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**Knowledge Management Capability and
Innovator Mindset as Mediators in the SECI
Model's Impact on Human Library
Innovation Performance in Chinese
Universities**



Abstract: The widespread development of human library activities in Chinese universities has garnered continuous attention from the academic community. However, there are currently few papers utilizing knowledge management tools to assess the impact of human library activities on innovation within Chinese university libraries. This study intends to analyze the innovation performance of human libraries using the SECI knowledge management paradigm, which is considered a management innovation. This study based on a theoretical framework, employs an explanatory mixed research method to explore the roles of two intermediary variables, knowledge management capability and innovator mindset, in the influence of SECI model application on human library innovation performance. The research findings indicate that while SECI model application directly affects human library innovation performance, effectively utilizing SECI model application can positively facilitate both innovator's mindset and knowledge management capability, thereby indirectly better enhancing library innovation performance. This discovery holds significant value for library managers and researchers, providing guidance for the formulation of more effective strategies to improve library innovation performance. This study employs knowledge management concepts and tools to promote the design and implementation of university human library activities.

Keywords: human library; SECI model application; knowledge management capability; innovator mindset; innovation performance

1. INTRODUCTION

Human libraries are a special form of reading where people are referred to as "book". Its readers can obtain knowledge and experience through "borrowing" human books. In 2008, Chinese-American Librarian Professor Zeng Lei introduced the human Library to China through the "Advanced Seminar on Preface of Digital Library" (Xu, 2021). University libraries, public libraries, public welfare institutions, and individuals organize human libraries in China (Wu, 2020). University libraries use their knowledge, environment, and culture to drive Human Library activities (Tan & Hu, 2018). In 2017, China's universities included Shanghai Jiao Tong University, Zhe Jiang University, Nanjing Normal University, Dalian University for Nationalities, Yang Zhou University, Suzhou University, Shanghai University, Sichuan

University, Southern Medical University, Southwest Petroleum University, University of Electronic Science and Technology, and Chong Qing University. In addition, over 30 universities, including the China University of Geosciences, have live library activities (Liu & Chen, 2015).

2. LITERATURE REVIEW

2.1 Human Library Innovation Performance

Rowley (2011) recommended a seven-part library innovation strategy: innovation ability and culture; innovation portfolio; innovation process; innovation leadership; innovation and creative teams; open innovation and cooperation; and user participation in innovation. Jantz (2013) wrote a seminal paper on library innovation performance. He suggested that senior team cohesion, structural differentiation, the external environment, and ambient orientation are essential elements affecting library innovation performance (Tanveer et al 2020). Wang (2022) believes organizational innovation values and librarian intrinsic motivation will considerably affect library innovation. Researchers have uncovered a variety of innovation performance characteristics that might assist organization in understanding them, developing strategies, and improving innovation performance

(Rowley, 2011; Jantz, 2015; Xu & Zhang, 2012; Wang, 2022).

2.2 SECI Model Application

Nonaka and Konno (1998) introduced the concept of ba, which refers to the material, interpersonal, and spiritual components of "place" or, perhaps more broadly, "context." The four different notions of Ba that together make up the "knowledge spiral" are defined in relation to each of the four quadrants of the SECI model (Adapted from: Ikujiro Nonaka & Noboru

Konno, The Concept of 《Ba》 : Building a Foundation for Knowledge Creation. California management Review VOL40, pages 40-54, 1998.)

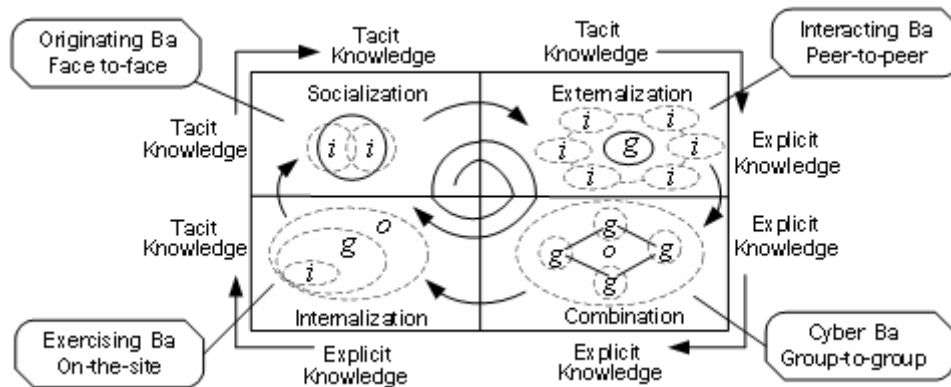


Figure 1 SECI Model and Ba Source: (Grundstein, 2014, 5-6)

This study fully integrates the theory and practice of Chinese university human libraries and creates a SECI model that matches Chinese institutions (Jieru & Khan, 2024). However, most participants in human library activities only summarize and reflect on human library practices. Therefore, establishing this model is valuable. As shown in Table 1. The model is based on the SECI model improved by Nonaka and Konno (1998).

Table 1 SECI Application Model of Human Libraries in Chinese Universities

Activity subject	Stage	Solve the problem	How to achieve	Conditional support
University library	Originating Ba (Socialization)	knowledge sharing	Determine the willingness to share book	The librarian's keen thesense of smell
	Interacting Ba (Eternalization)	knowledge transfer	Interaction between human books and colleageatmosphere readers	Good interactive
Cyber Ba	(Combination)	Knowledge Integration	Application of network information technology	Library's attention and investment in knowledge management
	Exercising Ba (Internalization)	knowledge application	business reengineering	Innovative behavior of librarians

(1) Originating Ba (knowledge sharing) —determine the willingness to share from human books

The human book will talk to the human library's founder. The activity will help summarize the human book's "story." Restructuring and refining the human book organizes tacit knowledge. The content of the human book needs to be screened and refined, and the lending of the human book is generally free (Zhu & Cai, 2021). If

the human book is willing to share, it can realize the knowledge sharing facing readers.

