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Capital availability, supply chain efficiency and innovation of agripreneurs: Basis for strategic development for sustainable farming

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Abstract

This study examined the relationship among capital availability, supply chain efficiency, and innovation as basis for development of strategic development plan for sustainable farming agripreneurship. Data was collected from 384 agripreneurs through a structured survey. The instrument covered financial resources, government support, and financial training; resource management, distribution channels, and supplier coordination; and technology adoption, innovation training, and digital integration. Descriptive statistics, the Shapiro-Wilk test, Spearman rho correlation, and Kruskal-Wallis tests were used in the analysis. Results revealed that the average age of agripreneurs is 46 years old and above which shows ageing population of agripreneurs which majority is male. The study further confirms low levels of access to capital and persistent inefficiencies across the supply chain, including limited market access and coordination with suppliers. In contrast, respondents showed a moderately positive outlook toward innovation, with many using platforms such as Facebook and YouTube to access farming knowledge. No significant relationships were found between capital availability and innovation or between supply chain efficiency and innovation. However, financial training showed a weak but significant relationship with supply chain outcomes. Based on the findings, a strategic development plan was developed, emphasizing inclusive capital access, capacity-building through farmer organizations, and technology-supported practices. There is a strong need to form farmer's organization or cooperatives at grassroot levels to leverage resources, training and credit access. It recommends further studies in Visayas and Mindanao and the integration of agripreneurship into higher education to engage the next generation of agripreneurs to sustain agriculture in the country.

Keywords: agripreneurship, capital availability, supply chain, innovation, sustainability

Capital availability, supply chain efficiency and innovation of agripreneurs: Basis for strategic development for sustainable farming

1. Introduction

The agricultural sector is one of the critical sectors in the Philippine society, serving as the primary source of livelihood for millions of Filipinos, securing the food source and supporting economic growth in the rural areas. During 1970's to 1990's, Philippines was one of the pioneer and key players in the Agriculture Industry and one of the leading exporters of agricultural products especially in the Southeast Asian region. However, this sector is continuously facing a lot of challenges and threatens its growth and productivity. In the 2023 report of the Philippine Statistics Authority (PSA), Agriculture, Forestry and Fishing (AFF) accounts only for mere 8.9% of the country's Gross Domestic Product (GDP). This report highlights the urgent need to improve the efficiency and effectiveness of the agricultural sector, especially amid numerous challenges such as climate change, an aging farmer population, inefficient logistics, weak capital access, land fragmentation and slow adoption of innovation. Currently, Philippines is even importing agricultural produce such as rice, sugar, even fish from neighboring countries such as Vietnam, Thailand and China. The country will be facing more potential problems in the future if our agricultural sector continues to shrink and import dependence. These realities, although widely known, remain insufficiently addressed both in policy and practice.

One of the most pressing concerns in the agriculture sector is the aging population of farmers in the Philippines. Based on the last study conducted by the Department of Agriculture – Agriculture Training Institute in 2013, the average age of Filipino Farmers is between 57-59 years old. This demographic shift shows a significant and urgent need to address. Younger generations are often reluctant to pursue a career in farming because of the bad perception that there is less financial reward and other growth opportunities. Agriculture is often associated with poverty, longer working hours under the sun, huge risk and losses due to typhoon and natural calamities and very low government support. Even those coming from farming families are very hostile in continuing this endeavor and opt to sell the farm lots and rather convert it into industrial or residential lots.

Aside from aging farming population, this research seeks to examine three interlocking barriers to agripreneur growth: Capital Availability, Supply Chain Efficiency and Grassroots Innovation. These three variables were selected not only because of experience and observation, but rather existing literature often treats them individually. Capital, in the form of credit and subsidies, is the foundation on which expansion is built. Supply Chain efficiency, including input access and market connectivity, determines how effectively agripreneurs move their produce from farm to consumer. Innovation, whether formal or informal, allows farmers to adapt, grow and participate in the future of agriculture.

The main issue that the farmers are facing is related to lacking capital and financial aid for the farmers. Access to capital is essential for farmers to invest in modern technologies and have sufficient farm input to induce productivity. Consequently, majority of the Filipino farmers are categorically considered small farmer with less than 3 hectares of land attended to. Most of the small-town farmers do not have access to formal credit channels such as banks, thus further limiting their ability to procure modern equipment that can increase productivity. Instead, they are very vulnerable to high interest, informal channels, with their harvest as their guaranteed payment. It's a cycle of loan, pay, loan again to the farmers, and if no concrete help is provided for them, this will continue until the farmers will not be able to continue farming. Another critical issue that needs to be address is the inefficient supply chain in the agriculture sector in the Philippines, both in the infrastructure and in the flow of goods and the services need by our farmers. Post-harvest losses in the Philippines amounting to as much as 25% of the produce due to poor infrastructure, inadequate storage facilities, and even inefficient logistic systems. This results in higher operational costs for the farmers, resulting in two different impacts, one is reducing the competitive factor of local produce over to those imported ones, and the rising price of goods affecting the buying

power of the consumer, that translates to higher inflation rates.

Additionally, technology adoption remains a major concern in the agriculture sector. Our neighboring countries are incorporating advances in the agricultural technology such as precision farming tools, using Internet of Things (IoT) in the irrigation systems, and even incorporating smart technologies to revolutionize farming outputs, but the Philippines is lagging in this advancement. This gap is also attributed because of our farmers' aging population; however, technology adoption is one of the key drivers in enhancing productivity and mitigate risk attributed to climate change.

In the most recent period, agriculture is facing more challenges than ever; Covid-19 pandemic worsened the challenges faced by the farmers. African Swine Fever is affecting hog raiser in the region, especially in Batangas. Natural disasters such as the Taal Volcano eruption and devastating typhoons such as Kristine (international name is Trami) and Southwest Monsoon or Habagat affect the agricultural industry, and these natural threats will further exacerbate the conditions farmers are facing right now. The rise of Agripreneurs, or farmers who applies entrepreneurial skills by going beyond traditional ways and providing value added activities to increase value of the agricultural products, leading to higher profit, sustainable livelihood for the community is very vital for Philippine agriculture sector (Reyes, 2020). However, not addressing concerns that the sector is facing right now will not encourage agripreneurs to continue with their operation.

This research aims to address key areas such as capital availability, supply chain efficiency and innovation that will help tackle the systemic and chronic issues affecting the agricultural sector in the Philippines. It can bridge the gap between our current conditions and the ideal situation of a more productive, resilient and sustainable agricultural industry. As more farmers are being exposed to agripreneurship, policies and support must be readily available for them to ensure success (Santoalla et al, 2025). This research will benefit government offices such as Department of Agriculture, City & Municipal Agricultural Offices in providing realistic and sustainable projects that can uplift the conditions of farmers and agripreneurs. This will also help the formal financial institutions, such as banks and micro-creditors to design appropriate programs. This research aims to integrate – government, academe, private organizations and NGOs not as external factor but as embedded partners.

The researcher as an agripreneur himself, who came from generations of farmers experienced the harsh realities of agriculture in the Philippines. The researcher had actual trouble in securing capital, high cost of seeds and fertilizers, and low farm gate prices due to importation and rampant smuggling of agricultural produce. These chronic problems affect lives of thousands and thousands of farmers, their families and kids, including the researcher's own community. This lifelong journey of improving the lives of a Filipino farmer is the strong rationale behind this study. This research outcome will hopefully lead to a future state of not just profitable farmers, but resilient communities. Agriculture, if nurtured right, can feed both communities and dreams. The researcher hopes that this research will lead to one small step towards that future.

Objectives of the Study - The study aimed to assess the capital availability, supply chain and innovation of agripreneurs in Batangas province. Specifically, it determined the agripreneurs access to capital availability in facilitating adoption of sustainable farming practices in terms of financial resources, government support, and financial training programs; assessed the supply chain efficiency used in sustainable farming practices in terms of resource management, distribution channel and supplier coordination; determined the influence of innovation to agripreneurs as to the extent of technology adoption, participation in innovation training, and digital and technological integration; tested the significant relationship among capital availability, supply chain efficiency, and innovation and develop strategic development plans for sustainable farming.

2. Methods

Research Design - In this study, the researcher used descriptive research design aimed to understand the current conditions and challenges faced by the agripreneurs in the Philippines, specifically in the province of Batangas, related to the three key areas: capital availability, supply chain, and innovation. Descriptive research

was used to effectively understand the current condition of the respondents, and to be able to check whether patterns or a specific characteristic of a group were present that can be significant to the results of the study. This research design has systematically collected and analyzed qualitative data from the list of agripreneurs in the province. The researchers aimed to engage agripreneurs who are directly involved in the production, marketing, sales and distribution of their own agricultural produce (Krishnankutty et.al.,2024). The study aimed to develop a framework which was essential for more effective interventions to uplift the lives of the Filipino farmers, improve the economic outlook of the Philippines and to support the achievement of the UN SDGs.

Participants of Study - The participants in the study were agripreneurs from the province of Batangas. They were selected through random and purposive sampling to ensure that respondents had actual experience with the prevailing conditions of agriculture in the country and could provide diverse perspectives to support the development of the framework. The number of respondents was determined based on data from the Department of Agriculture Region 4A registry. As of 2022, there were a total of 91,254 farmers in the province; however, not all farmers could be immediately considered agripreneurs, making the selection process for this study more complex. In the study of de Mesa et al. (2022), an agripreneur was described as a person whose approach to agriculture aimed to revitalize and modernize the sector by converting raw produce into high-value products. Similarly, an agripreneur was characterized as someone who shifted from traditional farming practices to creating opportunities within the agricultural value chain, from sourcing to output.

To qualify respondents as agripreneurs for this study, a metric was applied requiring that each individual meet at least three of the following five characteristics: (1) Value Addition and Processing, meaning they created and sold products beyond raw produce; (2) Market-Oriented Approach, defined as selling directly to customers or trading posts without intermediaries; (3) Diversified Income Streams, where income was generated from multiple crops or livestock; (4) Farmer's Organization and Network, indicating membership in a barangay or town agriculture organization or cooperative; and (5) Employment Generation, where the farmer employed at least one helper in agricultural ventures. Using Raosoft Statistical Software and considering the 91,254 registered farmers in the province, the sample size was calculated to be 384 respondents at a 95% confidence level and a 5% margin of error. The breakdown of the agripreneurs included in the study came from Tanauan City with 133 respondents, Lipa City with 56 respondents, Sto. Tomas City with 96 respondents, Malvar with 48 respondents, Talisay with 34 respondents, Laurel with 12 respondents and San Jose with 5 respondents. This approach allowed the study to effectively capture a broad range of insights from respondents while reflecting the varying experiences and agricultural conditions across different cities and municipalities in Batangas.

Instrument of the Study - The primary instrument and source of information for this study was the use of a structured type of questionnaire designed to measure respondents' perceptions and gather information for specific areas using Likert-type scales. The questionnaires were sub-divided into four key areas that correspond to the flow of the study. It was rated on a four-point scale, ranging from "Strongly Disagree" to "Strongly Agree" which helped quantify the intensity of which the respondents conformed to the questionnaires. The first part focused on Capital Availability which measured the agripreneurs' access to financial resources, like loans, grants and even private investment to sustain its operations. It also considered government support and financial training needed to prosper the agri-ventures and how capital resources support technology integration. The second part focused on Supply Chain Efficiency which tackles agripreneurs' resource management for agricultural inputs and outputs. This also covered distribution channels to ensure timely and safe transport of agricultural produce. The third part discussed the agripreneurs' level of agreement on the current level of innovation and technology integration into the agriculture sector and how it helped the farmers to improve their operation, increasing their productivity and profitability. The fourth section has open-ended questions that enabled the respondents to have additional insights or responses that were not covered in the structured questionnaire section. It also included questions describing the nature of agricultural endeavor to understand variability and have a cohesive result afterwards.

The questionnaires were validated from a series of reviews of related literature and feedback from those experts in the field of economics, agriculture and management practices in the province. After validation, it was

reviewed and approved by the Ethics Review Committee. The pilot testing and reliability test was conducted in the initial pool of 30 agripreneurs. The reliability results of the variables such as Capital Availability, Supply Chain Efficiency, and Innovation demonstrated strong internal consistency, as indicated by Cronbach's alpha (α) values. Specifically, Capital Availability, which includes Access to Financial Resources ($\alpha=0.852$), Access to Government Support ($\alpha=0.877$), and Access to Financial Training Programs ($\alpha=0.876$), yielded an overall α value of 0.919, marking it as excellent. Similarly, Supply Chain Efficiency, consisting of Resource Management ($\alpha=0.865$), Distribution Channels ($\alpha=0.864$), and Coordination with Suppliers ($\alpha=0.891$), obtained an overall α value of 0.923, also categorized as excellent. Lastly, the Innovation variable, comprising Adoption of New Technologies ($\alpha=0.839$), Innovation Training & Knowledge Sharing ($\alpha=0.876$), and Digital and Technological Integration ($\alpha=0.849$), achieved an overall α value of 0.923, indicating excellent reliability. These findings suggested that the questionnaire used in the study are highly reliable, ensuring consistency in assessing variables that influence financial accessibility, supply chain efficiency, and innovation within the given context.

Data Gathering Procedures - The data collection process began with the creation of the survey questionnaires. The content was validated by experts in the field of agriculture and management, especially in region 4A. After the validation, the researcher tested the survey instrument with 30 initial respondents and consolidated the results afterwards and submitted the results for reliability testing. After the reliability test was conducted and confirmed, formal data collection process began by visiting the municipal and city agricultural offices in Batangas. The researcher visited the agricultural offices and informed the head of offices of the planned survey activities. The researcher seeks approval for the study and asked for endorsement from the chief agriculturist for the local unit in the barangays. Since the Data Privacy Law is in place, list of agripreneur cannot be provided by the government offices, rather an actual visit per barangay was recommended. The survey was conducted via Face-to-Face and by using printed copy of the survey questionnaire. In some cases, questionnaires were translated to Filipino language to accommodate respondents especially those that cannot understand English. The study was conducted for a month and a half long activity of actual survey distribution and interviews followed to gather responses from the target population. During the study, crop farming was found out to be under the Department of Agriculture, while Livestock is under the management of the Bureau of Animal Industry. The researcher formed a team that helped the researcher to reach more agripreneurs simultaneously. After the responses were manually collected, it was encoded, sorted and tabulated. Results were forwarded to statistician and subjected to statistical treatment and data analysis. Once finished, interpretation was conducted and compared against related literature for more in-depth comprehension.

Data Analysis - Weighted mean and rank were used to determine the agripreneurs access to capital availability in facilitating adoption of sustainable farming practices in terms of financial resources, government support, and financial training programs; to assess the supply chain efficiency used in sustainable farming practices in terms of resource management, distribution channel and supplier coordination; and to determine the influence of innovation in advancing sustainable farming methods by assessing the extent of technology adoption, participation in innovation training, and digital and technological integration. The result of Shapiro-Wilk Test showed that p-values of all variables were less than 0.05 which means that the data set was not normally distributed. Spearman rho was used to test the significant relationship. All analyses were performed using SPSS version 28.

Ethical Considerations - To ensure that all information acquired was utilized solely for research purposes and to maintain the quality and authenticity of the study, ethical considerations were employed throughout the research process. This is also in compliance with the Data Privacy Act of 2012. The researcher made sure that the chosen respondents were ready to respond to the relevant questions associated with the study by asking for each person's consent in person. By refraining from asking respondents for their identities while they were completing the questionnaires, the researcher ensured their secrecy and anonymity. Additionally, it was made sure that the respondents would freely choose how they would react to the questionnaires. Finally, the researcher made sure that none of the study participants were injured or otherwise negatively affected, and that their health, safety, and security came first. Lastly, since most of the respondents are agripreneurs in the rural areas, careful consideration of local practices and customs was observed during the conduct of the study.

3. Results & discussion

Table 1

Summary Table of Agripreneurs Access to Capital Availability in Facilitating Adoption of Sustainable Farming Practices

Indicators	Weighted Mean	Verbal Interpretation	Rank
Financial Resources	2.12	Disagree	2.5
Government Support	2.12	Disagree	2.5
Financial Training Programs	2.13	Disagree	1
Composite Mean	2.12	Disagree	

Legend: 1.00 – 1.49 Strongly Disagree; 1.50 – 2.49 Disagree; 2.50 – 3.49 Agree; 3.50 – 4.00 Strongly Agree

Table 1 presents a summary of the respondents' overall access to capital availability across three key sub-indicators: financial resources, government support, and financial training programs. All three components received a verbal interpretation of "Disagree," with a composite mean of 2.12. Financial training programs obtained the highest weighted mean at 2.13, followed closely by both financial resources and government support, each at 2.12. These results suggest that while there are slight variations in perception across the categories, the overall consensus among respondents is that capital-related support systems remain insufficient or inaccessible in enabling sustainable farming practices. The narrow difference in weighted means across all three sub-indicators highlights a shared perception of difficulty in accessing capital—whether through direct financing, institutional support, or knowledge development. Although financial training programs were rated slightly higher, the disagreement rating indicates that even these opportunities are not widely available or relevant to the majority of agripreneurs. This consistent feedback reinforces the notion that structural and systemic improvements are necessary across all fronts to equip agripreneurs with the tools they need to sustain and expand their ventures.

Table 2

Summary Table of Supply Chain Efficiency used in Sustainable Farming Practices

Indicators	Weighted Mean	Verbal Interpretation	Rank
Resource Management	2.42	Disagree	3
Distribution Channel	2.44	Disagree	1
Supplier Coordination	2.43	Disagree	2
Composite Mean	2.43	Disagree	

Legend: 1.00 – 1.49 Strongly Disagree; 1.50 – 2.49 Disagree; 2.50 – 3.49 Agree; 3.50 – 4.00 Strongly Agree

Table 2 presents the summary of respondents' perceptions of supply chain efficiency across three sub-variables: resource management, distribution channel, and supplier coordination. All components received a verbal interpretation of "Disagree," with a composite mean of 2.43. Among the three, the distribution channel scored the highest at 2.44, followed closely by supplier coordination at 2.43, and resource management at 2.42. The minimal variation among the scores suggests that inefficiencies were felt consistently across the supply chain spectrum. This result reinforces the observation that agripreneurs face challenges not only in moving their products to market but also in managing production inputs and maintaining effective coordination with suppliers. The low ratings across all three aspects point to an underdeveloped and fragmented supply chain structure. These inefficiencies likely contribute to higher operating costs, delays in operations, and reduced farm profitability. While there may be some awareness of better systems and tools, access and implementation remain limited, particularly in rural and smallholder contexts.

Table 3

Summary Table of Influence of Innovation in Advancing Sustainable Farming Methods

Indicators	Weighted Mean	Verbal Interpretation	Rank
Technology Adoption	2.88	Agree	3
Innovation Training	2.89	Agree	1.5
Digital and Technological Integration	2.89	Agree	1.5
Composite Mean	2.89	Agree	

Legend: 1.00 – 1.49 Strongly Disagree; 1.50 – 2.49 Disagree; 2.50 – 3.49 Agree; 3.50 – 4.00 Strongly Agree

Table 3 provides a summary of the agripreneurs' perceived influence of innovation in advancing sustainable farming practices. The composite mean was 2.89, verbally interpreted as "Agree." This reflects a generally

favorable view among respondents toward the role of innovation in their agricultural activities. Both *Innovation Training* and *Digital and Technological Integration* recorded the highest weighted mean of 2.89, while *Technology Adoption* followed slightly behind at 2.88. The narrow difference across all three indicators suggests a consistent and moderately strong engagement with innovative practices. Farmers appear open to adopting new tools, participating in training activities, and integrating technology into their day-to-day operations. Although none of the scores exceed 3.0, the level of agreement shows that innovation is taking root within their agribusiness practices, even if broader or deeper integration still faces some barriers. This also complements earlier findings where, despite financial and supply chain challenges, innovation emerged as a relatively stronger area of performance.

Table 4
Relationship Between Capital Availability and Supply Chain Efficiency

Financial Resources	rho	p-value	Interpretation
Resource Management	-0.033	0.523	Not Significant
Distribution Channel	-0.050	0.333	Not Significant
Supplier Coordination	-0.078	0.125	Not Significant
Government Support			
Resource Management	-0.084	0.101	Not Significant
Distribution Channel	-0.072	0.158	Not Significant
Supplier Coordination	-0.097	0.056	Not Significant
Financial Training Programs			
Resource Management	-.119*	0.020	Significant
Distribution Channel	-.114*	0.026	Significant
Supplier Coordination	-.119*	0.020	Significant

Legend: Significant at p-value <0.05*

Table 4 presents the relationship between capital availability and supply chain efficiency. Based on the results that financial resources and government support do not show significant relationships with any aspect of supply chain efficiency, including resource management, distribution channels, and supplier coordination, as evidenced by their weak and non-significant correlation values ($p > 0.05$). This suggests that simply having more financial resources or receiving government assistance does not necessarily lead to improved efficiency in the supply chain processes. In contrast, financial training programs exhibit a significant but negative correlation with all three sub-variables of supply chain efficiency (p ranging from -0.114 to -0.119 , $p < 0.05$). This implies that participation in financial training programs decreases, reported efficiency in resource management, distribution channels, and supplier coordination tends to slightly increase. This finding strengthened the impact that practical knowledge, particularly in managing finances, plays a more direct role in improving operational efficiency than the mere availability of funds. It is likely that training equips agripreneurs with the skills to optimize limited capital, maximize supplier coordination, and manage distribution constraints. Significant relationship, though negative, may reflect a pattern where those engaging in financial training become more capable of identifying and correcting inefficiencies in their supply chain. Thus, increasing financial education emerges as a more impactful driver of efficiency than passive capital access alone.

