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Elevating Organizational Performance of University through Organizational Learning, Organizational Agility, and Service Innovation

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Abstract

With the development of recent decades, the quality and overall strength of Chinese universities have gradually improved. As comprehensive service-oriented organizations, universities can enhance their development level and overall image by improving organizational learning, organizational agility, and service innovation. To narrow the gap between local universities in Hainan and those in developed regions of China and the world, and to accelerate the process of building Hainan into a pacesetting island for international-oriented education, this study examines the factors affecting the organizational performance of local universities in Hainan. This research explored the effects of organizational learning and organizational agility on organizational performance, and the mediating role of service innovation. A survey was conducted among 506 faculty members from five universities in Hainan. Structural equation modeling results showed that organizational learning significantly impacts organizational performance, organizational agility significantly impacts organizational performance, and service innovation plays a mediating role. The findings emphasize that organizational learning, organizational agility, and service innovation are crucial factors influencing organizational performance in universities. This study provides theoretical and practical insights for university managers to improve organizational performance. It suggests that universities should focus on the important role of organizational learning and agility in service innovation to further enhance organizational performance. With increasing competition in higher education globally, countries are putting higher demands on organizational innovation management. Building learning organizations, enhancing organizational agility, and optimizing service innovation are vital for improving university performance. The research findings offer valuable insights for studying factors affecting organizational performance development in universities.

Keywords: *Organizational Learning, Organizational Agility, Service Innovation, Organizational Performance.*

Introduction

As a pacesetting island for international-oriented education built by China, Hainan holds a significant position globally. However, there is a substantial gap in development speed and comprehensive strength between universities in Hainan and those in more developed regions of China. This discrepancy is evident in various aspects such as the number of universities, professional capabilities of staff, student learning abilities, teaching and research skills, financial strength, spending power, international recognition, and corporate recognition.

Despite recent efforts to acquire high-quality international education resources and initiate cooperative education to attract outstanding universities and talent to Hainan, local universities face considerable challenges in their long-term development. Thus, it is crucial for university administrators to identify and implement development strategies for local universities in Hainan. While existing research has focused on the economic, social, and policy development of universities in Hainan, there has been limited attention to the internal organizational management aspects, such as organizational learning, organizational agility, and service innovation.

Universities are multifaceted organizations where curriculum development, staff development, scientific research investment, and program internationalization are critical indicators of overall strength. Additionally, factors like the stability of internal organizational structures, advanced management levels and concepts, service quality, organizational learning levels, and organizational agility all impact university performance. Organizational performance, defined as a comparison of results or outputs against initial projections or

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targets, is a key measure of success (Ahmad et al., 2015; Iqbal et al., 2019). Traditional performance measurements, which often focus on explaining past failures or successes, need to evolve to include more effective indicators that comprehensively measure university performance (Kanji & Moura E Sá, 2007; Xing & Li, 2010).

Past studies have identified various variables influencing organizational performance, including organizational learning, organizational agility, and service innovation. Organizational learning, defined as a process where managers improve organizational members' abilities to better understand and manage the organization and its environment, significantly impacts performance (Jones, 2013). Organizational agility, the ability to respond quickly to changes and improve efficiency, also plays a crucial role (Yeganegi & Azar, 2012). Moreover, product and service innovation, which impacts firm performance, is vital in enhancing organizational efficiency and effectiveness (Artz et al., 2010).

However, there has been a gap in research using service innovation as a mediating variable in studying the relationship between organizational learning, organizational agility, and organizational performance. This study aims to fill this gap by developing a research model linking these variables to provide university managers with insights to improve organizational performance through enhanced organizational learning, agility, and service innovation.

This study aims to validate a model for improving organizational performance in Hainan universities. By clarifying management concepts and emphasizing the roles of organizational learning and agility in fostering service innovation, this study provides theoretical and practical contributions to enhancing university organizational performance. In an increasingly competitive global higher education landscape, focusing on these factors is essential for universities to meet higher demands for organizational innovation and performance.

Literature Review

Organizational Learning

Organizational learning has been a cornerstone of management research since Cangelosi and Dill's seminal work in 1965. The concept evolved with contributions from Argyris and Schön, who described it as a process of detecting and correcting errors, and from March, who viewed it as a mechanism for improving organizational performance (Dibella et al., 1996). The three-dimensional scale of commitment to learning, shared vision, and open-mindedness developed by Sinkula et al. in 1997 has become a widely adopted framework for measuring organizational learning. These dimensions highlight how organizational learning transforms through structural changes and external influences (Argote & Miron-Spektor, 2011).

Organizational learning enables members to acquire external knowledge, which enhances their understanding of new technologies and innovations, fostering proactive learning behaviors and innovation (Chiva et al., 2014; Zou et al., 2018). Organizations that effectively implement learning mechanisms can adapt better to their environments and leverage new knowledge for competitive advantage. Sun's (2018) study employed Sinkula et al.'s scale to measure the impact of organizational learning, revealing its significant role in improving organizational performance through effective knowledge transformation and strategy development (Permana et al., 2020). The concept underscores the importance of creating an environment where learning is continuous and integrated into the organizational fabric. Furthermore, organizational learning is linked to enhanced adaptability and resilience, as it empowers members to anticipate and respond to changes and challenges more effectively (Jones, 2013). This capability is crucial for sustaining long-term success and fostering innovation within the organization.