(2) Interacting Ba (knowledge transfer) — interactive interaction between human books and university readers

Interacting Ba represents knowledge transfer and externalization. Human books recount this scene. (1) Sit with readers, integrate with readers, and establish a close and equal reading relationship (Yang & Wang, 2022);

(2) Two-way interactive communication relationship (Zhu

& Cai, 2021). Borrowing usually takes 30 minutes (Zhang, 2023). Human book and university readers have created a shared semantic space. The human book gains self-esteem from reader praise and imparts knowledge.

(3) Cyber Ba (knowledge integration) —network information technology

The knowledge record, preservation, reuse, and other links of the human library contain this virtual scene (Li & M.S, 2023). Processing information technology media will systematize explicit knowledge (Song et al., 2022). Knowledge transformation requires multimedia technology in the information society (Nong & Liu, 2022). Some Chinese university libraries prioritize knowledge preservation and reuse (Y. Wu & Zhang, 2021).

(4) Exercising Ba (knowledge application) —business reengineering

This scenario requires readers to absorb and apply their knowledge. Because applying knowledge in real life or simulations improves internalization, university libraries should create a practical field for readers (Yuan & Zhu, 2021). The practice field internalizes organizational knowledge into individual tacit knowledge.

2.3 Knowledge Management Capability

Liu & Deng (2015) describe KMC as creating, transferring, applying, and retaining knowledge. Mao et al. (2015) claimed that KMC uses knowledge resources for competitive advantage. Naqshbandi & Jasimuddin (2018) defined KMC as knowledge processing and infrastructure. Technology, structure, and culture support knowledge acquisition, transformation, application, and protection. Xie et al. (2019) define KMC as the ability of an enterprise to integrate and coordinate knowledge resources around knowledge activities and business processes.

2.4 Innovator's Mindset

According to harvard business school professor Clayton Christensen(2013), innovators should be independent, constantly look for opportunities, believe they can see things others miss, experiment with new ideas, learn from their mistakes, and draw inspiration from various fields and industries to apply to their work. Seelig (2015) suggests analyzing attitudes and cognitive biases to promote creativity (Waheed, A. *et al.* 2023). She thinks reflection, experimentation, and learning may inspire creation: creativity, confidence, and ingenuity increase. Couros (2016) describes an innovator's mindset as believing they can improve their intelligence, abilities, and ideas.

2.5 Research Framework

After analysing the theory and relevant literature, the researcher realized that it could be used to build the framework of the research theoretical framework depicted in figure 2

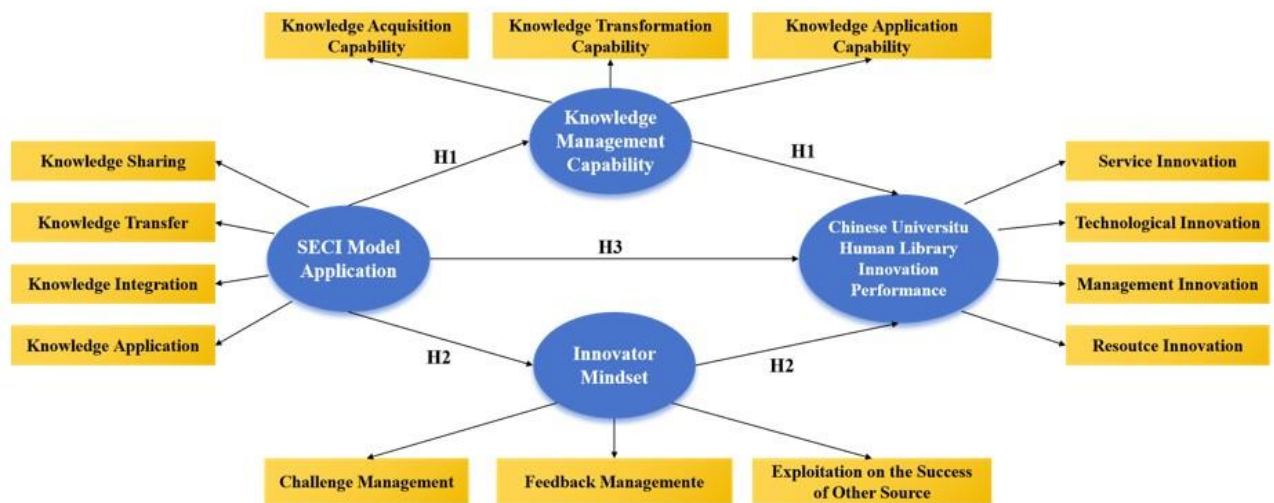


Figure 2 Research Conceptual Framework of Human Library Innovation Performance

This research aims to understand better what drives and affects human libraries' performance. The dependent variable is human library innovative performance, while the SECI knowledge management model is the independent variable. Moreover, the two more variables,

knowledge management capability (abbreviated as KMC), and innovator's mindset (Abbreviated as IM), are mediating variables (Khan et al. 2022).

3.1 Research design

The research will use an Explanatory Sequential Design - a two-phase approach, in which quantitative data will be gathered and analyzed first, followed by qualitative data gathered and evaluated depending on the outcomes of the quantitative portion of the study. An explanatory-sequential strategy is a sequential approach utilized when the researcher wants to supplement quantitative findings with qualitative data. As a result, the qualitative data is employed in later interpreting and clarifying the quantitative data analysis results. Because the QUAN design is the focus in many cases, a generic qual design is used in explanatory ways. This two-phase strategy is very valuable for a researcher who wants to explain the findings of the study's first phase using qualitative data gathered during Phase two (Edmonds & Kennedy,

2016, P.196). A mixed explanatory method advantage is that combining quantitative and qualitative methods helps balance drawbacks and strengthen evidence and trust in conclusions. Moreover, it yields finer results than any method. However, the shortcomings are that combining approaches involves more time, money, and experience to gather, analyse, and

interpret data than one method (www.gov.uk).

