

Management Analysis on the Improvement of Educational Service of University Library under the Environment of Big Data

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Abstract: Under the big data (BD) environment, the main work of university library education service is to carry out corresponding business for college students. In this process, we need to constantly improve our professional knowledge, skill level and message literacy. Therefore, in order to achieve this goal, we must pay attention to the effective collection of reader resources. This paper first introduces the concept, management characteristics and functions of university library education, then expounds the principles of improving university library education service, and uses the method of questionnaire to investigate the current situation of university library education service. Finally, the survey results show that students are not satisfied with the overall image of the librarians and the quality of their staff. At the same time, some students believe that at present, colleges and universities have basically established a perfect learning resource system to provide high-quality and efficient message services for the majority of users. Others believe that college students mainly browse when reading, lacking interests and autonomy. In addition, most readers still maintain a wait-and-see attitude towards library education. Most teachers hope to change the working attitude of library staff, improve the management quality and enhance the working ability of staff.

Keywords: Big Data; University Library; Educational Service; Management Improvement

1. Introduction

With the advent of the BD era, people have new requirements for library education services. In the BD environment, university libraries should also innovate and reform them according to the needs of readers [1-2]. The traditional model can no longer meet the growing needs of contemporary users for diversified message resources and knowledge content and personalized reading. At the same time, with the burgeon of mobile Internet technique, cloud computing and other emerging message technologies, the digitization of traditional paper documents is becoming higher and higher, which makes us put forward higher requirements for book retrieval methods, How to achieve higher quality and efficient educational services of University Libraries in the BD environment is an important topic today [3-4].

Many scholars have done relevant research on the service of university library (SOUL). Under the BD environment, the reform and innovation of educational services of university libraries is a new concept put forward by effectively combining the traditional paper-based teaching mode with new technical means such as modern digital technique, message retrieval method and network platform. Some scholars put forward that the educational SOUL refers to the exchange, learning and sharing platform that uses BD technique to provide users with message, knowledge and skills [5-6]. In this process, we should fully tap the needs and potential needs of readers. University library personnel include not only staff in the traditional sense, but also all kinds of talents in the modern sense. They are not only simply reading literature or dealing with simple affairs. Other scholars believe that university libraries, as an important part of higher education, need to pay great attention to the use of modern networks, multimedia and other new scientific and technological resources to effectively guide college students and guide students to learn and read knowledge. How to achieve this goal, we must establish a perfect and efficient data center database system, So as to provide more and better services for teachers and students [7-8]. The above research has laid the foundation for this paper.

BD is an inevitable trend in the message age. It has also become a new challenge to the library education service with the continuous improvement of social informatization and the rapid improvement of human scientific and technological ability. In response to the changes brought by digital technique, university libraries need to actively explore how to give better play to their advantages and roles. Firstly, this paper analyzes the current situation and existing problems of higher education network resources construction in China. Secondly, it expounds the construction strategy of University Librarian Education Service System Based on cloud computing platform from different angles. Finally, it is of great significance to promote the effective improvement of College Students' autonomous learning and personality burgeon under the BD environment.

2. Discussion on the Improvement of Educational SOUL Based on BD Environment

2.1 University Library Education

2.1.1 Concept

University library is not only the main place for college students to study, but also a platform to provide message resources and knowledge services. After classifying, integrating, analyzing and processing the massive data collected by means of BD technique, it can be effectively produced for the needs of readers [9-10]. University library education service refers to the burgeon and utilization of library message resources by college students to provide high-quality and efficient teaching and learning environment through modern network technique. It mainly includes the burgeon of university literature database, reader consultation and reading service, students' work arrangement and daily study and life. Its goal is to make effective use of the collected books and materials and improve the teaching quality of the library, so as to achieve the goal of promoting social burgeon and cultivating high-quality talents. In the BD environment, the relationship between educators and educates involved in University Library teaching activities is complex and changeable. On the one hand, we need to improve teachers' own quality, on the other hand, we should also pay attention to students' personality burgeon needs and interest cultivation to promote good communication and learning progress between teachers and students[11-12].

