

The Impact of The Number of Public Libraries on First-Batch Undergraduates

Biyuan Ye

Department of Foreign Languages, Guilin University of Electronic Technology, Guilin, China

1911121225@mail.sit.edu.cn

Abstract. Over a decade, the number of public libraries in Guangxi has seen a noteworthy increase from 94 to 116. To ascertain the impact of this development on the education sector, a panel data model was constructed using data from Guangxi between 2011 and 2021. The goal of the model was to examine how many public libraries had an impact on the growth of the initial group of undergraduates. The results showed a substantial positive relationship between the number of public libraries and the enrollment of first-batch undergraduates, proving that the presence of public libraries had improved educational possibilities in Guangxi. The study's conclusions suggest that there may not be a significant relationship between the circulation of materials by undergraduate students during their studies and the purchase of newspapers and periodicals by public libraries. This suggests that other factors may determine young scholars' popularity and usage of library resources. Further research may be required to understand this complex relationship's underlying dynamics and variables fully.

Keywords: public libraries; first-batch of undergraduates; Guangxi.

1. Introduction

The college entrance exam serves as a means to select individuals who meet the standards required for society, and the proportion of first-batch undergraduates reflects the quality of education. It must be emphasized that the first batch of undergraduates holds a significant edge over subsequent groups. In Guangxi, the percentage of first-batch undergraduates for college entrance exams has significantly increased from 6.5% to 13.06% over a decade, highlighting their clear advantage. Moreover, by the end of 2021, 179 million people had visited public libraries in the area, with gaokao-takers leveraging these facilities to improve their competitiveness in exams and undertake advanced studies [1,2].

Therefore, the purpose of this study is to examine how the proportion of first-batch undergraduates is affected by local public libraries. This offers educational departments a practical and empirical basis for carrying out precise computations. Additionally, it deepens our comprehension of the critical function of public libraries, and it is important to recognize their importance.

2. Literature Review

2.1. Factors that contribute to the percentage of first-batch undergraduates

The percentage of first-batch undergraduates for college entrance exams in China has significantly increased. Many believe that investing in high-quality extracurricular training services leads to better returns on educational investment. However, families with limited education budgets may need to consider alternative investment options. To address this, teachers encourage students to use libraries and develop independent learning skills [3]. With the adjustment of the college entrance examination reform in China, librarians have made enlightening suggestions to improve students' reading skills [4]. To enhance the number of college enrollments, it is recommended to furnish students with outstanding supplementary reading materials inside and in the library. Furthermore, the pedagogical methodologies should be transformed. This will encourage a conviction for acquiring knowledge and conducting research among students [5,6]. More than relying simply on a question bank, expanding pupils' reading materials can greatly boost their potential to pass the college entrance exam [6]. Since 2017, the Chinese government has actively encouraged the development of digital libraries. This

platform offers precisely customized learning materials that satisfy users' reading needs, greatly enhancing the standard of regional education [7,8].

2.2. The impact of public libraries on learning

In the 1960s, research was conducted overseas to explore the correlation between library usage and student academic success [9,10]. It has taken significant time for analysis within the country to fully delve into and examine this subject matter, spanning two decades. Despite potential delays, conducting thorough research on the correlation between these factors within education is paramount. Findings from research conducted in homes have revealed a significant correlation between the use of libraries and the academic success of students [11,12]. Furthermore, studies have suggested that the location of university libraries may impact academic performance [12]. University libraries are crucial to the academic and professional development of students. Those prioritize and invest in these knowledge repositories to ensure students receive a top-notch education, as their success is paramount to the success of academic and professional communities. [13]. According to a survey by the Ningbo University of Finance and Economics' University Student Research Project Fund, which was done in 2020, 97.6% of students routinely use library resources for their research projects. Their confidence and practical skills have significantly increased as a result of this exercise. According to the study, pupils who use library resources have research literacy and practical abilities compared to those who don't. Having access to library materials can help students succeed academically and promote a culture of learning [14].

Studies have shown that libraries play a significant role in fostering collaborative talent development among universities. However, despite extensive research on the positive impact of library usage on learning outcomes, there currently needs to be empirical evidence to support the relationship between the number of public libraries and the proportion of first-batch undergraduates. This highlights the need for further investigation into the potential influence of public library availability on student success in higher education.