Organizational Agility

The concept of organizational agility, which emerged in the 1990s alongside agile manufacturing, refers to the ability to rapidly respond to changes and improve efficiency (Forsythe, 1997; Yusuf et al., 1999). Agility encompasses agile drivers, capabilities, and providers, which collectively enable organizations to adapt to

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unpredictable changes in the business environment (Sharifi et al., 2001). It includes the capacity to perceive and respond quickly to environmental changes, a critical dynamic capability for maintaining competitiveness (Overby et al., 2006; Roberts & Grover, 2012).

Recent advancements have emphasized organizational agility as a dynamic capability that enhances performance by enabling rapid adjustment to internal and external changes (Van Oosterhout et al., 2006; Felipe et al., 2016). It facilitates knowledge retrieval and application, driving high-quality service and product development (Cegarra-Navarro et al., 2016; Wamba, 2022). Agility allows organizations to reconfigure their resources and processes quickly in response to market demands and technological advancements, which is crucial in today's fast-paced environment. The ability to quickly adapt also reduces the risk of obsolescence and enhances the organization's capacity to capitalize on new opportunities and mitigate potential threats. Additionally, agile organizations tend to foster a culture of continuous improvement and innovation, encouraging employees to develop creative solutions and improve existing processes (Hult et al., 2004). This proactive approach to change is essential for maintaining a competitive edge and achieving sustainable growth.

Service Innovation

Service innovation, a multidimensional construct, plays a crucial role in enhancing organizational performance by improving processes, products, and management practices (Den Hertog et al., 2010; Droege et al., 2009). It involves optimizing learning and research products to enhance satisfaction and performance in higher education settings (Cheng et al., 2019). The relationship between market orientation, organizational learning, and service innovation performance highlights the mediating role of adaptive and exploratory learning (Jian et al., 2018).

Service innovation encompasses various dimensions, including product innovation, process innovation, and organizational innovation (Huang & Rice, 2012). Product innovation refers to introducing new or significantly improved services and goods, enhancing their performance and functionality (Dodgson & Gann, 2018). Process innovation involves improving existing procedures and workflows to increase efficiency and effectiveness (Roberts & Amit, 2003). Organizational innovation focuses on developing new management practices and structures to foster a culture of creativity and continuous improvement (Edvardsson & Tronvoll, 2013).

Empirical evidence suggests that service innovation is a key driver of organizational success, particularly in service-oriented industries (Cheng et al., 2019; Ibrahim, 2023). Innovative services can lead to increased customer satisfaction, loyalty, and overall performance by meeting evolving customer needs and expectations. Moreover, service innovation often requires collaboration and knowledge sharing across different organizational levels, fostering a more cohesive and dynamic work environment (Snyder et al., 2016). This collaborative approach can lead to more effective problem-solving and decision-making, ultimately contributing to enhanced organizational performance.

Organizational Performance

Organizational performance, defined as the comparison of results or outputs against initial projections or targets, is a critical measure of success in an organization (Ahmad et al., 2015; Iqbal et al., 2019). Traditional performance measurements, which often focus on explaining past failures or successes, need to evolve to include more effective indicators that comprehensively measure university performance (Kanji & Moura E Sá, 2007; Xing & Li, 2010). Factors influencing organizational performance include organizational learning, agility, and innovation. These factors collectively determine the effectiveness and efficiency with which an organization meets its objectives and sustains competitive advantage.

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Organizational performance is influenced by various internal and external factors, including leadership, organizational culture, and external environment (Ahmad et al., 2015). Effective leadership and a strong organizational culture can enhance employee engagement, motivation, and productivity, leading to improved performance outcomes (Iqbal et al., 2019). Additionally, external factors such as market conditions, regulatory changes, and technological advancements can impact organizational performance, necessitating continuous monitoring and adaptation (Kanji & Moura E Sá, 2007).

Research has shown that four aspects, such as employee satisfaction, can have an important impact on organizational performance (Xing & Li, 2010). By fostering a culture of continuous learning, organizations can improve their adaptability and resilience, enabling them to respond effectively to changes and challenges (Sun, 2018). Agility allows organizations to quickly adjust their strategies and operations in response to market demands and technological advancements, enhancing their competitiveness and performance (Overby et al., 2006). Service innovation drives performance by introducing new and improved processes, products, and management practices, meeting evolving customer needs and expectations (Cheng et al., 2019; Ibrahim, 2023).

Hypotheses Development

Organizational learning facilitates continuous improvement and innovation by enabling the effective transformation of knowledge and strategy development. This leads to enhanced organizational performance by improving members' ability to adapt and innovate. Studies have shown that organizational learning is crucial for developing a competitive advantage and improving performance outcomes (Salim & Sulaiman, 2011; Sun, 2018).

H1: Organizational learning positively affects organizational performance.

Organizational agility allows institutions to rapidly adjust to internal and external changes, ensuring they remain competitive and efficient. This adaptability is crucial for maintaining high performance in a dynamic environment. Research indicates that agility helps organizations respond to market shifts and technological advancements, thus enhancing overall performance (Overby et al., 2006; Nafei, 2016).

H2: Organizational agility positively affects organizational performance.

Service innovation enhances organizational performance by introducing new and improved processes, products, and management practices, which increase efficiency and satisfaction among stakeholders. Empirical evidence suggests that service innovation is a key driver of organizational success, particularly in service-oriented industries (Cheng et al., 2019; Ibrahim, 2023).

H3: Service innovation positively affects organizational performance.

Organizational learning drives service innovation by fostering a culture of continuous improvement and knowledge sharing, which in turn enhances organizational performance. Studies have highlighted the role of learning in promoting innovative practices and improving service delivery (Jian et al., 2018; Permana et al., 2020).