2.1.2 Management Characteristics

(1) Professional. In the BD environment, the traditional paper book teaching has been unable to meet the needs of modern people for message resources, and borrowing, consulting and reading have become an indispensable part of higher education.

(2) Diversity. Different users have different message needs. The traditional paper document message resources can not meet people's message needs. The use of modern network technique, digital storage and cloud computing for retrieval and research is one of the topics concerned in the teaching of university libraries. Therefore, in this case, we need to store the data in the cloud to maximize its value.

(3) Richness of message resources. In the era of BD, various new technologies, emerging carriers and applications emerge in endlessly. All these provide convenience for college students to obtain knowledge, but also bring challenges to the traditional teaching.

(4) Openness. In the traditional message age, the resources and message obtained by people are limited, closed, fragmented and scattered. However, with the rapid burgeon of network technique and digital message technique and the continuous improvement of the application level of message technique in the fields of computer software and hardware systems, it will become an educational service with higher ability to gather and process massive data.

2.1.3 Function

Under the BD environment, the role of university library education service is mainly reflected in the following aspects:

(1) Promote the all-round burgeon of college students. Nowadays, China's social economy is growing rapidly and cultural demand is increasing. Under the background of the rising number of students and the increasing requirements for professionals, we can see that traditional paper books can not meet people's requirements for knowledge diversity and quickness in the message age, and university library education services can fully utilize the network platform to provide richer personalized services for college students in the BD environment.

(2) Promote the study of College Students' IAP theory. In the BD environment. Therefore, improving students' comprehensive quality by strengthening students' professional skill training has become one of the topics that major higher vocational colleges need to consider and pay attention to. At the same time, we can also use the Internet platform for educational service, so as to achieve good results. In addition, it can effectively promote the teaching activities of the combination of College Students' IAP theory learning and practice.

2.2 Principles for Improving Educational Services of University Libraries

The principle of improving university education service refers to innovating the traditional teaching mode in the BD environment to realize the library education service to keep pace with the times and meet the burgeoning needs of the times.

(1) Reader centered. From the reader's point of view. To meet the real needs of users is the "people-oriented" thought put forward in the concept of "humanism".

(2) Adhere to correct guidance and establish the concept of "foothold". Pay attention to the ideological and political work of college students, strengthen the construction and management level of school library, improve the construction of campus cultural atmosphere, and make new ideas and structural arrangements in effectively promoting reform and innovation activities.

2.3 Technical Support for BD Environment

2.3.1 Concept

BD technique refers to the collection, analysis and utilization of massive various data, and the sharing of high-value message through corresponding processing, decision-making and other means. In the new Internet media environment under the background of Internet plus, large databases are combined with cloud storage technique and search engine optimization algorithm to provide services. With the high-speed operation of human society, a variety of new technologies, new methods and emerging massive data make the "Big Bang" an inevitable trend. On the other hand, it is precisely because these new things have great potential and energy that we make a breakthrough in their research and burgeon.

In the context of the BD era, in the process of carrying out the educational service work of university libraries, the traditional single and old teaching mode can no longer meet the burgeoning needs of modern society. Therefore, it is necessary to actively promote the application of new technologies and methods to practical application. To achieve this goal, we must fully utilize advanced technologies such as network resources and digital message to effectively manage and improve university libraries.

2.3.2 Features

There are many data types and data sources, and data types also have complex structures and variable forms. The emergence of social and mobile network terminal devices enables users who previously passively receive message to actively generate message, such as wechat, microblog, BBS, blog and other social tools to access the Internet anytime and anywhere to share unlimited mood, pictures and other message. No longer have leads to data structured, which is a purely structured form, and more data is unstructured and semi-structured. The browser content of the current user has changed greatly. In addition to text, users share a lot of message in very different formats, such as images, sound and video. This leads to a large amount of unstructured data. Data is faster and faster, users receive and disseminate message faster and faster, and users communicate more and more message. Luck explodes the amount of data. At the same time, the network message is not static, but updated in real time. It is in a state of continuous renewal and rapid growth. In order to ensure a higher quality of message in this state, it is sufficient that the transmission and storage speed of data must be very high. If not handled in time, a lot of time sensitive data will lose value. In short, BD not only grows fast, but also processes data quickly.