3.2 Sample Frame and data collection

3.2.1 Quantitative data collection and Sampling

The sampling frame of the study is a list of staff members from China university library , This study will use multi-stage sampling techniques, also known as multi-stage sampling or segmented sampling.The research framework encompasses 14 dimensions, the recommended

sample size should be $14 \times 20 = 280$ units. To account for potential non-responsive questionnaires and the impact of personnel reductions among Chinese library staff, an additional 60% of questionnaires ($280 \times 1.6 = 448$) were added to the base sample size of 280 units. These 448 questionnaires were distributed via the online platform "Wen Juan Xing" within Chinese library QQ groups, encompassing library staff from universities across all four regions of China. A total of 421 questionnaires were collected gradually. These 421 questionnaires

underwent a

rigorous screening process with three main criteria: (1) The exclusion of questionnaires with significantly abnormal response times, where those with response times less than 60 seconds were removed; (2)The identification of questionnaires with logical inconsistencies; (3)The detection of questionnaires where all six consecutive responses were the same.Through this screening process, 407 valid questionnaires were retained for analysis.

3.2.2 Qualitative data collection and Sampling

According to Creswell (1998, P.56), qualitative sample sizes of 20-30 are commonly used by researchers to ensure sufficient information. In the qualitative approach, they are referred to as informants. Purposive sampling will be used by the researcher to select informants as

follows:

Table 2 Part A: Background of Personnel in Qualitative Interviews

Number of informants based on their background			
Gender	Male = 1	Female = 1	
Years of work:	Less than 5 years=1	6-10 years = 1	Over 11 years= 1
Level of education	B.A. = 1	M.A. = 1	Ph.D. = 1
Job status:	Library frontline	Department Director or	Library Director or
	personnel = 1	Deputy Director = 1	Deputy Director = 1
	4	4	3
Total numbers = 11 informants			

Table 3 Part B: Questionnaire Scores for Each Variable

Variables	The lowest	The middle	The highest
SECI Model application	1	1	1
KMC	1	1	1
Library Innovation Performance	1	1	1
Innovator Mindset	1	1	1
	4	4	4

Total numbers = 12 informants

The total number of informants from both parts one and two is 23 informants. 23 information are all Chinese university librarians.

3.3 Research method

3.3.1 Quantitative analysis method based on structural equation model.

The study employed SPSS27.0 software and Smart-PLS 4.0 for data analysis and interpretation. The data included variables such as human library innovative performance (dependent variable), SECI model application (independent variable), as well as knowledge

management capability and innovator's mindset (mediator variables). In the quantitative analysis section, statistical analysis software were used to conduct descriptive statistics, reliability analysis, factor analysis, and test the direct effects and mediating effects of the model, as well as predict the model's fit based on the 407 valid sample data collected through a questionnaire survey.

3.3.2 *Qualitative analysis method based on text analysis.*

This study conducted interviews with 23 representative librarians and used data mining analysis tools such as Python and the Chinese open-source tool "Wei Ci Yun". Through text analysis, it explored the underlying influencing factors and potential mechanisms among four variables discussed in this paper, involving techniques such as frequency statistics and semantic network analysis.

4. Results and findings

This section focuses on data analysis using Smart-PLS 4.0, a commonly used software tool for structural equation modelling. It is employed to assess the validity and reliability of the measurement model and analyse relationships within the structural model. By establishing a measurement model and constructing a structural model, it aims to examine the connections between variables. Subsequently, the qualitative data from 23 interviewees is analysed using the "Wei Ci Yun" software. "Wei Ci Yun" is a qualitative research tool designed for organizing, coding, summarizing, and analysing semi-structured or unstructured text data. This software is utilized to uncover patterns, themes, and trends, with the objective of extracting valuable insights from the interviews.

4.1 *Quantitative Data Analysis*

In this study, a total of 448 formal questionnaires were distributed. Given that the research framework encompasses 14 dimensions, the recommended sample size should be $14 \times 20 = 280$ units. To account for potential non-responsive questionnaires and the impact of personnel reductions among Chinese library staff, an additional 60% of questionnaires ($280 \times 1.6 = 448$) were added to the base sample size of 280 units. These 448 questionnaires were distributed via the online platform "Wen Quan Xing" within Chinese library QQ groups, encompassing library staff from universities across all four regions of China. As an incentive, the study offered a 5

RMB reward for completing the questionnaire. Over the course of one month, a total of 421 questionnaires were collected gradually. These 421 questionnaires underwent a rigorous

screening process with three main criteria: (1) The exclusion of questionnaires with

significantly abnormal response times, where those with response times less than 60 seconds were removed; (2) The identification of questionnaires with logical inconsistencies; (3) The detection of questionnaires where all six consecutive responses were the same. Through this screening process, 407 valid questionnaires were retained for analysis.

4.1.1 *Descriptive Statistics*

Descriptive statistics is the most fundamental statistical method used to organize, categorize, simplify, or represent data obtained in research. It involves describing and summarizing the characteristics of data and the relationships between variables. It mainly includes frequency analysis of data, analysis of central tendencies, analysis of data dispersion, data distribution, and some basic statistical graphs. In this study, data were described from the perspectives of distribution status, numerical characteristics, and relationships between variables. During data analysis, it is generally advisable to start with descriptive statistical analysis to uncover underlying patterns and then select further analysis methods.

In this study, the overall sample distribution was described in terms of five aspects: gender, years of work experience, education level, region, and job role.

Table 4 Statistical Table of Survey Sample Distribution

Name	Options	Frequency	Percentage (%)
Gender	male	107	26.3
	female	299	73.7
Years of Work	less than 5 years	84	20.6
	6-10 years	116	28.5
	Over ten years	207	50.9
Educational Level	junior college	39	9.6
	undergraduate course	146	35.9
	master	198	48.6
	doctor	9	2.2
	other	15	3.7
Region	Central region	80	19.7
	Eastern region	40	9.8
	Southern region	94	23.1
	Northern region	173	42.5
Work Status	library frontline personnel	267	65.6
	department director or deputy director	92	22.6
	library director or deputy director	48	11.8
	Total	407	100.0

From Table 4, most respondents are female (73.7%). Over half of the respondents have over ten years of work experience (50.9%). Nearly half of the respondents have a master's degree (48.6%). Most of the respondents are from the Northern region (42.5%). Over two-thirds of the respondents are library frontline personnel (65.6%).