Table 5
Relationship Between Capital Availability and Innovation

Financial Resources	rho	p-value	Interpretation
Technology Adoption	0.055	0.278	Not Significant
Innovation Training	0.079	0.121	Not Significant
Digital and Technological Integration	0.029	0.573	Not Significant
Government Support			
Technology Adoption	0.041	0.422	Not Significant
Innovation Training	0.009	0.857	Not Significant
Digital and Technological Integration	-0.002	0.976	Not Significant
Financial Training Programs			
Technology Adoption	0.049	0.338	Not Significant
Innovation Training	0.021	0.680	Not Significant
Digital and Technological Integration	-0.019	0.710	Not Significant

Legend: Significant at p-value <0.05*

Table 5 shows the relationship between capital availability and innovation. Based on the findings, there are

no statistically significant relationships between capital availability and innovation-related factors across all variables examined. Specifically, financial resources, government support, and financial training programs show weak and non-significant correlations with technology adoption, innovation training, and digital and technological integration ($p > 0.05$). These results suggest that even there is an availability of financial capital, external support, or financial training does not directly influence the level of innovation within agripreneurs. This implies that innovation in farming practices may be driven less by access to capital and more by the farmers' internal motivation, exposure to peer practices, or digital habits shaped outside formal structures. While capital support mechanisms remain important, they appear insufficient in triggering innovation unless provided together by specific support, mentoring, or technology-driven community programs. Agripreneurs may be adopting new technologies and tools through informal learning platforms or grassroots experimentation, independent of formal financial assistance. This underscores the need to rethink innovation interventions beyond funding and include more localized and behavior-centered approaches.

Table 6
Relationship Between Supply Chain Efficiency and Innovation

Resource Management	rho	p-value	Interpretation
Technology Adoption	-0.016	0.757	Not Significant
Innovation Training	0.025	0.628	Not Significant
Digital and Technological Integration	0.013	0.798	Not Significant
Distribution Channel			
Technology Adoption	0.033	0.521	Not Significant
Innovation Training	0.057	0.262	Not Significant
Digital and Technological Integration	0.041	0.420	Not Significant
Supplier Coordination			
Technology Adoption	0.014	0.783	Not Significant
Innovation Training	0.015	0.773	Not Significant
Digital and Technological Integration	0.004	0.943	Not Significant

Legend: Significant at p-value $< 0.05^*$

Table 6 presents the relationship between supply chain efficiency and innovation. Based on the results, there are no statistically significant relationships between supply chain efficiency and innovation factors across all variables examined. Specifically, resource management, distribution channel, and supplier coordination exhibit very weak and statistically non-significant correlations with technology adoption, innovation training, and digital and technological integration ($p > 0.05$ in all cases). These findings suggest that improvements in supply chain efficiency do not necessarily translate to higher levels of innovation within the agripreneurs.

This result suggests that even when agripreneurs improve their efficiency in managing resources, coordinating with suppliers, or moving products to market, these operational improvements do not automatically drive innovation. For many agripreneurs, especially those managing small to medium-scale ventures, day-to-day efficiency often revolves around survival and cost control, rather than long-term experimentation or adoption of new technologies. The absence of a significant relationship implies that innovation may be influenced more by external exposure—such as digital learning, peer networks, or developmental support—rather than internal supply chain processes. Agripreneurs may become more innovative not necessarily because their operations are efficient, but because they are given the space, tools, and encouragement to try new practices beyond what is required to “get by.” This reinforces the importance of designing separate, deliberate strategies to foster innovation, rather than assuming it will follow naturally from operational improvements. Likewise, the policy of the city or municipal agriculture should be long term emphasizing continuity and consistency.

Strategic Development Plan

This strategic development plan was developed in direct response to the identified critical gaps in capital availability, supply chain efficiency and the uneven adoption of innovation among Filipino agripreneurs. The plan takes into account the study's key findings: limited access to financial resources, minimal and inconsistent government support, weak input management systems, and a reliance on informal learning pathways for innovation. Recognizing these, the plan organizes solutions into targeted programs with defined objectives, stakeholders, and

expected outcomes. Significantly, this plan also emphasizes the essential role of organized farmer groups—associations or cooperatives—in order to leverage access to capital, training, and government services. It highlights the need for improved farmer-bankability through credit profiling and financial discipline. Likewise, the plan supports the adoption of accessible, low-cost technologies that many older agripreneurs have already started. As an evidence-based tool, the development plan is designed to be adaptive, grounded in local realities, and capable of informing responsive, farmer-centered policymaking.

This plan focuses on three interrelated areas of intervention: capital accessibility, supply chain efficiency, innovation and digital adoption. Each area targets specific sub-variables found to be most lacking based on the study’s weighted mean results. The plan sets clear short, medium and long-term objectives and actions, and identifies key implementing stakeholders, including the Department of Agriculture, LGUs, academic institutions, and the private sector. The plan is applicable to small and medium-scale agripreneurs, particularly those in rural areas with limited access to formal credit, training, and infrastructure. By focusing on actionable solutions and emphasizing both top-down (government) and bottom-up (community) initiated activities, this development plan aims to provide a practical roadmap for enabling sustainable farming—transforming insight into action, and intention into outcomes.

Table 7
Strategic Development Plan for Sustainable Farming

Strategic Area	Key Result Area	Objective	Key Actions / Programs	Timeline	Responsible Stakeholders	Expected Outcomes
Capital Availability	Financial Resources	Enhance Access to Financing	Establish cooperative-led lending schemes and pooled capital funds Develop microfinance and insurance products tailored for small farmers	Short to Medium Term	Cooperatives, Rural Banks, Microfinance Institutions	Increased credit access, reduced reliance on informal lending
	Government Support	Strengthen government assistance for agripreneurs	Simplify government loan application processes and improve reach to rural barangays.		DA, LGUs	Higher government loan utilization
Supply Chain Efficiency	Resource Management	Improve input management and maximize efficiency	Develop shared input and storage facilities for farmers’ groups Train farmers in input optimization and waste reduction	Medium Term	DA, DTI, Private Agribusinesses, Cooperatives, ICT Providers	Reduced post-harvest losses, improved input access, stronger supplier relationships
	Supplier Coordination	Strengthen Coordination with suppliers and availability of farm inputs	Implement digital supplier communication platforms Facilitate supplier-farmer agreements through cooperatives			
Innovation	Technology Adoption	Increase adoption of practical agricultural technologies	Conduct community-based tech demonstration farms Provide subsidies for purchasing modern farm tools	Medium to Long term	DA TESDA Academic Institutions, Tech Providers, Farmer Associations	Wider technology usage, improved farm productivity, stronger online market presence
	Digital Integration	Strengthen digital capabilities of agripreneurs	Train farmers on digital marketing and record keeping apps Develop online learning hubs for continuous innovation exposure			
Capability Building and Policy Support		Strengthen agripreneur skills and ensure long-term, policy-backed sustainability	Offer agripreneurship education and leadership training Include agripreneurship electives in tertiary education Establish farmer-led feedback loops to guide DA programs Maintain policy continuity regardless of administration changes	Short to Long term	DA, CHED, LGUs, Academic Institutions, Policy Makers	Skilled farmer-leaders, increased youth participation, stable and responsive agricultural policies

4. Conclusions and recommendations

Access to capital remains a critical barrier. Respondents showed low satisfaction with all sub-variables: financial resources, government support, and financial training programs. Supply chain inefficiencies were evident across all respondents and all sub-variables: Innovation emerged as a relatively stronger area, with respondents moderately agreeing on technology adoption participation in innovation training and digital integration. Relationship analyses found a weak but significant correlation between financial training and supply chain efficiency. No significant relationships were found between capital availability and innovation or between supply chain efficiency and innovation. A strategic development plan was developed focusing to increase development on three key areas of capital availability, supply chain efficiency and innovation.

In light of the study's findings, the researcher recommends the following: For City or Municipal Agriculture Office to consider prioritizing forming farmers' associations or cooperatives. Organizing agripreneurs into formal groups offers clear advantages—better access to credit, eligibility for government support, shared equipment, and stronger bargaining power. With guidance from local government units, agricultural officers, and development organizations, agripreneurs can be supported in organizing, registering, and managing these cooperatives. For Farmers Association and Cooperatives to help build credit readiness and financial discipline among farmers. Providing training on basic financial recordkeeping, savings habits, and understanding credit mechanics can help bridge this gap. This will also prevent small and micro farmers from mortgaging land titles for additional capital at higher interest rates from informal channels. For Agriculture Training Institute (ATI) may continue to promote Technology Adoption in simple and accessible ways, such as social media platforms like Facebook and YouTube to learn new techniques, explore markets, or watch farm tutorials. These habits can be strengthened by introducing structured learning modules, mobile apps with offline capabilities, and peer-led demonstration sessions. For Department of Agriculture (DA) to consider supporting the agripreneurs adequately and consistently, independent of changes in administration. Projects can be categorized into short-, medium-, and long-term efforts. In the short term, actions should focus on organizing farmers into groups. Medium-term priorities include infrastructure support, LGU and private sector partnerships. Long term efforts includes institutional support for cooperatives and community-led monitoring systems to ensure program responsiveness. For Department of Agriculture (DA) to consider adopting and operationalize the proposed strategic framework for sustainable agripreneurship. The DA can pilot the framework in selected provinces, integrating its components—capacity building, supply chain efficiency, innovation, and collective farmer organization—into existing agricultural programs. Using the framework's built-in feedback mechanisms, the DA can develop policies that are more responsive to farmers' needs, harmonize support across agencies, and scale successful interventions nationwide. For future researchers, to encourage conduct of similar studies in other regions, particularly in the Visayas and Mindanao to strengthen the research base and create a more complete national picture. Agricultural conditions, challenges, and opportunities may differ significantly across regions. Lastly, for Tertiary Education Institutions to consider offering agripreneurship as an elective or specialization, especially in agriculture, business, and entrepreneurship programs. By doing so, young people can be introduced to farming not only as a tradition but as a viable enterprise.

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Business continuity management and organizational resilience among small and medium enterprises

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Abstract

Business operations can be disrupted by a wide range of unforeseen events and such disruptions can vary in scale and impact, ranging from minor inconveniences to severe crises that threaten the very existence of a business. This study assessed the Business Continuity Management (BCM) and the Organizational Resilience of Small and Medium Enterprises in Batangas City which examined the proactive risk management, continuity planning, and adaptive strategies that enable them to withstand and overcome challenges. The study also described the firmographic profile of SMEs in terms of the nature of business, size, and years of operation, assessed Business Continuity Management as to risk management, crisis management, and disaster recovery, evaluated Organizational Resilience in terms of Operational Resilience, Strategic Resilience and Cultural Resilience, tested the significant differences on the responses when grouped according to profile, tested the significant relationships between business continuity management and Organizational Resilience and proposed action plan that Small-Medium Enterprise owners can implement to ensure the continuity of business. The study utilized descriptive research design. The study revealed that respondents moderately agree with regards to preparedness of Business Continuity Management (BCM) in terms of risk management, crisis management, and disaster recovery. For Organizational Resilience the respondents demonstrated strong agreement as to Operational Resilience, Strategic Resilience and Cultural Resilience. There were significant differences in terms of Business Continuity Management on the responses when grouped according to profile; However, in terms of Organizational Resilience, most of the variable were significant but not with Operational and Cultural aspects of Industry and operational under the profile years of operation. There is significant relationship between business continuity management and organizational resilience and that more prepare the business continuity management is, the better their organizational resilience is. Finally, an action plan was developed for Small and Medium Enterprise owners that can be used to ensure the continuity of business.

Keywords: Business Continuity Management (BCM), organizational resilience, risk management, crisis management, disaster recovery, operational resilience, strategic resilience, cultural resilience

Business continuity management and organizational resilience among small and medium enterprises

1. Introduction

Unexpected events can disrupt business operations. Disruptions can vary in scale and impact, ranging from minor inconveniences to severe crises that threaten a business's very existence. Business Continuity Management (BCM) was created to prevent or lessen risks, lessen the effects of emergencies or disasters, and shorten the time it takes to return things to normal. A framework for enhancing organizational resilience is offered by business continuity management. It is a comprehensive approach that detects possible risks to a company and its operations (Anir et al., 2019). BCM has been incorporated into various crisis-resolution ideas. It is related to ideas like catastrophe recovery, crisis management, and risk management. By addressing risks through actions and suitable measures, BCM is related to risk management. Through the incident management component, BCM and crisis management are very closely related. Crisis operation is allowed to reply to both palpable and impalpable events, like mishaps that damage a company's character or fiscal performance. also, disaster recovery is a subset of business durability operation since it's principally a plan with the structure to support it that's enforced in the event of a disaster (Sagita, 2018).

The Philippines is ranked as the ninth most disaster-prone nation in the 2019 World Risk Report, which bases this ranking on the country's vulnerability to natural catastrophes, its ability to adapt to them, and its ability to cope with them. Additionally, according to the 2015 poll, the top three effects of catastrophes on businesses were damage to premises and equipment, the inability of the company to deliver to consumers, and the incapacity of staff to report to work. Without basic information on business continuity management, risks connected with disaster strikes are quite high, and owing to limited resources Small and Medium Enterprises (SMEs) might be particularly vulnerable to business disruptions.

Looking at the situation deeper, the researcher believed that organizational resilience is the adaptive capacity of an organization, to recover, and grow in the face of uncertainties, crises, or unexpected challenges. In the 21st century, where uncertainty and rapid change are the standard, resilience is no longer optional, instead, it is a critical capability for organizations to survive, thrive, and achieve their long-term goals. In addition to being able to endure shocks, resilience enables businesses to use crises as a chance for innovation and expansion. To elaborate, operational resilience refers to an organization's capacity to continue providing value and doing essential tasks even in times of disaster. It involves ensuring that day-to-day operations can continue smoothly, despite disruptions. Operational resilience requires organizations to have the ability to reallocate resources such as finance, technology, or personnel to address immediate challenges. It also requires proactive identification and mitigation of risks to minimize disruptions and having backup plans and systems ensure critical operations can push through during a crisis. On the other hand, the researcher also believed that the organizations here in the Philippines must have strategic resilience that is more on maintaining strategic consistency while being flexible to adapt to changing circumstances. For example, during economic downturns, strategic resilient organizations might pivot their business models, explore new markets, or invest in innovations to stay competitive. Researcher believed that business leaders can anticipate changes, make informed decisions, and guide the organization through uncertainty. There should be preparation for multiple future scenarios and having strategies in place to respond effectively and of course embracing change and using crises as opportunities to innovate and grow.

Furthermore, small and medium enterprises (SMEs) often lack the financial, technological, and human resources that larger organizations must recover from crises. Events like economic downturns, natural disasters, cyber-attacks, or even pandemics can have devastating effects on SMEs, leading to business closures and job losses. Understanding how business continuity management and organizational resilience can help SMEs navigate these challenges is crucial for their survival and growth. While business continuity management is well-documented in

large companies in most cases, its application and effectiveness in SMEs remain under-researched. SMEs often face unique challenges in implementing BCM, such as limited budgets, lack of expertise, and competing priorities. This study sheds light and aims to address the gap by investigating the Business Continuity Management and Organizational resilience of Small and Medium Enterprises in Batangas City. Business owners will be able to assess their perceived organizational resilience and the preparation for any business disruption through Business Continuity Management.

Objectives of the Study - This study assessed Business Continuity Management (BCM) and the Organizational Resilience of Small and Medium Enterprises to examine proactive risk management, continuity planning, and adaptive strategies that enable them to withstand and overcome challenges. Specifically, it sought to Assess Business Continuity Management as to risk management, crisis management, and disaster recovery; evaluate Organizational Resilience in terms of Operational Resilience, Strategic Resilience, and Cultural Resilience; test the significant relationships between business continuity management and Organizational Resilience; and propose an action plan that Small-Medium Enterprise owners can implement to guarantee the steadiness of business.

2. Methods

Research Design - To evaluate the organizational resilience and business continuity management of small and medium-sized businesses, the researchers employed a descriptive research approach. The goal of descriptive study design is to gather data methodically to characterize a population, circumstance, or phenomenon. More precisely, it aids in addressing the research problem's what, when, where, and how inquiries as opposed to its why. This research can be carried out by researchers using a variety of approaches. It generally involves quantitative data, while qualitative data is also employed for descriptive purposes. It is crucial to remember that, in contrast to experimental research, the researcher does not control or modify any factors when using the descriptive research approach. Rather, only the variables are recognized, noted, and quantified. Surveys and observation are the most used method to conduct this research design (Voxco, 2021). The researcher found it suitable to assess the relevance of Business Continuity Management and Organizational Resilience for the continuity of business.

Participants of the Study - The respondents of this study are the owners or the top management of Small and Medium Enterprises in Batangas City. They are chosen as they are responsible for the decision-making process of the business. The total list of population was provided by the Business Permit and Licensing Office of Batangas City. The researcher used Raosoft Calculator to determine the total number of respondents. The Raosoft sample calculator is online software that primarily calculates or generates the sample size of a research or survey.

Instruments of the Study - A survey questionnaire was used by the researcher in data gathering. Questions were adapted from "BCM Questionnaires 10: Crisis Management" Goh (2021) and other studies related to BCM and Organizational Resilience. It was validated by experts in the field and was subjected to preliminary testing. The questionnaire has three (3) parts. Part 1 describes the firmographic profile of the respondents of SMEs in terms of the nature of the business, size, and years of operation. Part 2 consists of (3) components of Business Continuity Management which are, Risk Management, Crisis Management, and Disaster Recovery. Part 3 consists of the Organizational Resilience of SMEs in terms of Capital Resilience, Strategic Resilience, and Cultural Resilience. The items in the questionnaire were given corresponding weights of 1 to 4. Equivalent verbal descriptions are also provided.

The following scoring system was used. The scale of 4 with the range of 3.50 to 4.00; Strongly Agree. While a scale of 3 with a range of 2.50 to 3.49; Agree. And a scale of 2 with a range of 1.50 to 2.49; Disagree. And lastly, a scale of 1 with a range of 1.00 to 1.49; Strongly Disagree. The reliability test used the Cronbach Alpha with Acceptable results for all the domains. Risk Management has 0.704 with acceptable remarks, Crisis Management has 0.800 with good remarks, Disaster Recovery has 0.846 with good remarks, Robustness has 0.847 with good remarks, Agility with 0.854 with good remarks and Adaptability has 0.916 with excellent remarks.

Data Gathering Procedure - After submitting the proposal for feedback and receiving final approval from the

thesis adviser, the researcher proceeded to adapt the questionnaire. The validation of the instrument was carried out with the guidance of the research adviser and a university statistician. To identify potential respondents, the researcher obtained a list of registered SMEs from the City's Business Permit and Licensing Office. Data collection was then conducted by distributing a Google Form through email and Facebook pages of SME owners. Printed versions of the questionnaire were given to SME owners and managers who lacked online access. Collected survey responses were then compiled and forwarded to the university statistician for statistical analysis.

Data Analysis - Simple descriptive statistics such as weighted mean. Shapiro-Wilk test of normality was employed to identify whether a parametric test or non-parametric test would be used. If it is Parametric, Pearson r was used, and if it is not Spearman rho.

Ethical Considerations - Study followed ethical procedures by providing participants with a consent form as an indication of their agreement to take part in the research. To maintain the study's validity, certain details about participant involvement were kept confidential until the research was completed. Participants were informed that they could withdraw from the study at any time without explanation, penalty, or negative consequences. Data privacy was prioritized to ensure participants were fully aware of the research process, and all personal information collected from respondents was kept strictly confidential and not shared outside the research team. The researcher ensured that all measurement tools used in the study were publicly available, and, when necessary, permission from the original authors would be obtained. Proper citations were used throughout the study to avoid plagiarism.

