Analysis of Book Borrowing and External Access in University Libraries

Authors: Ouyang Junzhe, Ouyang Junzhe

Date: 2017-01-11T00:00:00+00:00

Abstract

The development of libraries is facing impacts from digitalization and networking, and local institutions of higher education have encountered bottlenecks in their development. By utilizing the favorable conditions of information technology and employing data analysis as an effective means, the potential of university libraries can be deeply explored, the service target groups of libraries can be expanded, and the utilization efficiency of libraries can be improved. The concept of a borrowing factor is proposed for the first time, which quantifies students' utilization efficiency of the library. By drawing on experiences from university libraries both domestically and internationally, specific operational plans are proposed regarding how to attract external readers. ABSTRACT:With the rapid development of the information technology, traditional library is now facing challenges from the network and digital reading. Local colleges and universities have also encountered the bottleneck of development. By taking the advantage of information technology, data analysis has become an effective means to dig the potential of the academic library. Expanding the services of the academic library can help to improve the utilization efficiency of the library. For the first time, the author puts forward the concept of borrowing and reading factor. It quantifies the utilization efficiency of the library. By learning experiences from academic libraries around the world, detailed implementation plan is given to JINGDEZHEN Ceramic University library for attracting external readers.

Full Text

Preamble

Research on Utilization Efficiency and Opening to External Readers of Academic Libraries: A Case Study of Jingdezhen Ceramic University Library

OUYANG Junzhe, mikemaike@qq.com (Jingdezhen Ceramic Institute, Jingdezhen, Jiangxi 333403, China)

Abstract: With the rapid development of information technology, traditional libraries are facing unprecedented challenges from digital and networked reading. Local colleges and universities have encountered developmental bottlenecks. By leveraging information technology and employing data analysis as an effective tool, this study aims to deeply explore the potential of academic libraries, expand their service user base, and improve utilization efficiency. For the first time, this paper introduces the concept of the "borrowing factor" to quantify students' utilization efficiency of library resources. Drawing on experiences from academic libraries both domestically and internationally, this study proposes specific operational plans for attracting external readers.

Keywords: borrowing factor; external readers; book turnover rate; per capita reading volume

Jingdezhen Ceramic University, founded in 1910, is the only institution of higher education in China specializing in ceramics. The university currently enrolls over 19,000 full-time students and employs more than 800 full-time faculty members.

The Jingdezhen Ceramic University Library was established in 1958 and currently consists of two facilities: the Xinchang Campus Library (the old building) and the Xianghu Campus Yifu Library (the new building). The old library comprises five floors with a construction area of 6,900 square meters, while the new library covers 21,000 square meters. Together, the two libraries house a collection of 1.43 million volumes and have purchased over 30 types of Chinese and foreign electronic information resources.

Data Sources and Interpretation

All data were obtained from the Huiwen Library Information Service System used by the library. The author compiled and organized the statistical data, with results presented in Table 1 , Table 2 , and Figure 1 [Figure 1: see original paper].

2.1 Book Turnover Rate

Table 1: Monthly Book Borrowing and Returning Volume (2016)

Monthly data reveal significant fluctuations. January saw the lowest borrowing volume, while March recorded the highest. May and June experienced the highest return volumes, followed by January. These patterns reflect the academic calendar: January falls during winter break when students return borrowed books before leaving for the holiday; March marks the beginning of a new semester when students' enthusiasm for learning peaks, and with a 60-day borrowing period, there is no urgency to return books. In May and June, students face end-of-semester examinations, and graduating students must return books before leaving campus, resulting in minimal new borrowing.

After careful consideration, the author used return volume to calculate turnover rate [1]. In the first half of 2016, total returns amounted to 55,282 volumes. Assuming similar activity in the second half, annual returns would be 55,282 × 2 = 110,564 volumes. According to the author' s statistics, the library' s circulating collection of social sciences, fine arts, and science and technology books totals 810,000 volumes.

Book turnover rate = Annual total returns / Total circulating collection = 110,564 / 810,000 = 13.65%. This relatively low turnover rate indicates that the library' s utilization efficiency requires improvement.