H4: Organizational learning affects organizational performance through service innovation.

Organizational agility supports service innovation by enabling quick responses to market changes and new opportunities, thereby improving overall performance. Research has demonstrated that agile organizations are better positioned to innovate and adapt to changing conditions (Sharifi et al., 2001; Felipe et al., 2016).

H5: Organizational agility affects organizational performance through service innovation.

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This study's hypotheses are grounded in extensive literature highlighting the positive impact of organizational learning and agility on performance, with organizational learning fostering continuous improvement and innovation, and agility ensuring rapid adaptation to changes (Salim & Sulaiman, 2011; Nafei, 2016). Service innovation, posited as a mediating variable, links these capabilities to performance outcomes through innovative practices (Ibrahim, 2023). By integrating service innovation as a mediating variable, this study addresses a gap in previous research, which mainly focused on the direct effects of organizational learning and agility. This approach provides a more nuanced understanding of the mechanisms driving organizational performance in higher education, offering practical insights for enhancing performance through targeted strategies.

Method

Participants

Data were collected from faculty members across five universities in Hainan, encompassing various administrative and teaching departments. Multi-stge sampling technique was used in selecting participants. 540 questionnaires being successfully collected. After discarding 34 incomplete questionnaires, 506 completed surveys provided a robust dataset for analysis. The survey instruments were based on established scales with proven reliability and validity, measuring organizational learning, organizational agility, service innovation, and organizational performance.

According to Hair et al. (2017), given that the study's path coefficients are likely in the range of 0.21–0.3 based on typical social science research, and the significance level is set at 5%, the minimum sample size required for this study would be 260 participants. Since the study successfully collected data from 506 participants, it significantly exceeds this minimum requirement, ensuring sufficient statistical power for detecting meaningful effects.

Table 1 shows a nearly balanced gender distribution, with females slightly outnumbering males (52.96% vs. 47.04%). The majority of respondents are administrative staff, comprising 54.35% of the sample, while teaching staff make up 45.65%. Most respondents hold a master's degree, representing 75.10% of the participants, highlighting the highly educated nature of the sample. Lecturers form the largest group among the academic titles at 65.41%. The representation from different universities is diverse, with Hainan Normal University having the highest number of respondents at 23.32%.

Table 1 Demographic Characteristics of Respondents (N = 506)

Characteristic	*n*	%
Gender		
Male	238	47.04
Female	268	52.96
Profession		
Administrative Staff	275	54.35
Teaching Staff	231	45.65
Education		
Bachelor's Degree	55	10.87
Master's Degree	380	75.10
Doctoral Degree	71	14.03
Academic Titles		
Teaching Assistant	80	15.81
Lecturer	331	65.41
Associate Professor	60	11.86
Professor	35	6.92

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Place of work		
Hainan University	92	18.18
Hainan Normal University	118	23.32
Haikou University of Economics	102	20.16
University of Sanya	95	18.77
Hainan Tropical Ocean University	99	19.57

Measures

Organizational learning (OL) was measured using the Organizational Learning Scale (OLS) developed by Sinkula et al. (1997) and Sun (2018). This scale includes three dimensions: commitment to learning, shared vision, and open-mindedness. Commitment to learning assesses the emphasis the organization places on learning as a core value, which is vital for competitive advantage, member learning, and strategic development. Shared vision evaluates how clearly members understand and accept the organization's vision and goals, including strategic purposes and work objectives. Open-mindedness measures the organization's ability to encourage creative thinking and the acceptance of new ideas. The OLS consists of 11 Likert-type items rated on a 5- point continuum (1 = strongly disagree, 5 = strongly agree). Higher scores indicate a stronger presence of organizational learning. The reliability estimates, with Cronbach's alpha for the subscales ranging from .82 to .84, and validity estimates demonstrate good convergent and discriminant validity.

Organizational agility (OA) was assessed using the Organizational Agility Scale (OAS), developed by Jaworski and Kohli (1993) and Nafei (2016). The OAS includes three dimensions: sensing agility, decision-making agility, and acting agility. Sensing agility measures the organization's ability to monitor and respond to environmental changes, such as customer preferences, competitor actions, and new technologies. Decision-making agility evaluates the organization's ability to collect, analyze, and act on relevant information to reduce risks, allocate resources effectively, and develop new products. Acting agility assesses the organization's capacity to reallocate resources and adopt new processes in response to external changes. The OAS consists of 15 Likert-type items rated on a 5-point continuum (1 = strongly disagree, 5 = strongly agree). Higher scores indicate greater organizational agility. Reliability estimates, with Cronbach's alpha for the subscales ranging from .78 to .91, and validity estimates show good convergent and discriminant validity.

Service innovation (SI) was measured using the Service Innovation Scale (SIS) developed by Cheng (2014). The SIS encompasses product innovation, process innovation, and organizational innovation. Product innovation refers to the introduction of new or improved products and services to enhance functionality and performance. Process innovation involves improving existing procedures and workflows to increase efficiency and satisfaction among teachers and students. Organizational innovation focuses on developing new management practices and structures to foster creativity and continuous improvement. The SIS consists of 13 Likert-type items rated on a 5-point continuum (1 = strongly disagree, 5 = strongly agree). Higher scores indicate greater service innovation. Reliability estimates, with Cronbach's alpha for the subscales ranging from .81 to .87, and validity estimates demonstrate good convergent and discriminant validity.