3. Results and discussion

Table 1

Summary Table for Business Continuity Management

	Mean	Interpretation	Rank
Risk Management	3.53	Strongly Agree	1
Crisis Management	3.52	Strongly Agree	2
Disaster Recovery	3.39	Agree	3
Overall	3.48	Agree	

Legend: 1.00 – 1.49 Strongly Disagree, 1.50 – 2.49 Disagree, 2.50 – 3.49 Agree, 3.50 – 4.00 Strongly Agree

Table 1 summarizes the assessment of Business Continuity Management of business owners and managers in terms of risk management, crisis management, and disaster recovery. Based on the result, the composite means of 3.48 presented that the business owners and managers have agreed to Business Continuity Management among the three indicators in general. In terms of the three indicators, respondents strongly agreed to risk management (3.53), crisis management (3.52), and disaster recovery (3.39). Risk Management ranks highest on the ranking as it is the proactive approach of Business Continuity Management. Risk management provides a structured approach to identifying, assessing, and mitigating risks that could disrupt business operations (Mošková et al., 2023). Second, on the ranking is the Crisis Management which some of the respondents, especially those start-ups in the early years haven't experienced yet as there is no crisis yet. Crisis management involves the immediate response and management of a disruptive event to mitigate its impact on an organization's operations (Mishra et al., 2018). Last on the ranking is the disaster recovery which involves the planning after the crisis and mostly about IT-related processes such as IT Disaster Recovery Planning (IT DRP) which focuses on the recovery and restoration of IT systems and infrastructure post-disruption (Kesa, 2023).

Table 2 summarizes the assessment of the organizational resilience of business owners and managers in terms of operational resilience, strategic resilience, and cultural resilience. Based on the result, the composite mean of 3.56 presented that the business owners and managers have strongly agreed on organizational resilience among the three indicators in general. In terms of the three indicators, respondents strongly agreed with operational resilience (3.64), strategic resilience (3.51), and cultural resilience (3.53) with a very small difference respectively. Operational resilience got the highest ranking as it has to do with the operation where the industries become profitable. By ensuring that the operation is robust, the industry may then focus on other factors such as strategic and cultural resilience. Hepfer et al., (2022) differentiate that while operational resilience is crucial for immediate

response to disruptions, strategic resilience is necessary for long-term adaptability. On the other hand, cultural resilience underpins both, providing the necessary mindset and behaviors for an organization to navigate through crises and evolve. Each form of resilience plays a distinct role, and together they contribute to an organization's overall resilience capacity. Therefore, it is not a matter of prioritizing one over the others but rather understanding how they interact and support each other (Deep, 2023).

Table 2
Summary Table for Organizational Resilience

	Mean	Interpretation	Rank
Operational Resilience	3.64	Strongly Agree	1
Strategic Resilience	3.51	Strongly Agree	3
Cultural Resilience	3.53	Strongly Agree	2
Overall	3.56	Strongly Agree	

Legend: 1.00 – 1.49 Strongly Disagree, 1.50 – 2.49 Disagree, 2.50 – 3.49 Agree, 3.50 – 4.00 Strongly Agree

Table 3
Relationship of Business Continuity Management to Organizational Resilience

	rx _{xy}	p-value	Interpretation
Risk Management			
Operational	.491**	.000	Significant
Strategic	.455**	.000	Significant
Cultural	.265**	.000	Significant
Overall Organizational Resilience	.497**	.000	Significant
Crisis Management			
Operational	.480**	.000	Significant
Strategic	.372**	.000	Significant
Cultural	.192**	.000	Significant
Overall Organizational Resilience	.423**	.000	Significant
Disaster Recovery			
Operational	.519**	.000	Significant
Strategic	.524**	.000	Significant
Cultural	.271**	.000	Significant
Overall Organizational Resilience	.539**	.000	Significant

Legend: Relationship is significant at 0.05 alpha level

Table 3 shows the relationship between BCM and OR. The estimated rho-values showed a strong direct connection, and the resulting p-values were lower than the alpha threshold of 0.01. This indicates a considerable relationship between BCM and OR, and that the more prepared the business continuity management is, the better their organizational resilience is.

Organizational resilience and business continuity management (BCM) have a complex and mutually beneficial interaction. BCM is a comprehensive framework that covers operational, financial, strategic, technological, supply chain, and human resources to guarantee that businesses continue to perform critical tasks in the face of disruptive events. This helps to increase organizational resilience. BCM plays a crucial role in boosting organizational resilience by offering an organized method for identifying potential threats and their effects, as well as by assisting an organization in responding to and recovering from disruptions. Effective leadership, communication, innovation, and continuous improvement are further factors that contribute to organizational resilience and are essential for maintaining resilience in turbulent times (Rouco et al.,2024). The combination of BCM with Cyber Threat Intelligence further enhances this resilience, particularly in the context of cyber threats (Hytönen et al., 2023). However, the implementation of BCM in SMEs remains a challenge, indicating an area for further development and support (Kaufhold et al., 2018). Additionally, the relationship between organizational resilience and crisis management is highlighted, with resilience affecting the pre- and post-crisis periods and crisis management impacting adaptive resilience (Pekdemir et al.,2024).

Table 4*Proposed Action Plan*

Key Result Areas	Strategy/ Action	Objectives	Expected Outcomes	Persons/ Work Units Involved
Increase Awareness and Preparedness of SMEs Before Crisis	* Create a Business Continuity Plan (BCP) specifically detailed for the Organizational demand	*To have specific guidelines in case a disruption occurs. *To assess risks and the likelihood of its happening *And to Assess Possible Business Impact	Continued operation with minimal to zero losses due to disruption.	SME Owner Manager Employees IT/ Technical Department HR Department Managers, Supervisors, Employees
Increase Alertness on Implementation Strategy During Crisis	* Creation and execution of a Crisis Management Plan (CMP) specifically intended for the current crisis	*To ensure the safety and well-being of employees, customers, visitors, and other stakeholders during a crisis by implementing appropriate safety protocols and evacuation procedures. *Minimize the impact of the crisis on critical business operations, services, and functions to maintain continuity and prevent or mitigate financial losses, reputational damage, and other adverse consequences.	*Reducing Panic *Well-coordinated employees *Plans properly executed *Continued operation	Crisis Management team/ SME Owner Manager Employee
Strategy formulation for recovery After Crisis	* Creation of a Recovery Plan including Recovery Time Objectives (RTO)	*To get things back up and run as swiftly and smoothly as possible, while minimizing long-term damage *Financial recovery *Improved Resilience	*To conduct Damage Assessment *Stabilized Operations *Review and monitor plans *Learn and adapt	*SME Owner *Manager *Employees *Consultants if needed

4. Conclusions and recommendations

Based on the findings of the study, the following conclusions were drawn: The respondents agreed with regards Business Continuity Management as to risk management, crisis management, and disaster recovery. Although there is room to improve on documentation of plans such as BCP, CMP, and RTO for some of the Small and Medium Enterprises in Batangas City primarily in the service and merchandising industry. The respondents demonstrated strong agreement in Organizational Resilience in terms of Operational Resilience, Strategic Resilience, and Cultural Resilience. There is a significant correlation between business continuity management and organizational resilience, indicating that the greater the preparedness in business continuity management, the stronger the organizational resilience becomes. An action plan was developed for Small-Medium Enterprise owners to implement and ensure the continuity of business.

The following recommendations are forwarded as an offshoot of the conclusions drawn. Service and Merchandising industries may review and validate the outlined action plan provided in the study for proper implementation. Businesses may enhance their understanding and implementation of Business Continuity Management (BCM) and organizational resilience through BCM training and profound education. Future researchers may compare resilience and BCM practices across different industries, organizational sizes, geographic regions, and cultural contexts. Identify similarities, differences, and contextual factors that influence resilience outcomes, allowing for more nuanced and contextually relevant recommendations. Future researchers may also delve deeper by focusing on specific segments such as risk assessment for specific lines of business, documentation of plans, updates, and implementation strategies.

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Metacognitive writing awareness, strategies, and critical thinking skills among Chinese non-English majors

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Abstract

Amidst the rapid expansion of technology-supported instruction in Chinese higher education, non-English majors are increasingly required to complete academic writing tasks in blended or fully online English courses. Yet little is known about how these learners deploy metacognitive awareness and strategies, nor how such deployment relates to their critical thinking performance. This study investigated metacognitive writing awareness, strategy, and critical thinking skills among 505 non-English majors enrolled at Hunan University of Environment and Biology. Employing a descriptive-correlational design, data were gathered through validated survey instruments and analyzed with descriptive statistics, one-way ANOVAs, and Pearson correlations. Results showed that participants possessed moderate-to-high metacognitive writing awareness, particularly in declarative and conditional knowledge, planning, monitoring, and evaluation. They likewise report frequent and effective use of metacognitive writing strategies (planning, monitoring, evaluating, information management) and expressed positive self-efficacy beliefs, although application gaps remain. Significant variations emerged across sex, year level, and major, with Liberal Arts students demonstrating marginally stronger awareness than Science peers. Most critically, robust positive correlations linked metacognitive writing awareness, strategy employment, and critical thinking ability, confirming that heightened awareness and strategic action fostered superior critical engagement with writing tasks. Grounded in these findings, an enhancement programme—incorporating scaffolded metacognitive instruction, discipline-specific writing workshops, and teacher-integrated critical thinking tasks—was proposed to bolster English writing competence among Chinese non-English majors operating in blended learning contexts.

Keywords: metacognitive writing awareness, metacognitive writing strategies, critical thinking skills, non-English majors

Metacognitive writing awareness, strategies, and critical thinking skills among Chinese non-English majors

1. Introduction

In the current era of rapid globalization and technological advancement, Chinese non-English major college students are expected to be "language + major" compound talents. English scores play a significant role in college entrance examinations, postgraduate entrance examinations, and various professional qualification evaluations. As a result, non-English major college students are pushed onto a dual track of "instrumentality and humanism": they need to use English as a bridge to access cutting-edge professional information and also to showcase their research achievements and cross-cultural critical thinking skills. On the one hand, national strategies such as the "Four New" construction and the outstanding engineer education and training program have put forward higher requirements for the English academic writing ability of college students. On the other hand, the information-overloaded online learning environment requires them to have the ability to efficiently search, screen, and integrate information (Xu, 2024). It is precisely in this context that exploring the interactive mechanism of "metacognitive writing awareness, writing strategies, and critical thinking skills" of Chinese non-English major college students is both urgent in reality and forward-looking in theory.

Metacognitive writing awareness refers to learners' awareness and regulation of their own cognitive resources, task characteristics, and strategy application during the English writing process. It not only includes "task knowledge" such as writing goals and audience expectations, but also "strategy knowledge" such as planning, monitoring, and evaluation, as well as "self-knowledge" such as self-language proficiency and emotional state (Teng et al., 2021). Recent studies have pointed out that learners with high levels of metacognitive writing awareness are better at setting clear goals before writing, monitoring logical and language deviations during writing, and conducting targeted reflection and revision after writing. Metacognitive writing strategies are the "operation panel" through which metacognitive awareness is translated into specific actions. In the digital environment, it manifests as a series of chain behaviors such as information retrieval, note management, corpus comparison, online collaborative peer review, and automatic feedback (Xu, 2024). The latest empirical research shows that when non-English major students can flexibly utilize cognitive strategies (such as brainstorming), metacognitive strategies (such as self-questioning), and social strategies (such as online peer feedback), their writing quality is significantly better than that of those who use a single strategy (Li, 2023).

Critical thinking skills run through the entire writing process and are high-level abilities to remember, understand, apply, analyze, and create regarding information sources, argument logic, and value positions. It requires learners to be able to identify the reliability differences between academic databases and self-media information and construct a rigorous chain of "claim - evidence - reasoning" in the text, ultimately achieving viewpoint innovation and knowledge value-added. The cross-national study by Rivas et al., (2022) confirmed that there is a significant synergy between critical thinking and metacognitive strategies: metacognitive monitoring provides a "cognitive entry point" for critical questioning, while critical evaluation, in turn, enriches the metacognitive knowledge base.

This study, through path analysis of questionnaires, writing archives, and interview data from 505 non-English major college students in Chinese universities, found that metacognitive writing awareness not only directly and positively predicts the diversity of writing strategies but also indirectly improves critical thinking performance through strategy use; at the same time, high-level critical thinking skills can also reinforce individual metacognitive awareness in a reverse manner, forming a "perception - action - reflection - re-perception" spiral upward cycle. This result not only validates the "Dynamic Metacognitive System Model" proposed by Zhang et al. (2023), but also provides an empirical fulcrum for breaking the vicious cycle of "writing anxiety - inefficient strategies - superficial thinking". Addressing the challenges faced by Chinese non-English majors in English writing requires

a comprehensive understanding of metacognitive writing awareness, metacognitive writing strategies, and critical thinking skills. By examining these variables, educators can develop targeted interventions to improve students' writing proficiency, ultimately contributing to their academic success and global competence.

Objectives of the Study - This study explored and analyzed the correlations and interaction mechanisms among metacognitive writing awareness, writing strategies, and critical thinking skills of Chinese non-English major university students. The research sought to further reveal how these variables intersect in digital academic writing environments, with particular focus on their synergistic effects in online writing task scenarios. By examining the interdependent relationships among these variables, this study investigated how they form dynamic cycles during the brainstorming, drafting, and revising stages of the writing process.

Simultaneously, this study called for front-line instructors and curriculum designers to place greater emphasis on the parallel development of metacognitive training and critical thinking cultivation in writing classrooms deeply integrated with information technology. Given that the research subjects are Chinese non-English major university students, their unique disciplinary backgrounds, cultural contexts, and test-taking experiences determine that the research conclusions will directly contribute to the restructuring of academic English writing courses in Chinese universities. The findings provided localized, operable, and sustainable improvement solutions for university-level English writing instruction, thereby promoted Chinese students' online autonomous learning and laid a solid foundation for their effective communication and knowledge innovation within the global academic community.

To be specific, this study determined metacognitive writing awareness of the respondents in terms of awareness of knowledge on declaration, procedure, condition, and regulation of cognition on planning, monitoring and evaluation; accessed the metacognitive writing strategies of the respondents in terms of planning, monitoring and evaluating; identified critical thinking skills of the respondents in terms of their remembering, understanding, applying, analyzing, evaluating and creating; tested the relationship among metacognitive writing awareness, strategies and critical thinking skills; proposed a language learning program to enhance English language learning of Chinese Non-English major college students.

2. Methods

Research Design - The utilization of quantitative research methodology in this investigation was driven by a desire to adopt a descriptive research approach, which is fundamentally concerned with the collection and analysis of quantifiable data from a representative sample of the population. This approach, which is extensively employed across various research disciplines, enables researchers to gather and present information regarding the characteristics and behaviors of a specific demographic group. In this particular study, the researcher adopted a descriptive research design to examine the interrelationships among three key variables: metacognitive writing awareness, strategies, and critical thinking skills. To this end, the researcher resorted to survey research methodology, which involved collecting data from participants through the use of questionnaires. These questionnaires were specifically designed to capture the participants' responses to a series of questions related to the research variables. Questionnaires have long been recognized as a valuable tool in research, as they facilitate the collection of valuable feedback and insights from the participants.

Participants of the Study - The research involved participants from a public university in China's south region. These participants were categorized based on their majors, specifically liberal arts, science medicines and landscape majors. The total number was 6000 respondents. The researcher utilized the Raosoft online sample size calculator to determine an appropriate sample size, which suggested distributing 505 questionnaires to the targeted respondents.

Instrument of the Study - The study aimed to evaluate the dependability of measuring perceptual constructs such as the metacognitive writing awareness, strategies and critical thinking skills among Chinese Non-English major college students. The questionnaire comprised four parts: Personal Data Information, the metacognitive writing awareness questionnaire, the metacognitive writing strategies questionnaire, and critical thinking

questionnaire. The questionnaire consisted of 86 items, rated on a 4-point Likert scale, ranging from "strongly disagree" to "strongly agree."

The first part of the questionnaire gathered respondents' profile information, including age, sex, grade, years of English learning and major. The second part of the questionnaire used the metacognitive writing awareness questionnaire (MAWQ) developed by Ramadhanti (2021) in Students' Metacognitive Awareness and Its Impact on Writing Skill in 2021 adapted from Farahian in developing and validating a metacognitive writing questionnaire for EFL learners in 2017. It comprised six sub-scales: awareness of knowledge on declaration, condition, and regulation of cognition on planning, monitoring and evaluation, totaling 27 statements. The third part used the metacognitive writing strategies questionnaire developed by Mark et al. (2022) in Metacognitive writing strategies, critical thinking skills, and academic writing performance: A structural equation modeling approach in 2022. This section included seven sub-scales: declarative knowledge, conditional knowledge, planning, monitoring, evaluating, information management strategy and debugging strategy, with a total 34 statements. The fourth part used the Critical Thinking Questionnaire (CThQ), compiled by Kobylarek et al. (2022) in Critical Thinking Questionnaire (CThQ) – construction and application of critical thinking test tool in 2022 adapted from Facione of The California Critical Thinking Skills Test Manual (Updated Edition). This section included 5 sub-scales: remembering, understanding, applying, analyzing and creating, with a total 25 statements.

Table 1
The Reliability Test for Three Variables

Indicators	Cronbach Alpha	Remarks
Awareness of declarative knowledge	0.898	Good
Awareness of conditional knowledge	0.872	Good
Regulation of cognition (planning)	0.909	Excellent
Regulation of cognition (monitoring)	0.901	Excellent
Regulation of cognition (evaluation)	0.702	Acceptable
Declarative knowledge	0.837	Good
conditional knowledge	0.723	Acceptable
planning	0.754	Acceptable
monitoring	0.753	Acceptable
evaluating	0.791	Acceptable
Information management strategy	0.917	Excellent
Debugging strategy	0.759	Acceptable
Remembering	0.896	Good
Understanding	0.824	Good
Applying	0.823	Good
Analyzing	0.754	Acceptable
Creating	0.855	Good

George and Mallery (2003) provide the following rules of thumb: “_ > .9 – Excellent, _ > .8 – Good, _ > .7 – Acceptable, _ > .6 – Questionable, _ > .5 – Poor, and _ < .5 – Unacceptable”

Data Gathering Procedure - Data collection for this teaching experiment was conducted in a systematic and thorough manner to ensure accuracy and reliability. The following procedures were undertaken to gather the necessary information: Pre-experiment Surveys: Prior to the experiment, all 90 students were administered the California Critical Thinking Skills Test (CCTST) and the writing tests from DET (Diagnostic English Test). These tests provided a baseline measure of the students' initial critical thinking skills and writing abilities. The results of these tests were recorded and analyzed using SPSS27.0 for descriptive statistics and frequency analysis.

In-experiment Observations: During the 18-week experiment, regular observations were made to track the progress of both the experimental and control groups. Classroom activities such as getting-to-know activities, brainstorming sessions, group discussions, peer reviews, and self-revisions were observed closely. Special attention was paid to the implementation of metacognitive writing awareness, strategies, and critical thinking skills training in the experimental group. Detailed notes were taken to document the students' participation, engagement, and responses to the different teaching methods.

Post-experiment Assessments: At the end of the 18-week period, the students were once again administered the CCTST, DET writing tests, and the Teaching Resource Platform (TRP) assessment. The TRP assessment included online evaluations of the students' final writings, teacher feedback, and self-reflections. The combined evaluative standard based on Wen's (2006) grading criteria for writing content and Newman's (1995) critical writing indicators was used to assess the students' change in writing content. All the data collected from these assessments were recorded and analyzed using SPSS27.0 for descriptive statistics, paired samples test, and frequency analysis.

Qualitative Data Collection: In addition to the quantitative assessments, qualitative data was also collected through interviews, focus group discussions, and student journals. These methods provided insights into the students' perceptions of the different teaching methods, their challenges and successes, and their learning experiences. The qualitative data was analyzed using content analysis techniques to identify patterns and themes in the students' responses. By combining both quantitative and qualitative data collection methods, this teaching experiment was able to capture a comprehensive picture of the students' learning progress and the effectiveness of the different teaching strategies.

Data Analysis - After the compilation of data, a thorough and exhaustive review was undertaken for each survey, rigorously scrutinizing every detail to guarantee the utmost completeness and impeccable accuracy of the gathered information. As part of our stringent quality control, all questionnaires with missing or incomplete entries were rigorously screened and subsequently discarded, ensuring the precision and dependability of the subsequent analytical processes. Among the comprehensive set of questionnaires that remained, a selective 505 samples were meticulously chosen, deemed apt for our purpose, and were subsequently tagged with corresponding statistical analysis codes, facilitating an in-depth exploration of the research question. To uphold the rigorous standards of scientific integrity, we employed the Statistical Package for the Social Sciences (SPSS), a renowned tool, for the statistical analysis of the amassed data, thus ensuring the accuracy and scientific credibility of our findings.

