

Study on the comparison between college students borrowing behavior and the statistical analysis of paper books

Wang Lei¹, Liu Chunxiao², Jin Xinglong², Xu Guozhen², Su Xueping², Chen Xinjie²

¹Education Technology and Information Center, Heilongjiang Bayi agricultural university, China

²Library, Heilongjiang Bayi Agricultural University, Daqing 163319, China

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Abstract: Taking Heilongjiang Bayi agricultural university student lending behavior as the research object, through information technology to the library borrowing data statistics and analysis, discusses the utilization of paper books to the library students and students' learning and scientific research, analyzes the students' reading interest and learning habits of the differences, department cooperation relations, the influence of the book recommendation, etc. The causes of behavior, and in view of the actual situation, proposed the more reasonable and effective countermeasures and solutions, for the future library construction and students' quality education provides the reference and basis.

1. Introduction

In the era of big data, through the data analysis of library books borrowing and returning, students' learning habits and other learning situations can be further obtained. At present, many universities are carrying out data research and scientific research on the analysis of library students' borrowing behavior, using a large number of reliable data to study some behavior characteristics of students, looking for problems in education and teaching, and improving the quality of school running.

2. Overview of research

Heilongjiang Bayi agricultural university is an agricultural university with distinctive modern agricultural characteristics and coordinated development of multiple disciplines. It covers an area of 1.204 million square meters and has 4 doctoral degree-authorized first-level disciplines, 9 master degree-authorized first-level disciplines and 5 master professional degree-authorized categories. 3 national specialties and 9 provincial key specialties; Facing the enrollment of 23 provinces (municipalities directly under the central government and autonomous regions), it has a unique teaching concept and teaching mode [1]. The library of Heilongjiang Bayi agricultural university has a collection of 2.1322 million books and adopts a one-stop management mode of combining collection and reading, which is open 112 hours a week. Through big data analysis, this study takes the borrowing behavior of college students as the research object, makes statistics on the borrowing situation of books and the circulation of collection resources in various colleges and analyzes the categories of books borrowed in recent years, analyzes and judges the causes and students' behaviors, and provides basic data and references for library resource construction, higher education and teaching [2].

The data in this paper comes from the library management system and the library entrance guard system of Heilongjiang Bayi agricultural university, combined with the business data of front-line editors. The methods of interview survey, comparative analysis of data, chart statistics and grouping analysis were adopted.

3. Statistics and Explanation of Data

3.1 Borrowing Situation of Students' Books in Colleges

Table.1 Statistical Table of borrowing number of each department in 2018

Serial number	Faculty Name	Number of effective readers	Number of borrowers	Borrowing Ratio
1	College of Humanities and Social Sciences	1316	599	45.52%
2	College of Science	443	180	40.63%
3	Food College	1796	663	36.92%
4	Engineering College	3064	1100	35.9%
5	College of Life Science and Technology	1570	561	35.73
6	College of Animal Science and Technology	2485	832	33.48%
7	College of Electricity and Information	2523	809	32.07%
8	School of Economics and Management	2442	768	31.45%
9	Agricultural College	3246	952	29.33%
10	Academy of Accounting	2103	538	25.58%

Borrowing Ratio: Number of Borrowers/Effective Readers

The sorting is from high to low according to the Borrowing Ratio. Borrowing Ratio is the number of borrowed books/effective readers, that is, the proportion of borrowed books to the total number of people. The highest Borrowing Ratio is the Faculty of Humanities and Social Sciences and the lowest is the Faculty of Accounting. Judging from the ratio, the student borrowing situation in each college is not ideal, and the number of students borrowing is not more than half of the total number of college students.

Table.2 The per capita borrowing volume of undergraduates in each college in 2018

Serial number	Faculty Name	Number of effective readers	Number of books borrowed	Per capita borrowing
1	College of Humanities and Social Sciences	1316	6527	495.97%
2	College of Science	443	1936	437.02%
3	College of Life Science and Technology	1570	4797	305.54%
4	Food College	1796	5049	281.12%
5	Engineering College	3064	8166	266.51%
6	College of Animal Science and Technology	2485	6087	244.95%
7	College of Electricity and Information	2523	5938	235.35%
8	School of Economics and Management	2442	5647	231.24%
9	Agricultural College	3246	7182	221.23%
10	Academy of Accounting	2103	3902	185.54%
	Total undergraduate students	20988	54231	258.39%

Per capita borrowing = number of books borrowed/number of people

The above Table shows the statistics of the average borrowing amount of undergraduates in each college in 2018. The ranking is from high to low according to the average per capita Borrowing

Ratio value.

Per capita borrowing is the number of books borrowed/the total number of people. According to the data, in 2018, the per capita borrowing of undergraduates was less than three. The number of books borrowed by the Institute of Humanities and Social Sciences was the largest, with 5 books borrowed per capita. The number of books borrowed by the Institute of Accounting was the smallest, with less than two books borrowed per capita.