Organizational performance (OP) was measured using the Organizational Performance Scale (OPS) developed by Xing and Li (2010). The OPS focuses on staff satisfaction, social satisfaction, teaching and research performance, and financial performance. Staff satisfaction evaluates members' satisfaction with their current work and future prospects. Social satisfaction measures the university's advantages compared to other institutions, such as graduation rates, employment rates, and entrance scores. Teaching and research performance assesses whether the teaching and research levels meet current standards and how they compare to other universities. Financial performance evaluates the university's financial stability and its ability to secure financial support. The OPS consists of 14 Likert-type items rated on a 5-point continuum (1 = strongly disagree, 5 = strongly agree). Higher scores indicate better organizational performance. Reliability estimates, with Cronbach's alpha for the subscales ranging from .83 to .88, and validity estimates show good convergent and discriminant validity.

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In summary, higher scores on these measures indicate that respondents agree that these variables are key factors in determining a university's development. Analyzing these scores provides insights into university employees' attitudes towards organizational learning, organizational agility, service innovation, and organizational performance, helping to optimize organizational management through performance management. An effective performance management system can reduce management costs, allowing universities to focus more on student training and research, ultimately contributing more to society.

Data Analysis

The data analysis for this study was conducted using a quantitative research method, aligned with the deductive approach necessary to test the proposed conceptual model. The analysis was executed using SmartPLS 4 (Ringle et al., 2022), a robust tool for structural equation modeling (SEM). This method facilitated a comprehensive examination of the relationships between OL, OA, SI, and OP.

To ensure the reliability and validity of the measurement model, several statistical tests were conducted. Reliability was assessed using Cronbach's alpha and composite reliability (CR). A Cronbach's alpha coefficient above .7 is considered acceptable, indicating good internal consistency (Hair et al., 2014). The CR for each construct exceeded the threshold of .7, confirming the reliability of the measurement model. Convergent validity was evaluated through factor loadings, average variance extracted (AVE), and composite reliability. Discriminant validity was assessed using the Fornell-Larcker criterion and the Heterotrait-Monotrait ratio (HTMT).

To address potential common method bias, Harman's single-factor test was employed, revealing that the variance explained by the first factor was 32.578%, which is below the 40% threshold, indicating that common method bias was not a significant issue in this study. Common method bias refers to the spurious common variation between traits caused by the use of the same measurement tool, which can arise from the data collection method, item characteristics, and the response bias of participants. To mitigate this bias, multiple methods were adopted, including using a mature scale in the questionnaire design, ensuring anonymity in responses, and clearly stating that the data would be used only for analysis. Despite these precautions, the potential for bias remained due to the unified questionnaire format, necessitating the use of Harman's single-factor test.

The structural model was tested to examine the direct and indirect effects of the variables. Path coefficients, t values, and p values were calculated to determine the significance of the relationships. The analysis underscored the crucial mediating role of service innovation in the relationships between organizational learning, organizational agility, and organizational performance. To test these mediation effects, the bootstrapping method with 5000 iterations was used, confirming their significance as the 95% confidence intervals did not include zero.

Ethical Considerations

Before data collection commenced, ethical approval for this study was obtained from the Institutional Review Board (IRB) of the author's university. The IRB reviewed and approved the research protocol, ensuring that the study complied with ethical standards for research involving human subjects. Participants were informed about the purpose of the study, their rights to confidentiality, and their right to withdraw from the study at any time without any repercussions. Informed consent was obtained from all participants before they took part in the research. The IRB approval was crucial in safeguarding the ethical integrity of the study, ensuring that all procedures were conducted in accordance with ethical guidelines and standards.

Results

Initially, the measurement model confirmed convergent validity, by using factor loadings, Cronbach's alpha, and composite reliability. Then, we tested the discriminant validity of the model. Finally, we tested the hypothesis with a structural model.

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As shown in Table 2, we validated multiple psychological constructs, involving item loadings, Cronbach's Alpha, composite reliability (CR), and average variance extracted (AVE). Generally, a Cronbach's alpha coefficient above .7 is considered an acceptable level of reliability (Hair et al., 2014). According to Fornell and Larcker (1981), the criteria for assessing convergent validity include three main aspects: (1) all variables must have factor loadings greater than .5, (2) composite reliability (CR) must exceed .7, and (3) the average variance extracted (AVE) must be greater than .5.

LC's item loadings ranged from .784 to .842, with a Cronbach's alpha of .831, indicating good internal consistency. The construct reliability (CR) value was .888 and the average variance extracted (AVE) was .664, suggesting that the construct performed well in terms of reliability and convergent validity. SV's item loadings varied from .786 to .859, with a Cronbach's alpha of .829, indicating good consistency. The CR of .886 and AVE of .661 demonstrated good convergent validity. The OM construct's item loadings ranged from .854 to .875, with a Cronbach's alpha of .83, showing good internal consistency. The CR of .898 and AVE of .746 indicated the construct had good reliability and convergent validity.

SE's item loadings ranged from .797 to .857, with a Cronbach's alpha of .781, showing moderate internal consistency. The CR of .873 and AVE of .696 indicated the construct had good convergent validity. DM's item loadings varied between .755 and .836, with a Cronbach's alpha of .848, suggesting high internal consistency. The CR of .892 indicated good reliability, and the AVE of .623 showed sufficient convergent validity. The AC construct showed item loadings ranging from .758 to .827, indicating excellent internal consistency with a Cronbach's alpha of .905. The CR was very high at .925, and the AVE of .637 demonstrated good convergent validity.