3. Hypothesis for Research

According to studies, public libraries play a significant role in fostering social and cultural development, improving a region's quality of life. Furthermore, they are closely linked to regional education and serve to enhance its effectiveness. The Ministry of Education has released the Curriculum Plan for Ordinary High Schools, revised in 2020. During the required elective level of high school, pupils must read a minimum of 1.5 million words from various sources. The English curriculum guideline also mandates that pupils read a minimum number of words annually and at least 2,500 words per week [15]. People from different origins and skill levels, as well as those who cannot afford additional tutoring services, have found relief thanks to the accessibility of public libraries and educational institutions. It has greatly raised the bar for education in our communities.

Based on the analysis, the number of public libraries significantly influences the number of first-batch undergraduates in Guangxi. This effect remains effective even after controlling for other relevant factors.

4. Research Design

4.1. Sources of Data

During this research project, data was collected from the Yearbook of 14 cities in Guangxi from 2011 to 2021, supplemented by information from official sources on the regional education website [16]. In addition to data on per capita spending on culture, education, and entertainment for urban and rural residents, per capita GDP, financial spending on education in each city, and the number of high schools and universities in each town, the study sought to learn how many public libraries, library collections, and reader activities were organized in each of the 14 cities. These data sets give

academics the opportunity to learn more about the topic and develop a more complex grasp of the underlying events. Without them, any findings would be incomplete and unreliable.

4.2. Data Description

(1) Dependent Variable: the number of first batch of undergraduates

(2) Explanatory Variable: number of public libraries in each city. The model includes the number of individuals who took the college entrance exam, the types of newspapers and magazines purchased throughout the year, the total number of individuals in circulation, and the per capita GDP.

The data in Table 1 outlines the definitions and corresponding descriptive statistics for each variable. Table 1 offers a comprehensive overview of the data set, allowing for a thorough analysis of the variables under consideration.

Table 1. The Comprehensive Overview of the Dataset

Variable	Obs.	Mean	Std. dev.	Min	Max
Num of firth-bath undergraduates	154	2661.30	2078.83	124	9415
Libraries	154	7.89	3.59	3	14
Gaokao takers	154	2.27	1.25	0.39	5.58
kinds	154	2140.49	1346.45	416	7526
Num of visiting persons	154	1004.50	1108.52	87.1	5586.54

4.3. Model and Estimation

This study explores the causal relationship between the number of public libraries and the number of first-batch undergraduates. It constructs the following: To represent each cross-section, assigning “ i ” (where $i=1...N$), and to illustrate each point in time, setting “ t ” (where $t=1...T$). This notation identifies and analyzes the various cross-sections and their corresponding points in time within research or analysis. Utilizing a consistent and structured approach when considering data sets is vital.

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \dots + \beta_n X_{nit} + \alpha_i + \lambda_t + \varepsilon_{it}$$

Y_{it} , Sum of all dependent variables; β_0 , intercept, unchanged in the model; i , all cities in the model, such as Nanning, Liuzhou, and so on; t , from 201 to 2021, in complete 11 years; α_i , regions; β_1 - β_n , correlation; λ_t , time effects; ε_{it} , stochastic disturbance; X , the number of public libraries; the number of Gaokao takers; the types of newspapers and magazines purchased throughout the year; the total number of individuals in circulation and the per capita GDP; The primary focus of this study lies in the examination of the values of coefficients and P-values.

As seen in Table 2, to improve the accuracy of the model estimation, using logarithms is an effective method for establishing a normal distribution of data for econometric modeling and addressing heteroscedasticity concerns. This approach is known to reduce values above the median by a specific percentage, resulting in a more homogeneous data distribution.

The research indicates that an increase in public libraries positively impacts the number of first-batch undergraduates. Specifically, a 0.221% increase in the first batch of undergraduates is observed for every 1% increase in public libraries. Additionally, the analysis reveals that the number of students taking the college entrance exam has the highest regression coefficient. For every 1% increase in this number, there is a corresponding 1.23% increase in students who successfully pass the exam and enter college. It is important to note that the rise in the first batch of undergraduates is associated with overall gaokao-takers taking the exam. The study reveals that the influence of the types of newspapers purchased and the library’s general circulation on the outcome variable was negligible and insignificant.