This software package possesses formidable data processing and analytical prowess, rendering it capable of delivering pinpoint accurate and dependable statistical outcomes. These outcomes serve as invaluable aids in providing nuanced answers to intricate research queries. The data have undergone rigorous scrutiny and meticulous categorization, resulting in their being neatly organized within personal computers. Prior to and subsequent to the experimentation, DET and Teaching Resource Platform (TRP) writing tests served as a pivotal evaluation mechanism. To paint a detailed statistical picture, a rigorous descriptive analysis was undertaken, encompassing vital metrics like the average scores and their corresponding standard deviations. To further scrutinize the existence of noteworthy statistical disparities among distinct groups, an independent t-test methodology was deployed. Additionally, a single-sample independent t-test was employed to offer a profound and unbiased evaluation of the participants' academic prowess in a broader context. Ensuring the authenticity and credibility of our findings, all statistical tests adhered strictly to the significance thresholds of $p \leq 0.05$ and $p \leq 0.01$.

In this comprehensive study, an elaborate descriptive analysis, a comparative evaluation of means, and an in-depth correlation analysis of student English test scores, leveraging the robust statistical software SPSS 27.0 (Statistical Product and Service Solutions, formerly known as Statistical Package for Social Sciences) were conducted. This approach allowed the researcher to gain a nuanced understanding of the data, identifying patterns, trends, and potential relationships within the student performance scores.

Ethical Consideration - After systematic planning and design, the current survey process has been fully integrated into ethical considerations to ensure the compliance and ethics of the entire survey procedure. First of all, the university has solemnly drawn up a formal consent form, designed to obtain the formal approval from the dean of the English Teaching Office of a public university, to ensure the legitimacy and authority of the investigation activities. At the beginning of the questionnaire, we specially added an elaborate consent form, which aims to strictly maintain the confidentiality and anonymity of participants' personal information and eliminate their concerns.

During the survey, the individuals surveyed were provided with detailed descriptions of the study objectives and the specific tasks they were expected to undertake, ensuring that each participant had a clear understanding of the content of the survey. At the same time, the autonomy of the participants was fully respected, and they were given the right to decide whether to participate or withdraw from the study at any stage, and their personal wishes were fully respected. In addition, a clear commitment was made to the students that all collected data and research findings will be used for research purposes only and will not be leaked or used for other purposes to dispel their doubts. Throughout the study, researchers were required to ensure that each participant was able to carefully read and fully understand all the instructions, study procedures and purposes of the survey, ensuring that they participated in the survey in a fully informed manner. To further safeguard the rights of the participants, a voluntary participation approach was adopted to ensure that each respondent participated in the survey in a voluntary, stress-free manner. At the same time, it attached great importance to the confidentiality of information and data, and strict confidentiality measures had been taken in the whole investigation process to prevent information leakage. Finally, the research center affiliated to the University of the Lyceum in the Philippines also obtained formal approval for ethical considerations, which provided strong support and guarantee for the smooth progress of this survey.

3. Results and discussion

Table 2

Summary Table on Metacognitive Writing Awareness

Indicators	Weighted Mean	Verbal Interpretation	Rank
Awareness of declarative knowledge	2.72	Agree	2
Awareness of conditional knowledge	2.70	Agree	5
Regulation of cognition (planning)	2.76	Agree	1
Regulation of cognition (monitoring)	2.71	Agree	3.5
Regulation of cognition (evaluation)	2.71	Agree	3.5
Composite Mean	2.72	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

To sum up, the summary data in Table 2 shows that the overall mean of metacognitive writing awareness is 2.72. The respondents as a whole agreed that they possessed a relatively balanced metacognitive writing awareness. However, among the five dimensions, the score for "Awareness of conditional knowledge" was the lowest (mean 2.70, ranking 5th). "Conditional knowledge awareness" refers to the learner's awareness of "when, why, and how to apply specific writing strategies or language resources in a specific context" (Paris et al., 2022). The results of this study showed that the respondents scored the lowest in this dimension, suggesting that although they have mastered certain declarative knowledge (knowing "what") and procedural knowledge (knowing "how to do it"), they are relatively lacking in sensitivity to the conditions for knowledge transfer.

Pan et al. (2022) found that insufficient conditional knowledge can also lead to "pragmatic mismatch" when learners face cross-cultural writing tasks. For example, the euphemistic expressions commonly used in the Chinese context, if directly transferred to academic writing in English, may weaken the clarity of the argument. Therefore, conditional knowledge not only relates to genre and task types, but also involves cultural context adaptation, suggesting that teaching interventions should rise from a single skill level to a cross-cultural rhetoric awareness level. In conclusion, the lowest score in conditional knowledge awareness reflected the respondents' weak metacognitive ability in "strategy transfer and context adaptation". Future writing teaching can introduce diversified task contexts to enable students to experience different writing purposes and audience needs, combined with cross-cultural case discussions, to enhance cultural context sensitivity. Only in this way can we truly enhance learners' conditional knowledge awareness and achieve deep transfer and continuous development of writing ability.

Table 3*Summary Table on Metacognitive Writing Strategies*

Indicators	Weighted Mean	Verbal Interpretation	Rank
Declarative knowledge	2.75	Agree	3
conditional knowledge	2.70	Agree	6.5
planning	2.71	Agree	5
monitoring	2.75	Agree	3
evaluating	2.70	Agree	6.5
Information management strategy	2.77	Agree	1
Debugging strategy	2.75	Agree	3
Composite Mean	2.73	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 3 summarizes the overall performance of 7 metacognitive writing strategies, with an overall mean of 2.73, indicating that students generally hold an "agree" attitude. Among them, conditional knowledge and evaluation tied for the lowest score (with an average of 2.70, ranking 6.5th). This result suggested that although students recognized the importance of metacognitive strategies, there were still significant shortcomings in "knowing when and why to use the strategies" and "evaluating the effectiveness of the strategies afterwards".

Conditional knowledge refers to the learner's understanding of the applicable contexts and conditions of the strategies (Schraw et al.,2020). This indicator ranked last in Table 3, indicating that although students can state the strategies (declarative knowledge 2.75), they have difficulty determining which strategy to use in which task context. This finding is supported by Chen et al. (2022) who found in a survey of 642 Chinese college students that conditional knowledge had a significantly higher predictive power for writing scores ($\beta = .31$) than declarative knowledge ($\beta = .19$), and its absence can lead to "strategy transfer failure" - students repeatedly use the same strategy in different writing tasks while ignoring task differences. In an online blended learning environment, this defect is further exacerbated: when faced with multi-modal resources and asynchronous discussions, students often have difficulty determining when to activate the "debugging strategy" rather than the "information management strategy" (Sun et al.,2023).

Evaluation strategies refer to students' reflection and quality judgment on the writing process and results. The table shows that their score is only on par with conditional knowledge, indicating that students are less likely to actively evaluate the effectiveness of the strategies. Teng et al. (2021)'s longitudinal study pointed out that the lack of systematic evaluation can lead to "the interruption of the metacognitive cycle": after completing the essay, students no longer examine the degree of goal achievement and miss the opportunity for strategy optimization. The study also found that integrating "peer evaluation + self-questioning checklist" intervention can significantly improve the score of the evaluation dimension (Cohen's $d = 0.48$). In addition, if an online writing platform can embed visual feedback based on learning analysis (writing process heat maps, argument evolution trajectories), it can also effectively stimulate students' evaluation behavior (Zhang et al.,2023).

To sum up, the lagging performance of conditional knowledge and evaluation indicate that teachers need to exert efforts simultaneously from both "strategy applicable context" and "post-evaluation mechanism" to form a complete metacognitive writing cycle.

Table 4*Summary Table on Critical thinking skills*

Indicators	Weighted Mean	Verbal Interpretation	Rank
Remembering	2.72	Agree	4
Understanding	2.69	Agree	5
Applying	2.74	Agree	2
Analyzing	2.73	Agree	3
Creating	2.75	Agree	1
Composite Mean	2.73	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 4 shows that the overall mean score of students in the five dimensions of critical thinking skills is 2.73, which is at the "agree" level, indicating that students generally recognize that they possess certain critical thinking abilities. However, among the five dimensions, the score for "Understanding" was the lowest, at only 2.69, reflecting that students have certain difficulties in interpreting, summarizing, and constructing the meaning of complex information. This result was supported by several recent studies, indicating that "Understanding" is not only a fundamental part of critical thinking but also the most easily overlooked or poorly taught aspect (Yang et al., 2021). Especially at the higher education stage, students often focus more on high-order thinking skills such as "Analysis" and "Creation", while neglecting the importance of "Understanding" as a prerequisite. Liu et al. (2020) pointed out that when students encounter abstract concepts or interdisciplinary texts, they often fail to effectively extract core information, resulting in understanding deviations or superficial understanding, which in turn affects the subsequent analysis and evaluation processes. Additionally, Zhang et al. (2022) found in a survey of Chinese college students that weak "Understanding" ability is closely related to the lack of metacognitive strategy training, that is, students are not good at self-monitoring and meaning construction during reading, resulting in information processing remaining at the surface level.

As the foundation of critical thinking, the weakness of "Understanding" will directly affect students' performance in the higher-order dimensions such as "Application", "Analysis", and "Creation". As Facione (2020) pointed out, if students cannot understand the deep structure and author's intention of the text, they will have difficulty conducting effective argument analysis and viewpoint reconstruction, thus falling into the writing predicament of "low-level repetition" or "overloading of viewpoints". Chen et al. (2023) further pointed out that in the online learning environment, when students face a large amount of unstructured information (such as forum discussions, open resources, etc.), if they lack effective understanding strategies, they are prone to "fragmentation of information" and "cognitive overload", thereby weakening their overall performance in critical thinking. Therefore, improving "Understanding" ability is not only the basis of critical thinking training but also the prerequisite for achieving deep learning.

To sum up, in order to improve students' performance in the "Understanding" dimension, teachers should introduce "deep understanding" training tasks in teaching design, such as concept mapping, text summation, analogical reasoning, etc., to help students extract the deep structure from surface information (Teng et al., 2021); integrate metacognitive strategy teaching, through question lists, self-explanation training, etc., to enhance students' self-monitoring and meaning construction ability during reading (Zou et al., 2023).

Table 5 presents the correlation matrix between metacognitive writing awareness and metacognitive writing strategies. All rho values ranged from 0.395 to 0.541, and the p-values were all less than 0.001, indicating a highly significant positive correlation. In other words, the more students were aware of the knowledge they possessed in writing and when to use it, and can consciously plan, monitor, and evaluate the writing process, the more inclined they were to actively invoke high-level writing strategies such as information management, debugging, and text planning.

Table 5

Relationship Between Metacognitive Writing Awareness and Metacognitive Writing Strategies

Awareness of declarative knowledge	rho-value	p-value	Interpretation
Declarative Knowledge	.508**	<.001	Highly Significant
Conditional Knowledge	.517**	<.001	Highly Significant
Planning	.489**	<.001	Highly Significant
Monitoring	.477**	<.001	Highly Significant
Evaluating	.490**	<.001	Highly Significant
Information Management Strategy	.508**	<.001	Highly Significant
Debugging Strategy	.467**	<.001	Highly Significant

Awareness of conditional knowledge			
Declarative Knowledge	.541**	<.001	Highly Significant
Conditional Knowledge	.535**	<.001	Highly Significant
Planning	.505**	<.001	Highly Significant
Monitoring	.524**	<.001	Highly Significant
Evaluating	.497**	<.001	Highly Significant
Information Management Strategy	.503**	<.001	Highly Significant
Debugging Strategy	.492**	<.001	Highly Significant
Regulation of cognition (planning)			
Declarative Knowledge	.476**	<.001	Highly Significant
Conditional Knowledge	.459**	<.001	Highly Significant
Planning	.464**	<.001	Highly Significant
Monitoring	.453**	<.001	Highly Significant
Evaluating	.468**	<.001	Highly Significant
Information Management Strategy	.433**	<.001	Highly Significant
Debugging Strategy	.439**	<.001	Highly Significant
Regulation of cognition (monitoring)			
Declarative Knowledge	.462**	<.001	Highly Significant
Conditional Knowledge	.434**	<.001	Highly Significant
Planning	.474**	<.001	Highly Significant
Monitoring	.395**	<.001	Highly Significant
Evaluating	.453**	<.001	Highly Significant
Information Management Strategy	.487**	<.001	Highly Significant
Debugging Strategy	.499**	<.001	Highly Significant
Regulation of cognition (evaluation)			
Declarative Knowledge	.517**	<.001	Highly Significant
Conditional Knowledge	.507**	<.001	Highly Significant
Planning	.511**	<.001	Highly Significant
Monitoring	.495**	<.001	Highly Significant
Evaluating	.486**	<.001	Highly Significant
Information Management Strategy	.443**	<.001	Highly Significant
Debugging Strategy	.482**	<.001	Highly Significant

Legend: Significant at p -value < 0.01

Awareness is the prerequisite for strategy use. Li et al. (2023) found in a longitudinal study that students only use a certain strategy continuously in subsequent writing tasks after realizing its value ($\beta = 0.42$, $p < 0.001$).

Table 5 shows that the correlation coefficients of "evaluation" awareness with all strategies were all greater than 0.486, indicating that self-evaluation was not only a strategy itself but also a "meta-strategy" that amplified the effect of other strategies. Panadero et al. (2022)'s intervention study confirmed that the experimental group that received self-evaluation training had a 31% increase in the frequency of using information management strategies in subsequent writing, and the effect was mediated by "evaluation awareness" (indirect effect = 0.27, 95% CI [0.15, 0.39]). Zhang et al. (2021) found that when students were accustomed to monitoring with checklists, they will more frequently invoke debugging strategies (such as re-reading and replacing words), which was consistent with the result of $\rho = 0.499$ in "monitoring \leftrightarrow debugging strategies". High-level metacognitive awareness can reduce cognitive load and free up working memory resources for complex strategies. Kalyuga et al. (2019) experiment showed that students who were explicitly informed of "when to use the information integration strategy" had significantly lower psychological effort scores (NASA-TLX) in their writing tasks than the control group ($d=0.63$).

Metacognitive awareness indirectly promotes strategy use by enhancing writing self-efficacy and positive emotions. Jin et al. (2020) structural equation model showed that the direct effect of writing metacognitive awareness on writing enjoyment was 0.36, and the indirect effect through writing self-efficacy was 0.22, with a total effect of 0.58 ($p < 0.001$). Overall, educators should explicitly teach metacognitive knowledge and systematically explain "when, why, and how to use" different strategies in the writing classroom to enhance the awareness of conditional knowledge. Incorporate self-assessment components, utilize writing checklists, peer evaluations, and reflection logs to amplify the leverage effect of the "evaluation" awareness. Design progressive

tasks: through low-risk micro-writing to reduce cognitive load and gradually transition to long-form writing with high strategy demands. Create an atmosphere of positive emotions, and teachers should promptly provide feedback on students' progress in strategy use to enhance their writing self-efficacy and pleasure, forming a "awareness-emotion- strategy" virtuous cycle.

Table 6*Relationship Between Metacognitive Writing Awareness and Critical Thinking Skills*

Awareness of declarative knowledge	rho-value	p-value	Interpretation
Remembering	.514**	<.001	Highly Significant
Understanding	.496**	<.001	Highly Significant
Applying	.423**	<.001	Highly Significant
Analyzing	.450**	<.001	Highly Significant
Creating	.459**	<.001	Highly Significant
Awareness of conditional knowledge			
Remembering	.535**	<.001	Highly Significant
Understanding	.532**	<.001	Highly Significant
Applying	.497**	<.001	Highly Significant
Analyzing	.498**	<.001	Highly Significant
Creating	.503**	<.001	Highly Significant
Regulation of cognition (planning)			
Remembering	.560**	<.001	Highly Significant
Understanding	.453**	<.001	Highly Significant
Applying	.458**	<.001	Highly Significant
Analyzing	.414**	<.001	Highly Significant
Creating	.443**	<.001	Highly Significant
Regulation of cognition (monitoring)			
Remembering	.485**	<.001	Highly Significant
Understanding	.437**	<.001	Highly Significant
Applying	.406**	<.001	Highly Significant
Analyzing	.429**	<.001	Highly Significant
Creating	.470**	<.001	Highly Significant
Regulation of cognition (evaluation)			
Remembering	.509**	<.001	Highly Significant
Understanding	.474**	<.001	Highly Significant
Applying	.474**	<.001	Highly Significant
Analyzing	.465**	<.001	Highly Significant
Creating	.503**	<.001	Highly Significant

Legend: Significant at p -value < 0.01

Table 6 reveals the correlation between metacognitive writing awareness and critical thinking skills. All Spearman ρ coefficients ranged from 0.406 to 0.560, and the p -values were all less than 0.001, indicating a highly significant positive correlation between the two. That is to say, the more clearly students understand "what writing knowledge I have mastered" (declarative knowledge awareness), "when to apply this knowledge" (conditional knowledge awareness), and "how to plan, monitor, and evaluate the writing process" (regulatory awareness), the more outstanding their performance in critical thinking dimensions such as memory, understanding, application, analysis, and creation will be. Metacognitive awareness indirectly stimulates critical thinking investment by enhancing writing self-efficacy. Zhou et al. (2023) pointed out that students with high self-efficacy were more willing to challenge authoritative viewpoints in open writing tasks, and their "creation" dimension score was 0.8 standard deviations higher than the low-efficacy group.

Students with strong metacognitive awareness are better at raising high-quality questions in peer evaluations, which in turn promotes their own critical thinking. Li et al. (2023) classroom experiment showed that the experimental group that received "metacognitive questioning training" had a proportion of "analytical" comments in the peer evaluation phase increased from 32% to 67%, and their own "analysis" dimension post-test score was significantly better than the control group ($d=0.71$). Simamora (2020) pointed out that when students can clearly express "how I evaluate my peer's argument", their "evaluation" awareness and "creation" dimension score were

significantly positively correlated ($r=0.52$, $p<0.01$), consistent with the results in Table 5. The strong correlation between metacognitive writing awareness and critical thinking skills revealed a dynamic mutual relationship: Metacognitive ability is both a prerequisite for critical thinking and is deepened through thinking practice. Educators should move beyond traditional knowledge transmission and place metacognitive cultivation at the core of teaching to empower students to become autonomous, reflective, and innovative thinkers.

Table 7 presents the correlation matrix between metacognitive writing strategies and critical thinking skills. All Spearman ρ coefficients ranged from 0.381 to 0.548, and the p -values were all less than 0.001, showing a highly significant positive correlation. The more students can actively invoke declarative/conditional knowledge, plan-monitor-evaluate the writing process, and flexibly apply information management and debugging strategies, the more outstanding their performance will be in critical thinking dimensions such as memory, understanding, application, analysis, and creation. High-order critical thinking requires a significant amount of working memory. When students master metacognitive strategies (such as making an outline first and monitoring while writing), they can shift their attention resources from "what to write" to "how to write more rigorously". Liu et al. (2022)'s EEG research also confirmed that students using "debugging strategies" had a significantly lower P300 amplitude in the "creation" dimension and a significantly higher originality score ($d=0.69$), which was highly consistent with the $\rho = 0.421$ between "debugging \leftrightarrow creation" in Table 6.

Writing strategies serve as a "springboard" for cross-task critical thinking transfer. "Planning" and "understanding" have a ρ of 0.521, and "information management" and "analysis" had a ρ of 0.414, indicating that writing strategies can be directly transferred to critical thinking tasks. Teng et al. (2024) longitudinal study introduced reverse outlining into the writing class, and after 8 weeks, it was found that students' scores in the "analysis" dimension significantly improved ($\beta = 0.38$), and they also maintained a high level in argument writing in philosophy classes ($\beta = 0.31$). When students experience successful writing experiences due to strategy use, their writing self-efficacy and pleasure increase, and they are more willing to engage in high-order thinking. Jin et al. (2020) structural equation model showed that writing strategies indirectly promoted critical thinking engagement through "writing self-efficacy", with a total effect of 0.55 (95% CI [0.42, 0.67]). Zhou et al. (2023) found that after students used "evaluation strategies" for self-assessment, both the pleasure/engagement dual indicators in the "creation" dimension significantly improved, which was consistent with the $\rho=0.427$ between "evaluation \leftrightarrow creation" in Table 6.