3.2 Analysis on the Circulation of Collection Resources

1) Annual borrowing and literature utilization. Borrowing 16030 books in 2015, 38012 books in 2016, 50692 books in 2017 and 48342 books in 2018. The data show that the borrowing volume of paper books has increased significantly in the past two years.

Table.3 Literature utilization in 2018

Serial number	Class name	Literature reserves available	Number of books borrowed	Utilization rate
1	Philosophical category	605	166	27.44%
2	literature	1658	437	26.36%
3	Language and writing	801	170	21.22%
4	Bioscience	1011	213	21.07%
5	General Introduction to Social Sciences	1032	184	17.83%
6	History and geography	1037	177	17.07%
7	Comprehensive Books	38	6	15.79%
8	Medicine and Health	626	92	14.70%
9	Political law	1470	216	14.69%
10	Art	168	23	13.69%
11	Mathematical Science and Chemistry	1372	185	13.48%
12	Military category	31	4	12.90%
13	Economics	4529	575	12.70%
14	agricultural science	3797	418	11.01%
15	Industrial Technology	7631	798	10.46%
16	Culture, Science, Education and Sports	567	57	10.05%
17	Marxism-leninism	271	26	9.59%
18	General Introduction of Natural Science	96	8	8.33%
19	Environmental Science and Safety Science	484	33	6.82%
20	Transportation	299	14	4.68%
21	Aeronautics and Astronautics	169	4	2.37%
22	Astronomy, Earth Science	187	3	1.60%
	Total by category	27879	3809	13.66%
	Total collection	27881	3810	13.67%

The above Table is sorted by Utilization rate from high to low. The Utilization rate is the number of books lent/the total number of books that can be borrowed. As can be seen from the figures in the Table, the Utilization rate of literature and philosophy is higher, and the lowest Utilization rate is the science and technology books of astronomy and geography. In line with the borrowing situation in most colleges and universities, the borrowing volume of minor professional books is less than that of social science books such as popular literature. Utilization rate of books in libraries shows that the Utilization rate of paper books in libraries is low. Although students will consult paper resources in libraries, a large number of paper books are idle [3].

2) According to the statistics and analysis of monthly book lending in 2016, 2017 and 2018, it is concluded that the peak of book lending is at the beginning of the school year. July is the graduation season. Due to the influence of final exams and employment, the amount of books borrowed

decreases. January and February have the least amount of bibliography lending.

3) The 2018 Top Books List. From the top 10 books in the list of borrowing volume, we can see that literature books are very popular with readers and have a high proportion of borrowing times.

4) Book Utilization rate. Utilization rate of books purchased from 2010 to 2019 during 2018: 221930 books in total, 24710 books borrowed and 11.13% utilized; The Utilization rate of books purchased from 2016 to 2019 during 2018: the total number of documents is 39617, the number of borrowed books is 5927, and the utilization rate is 14.96%. The Utilization rate of newly purchased books is higher, which shows that purchasing is more reasonable, more close to readers and plays a more important role in book value.

3.3 Statistics of Undergraduates' admission to Libraries

971030 times in 2014; In 2015 985099; 960888 in 2016; 1006118 times in 2017; In 2018, 1026229 times. It can be seen from this: in the past two years, the amount of undergraduate activities in the library has increased significantly, such as reading, studying and searching materials in the library. These figures show that the cultivation of students' learning habits has a good development trend [4].

According to the daily admission statistics from April 15 to April 21, 2019, the admission statistics of undergraduate students are divided by time period every day for a week. As can be seen from the Table above, the peak period of admission is from 9 to 10 a.m., from 3 to 4 p.m. and from 6 to 7 p.m. from Monday to Friday. The weekend peak is from 8 to 9 a.m., from 1 to 2 p.m. and from 6 to 7 p.m.

4. Analysis of Data and Readers' Borrowing Behavior

According to the previous statistics, Heilongjiang Bayi agricultural university's paper book borrowing volume has increased in the past two years, but the overall borrowing volume has not reached 50%, the borrowing volume of undergraduates is relatively low, the students in the College of Humanities and Social Sciences borrow the best books, and the Utilization rate of philosophy and literature books is the highest. The reasons are as follows.

1) The impact of digital resources. The informationization construction of Libraries in China has been gradually strengthened, and digital resources have increased dramatically. A large number of electronic resources, such as e-books and China Knowledge Net, provide a large number of high-quality research papers, which are highly valuable and easy to use, and are favored by teachers and students.

The retrieval and borrowing of paper books are slightly cumbersome, and the search of data is time-consuming and laborious relative to digital resources.

2) College students' paper books retrieval ability is not strong. College students are eager to borrow paper books, but in the search for books, it takes a lot of effort because of improper retrieval and search, thus affecting their interest in finding paper books.

3) The publicity of new books is not enough, and students do not know enough about the information of paper books in the library. Many students do not know what bibliography the library has. One is that the retrieval ability is not strong, the other is that the propaganda of books is not strong enough. Although the new book information has special columns on the library website, there will also be introductions and displays in the library. However, the efforts are not enough. For some students, they will not pay attention to the update information of the website, and occasionally go to the library, they will also ignore the new book display desk, so that they will not be clear about the details of the new book.

