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# Smart Libraries as Mediators: Linking Learning University Library Models to Organizational Performance

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**Abstract**

**Background and Aim:** 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 mediator.

**Materials and Methods:** 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.

**Results:** The findings revealed that the smart library served as a key mediator, significantly enhancing the positive influence of the learning university library model on university library performance (standardized path coefficient$\beta$= 0.261, $p < 0.001$). Learning ($\beta$= 0.229，$p < 0.001$) and technology ($\beta$ = 0.225，$p < 0.001$) emerged as primary drivers of performance improvement, while resource, personnel, and organizational factors also played crucial roles.

**Conclusion:** This study contributes to interdisciplinary scholarship on smart libraries and learning organizations while offering actionable strategies for optimizing library performance and sustainable development in Guangxi and similar contexts. Despite its contributions, limitations include regional bias (Guangxi-focused sample) and reliance on self-reported data.

**Keywords**: Learning University Library Model; Smart Library; University Library Performance; Mediator Analysis; Structural Equation Modeling (SEM); University Library Management

## 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, 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 & Damon, 2010).

However, existing research inadequately addresses the interplay between learning organizations, smart libraries, and organizational performance in university settings—particularly in understudied regions like Guangxi, China. This study bridges this gap by investigating how smart libraries mediate the relationship between learning-oriented university libraries and their performance. By synthesizing learning organization theory and smart library frameworks, we propose a novel model tailored to Guangxi's unique socio-technical context. This research not only advances interdisciplinary scholarship but also addresses practical challenges in sustaining library competitiveness amid technological disruption.

## Objectives

This study explores the impact of the learning university library model on library performance in the background of the smart library through three objectives:

1. To identify and rank the relative importance of five key factors (learning, organization, personnel, resource, technology) impacting the performance of learning university libraries.

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



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3. To investigate the mediating role of smart libraries.

## Literature Review

### 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 & 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).

### 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 & 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 & Maiya, 2023; Göker & Göker, 2020).

This study applies Michael Marquart'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,



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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 & Sulyman, 2022; Marquardt, 2002).

**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 & 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.

**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. Research indicates that human resource management, leadership, organizational learning, enterprise resource planning, organizational excellence, and innovative culture have a significant impact on organizational performance(Singsa et al., 2020; A. Somjai et al., 2023; Somjai et al., 2023). 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 & 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.

**Mediator Effects of Smart Library**



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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. Resource integration enhances library performance, facilitating efficient user service (Mashroofa, 2022; Mohapatra & Das, 2017). Moreover, electronic human resource management emerges as a critical enabler of organizational performance(Khammadee, 2023).

Through intelligent devices and online learning platforms, smart libraries offer personalized services catering to users' learning experiences and outcomes. This innovation boosts user satisfaction and library performance (Gul & 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 & 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).

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

## Conceptual Framework

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.