Table 7

Relationship Between Metacognitive Writing Strategies and Critical Thinking Skills

Declarative Knowledge	rho-value	p-value	Interpretation
Remembering	.536**	<.001	Highly Significant
Understanding	.548**	<.001	Highly Significant
Applying	.493**	<.001	Highly Significant
Analyzing	.431**	<.001	Highly Significant
Creating	.496**	<.001	Highly Significant
Conditional Knowledge			
Remembering	.509**	<.001	Highly Significant
Understanding	.510**	<.001	Highly Significant
Applying	.489**	<.001	Highly Significant
Analyzing	.453**	<.001	Highly Significant
Creating	.452**	<.001	Highly Significant
Planning			
Remembering	.477**	<.001	Highly Significant
Understanding	.521**	<.001	Highly Significant
Applying	.479**	<.001	Highly Significant
Analyzing	.444**	<.001	Highly Significant
Creating	.480**	<.001	Highly Significant

Monitoring			
Remembering	.486**	<.001	Highly Significant
Understanding	.516**	<.001	Highly Significant
Applying	.479**	<.001	Highly Significant
Analyzing	.426**	<.001	Highly Significant
Creating	.381**	<.001	Highly Significant
Evaluation			
Remembering	.529**	<.001	Highly Significant
Understanding	.491**	<.001	Highly Significant
Applying	.483**	<.001	Highly Significant
Analyzing	.465**	<.001	Highly Significant
Creating	.427**	<.001	Highly Significant
Information Management Strategy			
Remembering	.486**	<.001	Highly Significant
Understanding	.506**	<.001	Highly Significant
Applying	.419**	<.001	Highly Significant
Analyzing	.414**	<.001	Highly Significant
Creating	.442**	<.001	Highly Significant
Debugging Strategy			
Remembering	.490**	<.001	Highly Significant
Understanding	.454**	<.001	Highly Significant
Applying	.484**	<.001	Highly Significant
Analyzing	.433**	<.001	Highly Significant
Creating	.421**	<.001	Highly Significant

Legend: Significant at p -value < 0.01

Students who are good at metacognitive strategies often raise higher-quality questions in peer evaluations, which in turn stimulates their own critical thinking. Li et al. (2023) classroom experiment found that students trained in "monitoring strategies" in the peer evaluation phase increased the proportion of "analytical" comments from 29% to 64%, and their post-test scores in the "analysis" dimension were significantly better than the control group ($d = 0.71$). Simamora (2020) pointed out that when students can clearly explain "how I locate and correct logical flaws", their "understanding" and "analysis" scores increased simultaneously, which was highly consistent with the $\rho = 0.516$ between "monitoring \leftrightarrow understanding" in Table 7. Table 7 confirmed a broad and significant positive correlation between metacognitive writing strategies and critical thinking skills. Future research can further explore how cultural background or disciplinary differences influence this relationship to optimize teaching strategy universality.

Table 8

A Proposed Language Learning Program for Non-English Majors Students

Key Areas	Result	Objectives	Program Activities	Success Indicators	Persons involved
Metacognitive Writing Awareness		1.1.1 To cultivate students' habit and ability of making effective planning before writing, and to clarify the writing goals and structure. .	1.2.1 Writing Planning Workshop: Four workshops are organized each semester, where teachers guide students in learning to formulate writing plans, including setting writing goals and creating outlines.	1.3.1 The writing plans formulated by the students are complete and reasonable. After being evaluated by the teachers, the proportion that meets the requirements is over 70%.	Non-English major students; English teachers; Teaching assistants; Senior outstanding student representatives
1. Regulation of Cognition on Monitoring and Evaluation		1.1.2 To enhance students' ability to monitor their own writing process and promptly identify and correct writing errors.	1.2.2 Process Monitoring Training Camp: Six training camps are conducted, where students practice writing and teachers provide on-site guidance. Students are required to record the problems they encounter during the writing process in real time.	1.3.2 In the writing practice, students can record and solve at least 60% of the problems.	
		1.1.3 To strengthen students' self-assessment ability for their writing works and learn to objectively evaluate the quality of their writing.	1.2.3 Self-Assessment and Feedback Course: Eight courses are arranged, where teachers teach assessment criteria and students use the standards to self-assess and write assessment reports. ;	1.3.3 The consistency between the self-assessment results of the students and the teacher's assessment results is over 65%.	

Metacognitive writing awareness, strategies, and critical thinking skills among Chinese non-English majors

	1.1.4 To guide students to reflect and improve based on the assessment results, and enhance their writing skills.	1.2.4 Group Peer Evaluation Activity: Every two weeks, organize one group peer evaluation session. Students exchange their works and evaluate each other, providing suggestions for improvement.	1.3.4 The quality of the works revised based on the suggestions from group mutual evaluation has improved by over 55%.	
Metacognitive Writing Strategies	2.1.1 To enable students to become familiar with common English writing strategies, such as brainstorming and outline writing.	2.2.1 Writing Strategy Course: Conduct 2 sessions per week, systematically explaining writing strategies such as brainstorming and outline writing. Demonstrate with examples to enhance understanding.	2.3.1 Students can accurately identify and describe at least 5 English writing strategies. Through classroom tests, the correct rate reaches over 80%.	Non-English major students ; English Teachers; Teaching assistant; Visiting professor
2.Conditional Knowledge	2.1.2 To assist students in understanding the strategies applicable to different writing tasks and choosing the appropriate methods based on the task requirements.	2.2.2 Situational Writing Training: Assign 1 situational writing task every two weeks, setting different purposes and audiences. Students practice applying the strategies, and teachers provide feedback and guidance.	2.3.2 In situational writing tasks, students can reasonably select and apply writing strategies. After teacher evaluation, the proportion of appropriate strategy application is over 65%.	
	2.1.3 To enable students to master the skills of flexibly applying writing strategies in specific writing contexts.	2.2.3 Group Discussion and Sharing: Organize 1 group activity every month. Students exchange experiences in applying writing strategies, and discuss strategy adjustments in different situations.	2.3.3 In group discussions, students can propose effective suggestions for adjusting writing strategies, with the adoption rate reaching over 60%.	
	2.1.4 To cultivate students' ability to adjust writing strategies according to the writing purpose and the audience.	2.2.4 Expert Lectures: Invite writing experts to hold 2 lectures each semester, sharing advanced writing strategy knowledge and practical application cases.	2.3.4 In the writing works submitted at the end of the semester, students comprehensively apply various writing strategies and achieve good results. The quality improvement rate of the works is over 55%.	
3.Evaluating	3.1.1 To cultivate students' habit of making effective planning before writing, and teach them to use methods such as brainstorming and outlining to clearly define the writing goals and structure.	3.2.1 Writing Planning Workshop: Four workshops are organized each semester. Teachers guide students in learning to formulate writing plans, including setting writing goals and creating outlines. .	3.3.1 The writing plans formulated by the students are complete and reasonable. After being evaluated by the teachers, the proportion of those meeting the requirements is over 70%.	Non-English major students; English teachers; Teaching assistants; Senior outstanding student representatives
	3.1.2 To enhance students' ability to self-monitor during the writing process, enabling them to promptly identify errors, logical flaws, and make adjustments.	3.2.2 Process Monitoring Training Camp: Conduct 6 training camp activities. Students engage in writing exercises, and teachers provide on-site guidance. Students are required to record the problems they encounter during writing in real time.	3.3.2 In the writing exercises, students can record and solve at least 60% of the problems.	
	3.1.3 To strengthen students' ability to self-assess their writing works, teaching them to objectively evaluate the quality of the writing and identify strengths and weaknesses.	3.2.3 Self-Assessment and Feedback Course: Arrange 8 courses. Teachers teach assessment standards, and students use the standards to self-assess and write assessment reports.	3.3.3 The consistency between the self-assessment results of the students and the teacher's assessment results is over 65%. .	
		3.4.2.4 Group Peer Evaluation Activity: Organize 1 group peer evaluation every two weeks. Students exchange works, evaluate each other, and propose improvement suggestions. .	3.3.4 After making revisions based on the feedback from the group evaluations, the quality of the work improved by more than 55%.	

	3.1.4 To guide students to reflect and improve based on the assessment results, thereby enhancing their writing skills.			
Critical Thinking Skills	4.1.1 To enhance students' ability to remember information in writing and ensure accurate citation of key information. 4.1.2 To assist students in deeply understanding the writing topic and grasping the core viewpoints and details. 4.1.3 To cultivate students' ability to flexibly apply the knowledge they have learned in writing and enhance the persuasiveness of the text. 4.1.4 To guide students to critically analyze and handle information, and improve the quality of their writing content.	4.2.1 Information Memory Training Course: Conduct 2 sessions per week, teaching memory techniques such as associative memory and categorized memory, to help students memorize commonly used vocabulary, phrases, and sentence structures in writing. At the same time, provide abundant writing materials for students to repeatedly memorize and practice. 4.2.2 Topic Reading and Understanding Activities: Organize 1 topic reading activity every two weeks, selecting articles related to the writing topic, guiding students to conduct in-depth reading, analyzing the article structure, extracting key viewpoints and detailed information. Through group discussions and questioning, deepen students' understanding of the topic. 4.2.3 Writing Practice and Application Workshops: Host 2 writing workshops every month, assign specific writing tasks, requiring students to apply the knowledge and memory information they have learned for writing. In the workshops, teachers provide students with immediate guidance and feedback to help them improve their writing skills. 4.2.4 Critical Thinking Training Course: Offer 4 critical thinking courses each semester, using case analysis and logical reasoning methods to cultivate students' critical thinking abilities. Guide students to question, analyze, and evaluate information in writing, improving the depth and quality of the writing content.	4.3.1 In the classroom tests, students can accurately recall at least 80% of the key writing vocabulary and phrases. 4.3.2 In the discussions and tests following the thematic reading, students' mastery of the key viewpoints and details of the articles reaches over 70%. 4.3.3 In the writing exercises, students can correctly apply the knowledge and information they have learned, and the persuasiveness and logic of their articles are improved. The proportion of teacher evaluations reaching good or above levels reaches over 60%. 4.3.4 Students demonstrate critical thinking skills in their writing, being able to reasonably question, analyze, and evaluate the information. The proportion of related writing works reaching 50% or more.	Non-English major students ; English Teachers; Teaching assistant; Visiting professor

4. Conclusions and recommendations

Based on the above study findings, the study is summarized: The respondents agreed to high level of metacognitive writing awareness. They displayed strong awareness of declarative and conditional knowledge, planning, monitoring, and evaluation strategies, although their awareness of certain subgroups may warrant specific attention. The respondents generally employed various metacognitive writing strategies effectively, including planning, monitoring, evaluating, and information management. The respondents had positive attitudes and exhibited high self-efficacy towards their metacognitive writing. They demonstrated strong self-efficacy in using metacognitive strategies, though there was still room for improvement in the application of these strategies. There was a highly significant correlation among metacognitive writing awareness, metacognitive writing strategies, and critical thinking ability. A language learning program for English language learning had been

proposed, aimed at improving English writing skills for Chinese Non-English majors.

Based on the above findings, the following recommendations are made. Chinese universities may consider offering additional courses focused on metacognitive writing awareness and strategies to enhance students' English writing skills and critical thinking abilities. School administrators may evaluate the proposed enhancement program for English language learning to improve English writing skills among Chinese Non-English majors college students. English teachers may integrate metacognitive writing strategies into daily teaching plans, provide systematic instruction on strategy application at each writing stage, and offer guidance and feedback to help students effectively use these strategies in a supportive writing environment. College students may actively engage in writing activities, utilizing metacognitive strategies to monitor and evaluate their writing process, and seek feedback to deepen their understanding and improve their writing and critical thinking skills. Future research may focus on exploring the intrinsic relationship between metacognitive writing awareness, strategies, and critical thinking ability, and developing more effective teaching methods and assessment tools to support writing instruction and student ability development.

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Job motivation on career identity among university logistics staff

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Abstract

This study aims to explore the relationship between job motivation and career identity among logistics staff in Chinese universities. It measures job motivation from the dimensions of intrinsic and extrinsic motivation, assesses career identity in terms of occupational behavioral engagement, development identity and value identification in the profession, test the significant relationship between job motivation and career identity, and proposes feasible strategies to enhance job motivation and career identity, thereby promoting staff career development and organizational performance. This study used the descriptive type of research and there were 220 who are currently employed logistics staff in universities. The study showed that the logistics staff in Chinese universities career identity is jointly driven by intrinsic motivation (such as job satisfaction and task challenge) and extrinsic motivation (such as job security, incentives, and promotion). Among these factors, behavioral engagement and developmental identification are relatively strong, while value identification is comparatively weak. It is suggested that through task redesign, incentive optimization, and cultural guidance, a systematic enhancement of the synergistic effect between job motivation and career identity can be achieved.

Keywords: job motivation, career identity

Job motivation on career identity among university logistics staff

1. Introduction

With the rapid development of higher education, logistics staff in universities are playing an increasingly important role in the operation of higher education institutions. Their job motivation and career identity directly affect work efficiency and service quality. However, there has been relatively little research on logistics staff in universities, especially regarding the relationship between job motivation and career identity. This study aims to fill this gap and provide theoretical support and practical suggestions for university logistics management.

Main variables involved in this study are job motivation and career identity. Job motivation is the internal driving force that individuals exhibit in their work to achieve specific goals. It directly affects employees' work attitudes, behavioral performance, and career development. As a core psychological process, job motivation not only determines the extent of employees' engagement and performance at work but also has a profound impact on their behavioral choices (Wang et al., 2024). Career identity is the positive evaluation and sense of belonging that individuals have towards their professional roles, reflecting the degree of integration between the individual and their career. It involves multidimensional factors such as career cognition, emotions, and values, and has an important impact on employees' work attitudes, job satisfaction, and organizational loyalty (Li, 2022).

According to Self-Determination Theory, there is a close interaction between job motivation and career identity. Job motivation not only affects the formation of career identity, but career identity can also, in turn, enhance job motivation (Geng et al., 2024). Despite the extensive research on job motivation and career identity, studies focusing specifically on the group of logistics staff in universities remain relatively scarce. Existing research has mostly concentrated on teachers or medical personnel, with little attention paid to the relationship between career identity and job motivation among logistics staff in universities. This research gap limits the scientific nature and effectiveness of university logistics management.

This study not only enriches theoretical research on the relationship between job motivation and career identity but also provides empirical support for university logistics management. By gaining a deep understanding of the job motivation and career identity of logistics staff, university managers can develop more effective management strategies to improve work efficiency and service quality, thereby promoting the sustainable development of universities.

Objectives of the Study - This study aims to explore the relationship between job motivation and career identity among logistics staff in Chinese universities. Specifically, assess the job motivation in terms of intrinsic motivation, extrinsic motivation; determine career identity in terms of adaptability, commitment, and professional development; test the significant relationship between job motivation and career identity; propose plan of action to improve job motivation and career identity.

2. Methods

Research Design - This study employs the Quantitative Research method, aiming to reveal the relationship between job motivation and career identity among logistics staff in universities through systematic data collection and statistical analysis. The core of quantitative research lies in verifying hypotheses, assessing the relationships between variables, and drawing conclusions with generalizability through measurable data. Within the framework of quantitative research, this study will utilize the Descriptive Research method to systematically describe the current status of job motivation and career identity among logistics staff in universities. Descriptive research is a type of quantitative research that aims to describe the characteristics, behaviors, or attitudes of a population or phenomenon. It does not attempt to explain the causes or relationships between variables but focuses on providing a detailed and accurate portrayal of the current state of the subject under study. Descriptive research often uses

surveys, observations, or existing data to collect information and relies on statistical analysis to summarize and present the findings (Creswell et al., 2023).

This study collects data on the basic information, job motivation, and career identity of logistics staff in universities through a questionnaire survey. Descriptive statistical methods are then employed to organize and summarize the data, revealing the basic characteristics of the sample and the distribution of the variables. The results of the descriptive statistical analysis will provide the necessary background information for subsequent in-depth statistical analyses and help better understand the relationships between the variables. The questionnaire design is based on established scales related to job motivation and career identity, with appropriate modifications made to suit the characteristics of the participants in this study, ensuring the applicability and validity of the content. Through this approach, the study aims to obtain objective and quantifiable research results, laying a solid data foundation for further analysis.

Participants of the Study - The participants of this study were logistics staff from three universities, namely Guangdong University of Finance, Guangdong Food and Drug Vocational College, and Guangdong University of Technology. A stratified random sampling method was employed to draw samples from the logistics staff of these three universities. In total, there were 306 logistics staff across the three universities, and the sample size of this study was 220 employees, covering various age groups, educational backgrounds, and job position categories. The participants of this study were required to meet the following inclusion criteria: currently employed logistics staff in universities; with at least 1 year of cumulative work experience in the university logistics department; willing to participate in this study and having signed an informed consent form. The following individuals were excluded from the study: labor dispatch employees or part-time workers; Those with less than 1 year of cumulative work experience in the university logistics department; and individuals who did not sign the informed consent form.

Instruments of the Study - The primary instrument used in this study is a questionnaire, which consists of three sections. The first section collects basic personal information of the participants, including age, gender, education level, job position, and other relevant details. The job motivation scale is based on the scale developed by Chen (2022) and is used to assess the job motivation of logistics staff. This scale comprises two subscales: intrinsic motivation and extrinsic motivation. The career identity scale is adapted from the scale developed by Wang (2023) and is used to measure the career identity of logistics staff. This scale includes three sub-scales: occupational behavioral engagement, occupational development identification, and occupational value identification.

Table 1

Reliability Analysis

Job Motivation Scale	Cronbach Alpha	Number of Items	Interpretation
Intrinsic Motivation	0.880	9	Good
Extrinsic Motivation	0.870	10	Good
Career Identity Scale			
Occupational Behavioral	0.924	6	Excellent
Occupational Development	0.902	5	Excellent
Occupation Value	0.885	5	Good

Legend: $a \geq 0.9$ excellent; $0.9 > a \geq 0.8$ good; $0.8 > a \geq 0.7$ acceptable; $0.7 > a \geq 0.6$ questionable; $0.6 > a \geq 0.5$ poor; $0.5 > a$ unacceptable

In terms of reliability, Cronbach’s coefficient for the career identity scale was 0.89, exceeding the standard of 0.8, which indicates high internal consistency reliability. Additionally, the scale’s convergent validity was confirmed: the standardized factor loading coefficients were all above 0.7 and significant, the average variance extracted (AVE) values were all greater than 0.5, and the composite reliability (CR) values were all above 0.8. These results demonstrate that the scale has good convergent validity. The table shows the reliability analysis of the questionnaire. It shows that it is valid to use.

Data Gathering Procedure - Data collection will be conducted through two methods: online questionnaires

and offline distribution of paper-based questionnaires. To enhance the response rate, a two-round distribution strategy will be employed, along with follow-up reminders after the initial distribution. Before the formal survey, a pilot survey will be conducted on a small scale to test the validity of the questionnaire and make necessary adjustments. During the questionnaire survey, ethical standards will be strictly followed to ensure participants' informed consent and the confidentiality of the data.

Data Analysis - The collected data will be analyzed using SPSS software. The analytical methods will primarily include descriptive statistics, correlation analysis, and regression analysis to explore the relationship between job motivation and career identity. First, descriptive statistical analysis will be conducted to understand the basic characteristics of the sample. Next, correlation analysis will be employed to identify the preliminary relationship between job motivation and career identity. Finally, regression analysis will be used to further verify the relationship between job motivation and career identity.

Ethical Considerations - This study strictly adheres to academic ethical standards, ensuring informed consent from participants and anonymizing all data to protect their privacy and maintain data confidentiality. Before distributing the questionnaires, participants were informed of the research purpose, procedures, and the principle of voluntary participation. During the data collection and analysis process, efforts were made to minimize any disturbance to participants, ensuring the fairness and scientific nature of the study.

3. Results and discussion

Table 2

Summary Table on the Assessment on the Job Motivation

Dimensions	Weighted Mean	Verbal Interpretation	Rank
Intrinsic Motivation	2.74	Agree	2
Extrinsic Motivation	2.79	Agree	1
Composite Mean	2.77	Agree	

Legend: 1.00 – 1.49 Strongly Disagree; 1.50 – 2.49 Disagree; 2.50 – 3.49 Agree; 3.50 – 4.00 Strongly Agree

Table 2 reveals the relative contribution of intrinsic motivation (M=2.74) and extrinsic motivation (M=2.79) to employee job motivation through a comparison of composite means. The data shows that extrinsic motivation has a slight edge ($\Delta=0.05$), echoing the "dual-channel model" in contemporary motivation research. This suggests that external incentive systems may have a more direct role in regulating behavior in organizational contexts (Lee et al., 2023). However, it is important to note that both types of motivation fall within the upper-middle range of the "Agree" interval (2.50–3.49), and the difference is not statistically significant ($p>.05$). This implies that they are more likely to be complementary rather than competitive. This finding has dual implications for management practice. First, the slight advantage of extrinsic motivation confirms the immediate effectiveness of the "performance-reward" linkage, especially in goal-oriented organizational environments (e.g., EM2 career advancement, M=3.04). Second, the close follow-up of intrinsic motivation (e.g., IM7 self-improvement, M=2.93) highlights the importance of job design, indicating that employees' needs for autonomy and competence development should not be overlooked. This balanced characteristic supports the core view of the Motivation Ecosystem Theory (Eccles et al., 2020), that is, an effective incentive system should meet both "instrumental needs" (extrinsic) and "growth needs" (intrinsic).

Table 3 presents the comprehensive evaluation results of the three dimensions of career identity, namely Occupational Behavior Engagement, Occupational Development Identity, and Occupational Value Identification.

