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Article

The impact of the learning university library model on organizational performance in Guangxi, China from the perspective of smart library

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Abstract: In the era of smart transformation, this study examines the impact of the learning university library model on university library performance, with the smart library serving as a mediating factor. Drawing on theories of smart libraries, learning organizations, and organizational performance, the research focuses on leaders and department heads of university libraries in Guangxi. A questionnaire survey conducted in 2024 yielded 437 valid responses. Utilizing statistical software, the study constructed a structural equation model (SEM) for analysis. The findings reveal that the smart library serves as a key mediator, significantly enhancing the positive influence of the learning university library model on university library performance. Learning and technology emerged as primary drivers of performance improvement, while resource, personnel, and organizational factors also played crucial roles. This study not only contributes to the interdisciplinary field of smart library and learning organization theory but also offers theoretical insights and practical guidance for the smart development of university libraries in Guangxi, which is strategically important for promoting the sustainable development of library services.

Keywords: learning; organization; personnel; resource; technology; learning university library model; smart library; university library performance

1. Introduction

With the rapid development of intelligent information technology, emerging technologies such as artificial intelligence and big data are inducing profound changes around the world (Rane et al., 2024). In this context, the smart library serves as the director. With the rapid development of intelligent information technology, emerging technologies such as artificial intelligence and big data are inducing profound changes around the world (Rane et al., 2024). In this context, the smart library, serving as the direction for the transformation and upgrading of the library industry, has a profound impact on the world. However, despite the numerous advantages brought by the smart library, its construction and development still confront multiple challenges. Notably, the enhancement of librarians' skills and quality has emerged as a pivotal factor (Aithal, 2016). Consequently, establishing a learning university library model is crucial in bolstering the core competitiveness of libraries (Camille and Damon, 2010). Nevertheless, currently, the literature pertaining to the integration of learning organizations and smart libraries is scant, highlighting an obvious research gap.

This thesis aims to explore the following research questions:

(1) What factors within the learning university library model significantly impact the university library performance?

(2) What direct impacts do factors within the learning university library model have on the university library performance?

(3) What bridging role does the intermediary of the Smart Library play between the learning university library model and the university library performance?

The construction and development of smart libraries is not only linked to the future of the library industry, but also exerts a profound impact on global knowledge sharing, cultural exchange, and technological innovation. However, the current literature on the integration of learning organizations with smart libraries is insufficient, and research on methods to enhance smart library performance through the construction of learning organizations is particularly scant. The purpose of this study is to bridge this gap, offering profound insights into the smart transformation and sustainable development of libraries at the strategic level. Furthermore, it holds significant referential value for university libraries seeking to bolster their core competitiveness.

2. Literature review

2.1. Smart library

A smart library is an intelligent collaboration organism that effectively integrates resources, technology, services, and librarians. With the aid of smart technology, the team of smart librarians offers discovery and perception services tailored to various user groups (Mishra, 2020; Yunus et al., 2023).

University scholars particularly focus on the constituent elements of smart libraries, namely smart technology, smart resources, smart librarians, and smart services. Smart technology pertains to the construction of information and communication infrastructure, smart public spaces, and information platforms within university libraries. Smart resources refer to the digital and physical resources available within the university library. Smart librarians are proactive and innovative in their learning and possess extensive professional resources to cater to the diverse service needs of users. Smart services involve the utilization of advanced technology to enhance the sophistication of university library service models. The space provided by smart libraries is both virtual and physical, offering a seamless blend of online and offline experiences. The interconnection of various resources enhances the efficiency of resource availability and content service business processes. Furthermore, high-quality librarians further customize services to enhance user satisfaction (Bi et al., 2022; Chen et al., 2018; Yuan and Yang, 2024).

As a new direction in library development, smart libraries are constantly transforming the service mode and management approach of libraries. In the future, smart libraries will continue to explore and practice in the areas of technology integration, service innovation, and sustainable development, thereby injecting new vitality into the development of the library profession (Adigun et al., 2024; Shahzad et al., 2024).

2.2. Learning organization

The concept of a learning organization originated in the West. Early pioneers, such as Forrester, laid the groundwork for this concept. Subsequently, Senge sparked an upsurge in the study and practice of the learning organization (Renesch and Chawla, 2006). Marquardt offered a holistic view of enterprises and introduced a system model for a learning organization comprising five subsystems: learning, organization, personnel, knowledge, and technology. Each subsystem possesses distinct learning levels, types, and skills, while they are also interconnected and mutually supportive (Marquardt, 2002).

With the rapid development of artificial intelligence, big data analysis, and other technologies, the efficiency of learning organizations in acquiring, collating, and disseminating knowledge has been significantly improved. In the future, two major development trends of learning organizations are particularly notable: one is the transformation of organizational culture, which aims to create an innovative atmosphere that encourages active learning, sharing, and cooperation; the second is the innovation of learning methods, utilizing online learning, distance education, and social learning, among other new approaches, to meet the diverse learning needs of employees (Aithal and Maiya, 2023; Göker and Göker, 2020).

This study applies Michael Maquart's learning organization theory and method to the development of smart libraries, particularly focusing on the formation of learning university libraries. Specifically, we are endeavoring to build a learning university library model that adapts to the development of smart libraries. The model revolves around five core elements: learning, organization, personnel, resources, and technology. Through the organic integration of these elements, it aims to facilitate the transformation of smart libraries into a more efficient and innovative learning organization.

Within the framework of a smart library, the learning university library emphasizes learning across all facets of its organization, serving as a cornerstone of learning organizations. This emphasis encompasses three interconnected levels: individual learning, team learning, and organizational learning. Individual learning involves acquiring skills, knowledge, insights, attitudes, and values through self-study, teaching, and observation, often facilitated by technology. Team learning pertains to the growth of knowledge, skills, and abilities within teams, while organizational learning refers to the enhancement of organizational intelligence, efficiency, and productivity through continuous improvement initiatives.

The organization of a learning university library forms a subsystem within the broader university structure, encompassing various factors and processes. It includes a shared vision of the future co-created by leaders and library members to guide the library's direction, action plans, and methodologies to achieve smart library goals. This culture supports the operation of a smart library through shared values, beliefs, practices, routines, and habits and an organizational structure comprising departments, hierarchies, and roles within the library.

The personnel subsystem is crucial for the realization of a learning university library. It comprises library leaders and librarians who learn from each other, act as teachers and students, engage with peers, and collaborate with library vendors. Librarians must be fully empowered and capable of understanding their roles and responsibilities to ensure the effective functioning of the library.

University library resources encompass both physical and electronic materials, which are managed by the library and include those acquired and generated within the institution. These resources involve continuous and interconnected processes such as acquisition, creation, storage, transfer, and application. Technologies are utilized to enhance the speed and effectiveness of learning and resource management in university libraries, including knowledge information systems, technology-based learning platforms, and electronic performance support systems (Igwe and Sulyman, 2022; Marquardt, 2002).

2.3. Organizational performance

Organizational performance pertains to the outcomes and efficacy of various operations conducted by an organization in pursuit of its established goals. It involves the effective utilization of management strategies, the pursuit of internal and external resources, and the satisfaction of organizational members and users (Gutterman, 2023; Jenatabadi, 2015; Taouab and Issor, 2019).