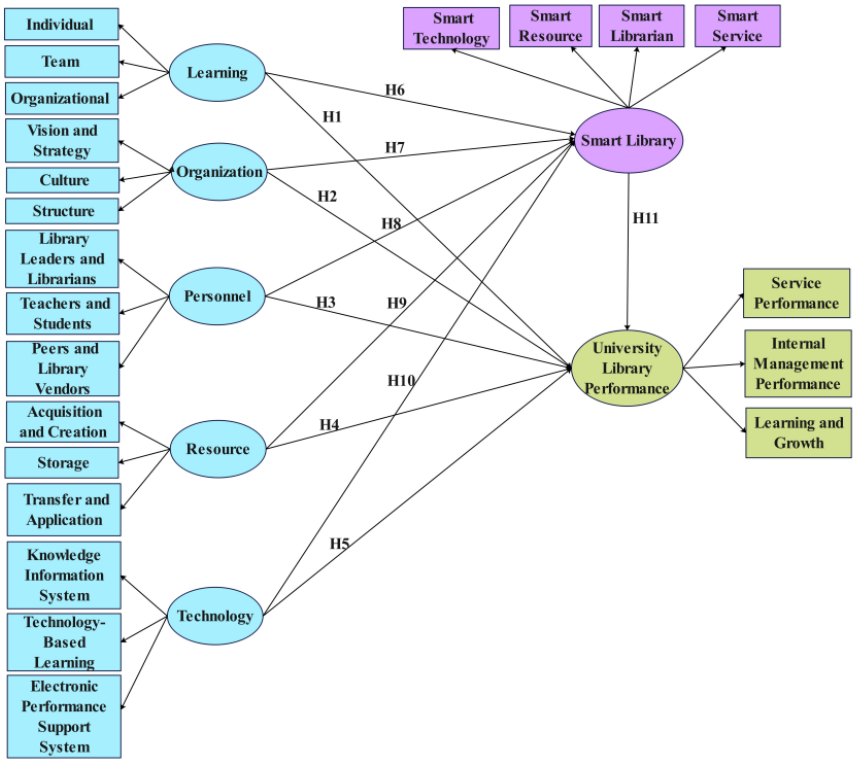


**Figure 1** Conceptual Framework
**Note:** Constructed by the researcher



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Consequently, we propose 11 hypotheses accordingly, as detailed in Table 1.

**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 the smart library. |
| H7 | Organization positively impacts the smart library. |
| H8 | Personal positively impacts the smart library. |
| H9 | Resource positively impacts the smart library. |
| H10 | Technology positively impacts the smart library. |
| H11 | Smart library positively impacts university library performance. |

## 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.

### Population and Sample Selection

This study covers all 40 ordinary university libraries in Guangxi (Xie, 2014). 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 a 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 (40*10) questionnaires, ensuring the reliability and universality of the research results.

### Questionnaire Design

The core content of 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 & Zhou, 2020; Wang, 2014).

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

Reliability was confirmed via Cronbach's α (>0.7 for all constructs; Table 2). Convergent validity (AVE > 0.5) and discriminant validity (AVE√ > inter-construct correlations) were established (Tables 3–4).

### Data Collection

The questionnaire was deployed through the Questionnaire Star platform (https://www.wjx.cn/). Participants provided informed consent, and data anonymization ensured confidentiality. Then, we utilized the personal connections of the members of the Guangxi University Library Working Committee to



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accurately distribute it to the target audience through QQ groups, WeChat groups, and other communication channels from May to June 2024. QQ groups and WeChat contact information are only used to distribute questionnaires and are not bound to questionnaire data.

**Data Analysis**

Descriptive statistical analysis was conducted using Statistical Product and Service Solutions (SPSS) to examine sample characteristics and data distribution. A structural equation model 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, a structural equation model was conducted using AMOS to verify the impact of learning university libraries on library performance and the mediating role of smart libraries. Using AMOS 24.0, SEM tested 11 hypotheses. Model fit indices (CFI = 0.998, RMSEA = 0.009) confirmed robustness. Path coefficients and *p*-values were calculated (Table 5). In addition, this study incorporated open-ended questions targeting the challenges and improvement suggestions regarding the development of learning organizations and smart libraries, thereby effectively supplementing quantitative data and enabling multidimensional interpretation with in-depth insights into the research findings.

## Results

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

**Description of Sample Characteristics**

The descriptive analysis focused on the gender, age, education, and position of university librarians in Guangxi. The sample was 85.81% female and 14.19% male, reflecting the local gender imbalance. Age distribution showed 14.87% aged 26–35, 44.39% aged 36–45, 23.57% aged 46–55, and 17.16% over 55, highlighting an older workforce potentially struggling with knowledge updating and technology adaptation. Educationally, 19.45% had bachelor's degrees, 62.24% had master's or higher, and 18.31% had doctorates, aligning with current qualifications but indicating few highly qualified individuals. Regarding position, 36.61% were leaders or deputy leaders, with 63.39% being department heads or deputies.

**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 indicate 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 meet the criteria for normal distribution.

**Reliability Analysis**

This study employs Cronbach's $\alpha$ coefficient to assess the reliability of the formal questionnaire scale. Table 2 presents the reliability analysis results. All scales and sub-dimensions exceed the 0.7 reliability threshold, confirming robust internal consistency.

**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 |



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| Scale | Variable | Number of items | Cronbach's α | |
|---|---|---|---|---|
| | 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 | 0.880 | |

## Validity Analysis

### 1. Fitness Test of Confirmatory Factors

Table 3 presents the fitness test results for the confirmatory factor models: the university library model, the modified smart library model, and the university library performance model. The indices for all these models confirm a good fit, making them ready 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 |

### 2. Convergent Validity Test

As demonstrated in Table 4, the learning university library exhibits composite reliability (CR) values ranging from 0.874 to 0.921 and average variance extracted (AVE) values between 0.582 and 0.701, both exceeding the recommended thresholds of CR>0.7 and AVE>0.5. The smart library demonstrates even stronger reliability, with CR values reaching a maximum of 0.983 (particularly for smart librarian competencies) alongside AVE values of 0.593-0.643. Regarding university library performance metrics, both CR (0.852-0.880) and AVE (0.658-0.710) values surpass established benchmarks. All measurement scales show acceptable factor loadings exceeding 0.6, collectively indicating robust convergent validity across constructs.