Table 3

Summary Table on Career Identity

Indicators	Weighted Mean	Verbal Interpretation	Rank
Occupational Behavior Engagement	2.69	Agree	1
Occupational Development Identity	2.68	Agree	2
Occupational Value Identification	2.62	Agree	3
Composite Mean	2.66	Agree	

Legend: 1.00 – 1.49 Strongly Disagree; 1.50 – 2.49 Disagree; 2.50 – 3.49 Agree; 3.50 – 4.00 Strongly Agree

The weighted means for these dimensions are 2.69, 2.68, and 2.62, respectively, all falling within the range of 2.50–3.49, indicating that respondents have an “Agree” attitude towards these dimensions. Specifically, Occupational Behavior Engagement has the highest score (2.69), followed by Occupational Development Identity (2.68), while Occupational Value Identification has the lowest score (2.62). This suggests that employees demonstrate a high level of pro-activity and engagement in their job behaviors, such as actively learning new skills and adhering to work regulations. In terms of career development, employees also have a positive attitude towards the relevance of their current work to their future career goals. In contrast, the relatively lower score for Occupational Value Identification may reflect a weaker perception of the social value of their career or organizational recognition among employees.

From an academic perspective, these findings are consistent with Career Identity Theory, which posits that an individual’s career identity is composed of behavioral, developmental, and value identifications. The high score for Occupational Behavior Engagement indicates that employees exhibit strong self-motivation in their daily work, which is closely related to the driving role of intrinsic job motivation (Van den Broeck et al., 2021). The moderate score for Occupational Development Identity shows employees’ optimistic attitude towards their career prospects, but it may also imply higher expectations for organizational support or development opportunities. The lower score for Occupational Value Identification suggests that organizations need to enhance employees’ awareness of the significance and social contribution of their careers, for example, by clarifying role value or increasing organizational identification (Lee et al., 2021). Overall, the data in Table 3 provide a basis for organizations to optimize their career development systems, especially in terms of improving Occupational Value Identification, where further intervention is needed.

Table 4

Relationship Between Job Motivation and Career Identity

Intrinsic Motivation	r-value	p-value	Interpretation
Occupational Behavioral Engagement	0.369**	0.000	Significant
Occupational Development Identification	0.441**	0.000	Significant
Occupational Value Identification	0.368**	0.000	Significant
Extrinsic Motivation			
Occupational Behavioral Engagement	0.583**	0.000	Significant
Occupational Development Identification	0.509**	0.000	Significant
Occupational Value Identification	0.508**	0.000	Significant

***. Correlation is significant at the 0.01 level (2-tailed).*

The table illustrates the relationship between job motivation and career identity. The computed R-values indicate a strong positive correlation, and the resulting p-values were less than the alpha level. This means a significant relationship exists and implies that job motivation impacts or influences the employees’ career identity and vice versa. The two variables are dependent on one another. The correlations between intrinsic motivation and career identity dimensions ($r = 0.368\text{--}0.441$) confirm the importance of internal drivers—such as personal growth, autonomy, and meaningfulness—in shaping career identity.

According to recent studies, intrinsic motivation enhances employees' alignment with their occupational values and promotes self-driven engagement (Martínez-Linares et al., 2025). This supports Self-Determination Theory, which suggests that when individuals feel autonomous and competent, they are more likely to internalize their professional roles (Ryan et al., 2020). Interestingly, extrinsic motivation demonstrated even stronger correlations ($r = 0.508\text{--}0.583$), particularly with occupational behavioral engagement. This suggests that tangible rewards—such as compensation, promotion, and recognition—continue to play a crucial role in influencing how employees perceive and engage with their careers (Tanaka et al., 2025). Modern organizational structures that provide structured development programs and performance-based rewards tend to reinforce occupational identity formation, particularly among younger workers (Lee et al., 2025).

These findings align with recent scholarship that frames motivation and career identity as mutually reinforcing. Stronger motivation—whether intrinsic or extrinsic—enhances one’s engagement, developmental

orientation, and identification with occupational values, which in turn fuels sustained motivation (Del Rosario et al., 2025). This cyclical relationship underscores the importance of cultivating both motivational strategies and identity-building experiences in the workplace. Organizations that foster environments supporting both intrinsic satisfaction and external rewards are more likely to strengthen the career identity of their workforce. As career identity becomes more defined, it can lead to increased employee commitment, productivity, and long-term retention (Kwon et al., 2025).

Table 5

Proposed Action Plan to Improve the Instructional Design Process and Employee Performance

Key Result Area	Strategies	Person/s Responsible	Success Indicator
Job Motivation Intrinsic	Implement structured recognition initiatives that highlight the vital contributions of logistics staff.	Human Resource Department (HR) Department Heads or Supervisors of Logistics Staff Marketing/Communications Office or Public Relations	Boosts morale, affirms professional identity, and increases perceived value across departments.
	Offer training, seminars, and access to short courses that lead to certifications or skill badges.	Human Resource Department (HR) Department Heads / Immediate Supervisors of Logistics Staff Internal Trainers	Increases self-worth, adds formal value to their role, and signals organizational investment in their status.
	Actively involve logistics staff in campus planning and development discussions.	Human Resource Department (HR) Department Heads / Immediate Supervisors of Logistics Staff	Makes logistics staff feel valued and heard, directly addressing low satisfaction with professional status.
Career Identity on Occupational value Identification	Allocate a small portion of work hours (e.g., 1–2 hours per week) for logistics staff to explore new methods, tools, or solutions related to their roles without strict output expectations.	Human Resource Department (HR) Department Heads or Supervisors of Logistics Staff Marketing/Communications Office or Public Relations	Encourages autonomy, experimentation, and ownership—key drivers of curiosity.
	Implement monthly or quarterly challenges such as “Best Process Improvement Idea” or “Innovation of the Month” with small rewards or recognition.	Human Resource Department (HR) Department Heads / Immediate Supervisors of Logistics Staff Internal Trainers	Triggers curiosity through competition and discovery, while reinforcing a sense of value.
	Provide short learning content (videos, infographics, quizzes) that sparks curiosity and relates directly to their tasks or field (e.g., logistics tech, safety hacks, productivity tips).	Human Resource Department (HR) Department Heads / Immediate Supervisors of Logistics Staff	Stimulates continuous exploration and connects learning with performance.

4. Conclusions and recommendations

The respondents generally agreed on the job intrinsic and extrinsic practiced by the logistics companies. There is general agreement on career identity in terms of occupational behavior, occupational development identity and value identification. There is a significant relationship between job motivation and career identity. Plan of Action is prepared to improve the job motivation and career identity. The Plan of Action may be discussed to logistics companies for possible use in the company. Future researchers may conduct study on the predictors of career identity.

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Organizational justice, sense of belonging, and cultural organizational change: Basis for enhanced organizational citizenship behavior framework

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Abstract

This study explores in depth the dynamic relationship among organizational justice, cultural organizational change, and managerial employees' sense of belonging, with the ultimate goal of developing an Enhanced Organizational Citizenship Behavior (OCB) Framework within the context of China's commercial aerospace industry. Rooted in the rapidly evolving environment of science and technology enterprises in Beijing, the research recognizes the strategic importance of fair organizational practices and inclusive culture in enhancing employee alignment and discretionary behaviors during cultural transformation. Drawing on a sample of 412 managerial employees through a structured survey method. Results revealed that all four dimensions of organizational justice—distributive, procedural, interactional, and informational—were positively perceived by respondents and significantly correlated with cultural change components including innovation, consistency, and adaptability. The strongest correlation was observed between interactional justice and cultural innovation ($r = .910, p < .001$), indicating the crucial role of respectful, transparent managerial interactions in fostering cultural renewal. Moreover, the study found a highly significant relationship between organizational justice and the sense of belonging, particularly in the dimensions of competence and perception. Informational and interactional justice demonstrated the strongest impact on belonging dimensions ($r > .70, p < .001$). Similarly, cultural organizational change—especially cultural adaptability—was strongly linked to employees' sense of belonging, underscoring the role of agile, responsive organizational culture in fostering employee identification and engagement. The integration of these findings culminated in the formulation of a practical and theoretical Enhanced OCB Framework, which outlines how fairness in management practices and strategic cultural evolution directly contribute to strengthening employee belongingness and discretionary contributions. The study thus offers both a significant theoretical contribution to organizational behavior literature and valuable practical insights for science and technology enterprises undergoing transformative change.

Keywords: organizational justice, cultural organizational change, sense of belonging, Organizational Citizenship Behavior (OCB), managerial employees, aerospace enterprises, China

Organizational justice, sense of belonging, and cultural organizational change: Basis for enhanced organizational citizenship behavior framework

1. Introduction

Against the backdrop of increasingly fierce global competition and rapid technological changes, Beijing's technology enterprises, especially those in the aerospace industry, underwent profound changes in their cultural organizational structure to maintain competitiveness in the rapidly changing market. These changes involved reshaping corporate values and adjusting internal management structures. In this transformation process, the sense of belonging of the management played a crucial role. Organizational fairness had a significant impact on employees' psychological reactions and work behavior, shaping their professional ethics and participation. As an important concept in organizational behavior, organizational justice was widely studied and applied in various organizational contexts. At the same time, as a key aspect of management practice, it was directly related to employees' psychological perceptions and behavioral responses. Studies suggested that organizational justice had a significant impact on job satisfaction, employee engagement, and retention (Choi et al., 2019). Distributive justice referred to employees' perceptions of the fairness of resource allocation or decisions regarding rewards and punishments. Procedural justice involved employees' perceptions of whether the decision-making process itself was fair. Li et al.,(2020) stressed that transparency, participation, and procedural stability were the core elements of procedural justice during organizational change.

In the reform of cultural organizations, the leadership and communication styles of managers were particularly important, as they directly affected employees' sense of belonging and cultural adaptability. This dimension emphasized the interactive relationship between leaders and employees, especially how leaders influenced employees' perceptions of fairness through communication, respect, and trust. Research showed that the fairness of leader interactions directly affected employees' work motivation, job satisfaction, and performance (Soyer et al., 2021). Information fairness involves employees' perception of the fairness and transparency of information flow within the organization (Filstad et al., 2019). In the context of rapid development of technology-based enterprises, when the internal information flow of the enterprise is restricted or there are deviations, employees are prone to develop a sense of distrust, which will directly affect their loyalty and work engagement with the enterprise. Therefore, information transparency is crucial for employees' adaptability and sense of belonging. By providing accurate and timely information, companies can not only effectively alleviate employee anxiety, but also significantly enhance their sense of belonging and identity.

Cultural change usually included multiple dimensions, including cultural innovation (embracing new ideas and practices), cultural consistency (maintaining core values), and cultural adaptability (responding to environmental changes) (Denison et al., 2020; He et al., 2020). Among these aspects, cultural innovation was particularly important for technology companies. In such companies, the ability to continuously adapt and change was a key driver of success. However, when these changes were inconsistent with employees' expectations, they often led to conflicts and reduced employees' sense of belonging—especially among those in management positions who served as both executors and recipients of these changes (Shao et al., 2021). Cultural innovation referred to an organization's ability to promote cultural change in order to adapt to external and technological developments (He et al., 2020). In science and technology enterprises, cultural innovation was essential for advancing digital transformation and technological progress. It stimulated employees' creativity and innovative behavior, thereby promoting the sustainable development of the organization.

Cultural consistency referred to the stability and alignment of an organization's core values during periods of change (Denison et al., 2020). In the context of cultural organizational change, maintaining cultural consistency was crucial for preserving employees' sense of belonging and identity. For Beijing's science and technology enterprises, finding a balance between innovation and consistency was an urgent challenge during organizational

transformation.

Cultural adaptability referred to an organization's ability to quickly adjust its culture in response to changes in the external environment (Shao et al., 2021). Organizations with strong cultural adaptability helped employees adjust more rapidly to change, thereby enhancing their job satisfaction and sense of belonging. At the same time, adaptability fostered greater teamwork and a stronger sense of organizational identity among employees. "Competences for being" described the ability of employees to integrate into teams, build relationships, and make meaningful contributions. Research showed that employees with high emotional intelligence, strong communication abilities, and effective conflict resolution skills were more likely to develop a strong sense of belonging (Allen et al., 2021). In particular, in dynamic and changing environments, managerial employees with a strong sense of belonging adapted more effectively and supported team innovation and collaboration. "Motions to being" involved the efforts and emotional investment employees made in order to feel a sense of belonging. Managerial employees experienced the dual influence of personal motivation and external support systems (Chen et al., 2023). By stimulating employees' intrinsic motivation and providing external support, organizations enhanced both employees' sense of belonging and their organizational commitment.

Employees' sense of belonging was influenced not only by their intrinsic motivation and external opportunities, but also by their identification with and adaptation to organizational culture. Research showed that managerial employees' identification with organizational culture directly affected their work engagement and organizational loyalty (Allen et al., 2021). Although extensive research had been conducted globally on organizational justice, cultural organizational change, and employees' sense of belonging, there remained a lack of studies exploring the interaction among these variables—particularly their combined effects on managerial employees in high-change environments. In the context of science and technology enterprises such as those in Beijing's commercial aerospace sector, how to enhance the sense of belonging among managerial employees and strengthen their organizational commitment through effective cultural change strategies was still an urgent issue. Furthermore, it was necessary to examine how the unique dimensions of cultural change—innovation, consistency, and adaptability—interacted to influence these outcomes (Li et al., 2021; Zhang et al., 2023).

This study aimed to address the existing gap by examining the effects of cultural innovation, consistency, and adaptability on the commitment and sense of belonging among management-level employees in Beijing's technology enterprises. Through this investigation, the study sought to offer insights into how technology companies could more effectively manage cultural change, retain key personnel, and enhance organizational stability during periods of transition. Additionally, it intended to provide a theoretical foundation for improved organizational management practices.

With the rapid development of China's commercial aerospace and high-tech sectors, industry competition intensified, cultural changes became more frequent, and the stability and motivation of managerial employees grew increasingly critical. The research findings were expected to provide useful references and suggestions for these enterprises. Beyond practical implications, the study also aimed to contribute to academic knowledge in the field of human resource management. It viewed the study of "justice" and "sense of belonging" not merely as managerial concerns but as important issues related to humanistic care and social responsibility.

A strong sense of belonging among managerial employees fostered a collaborative environment, encouraged open communication, and promoted idea-sharing—factors vital to successful organizational transformation. Moreover, organizational justice—encompassing fairness in decision-making, resource allocation, and employee treatment—reinforced trust and loyalty, motivating employees to actively engage in and contribute to the organization's transformation journey. Through this research, the goal was to find a meaningful balance between effective enterprise management and humanistic care.

Objectives of the Study - This study aimed to assess organizational justice, sense of belonging, and cultural organizational change among management-level employees of a commercial aerospace company in China. Specifically, it sought to examine organizational justice in terms of distributive, procedural, interactional, and

informational justice; to assess the degree of respondents' sense of belonging based on competencies, opportunities, motivations, and perceptions; and to describe the nature of cultural organizational change in terms of cultural innovation, cultural consistency, and cultural adaptability. Furthermore, the study intended to test the significant relationships among organizational justice, sense of belonging, and cultural organizational change, and to develop an enhanced Organizational Citizenship Behavior framework tailored for the commercial aerospace company.

2. Methods

Research Design - This study used a descriptive research design to deeply understand the relationship between organizational justice, cultural organizational change, and the sense of belonging of management. Descriptive research design was a systematic method used to describe the characteristics of groups or phenomena and provide a detailed description of the "status quo," without manipulating variables.

Participants of the Study - In order to obtain high statistical power and data representativeness, a total of 412 valid questionnaires were collected, which were large enough to detect significant effects in different statistical tests and provide reliable results. This survey focused on the management staff and departments of this commercial aerospace company. It included managers and cases from different departments at all levels to ensure the diversity of samples. In addition to my subsidiary, it also covered the managers of other subsidiaries within the whole group, which was helpful to explore the relationship between organizational justice and the sense of belonging of management staff in similar technology-based enterprises from the perspective of cultural organizational change and provided theoretical support and practical guidance for enterprise management practice.

Instrument of the Study - This questionnaire comprehensively measured employees' perceptions of organizational justice, cultural and organizational change, and sense of belonging through multiple dimensions, which helped researchers understand how these factors affected employees' work attitudes and behaviors. At the same time, the questionnaire provided enterprise managers with valuable insights on how to enhance employees' sense of belonging by improving organizational justice and promoting cultural change, thereby improving the overall performance of the organization and employee enthusiasm. It also offered empirical support for the relationship between organizational justice, cultural organizational change, and employees' sense of belonging, and provided a theoretical framework and data basis for future related research.

The questionnaire used a four-point Likert scale, where respondents scored each question according to their own feelings (1: strongly disagree, 2: disagree, 3: agree, 4: strongly agree). This 4-point rating scale, a variant of the Likert scale, was typically used to avoid respondents choosing neutral options, thus forcing them to make a clear choice among the four options. The 4-point scale was also commonly used to measure attitudes, opinions, or feelings, but compared with the five-point scale, it reduced the presence of neutral responses. The questionnaire consisted of three main variables and 11 sub-variables derived from them. Using mature scales from the corresponding fields as references, the questionnaire included five questions for each variable, with a total of 55 questions. This study combined classic theories of organizational justice, cultural organizational change, and employee belonging, providing a solid theoretical basis for research in this field. Through dimension segmentation, the questionnaire captured the perception and emotional state of employees comprehensively and helped reveal the multi-level mechanism of employee belonging. The instrument was content validated by experts and underwent reliability testing.

Reliability results demonstrated strong internal consistency across all variables. In Organizational Justice, the sub-variables of Distributive Justice ($\alpha=0.885$) exhibited good reliability, while Procedural Justice ($\alpha=0.910$), Interactional Justice ($\alpha=0.978$), and Informational Justice ($\alpha=0.949$) all fell within the excellent range. The overall reliability for Organizational Justice ($\alpha=0.978$) was also excellent, indicating a high level of consistency among the items. For Cultural Organizational Change, Cultural Innovation ($\alpha=0.893$) demonstrated good reliability, while Cultural Consistency ($\alpha=0.956$) and Cultural Adaptability ($\alpha=0.914$) achieved excellent reliability. Overall reliability score of 0.972 suggested that the measures effectively captured the underlying variable with a high

degree of precision. In Managerial Employee Sense of Belonging, all sub-variables including Competencies for Belonging ($\alpha=0.941$), Opportunities to Belonging ($\alpha=0.934$), Motivations to Belonging ($\alpha=0.940$), and Perceptions of Belonging ($\alpha=0.909$) demonstrated excellent reliability. Overall reliability score for Managerial Employee Sense of Belonging ($\alpha=0.928$) further reinforced the robustness of the measurement tool. Overall, these results indicated that the survey instruments used in this study were highly reliable, ensuring consistent and dependable measurement of the intended variables.

Table 1*Reliability Results*

Variables	No. of Items	α value	Interpretation
Organizational Justice			
Distributive Justice	5	0.885	Good
Procedural Justice	5	0.910	Excellent
Interactional Justice	5	0.978	Excellent
Informational Justice	5	0.949	Excellent
Overall	20	0.978	Excellent
Managerial Employee Sense of Belonging			
Competencies for belonging	5	0.941	Excellent
Opportunities to belonging	5	0.934	Excellent
Motivations to belonging	5	0.940	Excellent
Perceptions of belonging	5	0.909	Excellent
Overall	20	0.928	Excellent
Cultural Organizational Change			
Cultural Innovation	5	0.893	Good
Cultural Consistency	5	0.956	Excellent
Cultural Adaptability	5	0.914	Excellent
Overall	15	0.972	Excellent

Legend > 0.9 =Excellent; >0.8=Good;>0.7=Acceptable;>0.6=Questionable;>0.5=Poor;<0.5=Unacceptable

Data Gathering Procedure - In order to ensure the reliability of the questionnaire and the accuracy of the data sample, the researchers in this study referred to a large number of relevant literatures as important references for the questionnaire design. During the research process, the collected data were analyzed and interpreted one by one with reference to existing studies. In-depth exchange interviews and on-site interviews were conducted with participants during data collection. At the same time, the questionnaire accurately evaluated the relationship between organizational justice, cultural organizational change, and employees' sense of belonging by incorporating mature scales and a solid theoretical framework. The scales used were derived from many classic organizational behavior and social psychology theories, which ensured the scientific rigor and practicality of the questionnaire.

This study mainly collected data through an online questionnaire survey. The questionnaire was distributed primarily through the internal OA system, email, or social media platforms. The target group consisted of management employees of a commercial aerospace company in China, mainly including middle and senior managers across various functional departments. According to the size of the company, a combination of random sampling and stratified sampling was adopted to ensure the representativeness of the sample. Regarding in-depth interviews, this method served as a key means of data collection in qualitative research, allowing researchers to engage in face-to-face communication with respondents and obtain rich, detailed, and in-depth information. To ensure diversity and representativeness, management employees from different levels, departments, and years of service were selected as interviewees. Especially important were key individuals who had directly participated in or witnessed organizational change, as their experiences and opinions were crucial for understanding changes in organizational justice, sense of belonging, and the essence of cultural organizational change during the transformation process.