PI showed item loadings from .742 to .844, with a Cronbach's alpha of .811, indicating moderate consistency. The CR of .876 and AVE of .639 demonstrated good reliability and convergent validity. The PSI construct's item loadings varied between .782 and .821, with a Cronbach's alpha of .859, reflecting good internal consistency. The CR of .898 and AVE of .639 indicated good convergent validity. OI had item loadings between .818 and .866, with a Cronbach's alpha of .87, indicating high consistency. The CR of .911 and AVE of .719 both demonstrated high reliability and good convergent validity.

SS's item loadings ranged between .806 and .822, with a Cronbach's alpha of .83, indicating good internal consistency. The CR of .887 and AVE of .662 demonstrated good convergent validity; the SSA construct's item loadings ranged from .859 to .878, with a Cronbach's alpha of .838 showing good internal consistency. The CR of .903 and AVE of .756 indicated excellent reliability and convergent validity; the TRP construct's item loadings ranged from .823 to .864, with a Cronbach's alpha of .872 indicating high consistency. The CR of .912 and AVE of .722 showed the construct had good reliability and convergent validity. FP's item loadings ranged from .859 to .897 with a Cronbach's alpha of .86, reflecting high consistency. The CR value of .915 and an AVE of .782 both displayed excellent reliability and convergent validity.

Table 2 Construct Reliability and Convergent Validity

Construct	item	Λ	α	CR	AVE
LC	LC1	.837	.831	.888	.664
	LC2	.784			
	LC3	.795			
	LC4	.842			
SV	SV1	.859	.829	.886	.661
	SV2	.814			
	SV3	.791			
	SV4	.786			
OM	OM1	.875	.83	.898	.746
	OM2	.854			
	OM3	.862			

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SE	SE1 SE2 SE3	.849 .797 .857	.781	.873	.696
DM	DM1 DM2 DM3 DM4 DM5	.803 .755 .768 .782 .836	.848	.892	.623
AC	AC1 AC2 AC3 AC4 AC5 AC6 AC7	.786 .815 .822 .797 .780 .758 .827	.905	.925	.637
PI	PI1 PI2 PI3 PI4	.844 .835 .772 .742	.811	.876	.639
PSI	PSI1 PSI2 PSI3 PSI4 PSI5	.788 .782 .800 .821 .805	.859	.898	.639
OI	OI1 OI2 OI3 OI4	.865 .818 .843 .866	.87	.911	.719
SS	SS1 SS2 SS3 SS4	.806 .822 .813 .814	.83	.887	.662
SSA	SSA1 SSA2 SSA3	.878 .871 .859	.838	.903	.756
TRP	TRP1 TRP2 TRP3 TRP4	.863 .848 .823 .864	.872	.912	.722
FP	FP1 FP2 FP3	.896 .859 .897	.86	.915	.782

According to the criteria set by Fornell and Larcker (1981), if the square root of the average variance extracted (AVE) is greater than the absolute values of the correlation coefficients between latent variables, it indicates that the internal consistency is higher than the external consistency. This suggests that the latent variables are distinct from each other, thereby demonstrating high discriminant validity. As can be seen from the Table 3, the data for OL shows an average of 3.548 (SD = 0.800), indicating that most scores are in the upper-mid range, though there is some variability. The skewness value is -0.635, suggesting a slight left skew, meaning most data are concentrated in the higher scoring intervals. The kurtosis value is -0.039, indicating a relatively flat distribution, close to normal.

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For OA, the mean is 3.491 (SD = 0.676), reflecting more concentrated scores with less variability. The skewness is -0.342, showing a slight left skew, meaning most scores tend to be higher. The kurtosis is -0.362, indicating a slightly flat distribution with no pronounced peaks. Regarding SI, the mean is 3.655 (SD = 0.707), suggesting that evaluations of service innovation are generally high and concentrated. The skewness value of -0.948 indicates a strong left skew, with most scores tending towards the higher end of the spectrum. The kurtosis value is 0.685, showing a distribution that is sharper than normal, indicating a high level of central clustering. OP has the highest mean among the four dimensions at 3.877 (SD = 0.710), indicating generally high evaluations of organizational performance. The skewness is -1.479, showing a very strong left skew, with most scores being very high. The kurtosis is 1.728, indicating a distribution with a very sharp peak and thicker tails.

The bolded diagonal elements in the table are the square roots of the AVE for each variable, while the values below are the correlation coefficients between variables. A detailed analysis reveals that the square root of the AVE for OL (.830) is greater than the highest correlation coefficient between OL and other variables (.621); for OA, the square root of the AVE (.817) exceeds the highest correlation coefficient with other variables (.621); the square root of the AVE for SI (.850) exceeds the highest correlation coefficient with other variables (.638); and for OP, the square root of the AVE (.798) exceeds the highest correlation coefficient with other variables (.638). Collectively, these data indicate good discriminant validity.

Table 3 Discriminant Validity (Fornell-Larcker)

Constructs	M	SD	SK	KU	1	2	3	4
1. OL	3.548	0.800	-0.635	-0.039	**.830**			
2. OA	3.491	0.676	-0.342	-0.362	.621	**.817**		
3. SI	3.655	0.707	-0.948	0.685	.589	.555	**.850**	
4. OP	3.877	0.710	-1.479	1.728	.604	.565	.638	**.798**

Note. Diagonal values are the square root of AVE. Off-diagonal values are the correlations.

As can be seen from the Table 4, Heterotrait-Monotrait ratio (HTMT) is the ratio of the mean inter-construct correlations relative to the mean intra-construct correlations, which should be less than .9 according to Henseler, et al. (2015). In this study, all HTMT values are below .9, further indicating good discriminant validity.