**Table 4** Results of Convergent Validity Test

| Scale | Variable | CR | AVE |
|---|---|---|---|
| Learning University Library | Learning | 0.921 | 0.632 |
| | Organization | 0.921 | 0.701 |
| | Personnel | 0.874 | 0.582 |
| | Resource | 0.885 | 0.606 |
| | Technology | 0.895 | 0.631 |
| Smart Library | Smart Technology | 0.915 | 0.643 |
| | Smart Resources | 0.879 | 0.593 |
| | Smart Librarians | 0.983 | 0.626 |
| | Smart Services | 0.889 | 0.617 |
| University Library Performance | Service Performance | 0.869 | 0.688 |
| | Internal Management Performance | 0.852 | 0.658 |
| | Learning and Growth | 0.880 | 0.710 |



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### 3. Discriminant Validity

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 the Discriminant Validity Test

| Latent Variable | Learning | Organization | Personnel | Resource |
|---|---|---|---|---|
| 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 |
| **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 | |

### The Structural Equation Models and Hypothesis Testing

As shown in Figure 2, all the fit indices of the SEM established in this study meet the fit criteria, suggesting that the model has a good fit.



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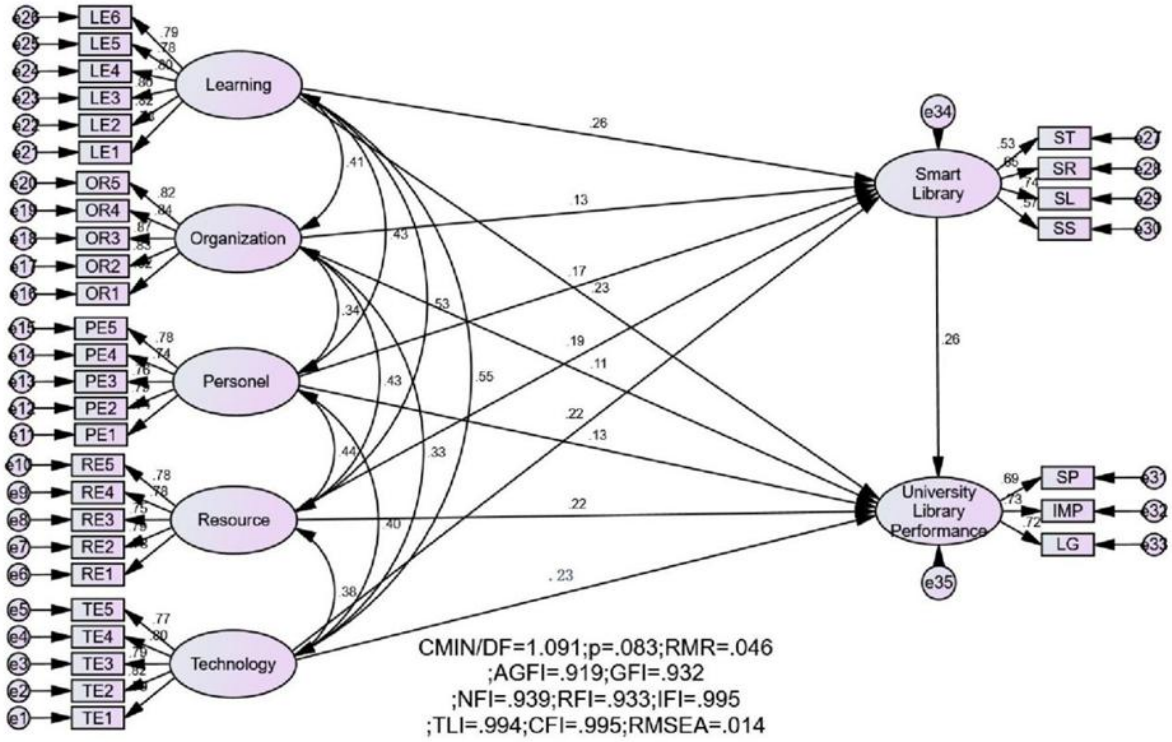


**Figure 2** Structural Equation Model
**Note:** Constructed by the researcher

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 impact 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 the smart library. The standardized path coefficient for learning in the smart library is 0.255, with $p < 0.001$. Therefore, this hypothesis is accepted.