Table 2 Data Analysis

VARIABLES	Num of firth-bath undergraduates
Libraries	0.221**
	(2.54)
Per GDP	0.475***
	(4.75)
Gaokao takers	1.233***
	(9.93)
kinds	0.013
	(0.22)
Num of visiting persons	0.004
	(0.14)
Constant	1.218
	(1.08)
Observations	154
Number of regions	14
RE	YES
p	0
r ² a	.
F	.

Robust z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4.4. Further analysis

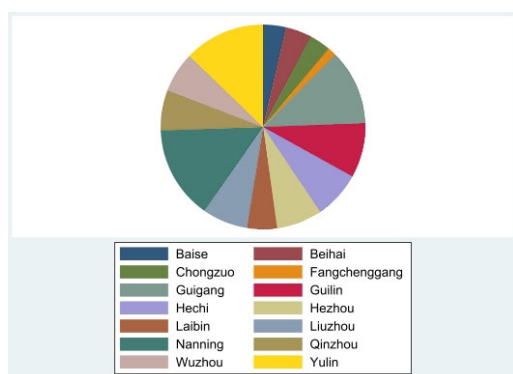


Figure 1 Percent of Gaokao takers

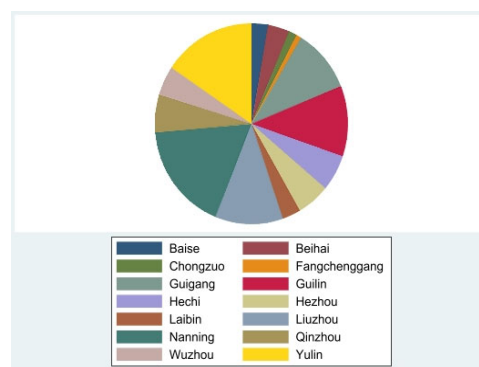


Figure 2 Percent of first-batch undergraduate

As can be seen, the number of first-batch undergraduates in the figure 2 is directly proportional to the overall increase in gaokao-takers. Among the four cities (Nanning, Qinzhou, Fangchenggang, Beihai) in the Beibu Gulf region, the provincial capital, Nanning, is reported to have a better educational environment owing to the uneven pattern of urbanization. Consequently, parents residing in the other three cities tend to relocate to the provincial capitals to enhance their children's educational prospects, leading to a surge in the number of individuals taking the college entrance exam in Nanning City. Families have developed a stronger connection to society and culture with the economy's growth and increased personal income, and parents have made a concerted effort to prioritize investing in their offspring's education, often seeking supplementary classes and courses. Investing in education is transforming with adjustments to education policies and rising expectations for higher education among children in the figure 1. Nowadays, parents are turning to the Internet, schoolteachers, other parents, and other platforms to gain valuable insights into how universities can help develop their children's talents and improve their exam preparation skills. This evolving strategy has proven to be highly effective. Teachers increasingly encourage students to utilize resources in the

“libraries,” like second classrooms, for self-directed learning. Investing in public libraries in Nanning is crucial for policymakers and educational institutions seeking to enhance the educational outcomes of the community. This study underscores the pivotal role of public libraries as an invaluable resource for individuals of all ages. As such, ongoing support and expansion of these institutions is necessary to ensure their continued success in providing critical educational opportunities.

5. Discussion

In China, questionnaires are frequently used to study university student performance; the theory and goal of the study are relevant to the institution's limited-grade students. College students demonstrate higher levels of academic expectation and self-identification than their middle school counterparts. This can be attributable to a number of things, such as more exposure to challenging courses and better academic standards, which can lead to overall success. How libraries affect student performance is substantially influenced by the age gap between middle school and college students.

Furthermore, the heightened self-awareness and sense of identity that college students possess can help them navigate the challenges and opportunities of higher education more effectively. University libraries have a more significant positive impact on student's learning outcomes, while public libraries focus on improving cultural literacy and overall quality, less impacting learning outcomes. University libraries provide specialized services tailored to specific disciplinary characteristics, while public libraries serve the entire society and cannot cater to the academic pursuits of particular age groups. Lastly, the resources collected by public libraries differ from those collected by university libraries. There is a positive correlation between the usage behavior of university libraries and students' reading quantity, quality, and academic performance, which is higher than that of public libraries.