Within the context of university libraries, university library performance is specifically categorized into service performance, internal management performance, and learning and growth. Unlike profit-oriented organizations, financial indicators are not considered in assessing the performance of university libraries (Pan, 2011; Wang, 2014).

The service performance of university libraries centers on the quality of services they provide, encompassing librarians' service skills, the efficiency of their service delivery, and their ability to promptly address user needs.

Internal management performance, on the other hand, relates to the efficiency of internal management processes, librarian satisfaction, and the smoothness of internal communication channels.

Lastly, learning and growth relate to librarians' or library organizations' capacity to adapt to changes, elevate their overall personal qualities, and foster the library's innovation and adaptability via ongoing learning and development, ultimately aiding in the preservation of a competitive edge for the library.

2.4. The impact of learning university library on the university library performance

In the research category of learning organizations, its relationship with organizational performance has been widely discussed. Studies have shown that organizational learning can improve corporate profits, customer satisfaction, knowledge performance, and other subjective and objective performance indicators (Egan et al., 2004; Ellinger et al., 2002). This theoretical framework is also applicable to non-profit organizations, especially when focusing on the specific field of university libraries.

University education researchers have discussed the opportunities and challenges faced by universities in the resource management environment and proposed strategies for building a learning organization (Juceviciene and Edintaite, 2012). In addition, Chinese scholars have found that human resource development in Chinese libraries has a significant impact on their overall performance (Pan, 2011). It can be inferred

that the construction of a learning university library affects the performance of the university library.

2.5. Mediator effects of smart library

Smart libraries leverage advanced technology to integrate resources, breaking spatial barriers and enabling knowledge sharing. This aids learning-oriented university libraries in acquiring high-quality resources, supporting their continuous growth. Moreover, resource integration enhances library performance, facilitating efficient user service (Mashroofa, 2022; Mohapatra and Das, 2017).

Through intelligent devices and online learning platforms, smart libraries offer personalized services catering to user learning experiences and outcomes. This innovation boosts user satisfaction and library performance (Gul and Bano, 2019; Hamad et al., 2024).

Smart libraries introduce intelligent management systems for automation, monitoring, and data analysis, improving efficiency and reducing costs. Efficient management supports learning-oriented and university libraries in achieving goals and enhancing performance (Akter, 2021; Muhamad and Darwesh, 2020).

By hosting online lectures and seminars, smart libraries foster academic exchanges, creating a vibrant atmosphere. This attracts users, enhances library influence, and boosts library performance (Amron et al., 2022; Muhamad and Darwesh, 2020)

In summary, as a mediator, the smart library strengthens the relationship between learning university and university library performance through knowledge sharing, service innovation, management improvement, and academic atmosphere creation, ultimately elevating the library's overall performance.

2.6. Research conceptual framework and hypothesis

Based on a comprehensive analysis of existing literature, this study constructs a research conceptual framework. This framework clarifies the roles of learning, organization, personnel, resource, and technology as independent variables, the smart library as a key intermediary variable, and university library performance as the dependent variable. This logical relationship is illustrated in **Figure 1.**

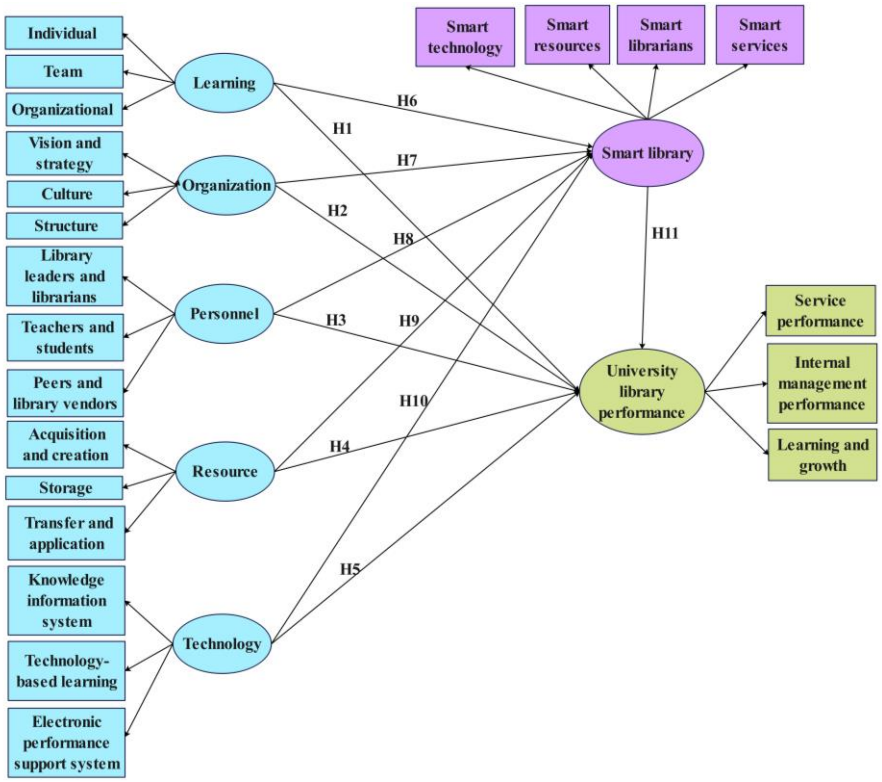

Figure 1. Research conceptual framework.

Consequently, we propose 11 hypotheses accordingly, as detailed in **Table 1**. The core objective of this study is to deeply analyze the internal relationships among these various factors and their specific impacts on university library performance by validating these hypotheses, with a particular focus on the significant role of smart libraries as mediating variables. This process aims to provide us with a more comprehensive and in-depth understanding in order to better guide the strategy formulation and practice optimization of university libraries in the process of smart transformation.

Table 1. Summary of the hypothesis.

NO.	Hypothesis
H1	Learning positively impacts university library performance.
H2	Organization positively impacts university library performance.
H3	Personal positively impacts university library performance.
H4	Resource positively impacts university library performance.
H5	Technology positively impacts university library performance.
H6	Learning positively impacts smart library.
H7	Organization positively impacts smart library.
H8	Personal positively impact smart library.
H9	Resource positively impacts smart library.
H10	Technology positively impacts smart library.
H11	Smart library positively impacts university library performance.

3. Research methodology

This study employs a combination of quantitative and qualitative analysis methods, focusing on libraries at ordinary universities in Guangxi. It aims to explore the impact of learning university libraries on library performance and verify the mediating role of smart libraries in this process. Due to the scarcity of publicly available data, we designed and implemented a targeted questionnaire survey.

3.1. Population and sample selection

This study covers 40 ordinary university libraries in Guangxi (Xie, 2024). The research subjects are the leaders and department heads of these libraries, who serve as the core force in library operation and management and typically possess deep understanding and rich practical experience in the construction of learning organizations and smart libraries. Considering that the total number of leaders and department heads in a typical university library is approximately 8 (though this may vary depending on factors such as library size and organizational structure), to ensure the breadth and representativeness of the sample, we plan to collect at least 10 questionnaires from each library. This strategy aims to comprehensively reflect the diversity and uniqueness of each library's efforts in building learning organizations and implementing smart library practices by covering managers at various levels and functions. The total expected sample size exceeds 400 questionnaires, ensuring the reliability and universality of the research results.