Table 4 Discriminant Validity (HTMT)

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. AC													
2. DM	.655												
3. FP	.461	.475											
4. LC	.523	.554	.509										
5. OI	.373	.445	.462	.485									
6. OM	.522	.458	.396	.609	.391								
7. PI	.468	.522	.497	.528	.715	.400							
8. PSI	.556	.525	.522	.540	.611	.500	.743						
9. SE	.520	.670	.340	.432	.345	.375	.369	.425					
10. SS	.449	.487	.578	.480	.467	.460	.533	.501	.447				
11. SSA	.372	.440	.610	.425	.452	.337	.568	.462	.322	.530			
12. SV	.579	.534	.521	.746	.478	.560	.498	.578	.455	.542	.446		
13. TRP	.474	.496	.608	.521	.492	.500	.547	.584	.396	.624	.685	.520	

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As illustrated in Table 5, OL significantly and positively affects SI, with a path coefficient of .398 ($p < .001$). This indicates a strong positive relationship between OL and SI. Similarly, OA significantly and positively influences SI ($\beta = .308$, $p < .001$). Regarding OP, OL has a path coefficient of .262 ($p < .001$), indicating that OL significantly enhances OP. OA ($\beta = .194$, $p < .01$), also shows a positive impact on OP. SI further emphasizes its importance ($\beta = .376$, $p < .001$), underlining its crucial role in driving OP.

To assess mediation effects within the model, using 5,000 iterations. A mediation effect is considered significant if the 95% confidence interval of the indirect effect does not include 0; if it does, the effect is not significant. The mediation effect of OL on OP through SI is .15 ($p < .001$). This statistically significant result demonstrates that SI plays a crucial mediating role between OL and OP. Similarly, the mediation effect of OA on OP through SI is .116 ($p < .01$). This finding confirms the significant mediating role of SI between OA and OP, highlighting the importance of SI in enhancing OP through both OL and OA.

Table 5 Path Analysis Results

	β	*SD*	*t*	*p*	2.50%	97.50%
OL -> SI	.398	.055	7.281	< .001	.286	.499
OA -> SI	.308	.065	4.71	< .001	.182	.437
OL -> OP	.262	.063	4.177	< .001	.137	.382
OA -> OP	.194	.063	3.061	.002	.069	.318
SI -> OP	.376	.06	6.277	< .001	.259	.496
OL -> SI -> OP	.15	.029	5.118	< .001	.097	.21
OA -> SI -> OP	.116	.034	3.413	.001	.059	.193

Figure 1 represents the structural equation model (SEM) results for the relationships among OL, OA, SI, and OP. The key constructs are organizational learning, measured by learning commitment (LC), shared vision (SV), and open-mindedness (OM); organizational agility, measured by sensing agility (SE), decision-making agility (DM), and acting agility (AC); service innovation, measured by product innovation (PI), process innovation (PSI), and organizational innovation (OI); and organizational performance, measured by staff satisfaction (SS), social satisfaction (SSA), teaching and research performance (TRP), and financial performance (FP).

The structural model includes several key paths between these constructs. Organizational learning has a strong positive effect on service innovation, with a standardized path coefficient of 0.398. Similarly, organizational agility positively influences service innovation, with a path coefficient of 0.308. Service innovation, in turn, has a significant positive impact on organizational performance, with a path coefficient of 0.376. Additionally, both organizational learning and organizational agility directly affect organizational performance, with path coefficients of 0.262 and 0.194, respectively.

Each construct in the model is measured by multiple indicators, as shown by the paths leading from the constructs to their respective indicators, such as LC1, LC2, LC3, and so on. The factor loadings for these indicators, such as 0.837 for LC1, indicate the strength of the relationship between each indicator and its underlying construct, and they are all above 0.7, suggesting good convergent validity.