2.2 Reader Statistics

Table 2: Statistics of Valid Library Readers

Valid readers total 17,811 across all categories, while the university' s total faculty and student population is approximately 20,000. This suggests that nearly 10% of faculty and students have never borrowed a single book from the library. Three primary factors explain this phenomenon. First, a small number of readers have not obtained campus ID cards, preventing their borrowing activities from being recorded in the system as valid transactions. Second, in today' s multimedia-rich environment, television, computers, and mobile devices consume significant attention; compared to these dynamic media, print books appear relatively dull and unengaging, diminishing some faculty and students' interest in reading physical materials. Third, some readers find the borrowing procedures cumbersome, physical books inconvenient to carry, and the risk of overdue fines or replacement costs for lost books unappealing, leading them to opt for in-library reading rather than external borrowing.

2.3 Book Borrowing Structure

According to the author' s statistics, fine arts books account for 42% of total borrowing volume, while fine arts majors represent only approximately 30% of Jingdezhen Ceramic University' s student population [Figure 1: see original paper]. This disparity suggests that fine arts students demonstrate higher enthusiasm for borrowing print materials relative to other majors, reflecting the unique nature of fine arts education where students prefer physical books for high-quality images that may lack sufficient clarity in electronic formats or online sources. Additionally, the university's strong artistic atmosphere appears to influence students from other disciplines to borrow art-related books, highlighting Jingdezhen Ceramic University' s distinctive character and unique appeal in the field of ceramic arts.

Social science books constitute 47% of borrowing volume—nearly half—demonstrating students' broad interests and willingness to explore knowledge beyond their majors. In contrast, science and technology books represent a mere 10% of borrowing, indicating either limited student interest in scientific and technical

subjects or that the latest scientific information is more readily accessible online. This also indirectly reflects that Jingdezhen Ceramic University' s research capacity remains relatively modest.

Data Mining and Deep Analysis

3.1 Borrowing Factor

Library book utilization involves two distinct phases: borrowing and reading. During borrowing, errors may occur due to improper machine operation or patrons selecting the wrong books. During reading, some borrowed books may never be opened, while others receive only cursory examination before being abandoned.

To address these issues, this paper introduces the concept of the "borrowing factor" to enhance statistical precision. The borrowing factor is a coefficient ranging from 0 to 1 that excludes instances where books are borrowed but not actually read due to various reasons, thereby providing a more accurate representation of genuine reading activity. This factor can reflect overall book utilization efficiency in a region; higher values indicate more effective use of library materials and can indirectly demonstrate library operational efficiency and the overall quality of readers in the area.

The author has established five grading levels for the borrowing factor: excellent (0.9–1.0), good (0.8–0.9), moderate (0.7–0.8), poor (0.6–0.7), and very poor (below 0.6). According to the author' s investigation and statistics, Jingdezhen Ceramic University readers achieve a borrowing factor of 0.8, indicating overall good performance but with room for improvement to reach excellence. Due to space limitations, detailed methodology and calculation procedures will be presented in a subsequent article.

3.2 Per Capita Borrowing Volume

In the first half of 2016, total books borrowed amounted to 47,837 volumes, total returns reached 55,282 volumes, and valid readers numbered 17,811. Since books borrowed in June would not necessarily be fully read within the half-year period, and returns in January included books read at the end of the previous year, using either borrowing volume or return volume alone would be inaccurate. Therefore, the author uses the midpoint value between these two figures, adjusted by the borrowing factor, to calculate half-year borrowing volume.

Half-year borrowing volume = (Total borrowed + Total returned) × Borrowing factor / 2 = (47,837 + 55,282) × 0.8 / 2 = 41,247 volumes.

Assuming similar activity in the second half, annual figures are estimated by doubling the half-year data. Annual per capita borrowing volume = 41,247 × 2 / Number of valid readers = 4.6 volumes.

3.3 Per Capita Reading Volume

According to the 13th National Reading Survey conducted by the Chinese Academy of Press and Publication, in 2015 China' s per capita reading volume was only 4.58 books, significantly lower than South Korea' s 11 books, France' s 20 books, and Israel' s 64 books [2]. Jingdezhen Ceramic University Library' s per capita borrowing volume of 4.6 books slightly exceeds the national average. However, it is important to note that per capita borrowing volume does not equal per capita reading volume, as borrowing volume only accounts for externally borrowed books and excludes in-library reading and reading outside the library. Therefore, Jingdezhen Ceramic University' s actual per capita reading volume should substantially exceed the 4.6-book borrowing figure.