3.2. Questionnaire design

The questionnaire comprises 56 multiple-choice questions and 2 open-ended questions, designed to collect both quantitative and qualitative data comprehensively.

(1) Multiple-choice questions: A five-level Likert scale is employed to evaluate variables related to learning university libraries (covering five dimensions: learning, organization, personnel, resources, and technology), library performance (including service performance, internal management performance, and learning and growth), and smart libraries (focusing on smart technology, smart resources, smart librarians, and smart services). The questionnaire has been revised based on existing scales to ensure the accuracy and relevance of the evaluation (Pan, 2011; Tian and Zhou, 2020; Wang, 2014).

(2) Open-ended Questions: Respondents are given the opportunity to record the problems encountered and improvement suggestions in the construction of learning organizations and smart libraries, providing deeper insights and feedback.

3.3. Data collection

The questionnaire was deployed through the Questionnaire Star platform (https://www.wjx.cn/), and we utilized the personal connections of the members of the Guangxi University Library Working Committee to accurately distribute it to the target audience through QQ groups, WeChat groups, and other communication channels from May to June 2024. At the same time, strict quality control measures were implemented to ensure the integrity and validity of the collected data.

3.4. Data analysis

Descriptive statistical analysis was conducted using statistical product and service solutions (SPSS) to examine sample characteristics and data distribution. Structural equation modeling was performed using analysis of moment structures (AMOS) to explore the research hypotheses. First, descriptive statistics were utilized to understand the demographic characteristics of the sample and the normal distribution of the data. Then, confirmatory factor analysis (CFA) was conducted to assess the reliability and validity of the questionnaire, including the evaluation of average variance extracted (AVE) and composite reliability (CR). After confirming that the data adhered to the normal distribution and passed the CFA verification, structural equation modeling was conducted using AMOS to verify the impact of learning university libraries on library performance and the mediating role of smart libraries. Additionally, qualitative analysis of the open-ended questions was incorporated to provide a deeper understanding and insight into the research findings.

4. Research results

For the research, 480 questionnaires were distributed, and 437 valid responses were obtained, resulting in a robust response rate of 91.04%.

4.1. Description of sample characteristics

The descriptive analysis of the sample characteristics focused on the basic information of the participants. In the descriptive statistical analysis, the following variables were considered: gender, age, education level, and position. According to the statistics, 85.81% of the sample was female, while 14.19% was male, reflecting the current gender distribution in university libraries in Guangxi, where female librarians outnumber male librarians. The participants were divided into four age groups: 14.87% were aged 26–35, 44.39% were aged 36–45, 23.57% were aged 46–55, and 17.16% were over 55. These statistics indicate that the majority of librarians are older. Older librarians may face challenges in knowledge updating, technology adaptation, etc. At the same time, the lack of young librarians may suggest that libraries need to make more efforts in talent introduction and training.

Regarding education level, the participants were classified into three categories: those with bachelor's degrees accounted for 19.45%, those with master's degrees or higher accounted for 62.24%, and those with doctoral degrees accounted for 18.31%. This distribution is consistent with the current educational qualifications of librarians, although there are relatively few with high academic qualifications. In terms of position, 36.61% of the participants were library leaders or deputy leaders, while 63.39% were department heads or deputy department heads.

4.2. Data normal distribution test

The sample data adheres to the normal distribution, which is a fundamental prerequisite for data analysis and processing using AMOS 24.0 software. It is generally accepted that a skewness absolute value below 3 and a kurtosis absolute value below 8 indicates that the data conforms to a normal distribution (Joseph et al., 2010). In this study, the maximum absolute skewness coefficient among the 56 observed variables is 1.09, which falls below 3, and the maximum absolute kurtosis

coefficient is 1.299, which is less than 8. Therefore, the data meets the criteria for normal distribution.

4.3. Reliability analysis

This study employs Cronbach's α coefficient to assess the reliability of the formal questionnaire scale. **Table 2** presents the reliability analysis results. The Cronbach's α for the Learning university library scale is 0.928, showing good reliability. Similarly, the α values for its five factors—learning (0.911), organization (0.921), personnel (0.874), resource (0.885), and technology (0.895)—all exceed 0.7, confirming good reliability. For the Smart library elements scale, Cronbach's α is 0.917, indicating a high level of reliability. The α values for its four dimensions—smart technology (0.915), smart resources (0.879), smart librarians (0.893), and smart services (0.889)—are also all above 0.7, indicating good reliability. Lastly, Cronbach's α for the University library performance scale is 0.876, reflecting good reliability. The α values for its three dimensions—service performance (0.868), internal management performance (0.852), and learning and growth (0.88)—all surpass 0.7, further confirming the scale's reliability in the formal questionnaire.

Table 2. Reliability analysis.

Scale	Variable	Number of items	Cronbach's *α*	
Learning university library	Learning	6	0.911	0.928
	Organization	5	0.921	
	Personnel	5	0.874	
	Resource	5	0.885	
	Technology	5	0.895	
Smart library	Smart technology	6	0.915	0.917
	Smart resources	5	0.879	
	Smart librarians	5	0.893	
	Smart services	5	0.889	
University library performance	Service performance	3	0.868	0.876
	Internal management performance	3	0.852	
	Learning and growth	3	0.88	

4.4. Validity analysis

This study utilizes AMOS 24.0 software to conduct a confirmatory factor analysis on factors related to university library learning, smart library elements, and university library performance scales. Initially, we assess the model's appropriateness using various fit indices: the chi-square to degrees of freedom ratio (CMIN/DF), *P*-value, root mean square residual (RMR), adjusted goodness-of-fit index (AGFI), goodness-of-fit index (GFI), normed fit index (NFI), relative fit index (RFI), incremental fit index (IFI), Tucker-Lewis index (TLI), comparative fit index (CFI), and root mean square error of approximation (RMSEA). Subsequently, we evaluate the convergent validity of each scale by examining the standardized factor loadings, composite reliability (CR), and average variance extracted (AVE). Lastly, discriminant validity

is assessed by comparing the square root of the AVE for each construct with the inter-construct correlation coefficients.

4.4.1. Fitness test of confirmatory factors

Table 3 presents the fitness test results for the confirmatory factor model of learning university library. The results indicate that the model fits well, with the following indices: CMIN/DF = 1.038, *P* = 0.315, RMR = 0.045, AGFI = 0.939, GFI = 0.95, NFI = 0.958, RFI = 0.953, IFI = 0.998, TLI = 0.998, CFI = 0.998, and RMSEA = 0.009. These indices all meet the fitness standards, suggesting that the model is suitable for further analysis.

Then, the fitness test results for the confirmatory factor model of the modified smart library are as follows: CMIN/DF = 1.174, *P* = 0.055, RMR = 0.046, AGFI = 0.946, GFI = 0.958, NFI = 0.962, RFI = 0.956, IFI = 0.994, TLI = 0.993, CFI = 0.994, and RMSEA = 0.020. Consequently, all these fitness indicators meet the established criteria, suggesting that the model is ready for further analysis.