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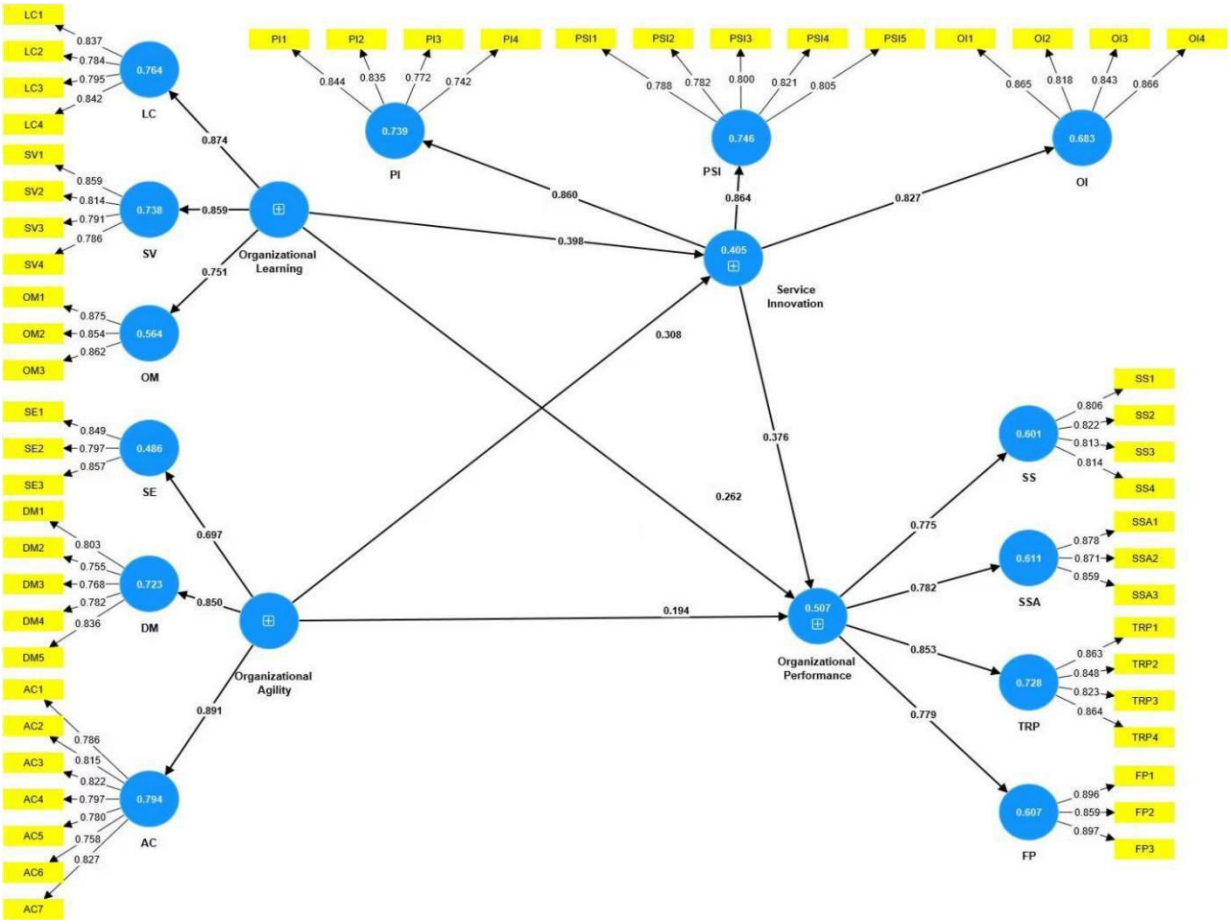
Figure 1 Structural Equation Model Results



Discussion

The first hypothesis of this study, that organizational learning positively affects organizational performance, was supported. Organizational learning positively affects organizational performance, consistent with Sun (2018), who emphasized the importance of a strong learning culture in enhancing organizational learning and value creation. Additionally, Salim and Sulaiman (2011) found that organizational learning significantly contributes to the development of competitive advantages and overall performance improvement. The second hypothesis, that organizational agility positively affects organizational performance, was also supported. The fourth hypothesis, that organizational learning affects organizational performance through service innovation, was supported, highlighting the mediating role of service innovation. Jian et al. (2018) emphasized that organizational learning promotes innovative practices and improves service delivery, which in turn enhances performance. The fifth hypothesis, that organizational agility affects organizational performance through service innovation, was also confirmed, emphasizing the importance of service innovation as a mediator. Sharifi et al. (2001) and Felipe et al. (2016) demonstrated that agile organizations are better positioned to innovate and adapt to changing conditions, thereby improving performance through service innovation.

The model highlights the importance of service innovation as a mediator in the relationships between organizational learning and organizational performance, as well as between organizational agility and organizational performance. The strong loadings and significant path coefficients support the validity and reliability of the constructs and the hypothesized relationships among them. The analysis underscores the crucial role of service innovation in enhancing organizational performance through the mechanisms of organizational learning and agility.

This finding aligns with Nafei (2016), who suggested that managers should focus on organizational factors,

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such as sensing agility, decision-making agility, and acting agility, to improve success and effectiveness. Overby et al. (2006) also noted that agility helps organizations respond to market shifts and technological advancements, enhancing overall performance. The third hypothesis, that service innovation positively affects organizational performance, was confirmed. This supports Ibrahim (2023), who found that service innovation can enhance work efficiency and satisfaction, ultimately improving organizational performance. Cheng et al. (2019) also highlighted that service innovation plays a crucial role in enhancing the performance of service-oriented organizations.

With continuous innovation and changes in the global education field, universities face fierce competition. To meet these demands, universities need to attract stakeholders through more innovative products and services. This study investigates the relationship between organizational learning, organizational agility, service innovation, and organizational performance in universities in Hainan. While previous studies mainly focused on the organizational performance of manufacturing organizations, banks, and tourism organizations (Harraf et al., 2015; Nafei, 2016; Ibrahim, 2023), this study focuses on higher academic service organizations. The variables discussed have a strong literature background, with research demonstrating significant relationships between these variables and organizational performance (Salim & Sulaiman, 2011; Sun, 2018; Cheng et al., 2019). To improve organizational performance, university managers need to foster a learning culture, build agile organizations, maintain sensitivity to external changes, and create innovative academic and educational products (Iqbal et al., 2019; Overby et al., 2006; Cheng & Krumwiede, 2012).

Theoretical Implications

This study fills a gap in the research on higher education service institutions by exploring the influence of organizational learning, organizational agility, and service innovation on organizational performance. It redefines the dimensions of each variable, designing relevant questionnaires based on actual conditions, enriching the research model of university organizational performance, and providing references for future research.

This study provides a comprehensive theoretical framework for understanding the factors influencing the organizational performance of universities in Hainan, which has been underexplored in existing literature. The integration of organizational learning, organizational agility, and service innovation into a single model offers a nuanced perspective on how these variables interact to enhance university performance. This approach extends the traditional focus on business and healthcare organizations to the academic sector, addressing a significant gap in research.