In order to verify that the distribution of the formal sample data adheres to the necessary properties of a normal distribution, a multivariate normal analysis is conducted on the independent and dependent variables encompassed within the initial model. This analysis encompasses assessments of the mean, standard deviation, kurtosis, and skewness.

Table 5 Descriptive Statistical Table for Human Library Innovation Performance

Dimension	Variable	Average Value Statistics	Standard Deviation Statistics	Skewness		Kurtosis		Dimension
				Statistics	Standard Error	Statistics	Standard Error	
Service	SI1	3.693	1.222	-0.786	0.121	-0.275	0.241	
	SI2	3.759	1.216	-0.901	0.121	-0.088	0.241	
	SI3	3.735	1.221	-0.835	0.121	-0.202	0.241	
	SI4	3.799	1.225	-0.950	0.121	-0.037	0.241	

Innovation	SI5	3.624	1.255	-0.704	0.121	-0.486	0.241	
Technological Innovation	TI1	3.582	1.215	-0.748	0.121	-0.333	0.241	3.652
	TI2	3.585	1.216	-0.747	0.121	-0.339	0.241	
	TI3	3.717	1.202	-0.862	0.121	-0.104	0.241	
	TI4	3.661	1.201	-0.748	0.121	-0.258	0.241	
	TI5	3.713	1.197	-0.870	0.121	-0.077	0.241	
Management Innovation	MI1	3.722	1.201	-0.875	0.121	-0.082	0.241	3.741
	MI2	3.720	1.193	-0.896	0.121	-0.026	0.241	
	MI3	3.737	1.210	-0.874	0.121	-0.112	0.241	
	MI4	3.774	1.217	-0.928	0.121	-0.047	0.241	
	MI5	3.749	1.220	-0.868	0.121	-0.151	0.241	
Resource Innovation	RI1	3.717	1.204	-0.855	0.121	-0.121	0.241	3.728
	RI2	3.735	1.211	-0.868	0.121	-0.123	0.241	
	RI3	3.818	1.244	-0.939	0.121	-0.121	0.241	
	RI4	3.690	1.194	-0.832	0.121	-0.126	0.241	
	RI5	3.769	1.222	-0.902	0.121	-0.105	0.241	

Based on table 5, the average rating for service innovation was 3.624 to 3.799 on a scale of

1 to 5. All service innovation dimensions had standard deviations between 1.216 and 1.255, indicating considerable response variance. Negative skewness and kurtosis in all service innovation aspects indicated a left-skewed data distribution that peaked more steeply than a normal distribution. Respondents scored technological innovation dimensions 3.582–3.717 on a 1–5 scale. All technological innovation dimensions had standard deviations between 1.201 and 1.216, indicating considerable response heterogeneity. All technological innovation dimensions had standard deviations between 1.201 and 1.216, indicating considerable response heterogeneity. These measures revealed negative skewness and kurtosis, indicating a left-skewed data distribution with a sharper peak than a normal distribution. On a scale of 1 to 5, respondents evaluated management innovation dimensions 3.720–3.774. The standard deviations for all management innovation variables were between 1.193 and 1.220, indicating considerable response heterogeneity. Negative skewness and kurtosis indicated a left-skewed data distribution that peaked more steeply than a normal distribution for all management innovation parameters. Finally, the average rating for resource innovation dimensions was

3.690 to 3.818 on a scale of 1 to 5. All resource innovation dimensions had standard deviations between 1.194 and 1.244, indicating moderate response variation. Resource innovation dimensions revealed negative skewness and kurtosis, indicating a left-skewed data distribution with a sharper peak than a normal distribution. According to the data, respondents had an overall favorable perception of the library's innovation performance across all four categories.

Table6 Descriptive Statistics Table for SECI Model Application

Dimension	Variable	Average Value Statistics	Standard Deviation Statistics	Skewness		Kurtosis		Dimension
				Statistics	Standard Error	Statistics	Standard Error	
Knowledge Sharing	KS1	3.791	1.219	-0.956	0.121	-0.008	0.241	3.744
	KS2	3.781	1.213	-0.955	0.121	0.008	0.241	
	KS3	3.732	1.211	-0.861	0.121	-0.134	0.241	
	KS4	3.715	1.204	-0.849	0.121	-0.132	0.241	
	KS5	3.703	1.196	-0.850	0.121	-0.105	0.241	
Knowledge	KT1	3.575	1.217	-0.723	0.121	-0.368	0.241	
	KT2	3.555	1.208	-0.711	0.121	-0.360	0.241	
	KT3	3.555	1.212	-0.697	0.121	-0.385	0.241	
	KT4	3.595	1.212	-0.786	0.121	-0.281	0.241	

Transfer	KT5	3.580	1.213	-0.750	0.121	-0.328	0.241	
Knowledge Interaction	KI1	3.744	1.209	-0.894	0.121	-0.077	0.241	3.723
	KI2	3.744	1.195	-0.942	0.121	0.043	0.241	
	KI3	3.708	1.204	-0.836	0.121	-0.148	0.241	
	KI4	3.708	1.202	-0.843	0.121	-0.132	0.241	
	KI5	3.713	1.203	-0.849	0.121	-0.126	0.241	
Knowledge Application	KA1	3.496	1.213	-0.598	0.121	-0.491	0.241	3.559
	KA2	3.570	1.213	-0.725	0.121	-0.357	0.241	
	KA3	3.577	1.217	-0.729	0.121	-0.361	0.241	
	KA4	3.572	1.207	-0.753	0.121	-0.310	0.241	
	KA5	3.580	1.221	-0.721	0.121	-0.380	0.241	

From table 6, on a scale of 1 to 5, respondents evaluated average knowledge-sharing dimensions between 3.703 - 3.791. knowledge-sharing dimensions had standard deviations between 1.196 and 1.219, indicating considerable response variation. They had negative skewness and kurtosis, indicating a left-skewed data distribution that peaked more sharply than a normal distribution. On a scale of 1 to 5, respondents ranked knowledge transfer dimensions between 3.555 and 3.595 on average. Knowledge transfer dimensions indicated moderate heterogeneity in responses, with standard deviations ranging from 1.208 to 1.217. The measure showed negative skewness and kurtosis, indicating a left-skewed and sharper peak than a normal distribution. Respondents scored knowledge interaction dimensions 3.708-3.744 on a