6. Conclusion

Based on the Yearbook and using a panel data model, this research explores the impact of public libraries on the number of first-batch undergraduates. The study's key findings reveal that an increase in public libraries positively affects the number of first-batch undergraduates. Additionally, With the rise of per capita GDP, there is a corresponding improvement in access to society and culture. This, in turn, leads to an increase in first-batch undergraduates. However, it is challenging to determine the proportion of high school students in the total circulation of public libraries as students' needs differ across regions. Therefore, the total circulation of public libraries does not significantly affect the number of online students taking the college entrance examination. Although the traditional way of teaching still prevails in today's educational system, there is a rising trend of promoting teacher-student interaction to encourage independent learning. Nevertheless, some parents focus excessively on test preparation and enroll their children in extra courses, which can harm their performance in competitive college entrance exams. To improve students' competitiveness, it is essential to provide a platform that encourages independent learning, discipline, and the development of critical thinking abilities. The famous school effect and academic resource partnerships between public libraries and high school education organizations are current strategies, however they ignore the effects of consistently performing well on societal structures. Additionally, this strategy ignores the significance of preventing the exclusive concentration of educational resources in top-notch institutions within particular geographic regions. When putting academic policies and programs into practice, it is imperative to take a perspective that prioritizes the wellbeing of students.

References

- [1] Sohu. The latest information on the percentage of first-batch undergraduates in all provinces in China in 2021 has just been released! Will Beijing be the first, or will Henan be the last? Sep 12, 2021. Retrieved on August 18, 2023. Retrieved from: https://www.sohu.com/a/489424918_120828047.

- [2] Yangguanggaokao. The table displays the grades for the 2011 College Entrance Examination in Literature and History for first-batch undergraduates in Guangxi. June 23, 2011. Retrieved on August 18, 2023. Retrieved from: <https://gaokao.chsi.com.cn/gkxx/ss/201106/20110627/217243835.html>
- [3] Zheng Mingliang. How to Maximize the Library's Potential in Developing High School Students' Self-Learning Skills. *English Teachers* 11, 35-36 (2009)
- [4] Mai Caiyun. Opportunities and Challenges of Primary and Middle School Libraries in the New Situation of College Entrance Examination. *Library Work and Study* 1, 106-110 (2019)
- [5] Bao Yu. Reflections on the Role of Libraries in Improving Knowledge and Library Education in the College Entrance Examination. *XUEYUAN* 4, 160-161 (2014)
- [6] Guan Guanghai. Creating a World of Student Research in High School Libraries. *China Educational Technology & Equipment* 20, 133-134 (2012)
- [7] Fang Yinling. A study was conducted on using the WeChat Public Platform for library services in high schools. *Media Forum* 10, 115-116 (2020)
- [8] Zhang Xiaomei. Investigation into the Utilization of Library WeChat Mini Programs. *Media Forum* 3, 123-125 (2020)
- [9] STEMMER JK, MAHAN DM. Investigating the relationship of library usage to student outcomes. *College & Research libraries* 77, 359 -375(2016)
- [10] STONE G, RAMSDEN B. Library Impact Data Project: looking for the link between library usage and student attainment. *College & Research Libraries* 74, 546-559 (2013)
- [11] Wang Ling. Empirical Research on the Correlation Between University Students' Utilization of Library Services and Academic Achievements: Taking Capital Medical University as an Example. *Library and Information Service* 24, 39-44 (2017)
- [12] Zhang Sainan, Liu Entao. Empirical Research on the Correlation Between f Library Resource Utilization and Student's Academic Performance: Taking University of Science and Technology Beijing as an Example. *Jiangsu Science & Technology Information* 3, 74-80 (2023)
- [13] Wang Yan. Case Study on the Correlation of Library Use and Personal Achievement of Undergraduate Students. *Journal of Academic Libraries* 1, 33-37(2013)
- [14] Liu Yingjun. The research examined university libraries' impact on student's academic achievements. *Inner Mongolia Science Technology & Economy* 5, 119-122 (2022)
- [15] Ministry of Education of China. The Ministry of Education on Printing and Distributing Curriculum Plans and Chinese Language for Ordinary High Schools, May 13, 2020. Retrieved on August 18, 2023, Retrieved from: http://www.moe.gov.cn/srcsite/A26/s8001/202006/t20200603_462199.html.
- [16] Guangxi Zhuang Autonomous Region Bureau of Statistics. Guang xi Statistical Yearbook, Dec 15, 2022. Retrieved on July 28, 2023, Retrieved from: <http://tjj.gxzf.gov.cn/tjsj/tjnj/material/tjnj20200415/2022/zk/indexce.htm>.