The results of the fitness test for the confirmatory factor model of university library performance are as follows: CMIN/DF ratio of 1.049, *P*-value of 0.396, RMR of 0.032, AGFI at 0.977, GFI at 0.988, NFI at 0.989, RFI at 0.983, IFI at 0.999, TLI at 0.999, CFI at 0.999, and RMSEA of 0.011. All these metrics confirm that the model adheres to the fitness criteria, indicating a good fit and readiness for subsequent analysis.

Table 3. The fitness test results of confirmatory factors.

Fit index	Inspection standards	Learning university library	Smart library	University library performance
CMIN/DF	<5	1.038	1.174	1.049
P	>0.05	0.315	0.055	0.396
RMR	<0.08	0.045	0.046	0.032
AGFI	>0.9	0.939	0.946	0.977
GFI	>0.9	0.95	0.958	0.988
NFI	>0.9	0.958	0.962	0.989
RFI	>0.9	0.953	0.956	0.983
IFI	>0.9	0.998	0.994	0.999
TLI	>0.9	0.998	0.993	0.999
CFI	>0.9	0.998	0.994	0.999
RMSEA	<0.08	0.009	0.020	0.011

4.4.2. Convergent validity test

Table 4 outlines the convergent validity test results for various factors related to a learning university library. Specifically, the CR values for learning, organization, personnel, resource, and technology are all above 0.7, ranging from 0.874 to 0.921. Furthermore, the AVE values for these factors exceed 0.5, with a minimum of 0.582 and a maximum of 0.701. Notably, all measurement items for these latent variables have standardized factor loading values greater than 0.6, indicating good convergent validity for the learning university library scale in this study.

The table also shows the results of the convergent validity test of the smart library elements. Here, the CR values for smart technology, smart resources, smart librarians, and smart services are all higher than 0.7, with the highest being 0.983 for smart librarians. Similarly, the AVE values for these elements are all above 0.5, ranging from 0.593 to 0.643. All measurement items for these four latent variables exhibit standardized factor loading values greater than 0.6, confirming good convergent validity for the smart library scale in this study.

Finally, the table presents the convergent validity test results for university library performance. The CR values for service performance, internal management performance, and learning and growth are all above 0.7, with values ranging from 0.852 to 0.880. The AVE values for these dimensions also exceed 0.5, with the lowest being 0.658 and the highest being 0.710. Importantly, all measurement items for these three latent variables have standardized factor loading values greater than 0.6, demonstrating good convergent validity for the university library performance scale in this study.

Table 4. Results of convergent validity test.

Variable	Item	Standardized factor loading	CR	AVE
Learning	LE1	0.776	0.912	0.632
	LE2	0.814		
	LE3	0.808		
	LE4	0.801		
	LE5	0.777		
	LE6	0.794		
Organization	OR1	0.825	0.921	0.701
	OR2	0.834		
	OR3	0.871		
	OR4	0.835		
	OR5	0.819		
Personnel	PE1	0.744	0.874	0.582
	PE2	0.788		
	PE3	0.758		
	PE4	0.746		
	PE5	0.776		
Resource	RE1	0.781	0.885	0.606
	RE2	0.788		
	RE3	0.752		
	RE4	0.787		
	RE5	0.784		
Technology	TE1	0.788	0.895	0.631
	TE2	0.815		
	TE3	0.792		
	TE4	0.806		
	TE5	0.77		

Smart technology	ST1	0.769	0.915	0.643
	ST2	0.798		
	ST3	0.799		
	ST4	0.831		
	ST5	0.806		
	ST6	0.805		
Smart resources	SR1	0.791	0.879	0.593
	SR2	0.807		
	SR3	0.76		
	SR4	0.765		
	SR5	0.725		
Smart librarians	SL1	0.808	0.983	0.626
	SL2	0.819		
	SL3	0.807		
	SL4	0.734		
	SL5	0.786		
Smart services	SS1	0.791	0.889	0.617
	SS2	0.743		
	SS3	0.822		
	SS4	0.755		
	SS5	0.812		
Service performance	SP1	0.797	0.869	0.688
	SP2	0.84		
	SP3	0.851		
Internal management performance	IMP1	0.826	0.852	0.658
	IMP2	0.785		
	IMP3	0.822		
Learning and growth	LG1	0.843	0.880	0.710
	LG2	0.849		
	LG3	0.835		

4.4.3. Discriminant validity *t*

When the AVE square root of the latent variable exceeds the correlation coefficient between the variable and other latent variables, it indicates good discriminant validity for the latent variables. According to **Table 5**, the correlation coefficients among the latent variables related to university library learning factors, smart library elements, and university library performance are all lower than the respective square roots of their AVE values, suggesting good discriminant validity among these latent variables.

Table 5. Results of discriminant validity test.

Latent variable	Learning	Organization	Personnel	Resource	Technology
Learning	0.795				

Organization	0.406	0.837			
Personnel	0.435	0.342	0.763		
Resource	0.528	0.426	0.444	0.779	
Technology	0.548	0.332	0.399	0.38	0.794
Latent variable	Smart technology	Smart resources	Smart librarians	Smart services	
Smart technology	0.802				
Smart resources	0.387	0.770			
Smart librarians	0.405	0.545	0.791		
Smart services	0.456	0.400	0.455	0.785	
Latent variable	Service performance	Internal management performance	Learning and growth		
Service performance	0.830				
Internal management performance	0.589	0.811			
Learning and growth	0.506	0.653	0.842		

4.5. The Structural equation models and hypothesis testing

As shown in **Figure 2,** the results indicate that: CMIN/DF = 1.091, *P* = 0.083, RMR = 0.046, AGFI = 0.919, GFI = 0.932, NFI = 0.939, RFI = 0.933, IFI = 0.995, TLI = 0.994, CFI = 0.995, and RMSEA = 0.014. All the fit indices of the structural equation model (SEM) established in this study meet the fit criteria, suggesting that the model has a good fit.