1-5 scale. All knowledge interaction dimensions had standard deviations between 1.195 and

1.209, indicating substantial response variation. Knowledge interaction dimensions had negative skewness and kurtosis, indicating a left-skewed data distribution that peaked more steeply than a normal distribution. Knowledge application dimensions are between 3.496 and

3.580. All knowledge application dimensions had 1.207–1.221 standard deviations, indicating high response variation. Due to negative skewness and kurtosis, knowledge application

dimension data peaked more abruptly than a normal distribution. The survey indicates that respondents had a positive view of the SECI model in the library. Standard deviations show some response variance. The data's negative skewness and kurtosis show that a tiny group of respondents strongly favor or oppose the SECI model in the library.

Table 7 Descriptive Statistics Table for Knowledge Management Capability

Dimension	Variable	Average Value Statistics	Standard Deviation Statistics	Skewness		Kurtosis		Dimension
				Statistics	Standard Error	Statistics	Standard Error	
Knowledge Acquisition Capability	KAC1	3.774	1.217	-0.928	0.121	-0.047	0.241	3.746
	KAC2	3.740	1.216	-0.861	0.121	-0.149	0.241	
	KAC3	3.774	1.219	-0.922	0.121	-0.064	0.241	
	KAC4	3.720	1.210	-0.842	0.121	-0.158	0.241	
	KAC5	3.722	1.211	-0.842	0.121	-0.163	0.241	
Knowledge Transformation	KTC1	3.720	1.212	-0.835	0.121	-0.173	0.241	3.743
	KTC2	3.769	1.222	-0.902	0.121	-0.105	0.241	
	KTC3	3.762	1.209	-0.927	0.121	-0.025	0.241	
	KTC4	3.732	1.217	-0.842	0.121	-0.182	0.241	
	KTC5	3.732	1.215	-0.848	0.121	-0.166	0.241	
Knowledge Application Capability	KPC1	3.690	1.207	-0.816	0.121	-0.204	0.241	3.694
	KPC2	3.693	1.208	-0.799	0.121	-0.220	0.241	
	KPC3	3.678	1.204	-0.798	0.121	-0.223	0.241	
	KPC4	3.710	1.203	-0.859	0.121	-0.125	0.241	
	KPC5	3.700	1.191	-0.865	0.121	-0.066	0.241	

From table 7, The knowledge acquisition capability dimensions are between 3.720 - 3.774 on a scale of 1 to 5. All knowledge acquisition capability variables had standard deviations between 1.210 and 1.219, indicating substantial response variation. The dimensions had negative skewness and kurtosis, indicating a left-skewed data distribution with a sharper peak than a normal distribution. The knowledge transformation competency dimensions were rated

3.720–3.769 on a 1–5 scale. Response heterogeneity was evident in all knowledge transformation capability variables' standard deviations between 1.209 and 1.222. Negative skewness and kurtosis represented a left-skewed data distribution with a sharper peak than typical. Respondents rated knowledge application skills as 3.678–3.710. Knowledge application capability measures had standard deviations between 1.191 and 1.208, indicating moderate response heterogeneity. Negative skewness and kurtosis represented a left-skewed data distribution with a sharper peak than typical.

Table 8 Descriptive Statistics Table for Innovator’s Mindset

Dimension	Variable	Average Value Statistics	Standard Deviation Statistics	Skewness		Kurtosis		Dimension
				Statistics	Standard Error	Statistics	Standard Error	
Challenge Management	CM1	3.727	1.214	-0.842	0.121	-0.172	0.241	3.709
	CM2	3.705	1.210	-0.809	0.121	-0.205	0.241	
	CM3	3.720	1.218	-0.816	0.121	-0.220	0.241	
	CM4	3.681	1.214	-0.746	0.121	-0.302	0.241	
	CM5	3.710	1.215	-0.803	0.121	-0.231	0.241	
Feedback Management	FM1	3.703	1.213	-0.797	0.121	-0.231	0.241	3.734
	FM2	3.749	1.214	-0.888	0.121	-0.103	0.241	

	FM3	3.715	1.221	-0.797	0.121	-0.256	0.241	
	FM4	3.784	1.223	-0.929	0.121	-0.064	0.241	
	FM5	3.720	1.222	-0.803	0.121	-0.250	0.241	
Exploitation on The Success	ES1	3.686	1.217	-0.746	0.121	-0.313	0.241	3.696
	ES2	3.695	1.230	-0.728	0.121	-0.375	0.241	
	ES3	3.688	1.199	-0.811	0.121	-0.168	0.241	
	ES4	3.715	1.211	-0.829	0.121	-0.179	0.241	

Form table 8, challenge management ratings ranged from 3.681 to 3.727 on a scale of 1 to

5. The dimensions had standard deviations between 1.210 and 1.218, indicating substantial response variance. Negative skewness and kurtosis indicated a left-skewed data distribution with a sharper peak than a normal distribution. Respondents evaluated feedback management dimensions between 3.703 and 3.784. All dimensions had standard deviations between 1.213 and 1.223, indicating moderate response variance. All dimensions had negative skewness and kurtosis, indicating a left-skewed data distribution with a sharper peak than a normal distribution. Respondents assessed source dimensions on a scale of 1 to 5 for exploitation success (3.686-3.715). The standard deviations for all source dimension success exploitation were between 1.199 and 1.230, showing considerable response variance. All dimensions had negative skewness and kurtosis, indicating a left-skewed data distribution with a sharper peak than a normal distribution.

The data in Tables 5-8 revealed that the distribution is not normal. However, there are some data distribution characteristics for which the PLS-SEM approach makes no distribution assumptions (Hair et al 2022, p. 19).