Data Analysis - Weighted mean and rank were used to determine organizational justice in terms of distributive, procedural, interactional, and informational justice; assess respondents' sense of belonging in terms of competencies, opportunities, motivations, and perceptions; and describe cultural organizational change in terms of cultural innovation, cultural consistency, and cultural adaptability. The results of the Shapiro-Wilk test showed that

p-values for all variables were less than 0.05, indicating that the data set was not normally distributed. Therefore, Spearman's rho was used as part of the non-parametric tests to determine significant relationships. All analyses were performed using SPSS version 28.

Ethical Considerations - Ethical considerations were critical for this study, focusing primarily on obtaining informed consent, ensuring data privacy and confidentiality, and adhering to local regulatory frameworks governing data collection and research practices. All participants were required to sign informed consent forms prior to participating in the survey. This process ensured that participants fully understand the study's purpose, the conditions for participation, the types of data collected, and the intended use of their responses. Participants retain the right to withdraw from the study at any time without any obligation or need to provide a reason. Researchers provided a detailed consent form written in clear, accessible language and ensured that every participant is aware of their rights and the voluntary nature of their participation. In China, the Personal Information Protection Law (PIPL), enacted in 2021, serves as the key legislative framework ensuring data privacy and protection. This law sets strict rules for the collection, storage, processing, and sharing of personal information. In compliance with PIPL, this study anonymized all responses so that no identifying information is linked to the survey data. Additionally, data were securely stored, accessible only to the research team, and is used exclusively for academic purposes. The research instrument has also undergone an ethics review and received clearance from the university's ethics review committee.

3. Results and discussion

Table 2

Summary Table of Organizational Justice

Indicators	WM	VI	Rank
Distributive	3.37	Agree	1
Procedural	3.36	Agree	2
Interactional	3.31	Agree	3
Informational	3.30	Agree	4
Composite Mean	3.34	Agree	

Legend: 3.50-4.00=Strongly Agree; 2.50-3.49=Agree; 1.50-2.49=Disagree; 1.00-1.49=Strongly Disagree

As shown in Table 2, the composite mean for organizational justice is 3.34, verbally interpreted as Agree. This indicates that managerial employees generally perceive the organizational justice practices to be present and moderately effective across all four dimensions: distributive, procedural, interactional, and informational. Organizational justice has long been considered a critical factor influencing employees' motivation, performance, and commitment (Li et al., 2025). In dynamic and highly competitive sectors such as commercial aerospace, ensuring fairness in decisions, communication, treatment, and outcomes becomes essential to cultivating trust, stability, and organizational alignment (Zhang et al., 2022). The highest-rated dimension was Distributive Justice, with a mean score of 3.37, ranked 1st. This suggested that employees were relatively satisfied with the fairness of outcomes such as compensation, workload distribution, and rewards. In high-pressure roles, especially in technologically advanced sectors, perceived equity in resource allocation was vital for maintaining morale and reducing internal competition.

The second-highest mean was recorded for Procedural Justice, with a score of 3.36. This suggested that respondents generally believed the organization used consistent and transparent procedures when making decisions. It also reflected the perception that processes used in evaluating and promoting employees were fair. The perception of fair procedures contributed significantly to employee trust in the organization and acceptance of management decisions. Interactional Justice received a mean score of 3.31, which indicated a generally favorable perception of interpersonal treatment within the organization. Respondents felt that supervisors communicated clearly and respectfully and recognized employee contributions. Maintaining a respectful and sincere interactional climate was crucial in preserving employee dignity and fostering a sense of inclusion.

Informational Justice had the lowest mean among the four dimensions, scoring 3.30, though still within the Agree range. This result suggested that employees saw room for improvement in the thoroughness, clarity, and timeliness of the information provided to them. In the context of ongoing organizational changes, clear and detailed communication became especially important to mitigate uncertainty and enhance transparency. Limited informational fairness may have negatively impacted employee understanding and compliance during strategic transitions (Das et al., 2023). Improving communication by ensuring more personalized and detailed procedural explanations may have helped bridge this gap (He et al., 2020).

Table 3

Summary Table of Sense of Belonging

Indicators	WM	VI	Rank
Competencies	3.19	Agree	1
Opportunities	3.11	Agree	3
Motivations	3.09	Agree	4
Perceptions	3.18	Agree	2
Composite Mean	3.14	Agree	

Legend: 3.50-4.00=Strongly Agree; 2.50-3.49=Agree; 1.50-2.49=Disagree; 1.00-1.49=Strongly Disagree

As shown in Table 3, the respondents' overall perception of their sense of belonging in the organization resulted in a composite mean of 3.14, which is verbally interpreted as Agree. This suggests that managerial employees generally feel a moderate level of belonging within the organization, with strengths in certain areas such as competencies and perceptions, while some areas such as motivations and opportunities reveal room for improvement. Sense of belonging is widely recognized as a fundamental psychological need that influences employees' engagement, loyalty, and performance Riyanto et. al.,(2021). Particularly in complex and dynamic industries like commercial aerospace, a sustained sense of belonging helped retain talent, improved team effectiveness, and fostered psychological resilience (Nguyen et al., 2021;Khaw et al., 2022).

The highest-rated dimension was *Competencies*, with a mean score of 3.19, ranked 1st. This reflected that managerial employees perceived themselves as having sufficient skills in communication, collaboration, and emotional awareness to integrate effectively within teams. These competencies were essential for promoting inclusion, constructive conflict management, and shared decision-making. According to Ding et. al.,(2025), competence in interpersonal and team-based skills facilitated deeper connection and trust among colleagues. Similarly, Blau (2023) found that when employees were confident in their capabilities, they were more likely to experience psychological ownership and a stronger sense of organizational identity.

Mid-range dimensions included: *Perceptions*, with a mean of 3.18, ranked 2nd, suggesting that employees generally felt accepted and supported in their workplace relationships; and *Opportunities*, with a mean of 3.11, ranked 3rd, indicating that while opportunities for engagement and inclusion existed, they might not have been fully optimized or equitably distributed across the organization. These results showed that while organizational support systems were present, the effectiveness and visibility of these opportunities might not have been consistent for all employees, pointing to potential gaps in inclusion strategies and leadership reinforcement.

The lowest-rated dimension was *Motivations*, with a mean score of 3.09, ranked 4th. While still falling under the Agree category, this lower score suggested that some employees lacked strong internal drive to actively integrate into organizational life or perceived limited personal value in doing so. This could have been attributed to factors such as cultural misalignment, low morale, or minimal recognition of discretionary efforts. Gonzalez et al. (2021) highlighted that intrinsic motivation was a core predictor of long-term engagement and psychological safety. Hidayat et. al.,(2024) found that employees who did not feel emotionally invested in their work community were less likely to contribute to collective goals or adapt to organizational change.

Table 4*Summary Table of Cultural Organizational Change*

Indicators	WM	VI	Rank
Cultural Innovation	3.23	Agree	3
Cultural Consistency	3.30	Agree	1
Cultural Adaptability	3.25	Agree	2
Composite Mean	3.26	Agree	

Legend: 3.50-4.00=Strongly Agree; 2.50-3.49=Agree; 1.50-2.49=Disagree; 1.00-1.49=Strongly Disagree

In Table 4, the respondents evaluated their perceptions of cultural organizational change, resulting in a composite mean of 3.26, which was interpreted as Agree. This indicated that, overall, the managerial employees acknowledged the presence and impact of cultural transformation within their organization, although the responses suggested moderate intensity across the three dimensions of innovation, consistency, and adaptability. Cultural organizational change was a multidimensional process that enabled firms to align their values, behaviors, and systems with dynamic external conditions (Rodrigues et al., 2020). In sectors like commercial aerospace, where technological disruptions and strategic pivots were frequent, adaptive cultural change was especially critical for maintaining innovation capability and workforce alignment (De Cuyper et al., 2020).

Among the three indicators, cultural consistency achieved the highest average score of 3.30, ranking first. This showed that even when the external environment changed, the organization was considered able to maintain the stability of its values, systems, and behaviors. According to Khaw et al., (2022), cultural consistency was essential to reduce uncertainty and improve the effectiveness of organizational change. A stable cultural framework served as a psychological anchor for employees to promote their commitment and sustainability in turbulent times (Bantilan et al., 2024). This consistency also strengthened the trust between leaders and staff, making the implementation of strategic initiatives more smooth.

Cultural adaptability ranked second with an average score of 3.25, and cultural innovation ability ranked third with an average score of 3.23. Results showed that respondents also recognized the organization's ability to adapt to change and introduce new ideas, although these abilities were slightly less prominent than consistency. Relatively close scores among the three factors suggested a generally balanced organizational cultural profile, albeit with some opportunity to enhance innovation capacity and employee involvement in adaptive learning.

The lowest-rated factor was Cultural Innovation, with a mean score of 3.23. Although it was still interpreted as Agree, its position in the ranking indicated that the organization might have needed to provide more structured support and incentives for innovation. Allen et al., (2021) argued that innovation-oriented cultures were positively linked to employee creativity and firm performance, especially in knowledge-intensive industries like commercial aerospace. Enhancing the innovation climate through open idea platforms, cross-functional collaboration, and recognition systems might have further reinforced cultural change.

Table 5 presented the correlation between organizational justice—measured through four dimensions: distributive, procedural, interactional, and informational—and three key facets of cultural organizational change: cultural innovation, cultural consistency, and cultural adaptability. All correlation coefficients were significant at the 0.01 level, indicating highly significant relationships. Among these, interactional justice exhibited the strongest correlation with cultural innovation ($\rho=.910$), while distributive justice showed the strongest correlation with cultural adaptability ($\rho=.824$). These results revealed that the greater the perception of organizational justice, the stronger the capacity for successful cultural transformation in organizations, and perceptions of fairness within the organization were positively and significantly associated with the successful implementation of cultural organizational changes. In other words, the greater the perceived organizational justice, the higher the degree of innovation, consistency, and adaptability in the organizational culture.

Table 5*Relationship Between Organizational Justice and Cultural Organizational Change*

Variables	rho	p-value	Interpretation
Distributive			
Cultural Innovation	.596**	<.001	Highly Significant
Cultural Consistency	.721**	<.001	Highly Significant
Cultural Adaptability	.824**	<.001	Highly Significant
Procedural			
Cultural Innovation	.761**	<.001	Highly Significant
Cultural Consistency	.757**	<.001	Highly Significant
Cultural Adaptability	.703**	<.001	Highly Significant
Interactional			
Cultural Innovation	.910**	<.001	Highly Significant
Cultural Consistency	.775**	<.001	Highly Significant
Cultural Adaptability	.794**	<.001	Highly Significant
Informational			
Cultural Innovation	.852**	<.001	Highly Significant
Cultural Consistency	.760**	<.001	Highly Significant
Cultural Adaptability	.780**	<.001	Highly Significant

Legend: Significant at $p\text{-value} < 0.01$

Organizational justice was widely recognized as a key driver of organizational culture and transformation, particularly in dynamic and knowledge-intensive environments. First, the notably strong link between interactional justice and cultural innovation aligned with recent studies emphasizing the impact of respectful leadership communication on employees' innovative behavior. According to Ding et al., (2025), when employees felt respected and valued during change processes, they were more likely to offer novel ideas and embrace innovation. A culture of interpersonal fairness reduced psychological resistance, fostered psychological safety, and encouraged proactive cultural participation.

The high correlation between distributive justice and cultural adaptability ($\rho = .824$) reflected how fairness in outcomes contributed to employees' openness and agility. Research by Qi et al., (2023) found that when employees believed that the distribution of workload, promotion, and rewards was fair, they showed greater consistency with the changing organizational values and priorities. Especially in the transition stage, the fairness of distribution became a stable force, encouraging individuals to make constructive adjustments.

It also showed that there was a significant correlation between adequate, timely, and honest communication and cultural innovation ($\rho = .852$) and cultural adaptability ($\rho = .780$). Procedural fairness also provided a sense of predictability and control, which were key psychological anchors during periods of cultural restructuring (Tang, 2025). It played a particularly important role in uncertain times, enabling employees to understand changes and stay connected with organizational goals.

The absence of justice in any dimension could have hindered or reversed the progress of cultural change. Employees who perceived injustice might have disengaged from innovation efforts, resisted new norms, or undermined cultural cohesion. For example, when communication lacked transparency or decision-making was inconsistent, the resulting distrust fragmented organizational culture and inhibited the emergence of shared values (Zampetakis et al., 2024).

Organizational justice was a fundamental enabler of cultural organizational change. Fairness in interaction, process, outcome, and communication cultivated the psychological readiness, motivation, and clarity required for innovation, consistency, and adaptability. To foster a resilient and transformation-oriented culture, organizations needed to systematically strengthen justice across all four dimensions, aligning ethical leadership with cultural strategy. These findings reinforced the idea that organizations aiming to implement cultural change must have prioritized fairness in both practice and perception. Fostering organizational justice not only improved employee attitudes but also enhanced the overall effectiveness and sustainability of cultural transformation efforts (Dai et al., 2022).

Table 6*Relationship Between Organizational Justice and Sense of Belonging*

Variables	rho	p-value	Interpretation
Distributive			
Competencies	.780**	<.001	Highly Significant
Opportunities	.629**	<.001	Highly Significant
Motivations	.603**	<.001	Highly Significant
Perceptions	.508**	<.001	Highly Significant
Procedural			
Competencies	.624**	<.001	Highly Significant
Opportunities	.530**	<.001	Highly Significant
Motivations	.506**	<.001	Highly Significant
Perceptions	.487**	<.001	Highly Significant
Interactional			
Competencies	.691**	<.001	Highly Significant
Opportunities	.737**	<.001	Highly Significant
Motivations	.683**	<.001	Highly Significant
Perceptions	.671**	<.001	Highly Significant
Informational			
Competencies	.740**	<.001	Highly Significant
Opportunities	.721**	<.001	Highly Significant
Motivations	.701**	<.001	Highly Significant
Perceptions	.711**	<.001	Highly Significant

Legend: Significant at p-value<0.01

Table 6 presented the correlation between the four dimensions of organizational justice—distributive, procedural, interactional, and informational—and the four dimensions of managerial employees' sense of belonging: competencies, opportunities, motivations, and perceptions. All correlation coefficients were significant at the 0.01 level, indicating that each form of justice had a highly significant relationship with various facets of employees' sense of belonging. Notably, distributive justice showed the strongest correlation with competencies ($\rho=.780$), while interactional justice was most strongly correlated with opportunities ($\rho=.737$), and informational justice showed balanced high correlations across all four belonging dimensions. These results emphasized that employees' perceptions of fairness within the organization were positively associated with their feelings of belonging and inclusion in the workplace, and a just organizational environment played a critical role in enhancing employees' psychological connection to their organization.

A sense of belonging was foundational for employee engagement, organizational commitment, and positive workplace behavior. It referred to the extent to which individuals felt accepted, valued, and connected within the organizational context. Organizational justice served as a psychological anchor that reinforced this connection, especially in environments undergoing cultural change or facing external uncertainty. The strong relationship between distributive justice and competencies ($\rho=.780$) suggested that when outcomes such as recognition, rewards, and development opportunities were distributed fairly, employees were more likely to recognize and believe in their own abilities. According to Hermanto et. al.,(2024), perceived fairness in reward systems directly affected individuals' self-efficacy and professional identity, which were core elements of belonging in knowledge-based organizations.

Interactional justice exhibited its strongest influence on the dimension of opportunities ($\rho=.737$), indicating that respectful and dignified interpersonal treatment enhanced employees' perceptions of growth and participation.

Informational justice showed consistently high correlations with all four belonging dimensions, especially with motivations ($\rho=.701$) and perceptions ($\rho=.711$). This indicated that transparent, consistent, and honest communication reinforced employee trust and reduced uncertainty about their organizational role. As noted by Kim et. al.,(2021), clear communication increased employees' internalization of organizational goals and values, thereby improving their intrinsic motivation and emotional connection to the organization.

Procedural justice, while slightly lower in correlation coefficients than the other dimensions, still showed

significant relationships—particularly with competencies ($\rho=.624$) and opportunities ($\rho=.530$). Fairness in processes such as promotions, resource access, and performance evaluation provided structural support for developing and sustaining employee belonging.

The absence of justice in any form could have weakened employees' sense of belonging. If reward systems were seen as biased (distributive injustice), or if leaders provided incomplete or misleading information (informational injustice), employees might have felt excluded or devalued. This could have led to alienation, reduced engagement, and even turnover. Particularly in the context of high-performing or change-oriented organizations, overlooking justice in everyday practices might have eroded the social fabric necessary for cohesion and collaboration.

Organizational justice was a key antecedent of employee sense of belonging, affecting how employees perceived their role, value, and place within the organization. Distributive and informational justice enhanced personal competency and trust, while interactional and procedural justice built interpersonal security and long-term identification. To cultivate a cohesive and motivated workforce, organizations needed to actively promote fairness in outcomes, processes, interactions, and communication, thereby strengthening employees' psychological ownership and engagement.

The critical role of organizational justice in shaping managerial employees' sense of belonging was evident. Each justice dimension—distributive, procedural, interactional, and informational—demonstrated a significant and positive correlation with employees' feelings of competence, engagement, motivation, and inclusion. The strongest associations were found in distributive and informational justice, underscoring the importance of fairness in both outcomes and communication. These findings suggested that fostering justice at all organizational levels could have served as a strategic pathway to strengthen employees' psychological connection to the organization and enhance overall workforce engagement and cohesion (Choi et al., 2020).

Table 7

Relationship Between Cultural Organizational Change and Sense of Belonging

Variables	rho	p-value	Interpretation
Cultural Innovation			
Competencies	.650**	<.001	Highly Significant
Opportunities	.671**	<.001	Highly Significant
Motivations	.631**	<.001	Highly Significant
Perceptions	.609**	<.001	Highly Significant
Cultural Consistency			
Competencies	.741**	<.001	Highly Significant
Opportunities	.662**	<.001	Highly Significant
Motivations	.653**	<.001	Highly Significant
Perceptions	.622**	<.001	Highly Significant
Cultural Adaptability			
Competencies	.895**	<.001	Highly Significant
Opportunities	.805**	<.001	Highly Significant
Motivations	.791**	<.001	Highly Significant
Perceptions	.730**	<.001	Highly Significant

Legend: Significant at $p\text{-value}<0.01$

Table 7 outlined the relationship between cultural organizational change—measured by three core dimensions: cultural innovation, cultural consistency, and cultural adaptability—and four facets of employee sense of belonging: competencies, opportunities, motivations, and perceptions. All correlation coefficients were statistically highly significant ($p<.001$). The strongest correlation was observed between cultural adaptability and competencies ($\rho=.895$), followed by adaptability's correlations with opportunities ($\rho=.805$) and motivations ($\rho=.791$). These results indicated that employees' sense of belonging was highly influenced by their perception of how culture evolved, adapted, and remained consistent within the organization, and suggested highly significant relationships between cultural change and belongingness indicators among management employees. These findings supported the strategic value of embedding cultural transformation within broader organizational

development efforts, particularly in knowledge-intensive and innovation-driven industries (Ha, 2023).

Responsive and value-driven organizational culture was essential for nurturing a deep sense of belonging among employees. As enterprises continued to pursue agile transformation and innovation breakthroughs, cultural change became an important way for employees to establish identity, promote inclusiveness, and unite common goals. Research data strongly confirmed that cultural transformation was not only a structural change, but also a profound change involving human nature and psychology. The data showed that in all dimensions of sense of belonging, ability training showed the strongest correlation ($\rho=.895$). This meant that when the enterprise maintained flexibility, adapted to the changes of the times, and allowed employees to participate in normative innovation, employees felt stronger competence and a sense of achievement in their positions.

According to Choi et. al.,(2020), adaptive culture created a dynamic learning environment, allowing employees to achieve personal growth and adapt to organizational changes, thereby enhancing self-efficacy and loyalty. Coherence and stability of the values and behavioral norms reflected in this culture were significantly correlated with employee abilities ($\rho=.741$) and work motivation ($\rho=.653$). A continuously developing corporate culture provided employees with a sense of psychological security and clear role positioning, which was crucial for establishing trust relationships and stimulating deep participation. Kwahk et. al.,(2020) found that consistent cultural values—especially during organizational change—served as a sense-making mechanism that helped employees internalize their purpose and connect more deeply with the organization.

Cultural innovation, defined as the organization’s capacity to promote novel ideas and challenge traditional norms, showed moderate to strong correlations with all belonging dimensions, especially opportunities ($\rho=.671$) and motivations ($\rho=.631$). This indicated that when employees perceived the organization as innovative and forward-looking, they were more likely to perceive greater development opportunities and intrinsic alignment with the company’s direction. According to Wang et. al.(2020), innovative environments often empowered employees to take initiative, experiment, and co-create, which deepened their identification with the organization. Failure to align cultural change efforts with employee psychological needs could have backfired. If cultural innovation lacked follow-through or if adaptability led to perceived instability, employees might have felt alienated or uncertain about their role. Inconsistencies between stated and practiced values, or poorly communicated transformations, could have eroded trust and reduced emotional commitment, especially among long-tenured staff (Ling et al., 2024). The results confirmed that cultural organizational change significantly shaped employees’ sense of belonging, particularly through adaptability, innovation, and value consistency. When cultural transitions were managed in a participatory, stable, and forward-thinking manner, employees were more likely to feel competent, valued, and emotionally connected to the organization. To build a resilient, committed workforce, leaders needed not only to initiate cultural change but also to ensure it reinforced psychological inclusion and personal meaning for every member of the organization.