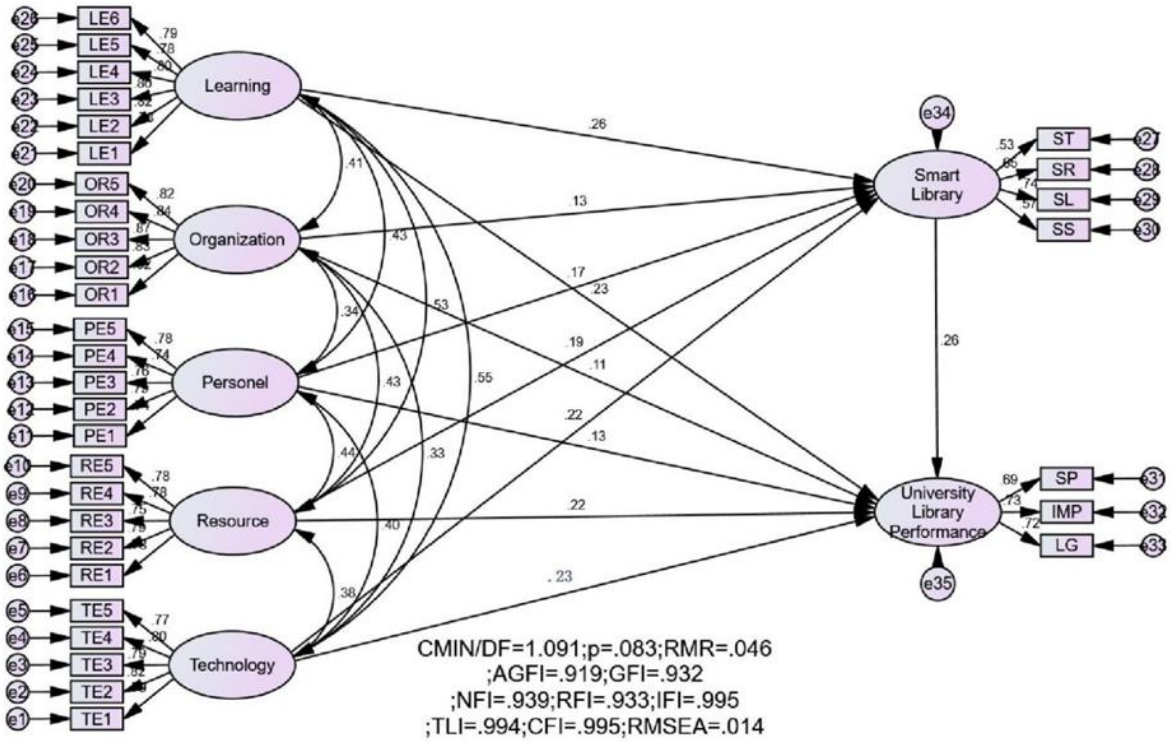

Figure 2. Structural equation model.

Table 6 presents the path coefficients of the SEM. The results indicate that:

H1: Learning positively impacts university library performance. The standardized path coefficient for learning on university library performance is 0.229, with $p < 0.001$. Therefore, this hypothesis is accepted.

H2: Organization positively impacts university library performance. The standardized path coefficient for the organization on university library performance is 0.111, with $p < 0.05$. Hence, this hypothesis is accepted.

H3: Personnel positively impacts university library performance. The standardized path coefficient for personnel on university library performance is 0.129, with $p < 0.01$. Therefore, this hypothesis is accepted.

H4: Resource positively impacts university library performance. The standardized path coefficient for the resource on university library performance is 0.219, with $p < 0.001$. Therefore, this hypothesis is accepted.

H5: Technology positively impacts university library performance. The standardized path coefficient for technology on university library performance is 0.225, with $p < 0.001$. Hence, this hypothesis is accepted.

H6: Learning positively impacts smart library. The standardized path coefficient for learning on the smart library is 0.255, with $p < 0.001$. Therefore, this hypothesis is accepted.

H7: Organization positively impacts smart library. The standardized path coefficient for the organization on the smart library is 0.13, with $p < 0.05$. Hence, this hypothesis is accepted.

H8: Personnel positively impacts smart library. The standardized path coefficient for personnel on the smart library is 0.166, with $p < 0.01$. Therefore, this hypothesis is accepted.

H9: Resource positively impacts smart library. The standardized path coefficient for resource on smart library is 0.187, with $p < 0.01$. Therefore, this hypothesis is accepted.

H10: Technology positively impacts smart library. The standardized path coefficient for technology on the smart library is 0.224, with $p < 0.001$. Hence, this hypothesis is accepted.

H11: Smart library has a positive impact on university library performance. The standardized path coefficient for smart library on university library performance is 0.261, with $p < 0.001$. Therefore, this hypothesis is accepted.

Table 6. Path coefficients of structural equation model.

Hypothesis	Path	Non-standardized factor loading	Standardized factor loading	*P*
H1	Learning → University library performance	0.18	0.229	***
H2	Organization → University library performance	0.081	0.111	*
H3	Personel → University library performance	0.119	0.129	**
H4	Resource → University library performance	0.168	0.219	***
H5	Technology → University library performance	0.182	0.225	***
H6	Learning → Smart library	0.146	0.255	***
H7	Organization → Smart library	0.068	0.13	*

H8	Personel → Smart library	0.11	0.166	**
H9	Resource → Smart library	0.105	0.187	**
H10	Technology → Smart library	0.131	0.224	***
H11	Smart library → University library performance	0.36	0.261	***

Note: * indicates $p < 0.05$, ** indicates $p < 0.01$, *** indicates $p < 0.001$.

The hypotheses explain that smart libraries, as crucial intermediaries, play a vital role in various subsystems (Learning, Organization, Personnel, Resource, and Technology) of learning-oriented university libraries, enhancing their performance. Learning, as the primary driver, fosters technological innovation, optimizes resources, upgrades service models continuously, and creates an optimized learning environment to cater to diverse needs. Additionally, smart libraries significantly contribute to improving university library performance by boosting organizational effectiveness, upgrading personnel quality, integrating resources, and driving technological advancements.

The research outcomes reveal that the learning university library model in Guangxi not only directly impacts the University Library Performance but also significantly enhances performance indirectly through the intermediary role of the Smart Library.

4.6. Suggestions received from the questionnaire

In response to the open-ended questions posed in the questionnaire, the researchers collected detailed and constructive feedback from 21 respondents.

Firstly, the primary challenges confronted by university libraries in Guangxi when establishing a learning organization and a smart library encompass the following: outdated hardware and software infrastructure, underdeveloped database systems, funding constraints, a scarcity of skilled personnel, and a lack of service innovation.

Secondly, from the perspective of a smart library, the following suggestions are put forward for university libraries in Guangxi to cultivate a learning organization and elevate organizational performance:

- Foster a vibrant learning culture;
- Establish a flat and agile organizational structure;
- Enhance team collaboration and interaction;
- Leverage intelligent technology to optimize performance evaluation;
- Accelerate the upgrading of hardware and software facilities;
- Expedite the development of databases and resources;
- Emphasize reader education and guidance.

5. Discussion and recommendation

5.1. Discussion

The main objectives of this study are discussed as follows.

Research Objective 1: To identify the critical factors influencing the construction and performance of learning university libraries.

Five crucial factors—Learning, Organization, Personnel, Resource, and Technology—are validated as significant in the construction and performance of learning university libraries.

Theoretical Contributions:

By integrating Marquardt's learning organization theory with insights from library science, management, and education, the study fosters a deeper understanding of learning organizations and offers new research directions. A customized key factor model tailored for Guangxi's learning-oriented university libraries is formulated, serving as a theoretical cornerstone for enhancing library performance.

Practical Guidance:

Library administrators can devise targeted strategies focusing on the five key factors to maintain competitiveness and achieve sustainable development.

Research Objective 2: To explore the intrinsic relationship between the learning university library model and university library performance.

This study reveals that focusing on learning, organization, personnel, resource, and technology in Guangxi's university libraries directly enhances library performance. Notably, learning and technology have the most significant impact, underscoring the importance of continuous learning and technological innovation in modern library management.

Key Insights:

A learning organization culture emphasizing continuous learning, knowledge sharing, and innovation is vital.