4.1.2 Quantitative Data Finding

The quantitative approach's objectives are twofold: (1) To examine the amount of SECI model application, knowledge management capabilities, and innovator's mentality on the performance of Chinese University Human Library Innovation, and (2) To analyze the knowledge management capability and the innovator's mindset as a mediating variable.

Firstly, evaluate the results of reflective measurement model through four aspects: Indicator reliability, Internal Consistency, Convergence validity Reliability, and Discriminant validity in this study.

Table 9 Internal Consistency Reliability

	Factor Loadings	T-Statistic	p-value
CM1 <- CM	0.863	62.361	0.000
CM2 <- CM	0.827	50.774	0.000
CM3 <- CM	0.819	48.692	0.000
CM4 <- CM	0.849	56.442	0.000
CM5 <- CM	0.874	62.717	0.000
ES1 <- ES	0.835	58.859	0.000
ES2 <- ES	0.831	51.544	0.000
ES3 <- ES	0.793	34.738	0.000
ES4 <- ES	0.824	44.748	0.000
FM1 <- FM	0.808	39.566	0.000

FM2 <- FM	0.808	45.862	0.000
FM3 <- FM	0.818	43.824	0.000
FM4 <- FM	0.816	40.562	0.000
FM5 <- FM	0.818	52.317	0.000
KA1 <- KA	0.812	47.024	0.000
KA2 <- KA	0.805	43.930	0.000
KA3 <- KA	0.817	42.416	0.000
KA4 <- KA	0.786	37.356	0.000
KA5 <- KA	0.815	42.761	0.000
KAC1 <- KAC	0.883	68.372	0.000
KAC2 <- KAC	0.865	68.125	0.000
KAC3 <- KAC	0.812	43.536	0.000
KAC4 <- KAC	0.762	32.986	0.000
KAC5 <- KAC	0.826	51.154	0.000
KI1 <- KI	0.801	41.294	0.000
KI2 <- KI	0.815	46.309	0.000
KI3 <- KI	0.813	48.007	0.000

Indicator outer loadings show the strength of the relationship between each indicator and its latent variable. High outer loadings mean indications reflect latent variables. Table 4.6 reveals strong internal consistency reliability for all components, with Cronbach's alpha values ranging from 0.808 to 0.883. which means each factor's elements measure the same concept. The factor loadings for all items were high, 0.762–0.883, which suggests a substantial correlation between the items and the construct. The T-statistics for all factor loadings were significant ($p < 0.001$). Results indicate that this study's measures are valid and reliable.

Discriminant validity analysis is to verify whether there are statistical differences in the correlation between two different dimensions. The table4.11-1.14 indicates good convergent and discriminant validity for the four constructs.

Table 10 Discriminant Validity of First Order

	CM	ES	FM	KA	KAC	KI	KPC	KS	KT	KTC	MI	RI	SI	TI
CM	0.847													
ES	0.689	0.821												
FM	0.676	0.679	0.813											
KA	0.483	0.489	0.514	0.807										
KAC	0.357	0.375	0.355	0.437	0.831									
KI	0.505	0.525	0.552	0.645	0.436	0.806								
KPC	0.335	0.373	0.348	0.419	0.686	0.394	0.795							
KS	0.548	0.489	0.516	0.688	0.507	0.681	0.450	0.826						
KT	0.544	0.500	0.531	0.684	0.506	0.668	0.471	0.676	0.844					
KTC	0.405	0.413	0.382	0.485	0.677	0.415	0.688	0.523	0.531	0.820				
MI	0.542	0.491	0.533	0.515	0.512	0.489	0.543	0.563	0.534	0.557	0.832			
RI	0.537	0.465	0.486	0.514	0.516	0.492	0.534	0.517	0.506	0.535	0.654	0.837		
SI	0.615	0.533	0.515	0.505	0.503	0.500	0.540	0.534	0.519	0.546	0.677	0.704	0.858	
TI	0.554	0.524	0.518	0.583	0.512	0.521	0.528	0.562	0.558	0.547	0.694	0.669	0.665	0.845

Table 11 Discriminant Validity of Second Order

	Human			
	Library Innovation	Innovator's Mindset	Knowledge Management Capability	SECI Model Application
Human Library Innovation Performance	0.871			
Innovator's Mindset	0.682	0.887		
Knowledge Management Capability	0.687	0.472	0.888	
SECI Model Application	0.696	0.67	0.604	0.869

Table 12 First order HTMT discriminant validity

	CM	ES	FM	KA	KAC	KI	KPC	KS	KT	KTC	MI	RI	SI	TI
CM														
ES	0.792													
FM	0.762	0.794												
KA	0.548	0.574	0.590											
KAC	0.399	0.433	0.402	0.495										
KI	0.572	0.616	0.635	0.746	0.497									
KPC	0.382	0.440	0.402	0.484	0.785	0.456								
KS	0.615	0.569	0.586	0.786	0.571	0.779	0.514							
KT	0.604	0.576	0.599	0.777	0.561	0.755	0.534	0.756						

KTC	0.452	0.478	0.435	0.554	0.764	0.475	0.793	0.591	0.593				
MI	0.604	0.566	0.602	0.585	0.576	0.556	0.624	0.634	0.596	0.630			
RI	0.610	0.545	0.558	0.598	0.589	0.571	0.623	0.594	0.576	0.615	0.749		
SI	0.677	0.606	0.575	0.569	0.556	0.564	0.612	0.594	0.572	0.608	0.752	0.795	
TI	0.613	0.601	0.583	0.660	0.572	0.590	0.603	0.630	0.619	0.615	0.775	0.761	0.734

Table 13 Second order HTMT discriminant validity

	Human Library Innovation Performance			
	Innovator	Management	SECI Model	Application
Human Library Innovation Performance	0.775			
Innovato Mindset	0.775			
Knowledge				
Management				
Capability	0.78	0.544		
SECI Model				
Application	0.778	0.762	0.685	

Secondly, this study aims to demonstrate whether Knowledge Management Capability and Innovator's Mindset play a mediating role in the influence of the independent variable SECI Model Application on Human Library Innovation Performance. The Bootstrap mediating effect test method was used to test whether the mediating effect is significant, with a confidence interval of Bias Corrected (95%) and 5000 repeated samples. The results of the mediating effect were tested, as shown in tables