H7: Organization positively impacts the 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 impact the 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 the smart library. The standardized path coefficient for resource on smart library is 0.187, with $p < 0.01$. Therefore, this hypothesis is accepted.



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H10: Technology positively impacts the 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 the 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 | Personnel → 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 | Personnel → 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.

**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: funding constraints (76%), outdated hardware and software infrastructure (62%), underdeveloped database systems (60%), scarcity of skilled personnel (58%), and a lack of service innovation (50%).

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.

## Discussion and Conclusion

The main objectives of this study are discussed as follows.



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**Research Objective 1**: To identify and rank the relative importance of five key factors (learning, organization, personnel, resource, technology) impacting the performance of learning university libraries.

Five crucial factors are validated as significant in the construction and performance of learning university libraries. Learning and technology are the main drivers of performance improvement, but resource, personnel, and organizational factors also play an important role.

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. Prioritize technological upgrades and staff training. Develop cross-departmental learning initiatives to mitigate skill gaps.

**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.

## 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.

### 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.



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Autonomous learning: Implement AI-powered training platforms and personalized learning paths for librarians 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.

**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.

**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.



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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.

**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. 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.

**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.

**7. Future Research Directions**

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



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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.

## 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. S. (2016). Smart library model for future generations. *International Journal of Engineering Research and Modern Education, 1*(1), 693–703.

Aithal, P. S., & Maiya, A. K. (2023). Innovations in the 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. *Library Journal, 86*, 52–54.

Chen, J., Guo, J., Xu, J., & Shi, X. H. (2018). Architectural planning of a smart library. *Digital Library Forum, 6*, 2–7.

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 the 21st century. *The Electronic Library, 37*(5), 764–783.

Gutterman, A. S. (2023). Organizational performance and effectiveness. *SSRN*. https://doi.org/10.2139/ssrn.4532570

Hamad, F., Al-Fadel, M., & Shehata, A. M. K. (2024). The level of digital competencies for the provision of smart information services 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. *SSRN*. https://doi.org/10.2139/ssrn.2599439

Joseph, F., Barry, J. B., Rolph, E. A., & Rolph, E. A. (2010). *Multivariate data analysis* (7th ed.). 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*.



Citation
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Khammadee, P. (2023). The relationship between e-HRM practices and organizational performance: The mediating role of organizational agility and sustainable competitive advantage. *Asian Administration and Management Review, 6*(1), 82–94.

Marquardt, M. J. (2002). *Building the learning organization: Mastering the 5 elements for corporate learning*. Davies-Black Publishing.

Mashroofa, D. M. (2022, August 12). Transforming the libraries to adapt to global changes through a smart library system. *Etakam Research Conference 2022, University of Jaffna*. 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. In *Intelligent Technologies for Science and Engineering* (Vol. 173).

Mohapatra, N., & Das, B. K. (2017). Modern and 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 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 dissertation, 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. In *Generative Artificial Intelligence in Agriculture, Education, and Business* (pp. 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. *Global Knowledge, Memory, and Communication*. https://doi.org/10.1108/GKMC-01-2023-0023

Singsa, A., Pamornmast, C., & Sriyakul, T. (2020). The impact of leadership, organizational excellence, and ERP on organizational performance: A case of SMEs in Thailand. *Asian Administration and Management Review, 3*(2), 1–14.

Somjai, A., Sirinapatpokin, S., & Kumtabut, O. (2023). How the critical success factors of knowledge management affect organizational performance and strategy. *Asian Education and Learning Review, 1*(2), 62–78.

Somjai, S., Siriattakul, P., & Jaepho, S. (2023). Organizational learning and innovative culture as potential mediators connecting leadership with performance: A study on Thai SMEs. *Asian Education and Learning Review, 1*(2), 14–26.

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 the 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's thesis, Jiangsu University of Science and Technology]. https://kns.cnki.net/kcms/detail/detail.aspx?dbname=CMFD202201&filename=1014077354.nh

Xie, F. (2014). On the function and construction of a smart university library. *Library Science Research, (6)*, 15–20.

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.



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Yunus, N., Ismail, M. N., & Osman, G. (2023). Smart library themes and elements: A systematic literature review. *Journal of Librarianship and Information Science*. https://doi.org/10.1177/09610006231207098



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