Technological innovation, including intelligent retrieval systems, big data analytics, and mobile services, elevates service efficiency and user experience. Comprehensive strategies, including nurturing a learning culture, optimizing organizational structures, and embracing technological innovation, are indispensable.

Research Objective 3: To investigate the Mediating Role of Smart Libraries.

Key Findings:

Smart libraries serve as a significant mediator between Guangxi's learning university libraries and their performance, bolstering information processing, service innovation, and user interaction capabilities.

Smart libraries have notable advantages in enhancing library performance, highlighting their vast promotion prospects in library management.

Future library administrators should actively explore smart library construction paths, strengthen technological research and development, and foster talent cultivation to steer libraries toward smart, digital, and networked directions.

5.2. Recommendation

Based on the survey results, which indicate that the factors of learning, technology, resources, personnel, and organization have a decreasing impact on the performance of smart and university libraries within learning-oriented environments, the following optimization suggestions are proposed for the construction of a Guangxi learning library model, focusing on the perspective of smart libraries.

5.2.1. Learning strategy

Given the relatively slow progress in smart library construction in Guangxi, coupled with the challenges of an aging librarian workforce and low educational attainment, it is crucial to strengthen the learning of smart library practices among librarians, teams, and the entire organization.

(1) Individual learning

Professional training: Encourage librarians to regularly participate in professional training that aligns with the development trends of smart libraries and their personal career needs.

Autonomous learning: Utilize smart library resources to create personalized learning paths and maintain a keen awareness of cutting-edge technologies.

Learning archive management: Establish personal learning archives to document learning outcomes, reflections, and career planning, supporting self-growth and organizational assessment.

(2) Team learning

Team seminars: Regularly organize interdisciplinary seminars, utilizing case studies, brainstorming, and other methods to stimulate innovative thinking.

Cross-departmental exchange: Develop a cross-departmental learning and exchange mechanism, fostering collaboration through mutual visits and joint projects.

Project-based learning: Encourage librarians to participate in smart library construction projects, enhancing their skills through practical experience.

(3) Organizational learning

Strengthen learning culture: Integrate the concept of smart library learning into the organizational culture, fostering an open and critical learning atmosphere.

Knowledge management system: Establish a knowledge management system to optimize the allocation of knowledge resources and share experiences in smart library construction.

5.2.2. Technical strategy

Addressing the challenges faced by Guangxi university libraries in terms of technology and equipment, funding, and a lack of professional talent, the following technical strategies are proposed.

(1) Technical infrastructure upgrade

Funding and resource allocation: Seek financial support from multiple sources, prioritizing the purchase of high-performance servers, the establishment of a cloud computing platform, and the deployment of IoT sensor systems.

Cutting-edge technology introduction: Leverage big data processing, cloud computing services, and IoT technologies to improve resource management efficiency.

(2) Technical talent team building

Technical training: Implement comprehensive technical skills training for librarians, covering areas such as data analysis, AI, and cloud computing.

Incentive mechanism: Establish an innovation incentive mechanism to recognize and reward individuals or teams that demonstrate outstanding performance in technology and service innovation.

(3) Technological innovation and application

Technical innovation team: Create a technical expert team to explore the application of new technologies in library operations.

Technical exchange platform: Develop a technical exchange platform that combines online and offline elements, facilitating knowledge sharing and technical collaboration.

5.2.3. Resource optimization strategy

In response to the issues of insufficient electronic resources and outdated physical space, the following resource optimization strategies are proposed.

(1) Electronic resource optimization

Intelligent knowledge management system: Develop an integrated intelligent system for efficient knowledge resource management.

Dynamic collection adjustment: Regularly evaluate and adjust electronic resource procurement based on discipline development and user behavior.

Resource sharing and cooperation: Expand the cooperation network, establish resource-sharing mechanisms, and reduce resource construction costs.

(2) Space resource transformation

Smart space transformation: Implement space transformation plans, incorporating smart devices and creating multifunctional smart spaces.

Diversified learning spaces: Plan and construct group discussion rooms, silent reading areas, etc., to provide a variety of learning environments.

Space management and services: Strengthen space management, offering personalized services to enhance user satisfaction.

5.2.4. Personnel optimization strategy

Addressing the shortage of highly educated talent and technical experts, the following personnel optimization strategies are proposed.

(1) Empowerment and autonomous growth

Clear responsibilities: Redefine librarian roles, granting autonomy and encouraging innovation.

Feedback mechanism: Collect opinions from teachers and students online to foster interaction between the library and its users.

Learning and communication: Encourage librarians to engage in learning activities and collaborate with smart library service providers.

(2) Talent introduction and training

Increase introduction efforts: Focus on recruiting high-level talent in areas such as information technology and data analysis.

Optimize training systems: Develop systematic training programs, providing learning resources and career advancement opportunities.

5.2.5. Organizational construction optimization strategy

(1) Strategic planning

Clearly define smart transformation goals, decompose tasks, and ensure funding, technology, and personnel support.

(2) Process optimization

Streamline existing processes, introduce workflow management systems, and achieve automation and intelligence. Adopt lean management and agile development principles to optimize processes and encourage innovation continuously.

5.2.6. Policy strategy

(1) Increase policy support and financial investment

The government and universities should continue to introduce policies supporting the development of smart libraries and increase financial investment.

(2) Cooperation Between University Libraries and Enterprises

Given limited funds, universities should seek partnerships with enterprises through sponsorship or collaborative research projects to obtain financial and technical support for smart library construction and development.

5.3. Future research directions

In order to improve the universality and applicability of research conclusions, future research should focus on the following directions.

(1) Expanding the scope of research

It should encompass more regions and levels of university libraries globally to reveal the commonalities and differences in library development across diverse cultural, economic, and educational backgrounds, thereby enhancing the broad applicability of the research findings.

(2) Employing comprehensive research methods

Building upon the continued use of quantitative research methods such as literature review and data analysis, future research should integrate qualitative research techniques like in-depth interviews and case studies. By collecting and analyzing multi-dimensional data (including user behavior, resource utilization, technology application impacts, etc.), a more comprehensive and in-depth research framework can be constructed to deeply understand the role and influence of libraries in higher education.

(3) Conducting long-term tracking research

Establishing long-term tracking observation points involves regularly collecting and analyzing relevant data to evaluate the impact of libraries on improving university performance, fostering knowledge innovation, and enhancing social services. This will provide a solid theoretical foundation and practical guidance for the sustained development of libraries over time.

(4) Adopting a global perspective on smart library research

Special attention should be given to the relationship between smart libraries and university performance. Analyzing the role of smart libraries in advancing university teaching, scientific research, and social services, as well as their influence on universities' global competitiveness and influence, will provide valuable insights and inspiration for university libraries worldwide. This, in turn, will promote the continuous innovation and development of the library profession.

Conflict of interest: The authors declare no conflict of interest.

References

Adigun, G. O., Ajani, Y. A., Enakrire, R. T. (2024). The intelligent libraries: Innovation for a sustainable knowledge system in the fifth (5th) Industrial Revolution. Libri, 74(3), 211-223.

Aithal, P. (2016). Smart library model for future generations. International Journal of Engineering Research and Modern Education (IJERME), 1(1), 693-703.