2.3.3 Data Mining Algorithm

In the transaction data set D , $Y \in X$ and itemsets exist itemsets, so D contains X and Y is contained in the transaction number and $D \setminus X$ is contained in the ratio of the amount of the transaction, the rules for $X \Rightarrow Y$ confidence (confidence), is a set of XY support and the ratio of the support of itemset X , notes for the confidence ($X \Rightarrow Y$), This is reflected in the conditional probability of Y occurring in transaction X , as shown in Formula (1):

$$\text{Confidence}(X \Rightarrow Y) = \frac{\text{Support}(XUY)}{\text{Support}(X)} \quad (1)$$

$$\text{Support}(X \Rightarrow Y) = \text{sup port}(X \cup Y) \quad (2)$$

The relevance of transactions depends on the support of rules. The security level of transactions is measured by trust. These two values reflect the availability and reliability of rules respectively. The possibility of rule occurrence is actually measured by the credibility of support and trust. The thresholds of data mining support (min.sup) and minimum trust (min, _conf) must be defined by association rules, general business requirements or mining experts. Support and trust below these two thresholds are not the key to generating association rules after data mining.

3. Experiments

3.1 Investigation Purpose

In the BD environment, the quality of university library education service affects college students' satisfaction and lifelong learning ability. Therefore, we should aim at this situation, take readers as the center and lead the burgeon concept with innovative thinking. Through literature analysis, this paper studies the differences between different users in the role orientation and work content of librarians, investigates and considers the problems faced in carrying out library teaching activities under the background of BD, and puts forward relevant countermeasures and suggestions, In order to improve the quality level of educational SOUL and improve its utilization of message resources and knowledge acquisition ability of college students in the process of reading.

3.2 Respondents

With the burgeon of modern network technique and digital technique, it has had a great impact on human life. Therefore, we should pay attention to the use of the Internet to provide readers with high-quality, convenient, practical, popular and personalized search tools. The education SOUL mainly focuses on the reading and research of College Students under the BD environment. Therefore, the survey objects include students and teachers.

3.3 Investigation Contents

This paper mainly studies the improvement of educational services of University Libraries under the BD environment, and collects and arranges a large amount of message by means of literature analysis, questionnaire and interview. This questionnaire survey mainly analyzes the students' evaluation of the educational SOUL and the teachers' evaluation of the management mode of educational SOUL, so as to investigate the current situation of educational SOUL and put forward targeted suggestions.

4. Discussion

4.1 Students' Evaluation of Educational SOUL

Table 1 is a survey of students' evaluation of the educational SOUL.

Table 1: Students should evaluate the education service of university libraries

	The overall environment	Equipment conditions	Collection resources	Librarian service	Service window
Freshman	5	4	4.4	4.3	5
Sophomore	5	4.2	4.8	4.2	4.5
Junior	4.8	4.8	4.7	4.8	4.9
Senior	4.9	4.5	5	4.6	4.6