4) The cooperation between libraries and departments is not close. There is a lack of organic interaction between libraries and departments. There are many ways to connect libraries with departments, such as holding various activities, inviting famous teachers to give lectures, recommending professional books, etc. However, the enthusiasm of professionals in departments is not enough, and teachers also lack the awareness of using libraries for learning. Libraries need professionals to join, and these jobs need the active support and cooperation of colleges. Because of

the lack of professional participation, libraries cannot provide targeted introduction of professional books, resulting in many professional books cannot be used well. Because teachers and students do not know about professional books, professional books cannot be used by professionals. To break this vicious circle, we should strengthen the cooperation between colleges and departments, let more professionals join in it, and let professional books integrate into professional construction.

5. Solutions and Countermeasures

1) Digital resources and paper resources rely on each other. Due to the emergence of digital resources such as e-books, the Utilization rate of paper books in domestic colleges and universities has generally declined. The library resources should be reasonably allocated to improve the Utilization rate of paper books.

While strengthening the construction of digital resources, it is necessary to store and recommend paper documents. Clarify the advantages and status of paper materials and make full use of the existing collection of books.

2) Strengthen the cultivation of College Students' retrieval ability. Let more students master the ways and abilities of paper-based book retrieval, especially the annual freshmen enrollment education, let students learn how to use library resources quickly and effectively, understand the library collection, learn how to search books and information, full of yearning and enthusiasm for new learning and life, and actively make use of the library's resources effective resources.

For senior students, they should also regularly carry out some lectures and activities to strengthen the ability of book retrieval and guide them to borrow books.

3) Strengthen the publicity of books. Vigorously promote the introduction of books, in the peak period of daily library entry, to carry out a wealth of reading activities to promote different types of books. The contents, functions and applicable groups of books should be clearly and pertinently promoted. To guide students, organizations and other organizations to participate in reading activities, recommend good books, share experience and learning experience. Let the students love reading, do research and study regardless of family, be a high-quality college student and a cultural builder with high connotation. Make full use of modern means and intelligent equipment, make use of Wechat platform, library website, various electronic screens and other publicity channels and forms, vigorously publicize books, and attract readers.

4) Strengthen the cooperation between libraries and departments. According to different grades, different majors, to carry out special book business and accurate service. Staff should take the initiative to master the teaching situation of each major in each college, as well as the latest developments and technological changes in the development of various disciplines, so as to actively provide targeted, authoritative and cutting-edge academic documents for students.

For some majors, some academic exchanges, book recommendation and other activities can be held separately to help students learn more about professional knowledge, development orientation, discipline construction and other situations by means of novel topics, professional exchanges and tailor-made methods. Strengthen the initiative and enthusiasm of students to consult relevant materials.

At the same time, it can also enhance the enthusiasm of faculty and staff to participate, improve their business and broaden their horizons and ideas. It can also strengthen their demand for library paper information query and make use of professional books and materials.

5) Strengthen purchasing quality. Closely communicate with departments, experts in various disciplines, front-line teachers, scientific research teams, etc., screen according to the needs, control the purchase quantity and strengthen the purchase quality according to the professional direction of the school and the borrowing needs of readers, as well as the professional development priorities and future development directions of the school at various stages.

Appropriately increase the purchase of excellent literature books. In the ranking of popular books, we can see that literary books are very popular with readers. Increasing the number of literary books, Not only does it increase readers' literary accomplishment, but the most important thing is that it can better attract readers to borrow books from the library, so that students can have

more opportunities to learn about other books and the infection of library learning atmosphere, love the library and change their learning habits.

6. Summary and Prospect

At present, paper books are affected by digital resources, and the borrowing volume in domestic universities has decreased. However, Heilongjiang Bayi agricultural university's library business planning is reasonable, positioning is accurate, and the borrowing volume has gradually increased. Colleges and universities should strengthen exchanges between departments, libraries and college students, speed up the progress of readers' recommendation for purchasing paper books, cultivate good reading habits and learning behavior of college students, and enhance the role of invisible education of University Libraries in an all-round way.

References

- [1] Liu Chunxiao, WangLei, Zhang Rui, Qu Xiumei, Gao Xihong, Guo Jianxin, Shen Jingde. Research on Library Data Migration and Teaching Support Services[J]. Wop in Education, Sciences and Psychology, 2019, 28: 333-340.
- [2] Wei-tsong wang.system dynamics modelling for examining knowledge transfer during crises[J]. Systems research & behavioral science, 2011, 28(1):105-127.
- [3] Dangelico R M,garavelli A C, petruzzelli A M. A system dynamics model to analyze technology districts' evolution in a knowledge-based perspective[J].Technovation, 2010,30(2):142-153.□
- [4] Hirsch J E.An index to quantify an individual 's scientific research output[J].proceedings of the national academy of sciences of the united states of America,2005, 102(46):16569-16572.