Aithal, P., Maiya, A. K. (2023). Innovations in Higher Education Industry–Shaping the Future. International Journal of Case Studies in Business, IT, and Education (IJCSBE), 7(4), 283-311.

Akter, M. (2021). Smart library management system (slms) using rfid technology Doctoral dissertation, University of Asia Pacific].

Amron, A., Budiantoro, R. A., & Wardhani, M. F. (2022). Smart university implementation in higher education to improve the graduates' competitiveness. Jurnal Kependidikan Penelitian Inovasi Pembelajaran, 6(2), 173-188.

Bi, S., Wang, C., Zhang, J., Huang, W., Wu, B., Gong, Y., Ni, W. (2022). A survey on artificial intelligence aided internet-of-things technologies in emerging smart libraries. Sensors, 22(8), 2991.

Camille, Damon. (2010). Strong Beginnings in Academic Libraries: Employee Orientations as a Start to a Learning Organization. 86, 52-54.

Chen, J., Guo, J., Xu, J., Shi, X. H. (2018). Architecture Planning of Smart Library. Digital Library Forum, 6, 2-7.

Egan, T. M., Yang, B., Bartlett, K. R. (2004). The effects of organizational learning culture and job satisfaction on motivation to transfer learning and turnover intention. Human resource development quarterly, 15(3), 279-301.

Ellinger, A. D., Ellinger, A. E., Yang, B., Howton, S. W. (2002). The relationship between the learning organization concept and firms' financial performance: An empirical assessment. Human resource development quarterly, 13(1), 5-22.

Göker, S. D., Göker, M. Ü. (2020). Rethinking innovative learning opportunities for teachers in educational organizations toward education 4.0. In Organizational Culture. IntechOpen.

Gul, S., Bano, S. (2019). Smart libraries: an emerging and innovative technological habitat of 21st century. The Electronic Library, 37(5), 764-783.

Gutterman, A. S. (2023). Organizational performance and effectiveness. Available at SSRN 4532570.

Hamad, F., Al-Fadel, M., & Shehata, A. M. K. (2024). The level of digital competencies for the provision of smart information service at academic libraries in Jordan. Global Knowledge, Memory and Communication, 73(4/5), 614-633.

Igwe, K. N., Sulyman, A. S. (2022). Smart libraries: Changing the paradigms of library services. Business Information Review, 39(4), 147-152.

Jenatabadi, H. S. (2015). An overview of organizational performance index: Definitions and measurements. Available at SSRN 2599439.

Joseph, F., Barry, J. B., Rolph, E. A., Rolph, E. A. (2010). Multivariate data analysis. Pearson Prentice Hall.

Juceviciene, P., & Edintaite, G. (2012). Organizational learning of teachers in higher education: challenges and opportunities of knowledge management. European Conference on Knowledge Management,

Marquardt, M. J. (2002). Building the Learning Organization: Mastering the 5 Elements for Corporate Learning. London: Davies-Black Pub.

Mashroofa, D. M. (2022, 12-Aug-2022). Transforming the libraries to adapt to global changes through smart library system Etakam Research Conference 2022, Jaffna University. http://ir.lib.seu.ac.lk/handle/123456789/6270

Mishra, A. (2020). Smart Technology for Libraries: An Emerging and Innovative Technological Habitat of this Century. Intelligent Technologies for Science and Engineering, 173.

Mohapatra, N., & Das, B. K. (2017). Modern Smart Library in the Information Age. INFOLIB: Knowledge Digest for LIS Professionals, 10(1-2), 1-6.

Muhamad, S. S., Darwesh, A. M. (2020). Smart university library management system based on the Internet of Things. UHD Journal of Science and Technology, 4(2), 63-74.

Pan, L. F. (2011). Research on the impact of human resource development on organizational performance in non-profit organizations [Doctoral Thesis, Wuhan University]. https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CDFDLAST2015&filename=1015536686.nh

Rane, J., Kaya, O., Mallick, S., Rane, N. (2024). Influence of digitalization on business and management: A review on artificial intelligence, blockchain, big data analytics, cloud computing, and internet of things. Generative Artificial Intelligence in Agriculture, Education, and Business, 1-26.

Renesch, J., Chawla, S. (2006). Learning organizations: Developing cultures for tomorrow's workplace. CRC Press.

Shahzad, K., Khan, S. A., & Iqbal, A. (2024). Identifying librarians' readiness to leverage artificial intelligence for sustainable competence development and smart library services: an empirical investigation from universities' librarians. Global Knowledge, Memory, and Communication.

Taouab, O., Issor, Z. (2019). Firm performance: Definition and measurement models. European Scientific Journal, 15(1), 93-106.

Tian, J., Zhou, J. L. (2020). Analysis of the model and system construction of smart library. Journal of Literature and Data, 2(2), 9.

Wang, S. S. (2014). An empirical study on the impact of learning organization construction on enterprise performance in medium-sized software enterprises [Master thesis, Jiangsu University of Science and Technology]. https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202201&filename=1014077354.nh

Xie, Y. N. (2024). List of National Colleges and Universities. Retrieved from http://www.moe.gov.cn/jyb_xxgk/s5743/s5744/A03/202406/t20240621_1136990.html

Yuan, J., Yang, N. (2024). On factors affecting users' willingness to participate in the smart services of academic libraries. Journal of Librarianship and Information Science, 56(2), 291-307.

Yunus, N., Nasir Ismail, M., Osman, G. (2023). Smart library themes and elements: A systematic literature review. Journal of Librarianship and Information Science, 09610006231207098.

Appendix Questionnaire: The impact of the learning university library model on organizational performance in Guangxi, China from the perspective of smart library

To Dear library colleagues

Thank you for taking the time out of your busy schedule to complete this questionnaire. This questionnaire aims to understand the relationship between Learning Organization and Organizational Performance in Guangxi University libraries under the background of Smart Library. This survey is purely academic, and the data obtained from the questionnaire will only be used for academic research and analysis. The questionnaire is filled out anonymously, with no right or wrong answers.

This questionnaire is divided into three parts. The first part is demographic information. The second part explores the impact of the Learning University Library model in Guangxi on Organizational Performance from the perspective of Smart Library. The third part is your suggestion. Other information you provide will contribute to the construction and development of the Guangxi University Smart Library. Thank you very much for your response. If you need more information or if there is anything we can do to help you complete or improve this questionnaire, please feel free to contact me.

Deng Min
Siam University

Part 1 Demographic Information

Remark: Please choose using ü in □ or fill in the information in the blank.

(1) Gender

☐ Male ☐ Female

(2) Age

☐ 26–35 ☐ 36–45

☐ 46–55 ☐ Over 56

(3) Education

☐ 1. Bachelor's Degree ☐ 2. Master's Degree

☐ 3. Doctor's Degree

(4) Position

☐ 1. Library Leader or Deputy Leader ☐ 2. Department Head or Deputy Head

Part 2 Relational Factors

The table below contains a series of statements about your library. Please read each statement carefully and select your opinion about your museum to answer 56 questions. The questionnaire uses a Likert scale, and each question is divided into 5 levels. 1 represents strongly disagree, 2 represents disagree, 3 represents neutral, 4 represents agree, and 5 represents strongly agree.