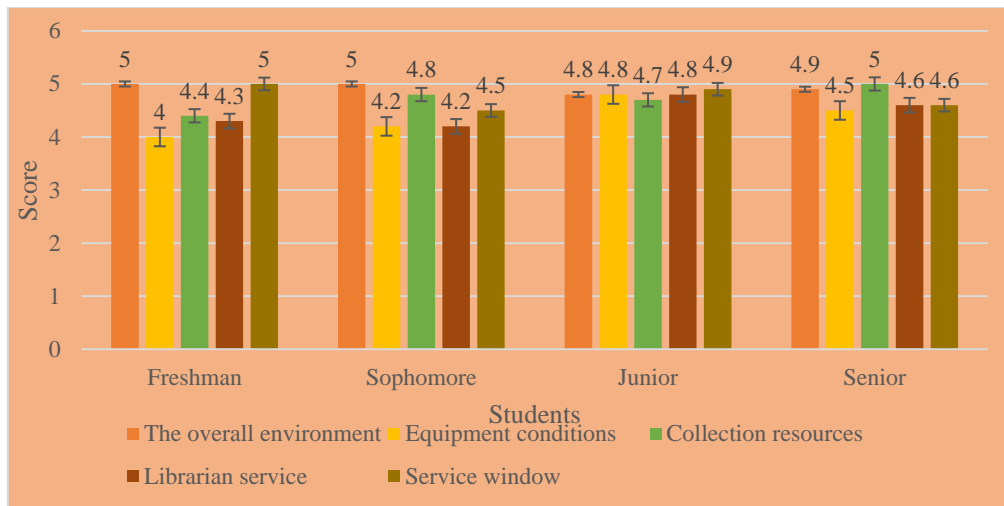


Figure 1: Students should evaluate the education service of university libraries

In the BD environment, the management level of educational services of University Libraries directly affects the satisfaction of readers. Through questionnaire survey and interview results (as shown in Figure 1) according to the analysis, students are dissatisfied with the overall image of librarians and the quality of staff. At the same time, some students believe that at present, colleges and universities have basically established a perfect learning resource system to provide high-quality and efficient message services for the majority of users. Others believe that college students mainly browse and lack interests and hobbies when reading and autonomy. In addition, most readers still maintain a wait-and-see attitude towards library education.

4.2 Teachers' Evaluation of Educational Service Management Mode of University Library

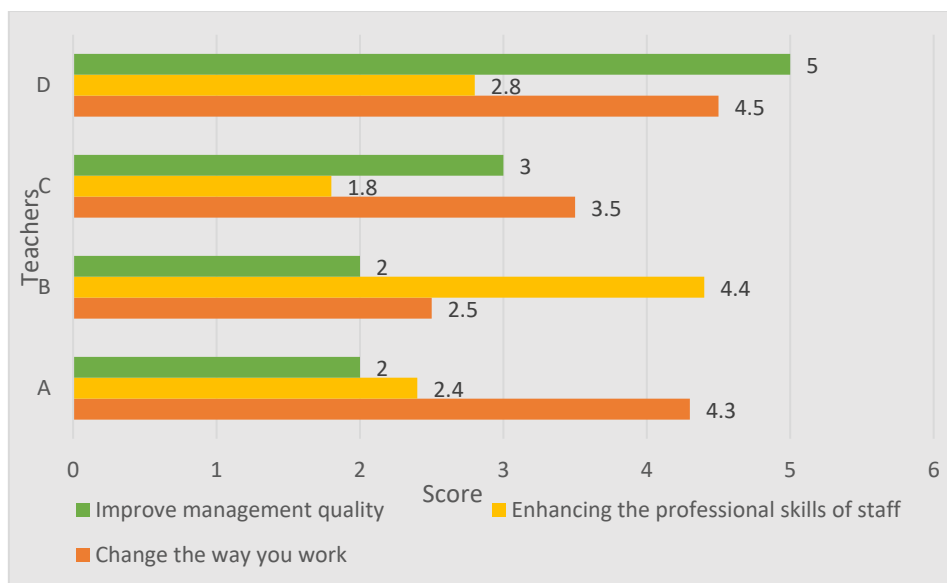


Figure 2: Teachers' evaluation of education service management methods in university libraries

University Teachers' satisfaction with library education service is mainly affected by their own knowledge level and practical ability. Under the background of different professional titles and academic qualifications, they put forward higher requirements for the teaching quality of university library. It can be reflected from Figure 2 that most teachers hope to change the working attitude of library staff, improve the management quality and enhance the working ability of staff.