Table 14 The Mediation Impact Test and The Direct Impact Test

	Original sample (O)	Standard deviation (STDEV)	T statistics (O/STDEV)	P-values	95% Confidence Interval	Proportion
SECI Model Application -> Knowledge						
Management Capability -> Human Library	0.231	0.027	8.477	0.000	0.17 - 0.28	9 - 7
Innovation Performance						33.2%

SECI Model Application		0.028	8.222	0.000	0.17	0.28	33.5%
-> Innovator's Mindset	0.233				7	7	
-> Human Library							
Innovation Performance							
SECI Model Application	0.232	0.047	4.952	0.000	0.13	0.32	33.3%
-> Human Library					9	5	
Innovation Performance							

Based on Tables 14, it can be found that (1) the mediation effect of the SECI Model Application ->Knowledge Management Capability ->Human Library Innovation Performance mediation path is 0.231, and the confidence interval of Bias Corrected (95%) is [0.179,0.287], excluding 0, indicating that the mediation effect is significant, accounting for 33.2%; (2) The mediating effect of SECI Model Application ->Innovator's Mindset ->Human Library Innovation Performance is 0.233, and the confidence interval of Bias Corrected (95%) is [0.177,0.287], excluding 0, indicating a significant mediating effect, accounting for 33.5%; (3) The direct effect is 0.232, and the confidence interval of Bias Corrected (95%) is [0.139,0.235], excluding 0, indicating a significant direct effect; (4) The total mediating effect is 66.7%, which is higher than the direct effect by 33.3%, indicating that the mediating effect is superior to the direct effect; Intermediaries cannot be ignored. All the above assumptions are valid.

Thirdly. Researchers have found the following conclusions through the evaluation of structural models :

(1) the VIF between the measured variables is below 8, and the VIF between the latent variables is also below 5, indicating that the model does not have collinearity.

(2) The structural model's path coefficient significance tests demonstrate that all are statistically significant at 0.05, which indicates a strong model link between independent and dependent variables. In particular, results show that human library innovation performance positively correlates with the innovator's mentality. Organizations with innovator-minded workers are likelier to use human libraries to drive innovation. Human library innovation is positively correlated with knowledge management skills. Knowledge management-strong firms are more likely to use human libraries to innovate. SECI model implementation improves human library innovation performance significantly. Organizations that employ the SECI model to manage knowledge are more likely to use human libraries to innovate. SECI model implementation positively impacts the innovator's attitude. Organizations that adopt the SECI approach to manage knowledge are more likely to have innovative personnel. Knowledge management capabilities improve with the SECI model application. Organizations employing the SECI model to manage knowledge are likelier to have good knowledge management.;

(3) The R^2 explanatory power of endogenous latent variables is generally greater than 0.67, indicating a strong explanatory power, ranging from 0.33 to 0.67 indicating moderate explanatory power, and from 0.19 to 0.33 indicating a small explanatory power. When it is lower than 0.19, it indicates almost no explanatory power. The results of this study are shown in the table below. The R^2 power of Human Library Innovation Performance is 0.661, Innovator's Mindset is 0.449, and Knowledge Management Capability is 0.365, both of which are greater than 0.33, The explanation level is relatively strong.

(4) Q^2 prediction measure illustrates how effectively the structural model predicts the secondary latent variables. All three latent variables have Q^2 prediction values greater than 0.3, which is considered a strong prediction level, implying that the structural model can correctly predict the secondary latent variables. All ten indices have Q^2 prediction scores greater than

0.245, which is considered a good prediction level, implying that the second-order measurement index can correctly forecast the relevant index;

(5) Further testing of the fit of the model shows that the model fit SRMR of this study is 0.044 below 0.08, and the NFI is 0.901 above 0.9, indicating a good fit of the model.

The factor path diagram of the research model is illustrated in Figure 3, representing the relationships among the various variables.

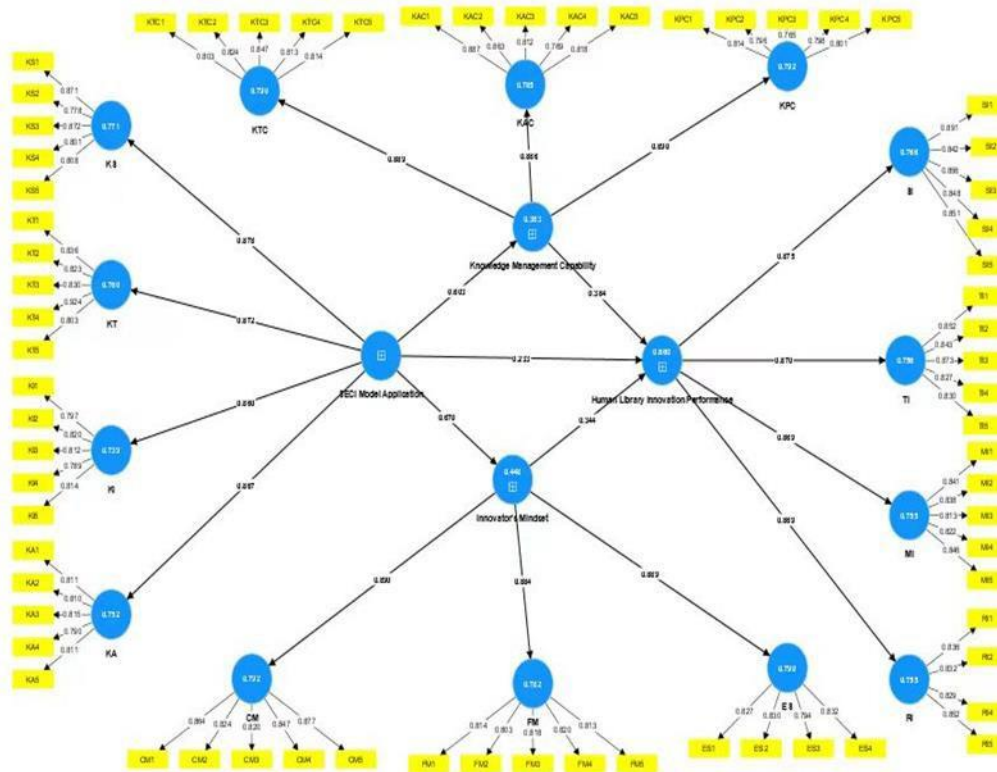


Figure 3 The path model diagram validated in this study.