OL has long been recognized as a critical component for organizational success. OL facilitates the acquisition and dissemination of knowledge within an organization, promoting continuous improvement and innovation. According to Argote and Miron-Spektor (2011), OL involves processes that enhance an organization's ability to gain and use knowledge, thereby improving performance. This study builds on existing theories by demonstrating that OL not only directly improves organizational performance but also indirectly enhances it through service innovation. This finding is consistent with the work of Sun (2018), who emphasized that a strong learning culture significantly contributes to organizational success.

OA refers to the ability of an organization to swiftly adapt to changes in its environment. This concept, which emerged alongside agile manufacturing, has been increasingly recognized as vital for maintaining competitiveness in dynamic markets. According to Overby et al. (2006), organizational agility involves capabilities that enable rapid response to changes, thus enhancing overall performance. This study corroborates these findings by showing that OA positively impacts both service innovation and organizational performance. Nafei (2016) also highlighted the importance of agility in improving organizational success, further supporting the results of this study.

SI is another crucial factor that drives organizational performance. SI involves the introduction of new or improved services, processes, or technologies that enhance an organization's ability to meet customer needs and improve efficiency. This study demonstrates that SI not only directly improves organizational

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performance but also mediates the effects of OL and OA on performance. The importance of SI in enhancing organizational outcomes has been well-documented in the literature. For instance, Ibrahim (2023) found that service innovation significantly improves employee productivity and customer satisfaction, which in turn boosts organizational performance.

By integrating these three constructs, this study provides a holistic view of how universities can enhance their performance. The findings suggest that university managers should focus on fostering a learning culture, enhancing organizational agility, and promoting service innovation to improve overall performance. This comprehensive approach aligns with the broader literature on organizational management, which emphasizes the importance of continuous learning, agility, and innovation in achieving sustainable success.

Furthermore, this study contributes to the existing body of knowledge by exploring the mediating role of service innovation in the relationship between organizational learning, agility, and performance. This approach addresses a gap in the literature, as previous studies have primarily focused on the direct effects of these variables. By highlighting the importance of service innovation as a mediator, this study offers new insights into the mechanisms through which organizational learning and agility enhance performance.

Overall, this study provides a valuable theoretical contribution to the field of organizational management in higher education. It extends existing theories by integrating multiple constructs into a single model and exploring their interrelationships. The findings offer practical implications for university managers, suggesting that a holistic approach that incorporates learning, agility, and innovation is essential for achieving high organizational performance. This comprehensive framework can serve as a foundation for future research on the factors influencing organizational performance in universities and other service-oriented organizations.

Practical Implications

The practical significance of this study lies in providing constructive suggestions for the development of university organizations in Hainan. As Hainan builds a pacesetting island for international-oriented education, it attracts high-quality education resources, enhancing its international status. The development of universities should prioritize human resources, considering talents as the first resource (Wang et al., 2024). This study suggests improving the system of talent development, innovating talent management mechanisms, and integrating external introduction with internal training (Iqbal et al., 2019; Xing & Li, 2010). Creating a learning organization can improve organizational efficiency and create a conducive environment for learning and innovation (Gomes & Wojahn, 2017; Gonzaga et al., 2020).

University organizations should also maintain sensitivity to external changes and respond quickly to competitors' changes (Yusuf et al., 1999; Yusuf et al., 2014). Continuous learning is vital for organizational development, enhancing members' capabilities and broadening their vision (Jones, 2013). Organizational learning training and building agile organizations are effective ways to improve organizational efficiency in universities (Huang & Rice, 2012; Hult et al., 2004).

Compared to universities in other developed areas, local universities in Hainan face challenges in human resource development, particularly in high-level and high-quality talents. This study emphasizes the importance of internal employee training over relying on external talent introduction (Kanji & Moura E Sá, 2007). Improving internal employee capabilities leads to stable organizational development and better organizational performance (Edvardsson & Tronvoll, 2013; Wang et al., 2024).

Universities, being centers of innovation with abundant scientific research resources, can improve their competitiveness and service quality through service innovation (Cheng & Krumwiede, 2012). By optimizing workflows and developing innovative products, universities can enhance overall performance, providing good working and learning experiences for staff and students (Snyder et al., 2016). The study results offer references for organizational management in universities and can be applied to other industries (Sherehiy & Karwowski, 2014; Vasanthan & Suresh, 2022).

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Limitations and Future Research

This study has some limitations, mainly that the research sample did not cover all universities in Hainan. Future research should expand the scope to include different regional economic developments and policies. Further studies should add more variables affecting organizational performance to explore these factors from various perspectives (Jaworski & Kohli, 1993; Kolb & Kolb, 2005). The author suggests that future research should continue studying university development, refining organizational performance factors, and exploring external influences such as policy changes and regional economic development (Fornell & Larcker, 1981; Hair et al., 2014).

In conclusion, this study provides a new perspective on the organizational management of universities in Hainan, exploring factors affecting organizational performance. Future research should continue to expand and deepen the study, combining management experiences from other well-known universities to support the development of local universities in Hainan (Ahmad et al., 2015; Iqbal et al., 2019).

Disclosure Statement

No potential conflict of interest was reported by the authors.

Author Contributions

Conceptualization : JW, ST

Data curation : JW, ST

Formal analysis : JW, ST

Funding acquisition : JW, ST

Investigation : JW, CP, ST

Methodology : JW, CP, ST

Project administration : CP, ST

Resources : JW, JS, ST

Software : JW, JS, ST

Supervision : CP, JS, ST

Validation : JW, JS, ST

Visualization : JW, CP, ST

Writing – original draft : JW, JS

Writing – review & editing: JW, ST

Disclosure of Interest

No competing interests.

Data Availability

Available from the author upon request.

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