Table A1. xxx.

Item	**The Influence of Learning Organization Factors in Guangxi University Libraries**	**Answer based on your opinion of your library**				
		1	**2**	**3**	**4**	**5**
1. Learning						
1	Your librarians regard continuous learning as an important task and believe that it will help improve the quality of library services.					
2	Your library should guide librarians in planning their learning and self-development and cultivate librarians who can adapt to the requirements of library work and have comprehensive professional abilities.					
3	Use effective communication skills and methods among your library staff to prevent information distortion or blocking.					

4	Your library trains team members on how to work in a team and learn through a team.
5	Your library provides librarians with training and guidance on learning, and it considers this an investment rather than a cost.
6	Your librarians think and act in a systematic and integrated way.
2. Organization	
7	The leaders of your library have the concept of a Learning Organization.
8	Your library has created an environment that supports learning and recognizes its importance.
9	Your library recognizes individual Learning behaviors, team Learning behaviors, and behaviors that help others learn.
10	Your library's "14th Five-Year Plan" includes content about constructing a Learning library.
11	Your library's organizational structure is lean, flat, and flexible, which facilitates communication and mutual learning at different levels.
3. Personnel	
12	Your library implements decentralization and authorization and aligns individual responsibilities with their Learning abilities.
13	Your library leaders and staff work, learn, and solve problems in partnership.
14	Your library attaches great importance to readers' suggestions on library services, learns from readers, improves services, and provides readers with Learning opportunities.
15	Your library should actively participate in learning activities of professional library associations and academic institutions and seek learning partners among peers.
16	Your library attaches great importance to communication with library service providers and learns from them to the greatest extent possible.
4. Resource	
17	Your librarians actively collect information to improve the library's work.
18	Your museum often holds business competitions or business sharing sessions to promote business improvement or the promotion of new technologies.
19	Your library has a mechanism for systematically encoding, storing, and transmitting important Resources.
20	Your librarians recognize the importance of conducting learning and sharing that Learning with fellow librarians.
21	Your library will set up temporary cross-departmental teams according to work needs to facilitate information transfer between different departments.
5. Technology	
22	Your library has an efficient and fast library system to facilitate learning.
23	Your library supports learning through electronic multimedia and provides a colorful, lively, and effective learning environment.
24	Your library supports a comprehensive learning environment integrating digital tools, online platforms, tutoring programs, and hands-on workspaces.
25	Your library uses group technology to manage collective processes accurately and efficiently, as well as mine similarities to optimize strategies and resource allocation, covering project management, team collaboration, and meeting management.
26	Your library uses electronic tools to improve performance and promote learning so that you can do your job better.

Table A2. xxx.

Item	**The Impact of Learning University Library in Guangxi on University Library Performance**	**Answer based on your opinion of your library**

		1	2	3	4	5
6.1 Service Performance						
27	The librarians in your library are rich in professional Resources and can effectively solve problems. The quality and level of service are constantly improving.					
28	Your library's services are constantly increasing to meet the diverse needs of our readers.					
29	Your library's communication channels with readers are unobstructed, and its services can respond to readers' needs in real-time.					
6.2 Internal Management Performance						
30	With the support of advanced information Technology, your library has high internal management efficiency.					
31	Your library focuses on bringing out the expertise and potential of librarians, providing them with broad development space and a professional growth environment, and the librarians are highly motivated and satisfied with their work.					
32	Your library's internal communication channels are unobstructed, information is transmitted efficiently, and team collaboration is smooth.					
6.3 Learning and Growth						
33	Through continuous learning and training, your library helps librarians enrich their Resources, improve their skills, and optimize their services.					
34	Your library has created a strong atmosphere for Resource Learning and sharing. The reader service team has grown rapidly, the service quality has improved, and it has won recognition from readers.					
35	Your library should actively respond to the challenges of the Resource economy and smart libraries, formulate talent training strategies, build a Learning Organization, and inject force into the sustainable development of your library.					

Table A3. xxx.

Item	**The Influence of Smart Library Elements on University Libraries in Guangxi**	**Answer based on your opinion of your library**				
		1	**2**	**3**	**4**	**5**
7.1 Smart Technology						
36	Your library's wireless network connection (WIFI) has wide coverage and high fluency.					
37	Your library has a mobile library application, and readers can use their mobile phones to query book information, reserve books, renew books, etc., anytime and anywhere.					
38	Your library uses RFID Technology to realize book identification and self-service borrowing and returning, simplifying the borrowing process and eliminating the need for manual service.					
39	Your library provides a self-service query and navigation system with high spatial positioning accuracy. Readers can use the touch screen or mobile phone to query the specific location of books and find the books they need.					
40	Your library provides virtual reality (VR) or augmented reality (AR) experiences to bring readers a more immersive reading experience.					
41	Your library uses intelligent systems to monitor and automatically adjust the physical environment to ensure that the environment remains in the most suitable state.					
7.2 Smart Resource						
42	Your library has a rich digital collection, covering many e-books, cutting-edge online journals, professional databases, and diverse digital resources to meet your learning and research needs.					
43	space Resources with constantly updated forms, such as shared space, experience space, etc., and the level of intelligence of library space management is high.					

44	Your library can effectively integrate various information resources and build a unified search platform to facilitate readers' searching and obtaining the information they need at one stop.
45	The construction of cross-network access channels for your library's Smart Resource is in good condition, supporting remote access to electronic Resources after identity authentication.
46	Your library's information management platform focuses on reader experience and interactivity with a simple interface, easy operation, and rich functions.
7.3 Smart Librarian	
47	Your library supports librarians in Learning relevant Resources about smart libraries, provides librarians with diverse Learning and practice opportunities, and helps librarians continuously improve their abilities and qualities.
48	Your library has a plan and implementation plan for building a team of Smart Librarians.
49	Your library's librarian team has strong information Technology application capabilities, and a high proportion of them have professional backgrounds in library science, information science, and bibliography.
50	Your library's librarians have strong service capabilities and information literacy education skills. They can cultivate readers' information retrieval, analysis, and utilization capabilities, are proficient in retrieval tools, and can efficiently guide readers in obtaining information.
51	Your library's staff has strong innovation capabilities, dares to try new service methods and tools, and can propose innovative service solutions based on reader needs and market changes.
7.4 Smart Service	
52	Readers can easily make reservations and choose reading seats or personalized reading spaces through your library's self-service system.
53	The library's Resource discovery and utilization are highly accurate and convenient, and readers can quickly locate and enjoy efficient services.
54	Your library provides personalized information customization and Learning support services by collecting and analyzing readers' behavioral data, borrowing records, search histories, and other information.
55	Your library conducts information literacy education based on new technologies such as online education platforms, mobile Learning applications, virtual reality (VR) and augmented reality (AR), big data analysis, and artificial intelligence (AI).
56	Your library provides decision support services, including information collection and integration, information analysis and research, and customized special reports or decision-making consultations to meet the needs of different decision-makers.

Part 3 Suggestion

What problems does your library have in constructing a Learning Organization and Smart Library? From the perspective of Smart Library, what suggestions do you have for building a learning organization at the University Library in Guangxi and improving organizational performance?

Thank you for your cooperation in this study.