easier, more natural, and more efficient. Students can ask questions and view answers at any time through the digital database system. Teachers can manage paper information such as papers through the database, provide targeted learning suggestions, and enhance students' awareness of self-directed learning.
5. Databases can provide data protection for college English teaching: In the field of English teaching, data protection is very important, not only responsible for the, but also to ensure and risk control of the teaching system. Databases can ensure the security of data and supporting electronic devices by encrypting, backing up, and fault-tolerant processing of data, and prevent various unexpected situations to ensure the stability of data protection in college English teaching.

In summary, databases play a crucial role in the field of college English teaching. Through the systematic management and analysis of student learning data, students can receive better learning support, and English teachers can timely understand students' learning situation, adjust and optimize teaching plans accordingly, improve the quality and effectiveness of college English teaching, and contribute to learning

### 3.2 Application of English Teaching Digital Resource Bank in Teaching

Third, explain the reading methods, writing methods, listening skills and translation skills; Fourth, timely check the completion of students' homework and make an objective and fair evaluation. The judgment of the particularity to be judged means that if the point is on the edge of the polygon, the direction of the vector  $\overrightarrow{P_i P}$ ,  $\overrightarrow{P P_{i+1}}$  is the same, and the judgment point  $P$  is between the line segments  $P_i P_{i+1}$ , then the following three discriminant functions are established at the same time:

$$j = (X_i + 1 + X_i)(P_y - Y_i) - (Y_{i+1} - Y_i)(P_x - X_i) = 0 \quad (1)$$

$$k = (P_x - X_i)(X_{i+1} - P_x) \leq 0 \quad (2)$$

$$1 = (P_y - Y_i)(Y_{i+1} - P_y) \leq 0 \quad (3)$$

Digital English teaching resources can enable students to select learning materials in the resource library according to their own needs and carry out autonomous learning after class when completing teachers' classroom teaching tasks. Students can make their own learning time and learning plan, and gradually develop the autonomous learning ability of "learning to learn".

## 4 Conclusions

Resource pool and network-assisted teaching mode integrate the advantages of modern media information, timeliness and interactivity into teacher teaching, students' writing learning inside and outside class, homework evaluation and other teaching links, and gradually show its unique advantages, which are well received by students. The arrival of the digital era has promoted the process of digital education, and the construction and application of digital educational resources have become a new trend in the today. In the field of college English teaching, the construction and of digital resources based on data mining technology incorporate learning process visualization, optimization of learning plans, and other content into teaching strategies to improve course participation and academic quality.

The difficulty in constructing digital educational resources lies in how to collect, store, and process data. Large data can provide a more realistic and accurate data foundation. How to obtain useful information about personal learning habits, academic achievements, learning goals, and personalized plans from the data is an important academic issue faced by college English teaching. Through data mining, hidden and useful information and patterns can be extracted from a large amount of data, and digital educational resources can be constructed and optimized to improve teaching quality and effectiveness.

In the construction of digital educational resources, it is necessary to accurately collect, classify, and organize data based on students' personalized needs. By analyzing students' basic data, preference data, and research data, we provide more personalized digital education resources, including courseware, reading materials, specialized exercises, and discussion questions, to meet the learning needs of different students.

In the application of digital educational resources, data mining can help teachers continuously discover and improve teaching methods and educational resources, providing more choices and opportunities for students' growth. Through the analysis of learners' data, we can better understand students' learning process and needs, and recommend practical and effective educational resources to students, such as improving oral ability, writing ability and Critical thinking, so as to promote students to form effective learning strategies and habits.

Of course, in the teaching process, any application of educational resources and technologies must comply with educational regulations and ethical standards, ensure students' rights and privacy, and continuously enhance scientific and authoritative aspects. Therefore, the construction and application of digital educational resources require the joint efforts and pursuit of the entire society, strengthening relevant supervision and

management, and ensuring the promotion of research and practical implementation of digital university English teaching.

## References

1. President Office of Hebei GEO University, Shijiazhuang, China Hebei Geo University, Shijiazhuang, China. Study on Construction of Open Network Teaching in University. Balkan Region Conference on Engineering and Business Education, vol. 2, no. 1, pp. 183–188, 2017
2. Rickyelton.: The digitization of construction. *Concret. Constr.* **64**(4), 64 (2019)
3. Odenthal, J., Jacobs, G., Kramer, A., et al.: FutureSite—test center for the development of tomorrow's construction site. *ATZheavy Duty Worldwide* **12**(4), 58–61 (2019)
4. Chaudhry, A.S.: Re-conceptualization of knowledge organization: imperatives of networked resources and digitization. *Int. J. Knowl. Content Dev. Technol.* **6**(2), 93–108 (2016)
5. Müller, L., Tipold, A., Ehlers, J.P., et al.: Digitization in teaching?—An analysis of requirements for implementing lecture recording in veterinary education. *Tierärztliche Praxis Ausgabe K: Kleintiere/Heimtiere* **47**(3), 164–174 (2019)
6. Mason, A., Richardson, S., Bugajewska-Waller, A., et al.: Digitization of toxin development. *Toxicol.* **190**, S48–S49 (2021)
7. Davies, I.W.: The digitization of organic synthesis. *Nature* **570**(7760), 175–181 (2019)
8. Noh, Y.: A study to evaluate the digitization level of Korean libraries (part II). *Library Hi tech* **34**(2), 359–403 (2016)
9. Shi, Y.: Research on the application of university digital campus platform based on data mining. *J. Huainan Normal Univ.* **19**(1), 3 (2017)
10. Zhang, F., Zhou, B., Xu, F., et al.: Research on digital resource sharing portal based on big data. *China Educ. Inf.* **7**, 3 (2016)
11. Du, H.: Research on the cultivation of data mining ability of digital accounting talents. *Bus. News* **225**(35), 190–192 (2020)
12. Zhang, Z., Wu, F.: Research on precision teaching mode based on big data and data mining technology. *Inf. Technol. Inf.* **10**, 3 (2018)
13. Wang, G.: Recommendation analysis of high-quality education resources for college students based on big data mining. **9**(8), 183–184 (2019)