The author estimates that the university' s per capita reading volume is at least 20 books. With approximately 10 courses per academic year and assuming a minimum of one textbook per course, each student reads at least 10 textbooks annually. Adding approximately five supplementary review materials, reference books, and extracurricular readings, plus the library' s per capita borrowing volume of 4.6 books, the total reaches 20 books. This is understandable—if a higher education institution' s per capita reading volume fell below the national average, it would be highly abnormal.

Although China' s per capita reading volume appears relatively low compared to some other countries, the author argues that this metric may be accurate for small-population nations but fails to effectively reflect reality in a large country like China with nearly 1.4 billion people and significant developmental disparities between urban and rural areas and between eastern and western regions. Nevertheless, regional reading imbalances do exist. As shown in Table 2, among nearly 18,000 valid readers, external and temporary readers total only 95, with an additional 20 military readers. With only one library within a five-kilometer radius of Jingdezhen Ceramic University, actively attracting external readers can expand library services, improve book utilization rates, and effectively address regional disparities in reading levels.

Opening to External Readers

4.1 Domestic and International University Library Opening Practices

As early as the 17th century, the renowned German librarian Naudé stated that "libraries should be open to all who wish to learn." Opening libraries to the public represents both an inevitable trend and a shared aspiration among library professionals to improve resource utilization. Currently, numerous domestic and international university libraries have opened to external readers, establishing operational methods and management models worthy of emulation. Based on the author' s analysis, contemporary university library opening policies fall into three categories: first, maintaining complete independence with minimal interaction with external readers and no external borrowing privileges, as practiced by Wuhan University, Huazhong University of Science and Technology,

and Harvard University; second, moderate opening that accepts external readers for in-library reading only, without borrowing privileges, as implemented by Peking University, Huazhong Agricultural University, and Wuhan University of Science and Technology; and third, comprehensive social integration with extensive opening that permits both in-library reading and external borrowing for registered external readers, as exemplified by Zhejiang University, Wuhan University of Technology, and the University of California [3].

4.2 Implementation Strategies

Opening to external readers inevitably encounters resistance and challenges, including how to manage external patrons, which collections to make available, and how to handle lost or damaged borrowed materials. Jingdezhen Ceramic University is renowned for its ceramic arts programs, and external readers would certainly be interested in the library' s fine arts collection. However, these books are generally beautifully produced and expensive. Therefore, fine arts materials should be restricted to in-library use only for external readers. Social science collections, being accessible, widely appealing, and abundant, may be made available for external borrowing.

To prevent loss and damage, external readers should pay a deposit, which also encourages careful handling of materials. Based on different needs, the library may issue reading permits and borrowing permits. Reading permits allow only in-library reading, while borrowing permits enable external loans. External readers should be limited to borrowing a maximum of one book at a time—borrowing too many may lead to less appreciation and less careful reading; borrowing one book at a time reflects a more earnest approach to learning.

Based on detailed systems analysis and local conditions, the author proposes the following plan: external readers may apply for temporary reading permits or borrowing permits using copies of their ID cards and household registration documents. Reading permits cost 110 RMB (100 RMB deposit + 10 RMB processing fee), allow only in-library reading, and are valid for one year. Borrowing permits cost 320 RMB (300 RMB deposit + 20 RMB processing fee), allow borrowing of one social science book priced under 100 RMB for a 28-day loan period, and are valid for one year.

Conclusion

Through deep mining of library-related data, this study enables operational analysis and collection management for academic libraries, providing more effective solutions to developmental bottlenecks faced by modern university libraries. Future research may leverage more comprehensive big data and introduce refined analytical methods to build new bridges and connections for the modernization and innovative service development of academic libraries.

References

[1] 于鸿儒. 论公共图书馆的图书周转率 [J]. 黑龙江图书馆, 1984(01): 12-19.
[2] 杜羽, 刘彬. 第十三次全国国民阅读调查结果公布 [N]. 光明日报, 2016-04-19(009).
[3] 浙江大学图书馆. 校外读者利用本馆书刊的规定 [EB/OL]. [2010-10-11]. http://libweb.zju.edu.cn/libweb/redir.php?catalog_id=10228.

Note: Figure translations are in progress. See original paper for figures.