4.3 Ways to Improve the Educational SOUL

The improvement of college education services should rely on modern science and technique, fully utilize Internet resources and carry out teaching activities in the context of BD. University libraries can

carry out distance education with the help of network technique and multimedia equipment. Through the analysis and processing of literature and picture message, we can better provide high-quality services. We should use large database system to promote the realization of data query and retrieval function. In addition, we should actively promote the reform of library digital management mode, fully utilize modern message technique means, and improve the level and efficiency of campus resource management.

5. Conclusion

With the advent of the BD era, the educational SOUL has a new model. In the BD environment, traditional paper-based message has slow transmission speed and high cost. After the effective retrieval and processing of documents and materials by using new tools such as cloud technique and mobile Internet, the digital resource files of electronic archives visualization can be shared to all users in time and provide personalized analysis and recommendation functions. At the same time, it can also upload the library borrowing and other relevant data between university libraries to the cloud through the network platform.

Acknowledgements

This work was supported by General Project of the 13th Five Year Plan of Educational Science in Henan Province(2020YB0199), Classroom Teaching Mode Reform Project of Nanyang Normal University (No. 2019-JXYJKT-22), Undergraduate First-class Course Teaching Quality Engineering Project of Nanyang Normal University (No. 2019-YLKC-005), 2021 Key Project of Higher Education Teaching and Research of Nanyang Normal University (No. 2021-GDJY-ZDXM-009), 2021 Nanyang Science and Technology Development Plan Project (Soft Science Research, RKX18).

References

- [1] Xu L, Jiang C, Wang J, et al. *Information Security in Big Data: Privacy and Data Mining [J]. IEEE Access*, 2017, 2(2):1149-1176.
- [2] Wamba S F, Angappa G, Papadopoulos T, et al. *Big data analytics in logistics and supply chain management[J]. International Journal of Logistics Management*, 2018:00-00.
- [3] Sivarajah U, Kamal M M, Irani Z, et al. *Critical analysis of Big Data challenges and analytical methods[J]. Journal of Business Research*, 2017, 70:263-286.
- [4] Xu W, Zhou H, Cheng N, et al. *Internet of Vehicles in Big Data Era[J]. IEEE/CAA Journal of Automatica Sinica*, 2018, 5(1):19-35.
- [5] Barbu A, She Y, Ding L, et al. *Feature Selection with Annealing for Computer Vision and Big Data Learning [J]. IEEE Transactions on Pattern Analysis & Machine Intelligence*, 2017, 39(2):272-286.
- [6] Yaoxue, Zhang, Ju, et al. *A Survey on Emerging Computing Paradigms for Big Data [J]. Chinese Journal of Electronics*, 2017, 26(1):1-12.
- [7] Kusiak A. *Smart manufacturing must embrace big data [J]. Nature*, 2017, 544(7648):23-25.
- [8] Zhang Y, Qiu M, Tsai C W, et al. *Health-CPS: Healthcare Cyber-Physical System Assisted by Cloud and Big Data [J]. IEEE Systems Journal*, 2017, 11(1):88-95.
- [9] Rathore M, Paul A, an Ahmad, et al. *Real-Time Big Data Analytical Architecture for Remote Sensing Application [J]. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 2017, 8(10):4610-4621.
- [10] Xing H, Qian A, Qiu R C, et al. *A Big Data Architecture Design for Smart Grids Based on Random Matrix Theory [J]. IEEE Transactions on Smart Grid*, 2017, 8(2):674-686.
- [11] Wang Y, Kung L A, Byrd T A. *Big data analytics: Understanding its capabilities and potential benefits for healthcare organizations [J]. Technological Forecasting & Social Change*, 2018, 126(JAN.): 3-13.
- [12] Kuang L, Hao, Yang L T, et al. *A Tensor-Based Approach for Big Data Representation and Dimensionality Reduction [J]. IEEE Transactions on Emerging Topics in Computing*, 2017, 2(3):280-291.