Table 15 Hypothesis Validation Table

Hypothesis content	Results
H1: Knowledge management capability positively mediate the relationship between SECI model application and human Library innovation performance.	Support
H2: Innovator's mindset positively mediate the relationship between SECI model application and human Library innovation performance.	Support
H3: The SECI model application has a positive impact on human Library innovation performance;	Support

This study supports hypotheses H1, H2, and H3. According to the SEM findings, using the SECI model has a substantial impact on the innovator's mindset and knowledge management capability. In conclusion, the SEM results revealed that using the SECI model significantly influences the innovator's mentality and knowledge management capability. The result implies that the SECI approach can help employees build an innovator's attitude and knowledge management skills, improving human library innovation performance.

Overall, the SEM results indicate that the three aspects of the innovator's mindset, knowledge management capability, and application of the SECI model are all crucial for human library innovation performance. Organizations that prioritize the development of these qualities can foster a more welcoming climate for innovation and achieve greater results.

4.2 Qualitative analysis results

The third research objective is to explain the created model by critical human library stakeholders. Researchers conducted 23 semi-structured librarian interviews. Data mining and analysis using Python and the Chinese open-source "Micro Word Cloud."

In a qualitative study, interviews were conducted with 23 librarians from different Chinese universities' human libraries. These librarians had varying levels of education, with a predominantly female representation. They held positions across all levels of university library hierarchy, including library directors or assistant directors, department heads or assistant heads, as well as front-line library staff. The interviews primarily consisted of open-ended questions, allowing the participants to express their genuine views on the factors influencing innovation performance in human libraries. Data analysis employed word cloud and word frequency techniques to identify, label, categorize, generalize, and summarize these factors. The researchers analyzed the answers to each question in the qualitative study and the full text of all

the answers, but due to space limitations, only the full text analysis was presented.

Information	Value
Word count	126156
Valid paragraph entries	223
Total word count	18773
Valid word count	1557
Average sentence length	42.19 words
Word density	8,29%

indicates that the study involves meeting the needs or requests of library users and how they affect innovation performance.

In summary, the above noun phrases emphasize crucial aspects of the research, including the role of interpersonal interactions, library activities and events, library user needs, knowledge dissemination, and service provision. These terms highlight the core themes and concepts within the study, elucidating the factors of the relationships mentioned in the paper. These noun phrases represent key concepts and themes in the paper and will contribute to understanding the relationships and impacts between the SECI model, knowledge management capabilities, innovator mindset, and the innovation performance of human libraries in China."

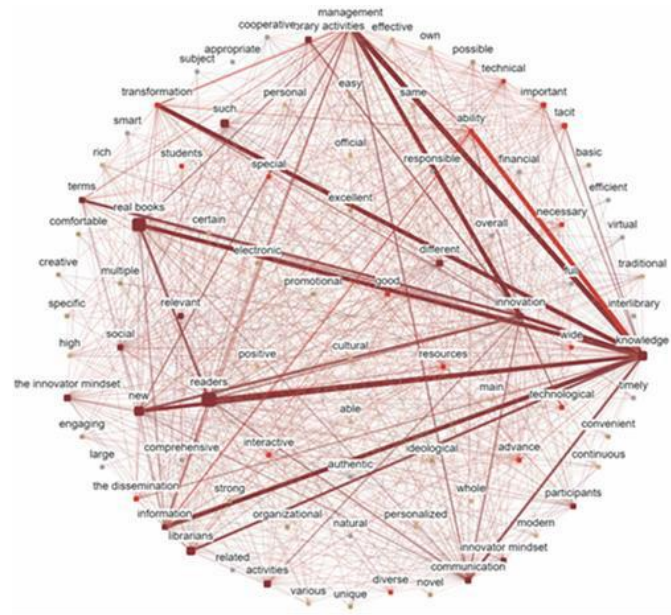


Figure 6 Interview Question Answer Tokenization Network Relationship Graph

As seen in Figure 6, through the analysis of tokenization network relationships, it becomes evident that "knowledge" is the most central term in this study. It is closely associated with "management activities," "real books," "readers," "transformation," "ability," and "librarians." "Management Activities" indicates that management activities involve the application and organization of knowledge. "Real Books" signifies that the study focuses on the unique knowledge resource format of real books. "Readers" pertains to the satisfaction of readers' needs with knowledge. "Transformation" implies that the study explores how knowledge is transformed, applied, or altered to meet library requirements. "Ability" underscores the skills and competencies required in knowledge management and library

services. "Librarians" suggests that the study may involve the role of librarians in knowledge management and services. These tokenization network relationships reveal the core concepts of the study and their interconnections, emphasizing the significance of knowledge in the research and its various facets, including management activities, real books, reader needs, knowledge transformation, and the role of librarians. This aids in a deeper understanding of the study's key themes and content.

This study found, through a comprehensive textual analysis of each question and the entire corpus, that the results support the findings of the quantitative research and endorse the five research hypotheses. Furthermore, some insights from the interviews also provide valuable discussion points for future research.

5. Conclusions And Discussion

This study explores the relationship between the application of the SECI model, knowledge management ability, innovator mentality, and innovation performance of Chinese university human libraries. The results of the Structural Equation Model (SEM) show that the three aspects of innovator mentality, knowledge management ability, and SECI model application play a key role in the innovation performance of human libraries. In our discussion and conclusion, we will focus on highlighting the role of the mediating variables of innovator mentality and knowledge management ability.

Overall, the conclusions of this study emphasize the mediating role of innovator mentality and knowledge management ability in the application of the SECI model and the innovation performance of human libraries, and provide practical guidance for relevant organizations to achieve more significant results in innovation.

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