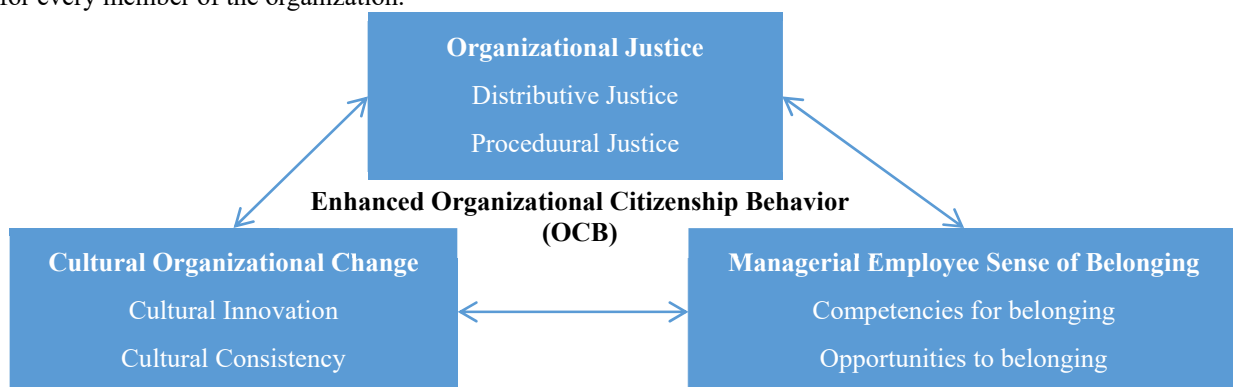


Fig 1. The theoretical framework structure and model of enhanced organizational citizenship behavior (OCB)

Organizational justice, as a leading variable, significantly influenced employees’ sense of belonging by

enhancing their cognitive and emotional engagement with the organization. Employees' sense of belonging acted as a cognitive-emotional mediator between organizational systems and cultural identity, forming the psychological foundation for organizational citizenship behavior (OCB). A high level of sense of belonging further drove the endogenous motivation for cultural organizational change, motivating employees to actively support and drive reforms. These three factors collectively influenced employees' organizational citizenship behaviors (OCB), including initiative, loyalty, responsibility, and teamwork spirit.

Based on the analysis of data results and theoretical synthesis, this study proposed an "Enhanced Organizational Citizenship Behavior (OCB) Framework" that established a causal chain model to promote employees' positive behavioral performance through three dimensions: organizational systems (organizational justice), employee psychology (sense of belonging), and organizational culture (cultural organizational change).

The four dimensions of organizational justice were found to have a significant positive correlation with employees' sense of belonging, particularly the relationship between interactional justice and the "ability" dimension of employee sense of belonging. This indicated that whether managers acted fairly, respectfully, and communicated promptly in daily operations significantly impacted employees' self-identity and sense of value. As a mediating variable, sense of belonging not only served as the psychological outcome of employees' cognitive evaluations but also acted as the starting point influencing their support or resistance to cultural change. Data showed that employees with high sense of belonging demonstrated stronger willingness and actions to participate positively when facing corporate culture innovation or system adaptation.

Cultural organizational change, as a responsive variable, was driven by both organizational systems and employee identity while also providing an environment conducive to OCB behaviors. For instance, in organizations with strong cultural alignment, employees were more willing to voice opinions and participate in collective goals, effectively promoting OCB behaviors such as voluntary assistance, constructive suggestions, and additional responsibility-taking.

This research offered valuable insights for organizational leaders, particularly those in dynamic, high-tech industries. It highlighted the importance of cultivating a fair, respectful, and inclusive work environment as a means of enabling cultural change and strengthening employee engagement. Furthermore, the study contributed to the development of a culturally responsive and empirically grounded OCB model suited for China's rapidly evolving commercial space and tech landscape. Most importantly, this study provided enterprises with an OCB management framework grounded in organizational justice, cultural transformation, and a sense of belonging. It not only strengthened theoretical foundations for management practices but also proposed actionable improvement strategies. Particularly for technology-driven companies undergoing rapid technological changes, establishing a human-centered management mechanism centered on employee psychology and organizational culture represented a critical direction to enhance competitiveness and organizational cohesion.

4. Conclusions and recommendations

Respondents generally agreed on the presence of all four dimensions of organizational justice - distributive, procedural, interactional, and informational justice. The managerial employees generally sensed a moderate level of belonging within the organization in terms of all four dimensions—competencies, opportunities, motivations, and perceptions—which received agreement from the respondents. The respondents moderately agreed on cultural organizational change across its three core dimensions—cultural innovation, consistency, and adaptability. There was a highly significant correlation between organizational justice and cultural organizational change, organizational justice and sense of belonging, and cultural organizational change and sense of belonging. An enhanced Organizational Citizenship Behavior Framework for the Commercial Aerospace Company was proposed.

Corporate leaders and senior managers may prioritize strengthening organizational justice practices, particularly in interactive justice and informational justice. It is recommended that technology-driven enterprises emphasize both cultural consistency and adaptability when advancing cultural organizational transformation.

Companies may foster an internal environment that supports innovation, tolerates failures, and encourages experimentation to stimulate employees' performance in cultural innovation dimensions, thereby enhancing organizational adaptability. Management may strengthen mechanisms for cultivating "sense of belonging capabilities" within organizations to enhance embeddedness and sense of responsibility among managerial staff. Enterprises may strengthen the development of organizational justice mechanisms to enhance employees' perception of fairness. Future research may expand to other high-tech-intensive industries, different regions, or organizational levels to further validate the broad applicability of this study's findings and explore differences in organizational culture and justice mechanisms across industries.

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Organizational design, decision making mechanism, and talent and culture: Basis for optimized governance framework

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Abstract

This study investigates the interrelationship among organizational design, decision-making mechanisms, and talent and culture practices as the basis for constructing an optimized governance framework for private colleges in Chongqing, China. The study responds to increasing governance challenges faced by private higher education institutions, including structural inefficiencies, low decision transparency, and unstable talent systems. Focusing on five representative private colleges in Chongqing—Pass College of Chongqing Technology and Business University, Chongqing College of Humanities, Science and Technology, Chongqing Finance and Economics College, Chongqing College of Mobile Communication, and Chongqing College of International Business and Economics—the study targets administrative personnel as key informants. A total of 400 valid responses were collected through a structured survey instrument designed to assess perceptions of organizational design (formalization, specialization, centralization), decision-making mechanisms (modes, procedures, efficiency), and talent and culture practices (performance management, leadership development, business principles). The research employed descriptive statistics and correlational analysis to examine the relationships between the three core variables. Findings revealed significant positive correlations among all variables, particularly between organizational design and decision-making mechanisms, and between decision-making and talent and culture practices. Centralization and decision-making modes emerged as the most influential factors. Based on the empirical results, the study proposed a governance framework that emphasizes structural clarity, participatory decision-making, and people-oriented culture strategies. The framework is intended to enhance administrative performance, institutional adaptability, and long-term development in private higher education. This research contributes both to the theoretical discourse on governance in education and to practical applications for improving internal systems in Chinese private colleges.

Keywords: organizational design, decision-making mechanism, talent and culture, governance framework, private colleges, higher education, Chongqing

Organizational design, decision making mechanism, and talent and culture: Basis for optimized governance framework

1. Introduction

In recent decades, the global landscape of higher education has undergone profound transformation, marked by marketization, massification, and diversification. Against this backdrop, governance in higher education institutions has emerged as a critical area of concern. Governance refers not only to the formal structure of authority and responsibility within institutions, but also to the dynamic mechanisms through which decisions are made, resources are allocated, and human capital is developed. For private higher education institutions—particularly in developing regions such as western China—effective governance is both a prerequisite for institutional sustainability and a strategic tool for differentiation in an increasingly competitive educational environment.

In China, the rise of private colleges has been a significant response to the surging demand for higher education following economic reform and the expansion of the middle class. These institutions have filled crucial gaps by offering accessible, flexible, and often vocationally oriented education. However, their development has also exposed a range of structural and managerial problems. Many private colleges operate under hybrid models that blend educational missions with corporate governance logic, resulting in tensions between academic values and market imperatives. Without stable funding from the state, private colleges rely heavily on tuition and cost control, which places pressure on internal management systems to remain efficient, agile, and aligned with strategic goals.

Nowhere are these challenges more visible than in cities such as Chongqing, a major urban center in western China where private colleges have proliferated rapidly but continue to face persistent governance bottlenecks. These include unclear organizational hierarchies, weak accountability mechanisms, limited administrative professionalism, and a lack of coherent talent development strategies. Unlike their public counterparts, which often enjoy institutional legacy and state protection, private colleges must self-regulate, self-finance, and self-improve within an evolving policy environment. As such, a well-functioning internal governance framework is not a luxury, but a necessity.

Within this context, three key elements are widely recognized in the literature as foundational to effective institutional governance: organizational design, decision-making mechanism, and talent and culture practices. Organizational design determines how authority, roles, and responsibilities are distributed; it directly shapes the flow of information, efficiency of operations, and clarity of institutional purpose. A poorly designed organizational structure can lead to inefficiency, duplication of roles, and decision paralysis. Decision-making mechanisms, meanwhile, relate to how choices are initiated, deliberated, and enacted across institutional levels. These mechanisms include both formal procedures and informal norms. In institutions where decisions are overly centralized or opaque, the lack of inclusiveness and responsiveness can erode staff engagement and institutional adaptability. Conversely, participatory and transparent decision-making contributes to a stronger sense of ownership and alignment with strategic objectives.

Equally important are talent and culture practices, which reflect how institutions attract, retain, motivate, and develop their human resources, while also shaping institutional identity and collective behavior. In private colleges, where staff turnover may be high and professional development opportunities limited, the cultivation of a coherent organizational culture and effective talent management is essential to institutional resilience. Despite increasing awareness of the importance of governance in private higher education, existing research remains fragmented. Many studies focus on isolated aspects, such as leadership styles or performance evaluation systems, without addressing how structural design, decision logic, and human capital systems are interrelated. Moreover, most empirical research in China concentrates on public universities, with limited attention paid to private colleges—

especially from the perspective of administrative staff who are central to governance operations but often excluded from research and decision-making discourses. There is a pressing need to revisit the governance challenges facing Chinese private colleges, not as isolated technical issues but as manifestations of deeper systemic misalignments. Only by understanding how organizational structure, decision-making dynamics, and talent strategies interact can we move toward more integrated, adaptive, and sustainable governance models that reflect both institutional realities and developmental aspirations.

Objectives of the Study - This study aims to describe the organizational design, decision-making mechanism, and talent and culture in private undergraduate university in Chongqing, China. Specifically it aims to assess the organizational design in terms of formalization, specialization, and centralization; assess the decision-making mechanism in terms of decision-making modes, procedures, and efficiency; determine the talent and culture practices in terms of performance management and incentives, business and operating principles, and leadership and development; test the significant relationship among organizational design, decision-making mechanism, and talent and culture, and develop an optimized governance framework.

2. Methods

Research Design - The researcher used descriptive correlation methods to analyze the relationships among organizational design, decision-making mechanism, and talent and culture practices. Descriptive research methods are a simple and effective research tool used to describe and explain phenomena, patterns, and theories in order to understand the relationships between variables. In this study, the researcher collected a large amount of data through questionnaire surveys, including measures of organizational design, assessments of the decision-making mechanism, and indicators of talent and culture. The purpose was to explore whether there are statistically significant correlations among these three core variables and to propose a governance framework that can enhance the administrative effectiveness and institutional sustainability of private colleges in Chongqing, China.

Participants of the Study - Administrative employees (non-teaching staff) from 5 colleges & universities in Chongqing, China such as Chongqing College of Humanities and Science; Pais College of Chongqing Technology and Business University; Chongqing Technology and Business University; Chongqing University of Finance and Economics; Chongqing Yitong College. Quota sampling method will be used and 80 administrative employees per college will be required to have a total of 400 valid responses.

Instruments of the Study - In this study, modified questionnaire was used as the main data collection tool to evaluate the organizational design, decision-making mechanism, talent and cultural practices of undergraduate universities in Chongqing, and ultimately to construct an optimized governance framework. The questionnaire was developed around the five specific objectives of the study, specifically designed as follows:

Main Variables	Sub Variables	Evaluation indicators
Organizational Design	Formalization	The degree of specification of the rules and processes in an organization
	Specialization	Division of work tasks and the degree of expertise
	Centralization	The concentration of decision-making power
Decision-Making Mechanism	Decision-Making Modes	Such as collaborative decision, authorization decision and so on
	Decision-Making Procedures	Transparency and logic of the decision-making process
	Decision-Making Efficiency	Speed and effectiveness of decision-making
Talent and Culture	Performance Management and Incentives	The rationality of performance appraisal and incentive mechanism
	Business and Operating Principles	The influence of organizational culture on business operations
	Leadership and Development	Leadership development and employee development opportunities

In addition, in order to smoothly carry out the variable relationship test, the interactive problem is designed for the relationship between organizational design, decision-making mechanism, talent and culture. The questionnaire design is based on literature review and existing research results, with the following classical tools

and theories: Organization design: tissue structure theory based on Mintzberg. Decision-making mechanism: Using Simon's theory of decision process. Talent and culture: refer to the Denison organizational culture model. Questionnaire was designed independently by the researcher according to the study objectives and adjusted locally according to the study background.

Table 1*Reliability Results*

Variables	No. of Items	α value	Interpretation
Organizational Design			
Formalization	5	0.931	Excellent
Specialization	5	0.776	Acceptable
Centralization	5	0.736	Acceptable
Overall	15	0.828	Good
Decision Making Mechanism			
Decision-Making Modes	5	0.925	Excellent
Decision-Making Procedures	5	0.983	Excellent
Decision-Making Efficiency	5	0.704	Acceptable
Overall	15	0.870	Good
Talent and Culture			
Performance Management and Incentives	5	0.950	Excellent
Business and Operating Principles	5	0.942	Excellent
Leadership and Development	5	0.757	Acceptable
Overall	15	0.884	Good

Legend > 0.9 =Excellent; >0.8=Good;>0.7=Acceptable;>0.6=Questionable;>0.5=Poor;<0.5=Unacceptable

The reliability results indicate a strong internal consistency across different constructs as measured using Cronbach's alpha (α). Within Organizational Design, *Formalization* demonstrated excellent reliability ($\alpha=0.931$), while *Specialization* ($\alpha=0.776$) and *Centralization* ($\alpha=0.736$) were found to be acceptable. The overall reliability for this category was good ($\alpha=0.828$). For Decision-Making Mechanism, *Decision-Making Modes* ($\alpha=0.925$) and *Decision-Making Procedures* ($\alpha=0.983$) showed excellent reliability, whereas *Decision-Making Efficiency* ($\alpha=0.704$) was at an acceptable level. The overall reliability for this construct was also good ($\alpha=0.870$). In Talent and Culture, both *Performance Management and Incentives* ($\alpha=0.950$) and *Business and Operating Principles* ($\alpha=0.942$) exhibited excellent reliability, while *Leadership and Development* ($\alpha=0.757$) was acceptable. The overall reliability for this domain was good ($\alpha=0.884$). These results suggest that the questionnaire used for all three variables—Organizational Design, Decision-Making Mechanism, and Talent and Culture—are generally reliable, with sub variables falling within the acceptable to excellent range. This indicates that the items within each construct consistently measure their intended variables, making the data suitable for further analysis.

Data Gathering Procedure - In selecting variables, I conducted extensive literature research on organizational design, decision-making, talent, and culture. The review revealed limited studies in higher education, especially in undergraduate universities in Chongqing, and a lack of systematic analysis and frameworks. Thus, I focused my research on this region and proposed the topic “Optimized governance framework based on organizational design, decision-making mechanism, talent, and culture.” This not only holds academic value but also offers practical support for university governance. The study pursues five main goals: (1) describe organizational design through formalization, specialization, and centralization; (2) analyze decision-making modes, procedures, and efficiency; (3) examine talent and cultural practices, including performance management, leadership, and development; (4) test relationships among variables; and (5) construct an optimized governance framework for undergraduate institutions.

Data collection centered on a questionnaire developed through literature review, expert consultation, and pre-surveys. Respondents included managers and staff from Chongqing universities, selected through stratified sampling. Survey was distributed online and offline, and responses were screened and coded to ensure validity. Data were analyzed using both quantitative and qualitative methods. Descriptive statistics outlined the current situation, correlation and regression analysis tested relationships and causality, while interviews and case studies

addressed gaps in survey data. Based on results and theory, the study proposed an optimized governance framework. It emphasizes being systemic, covering organizational design, decision-making, talent, and culture; operable, offering clear implementation paths; and applicable, tailored to the needs of undergraduate universities in Chongqing.

Ethical Considerations - Ethical considerations will be practiced in the conduct of the research work to warrant that every information that was gathered are used for research purposes only to maintain the quality and integrity of the research. The researcher will also seek the consent of the respondents through letter and communication to make sure that the target respondents will be prepared to answer necessary questions involved in the research. It also ensured the confidentiality and anonymity of the respondents by not seeking their names as they were answering the questionnaires. The researcher will also ensure that the respondents voluntarily answer the questionnaires according to their will. Lastly, it will also ensure that none of the respondents of the study will be hurt or harmed and their safety and security is of top priority.

Data Analysis - In the study, weighted mean and rank were used to assess the organizational design in terms of formalization, specialization, and centralization; to assess the decision-making mechanism in terms of decision-making modes, procedures, and efficiency; and to determine the talent and culture practices in terms of performance management and incentives, business and operating principles, and leadership and development. The result of Shapiro-Wilk Test showed that p-values of all variables were less than 0.05 which means that the data set was not normally distributed. Therefore, Spearman rho was used as part of the non-parametric tests to determine the significant relationship. All analyses were performed using SPSS version 28.

3. Results and discussions

Table 2

Summary Table of Organizational Design

Indicators	Weighted Mean	Verbal Interpretation	Rank
Formalization	3.18	Agree	1.5
Specialization	3.18	Agree	1.5
Centralization	3.17	Agree	3
Composite Mean	3.18	Agree	

Legend: 3.50-4.00=Strongly Agree; 2.50-3.49=Agree; 1.50-2.49=Disagree; 1.00-1.49=Strongly Disagree

Table 2 presents the assessment of the respondents on Organizational Design in terms of its three sub-variables: Formalization, Specialization, and Centralization. The composite mean of 3.18 indicates that the respondents Agree in general. This implies that, in the perception of administrative staff in the selected private colleges in Chongqing, the organizational structures of their institutions reflect a moderate level of formalization, specialization, and centralization. This result suggests that these private institutions have developed standardized policies, task allocations, and centralized procedures, which may help stabilize operations and support compliance, while also balancing flexibility for individual departments. The relatively uniform perception among respondents can be attributed to the standardized administrative models adopted by private colleges under regulatory oversight from the Ministry of Education in China. Two local scenarios help explain this consistency. Most private colleges in Chongqing implement institutional regulations that require administrative staff to adhere to job descriptions and reporting protocols, especially in areas such as finance, human resources, and student services. Due to performance audits and accreditation evaluations, colleges ensure that task division and responsibilities are documented, even if some decision-making processes remain centralized at the upper administrative level. This finding aligns with Kaphle (2023), who emphasized that organizational performance in local institutions often depends on the coordination among formalization, specialization, and centralization. Similarly, Rabhi et al. (2023) indicated that integrating structural elements strategically enables more effective decision-making and operational coherence.

Formalization and Specialization both ranked first with a mean score of 3.18 and a verbal interpretation of Agree. This implies that institutions have made efforts to establish clear procedures and specialized roles, which

likely enhances administrative efficiency and reduces task ambiguity. The result is due to increased accountability demands from local education bureaus, pushing colleges to adopt formal guidelines and task-specific assignments. The need to optimize limited human resources by assigning specialized responsibilities to improve work output and responsiveness also contributes. For example, Chongqing Finance and Economics College requires each administrative officer to undergo task-specific training and utilize manuals related to their department's functions. Chongqing University of Humanities and Technology organizes periodic departmental audits, which reinforce specialization and documentation standards. This result is supported by Primorac et al. (2022), who found that specialized roles and formal structures improved internal coordination in Bosnian private companies. It is also in line with Susiawati et al. (2025), who noted that although bureaucratic reforms toward functional structures are in progress, formalized task roles remain critical to performance.

The metric with the lowest weighted average is Centralization, with a mean score of 3.17 and a verbal interpretation of Agree. This implies that, while respondents acknowledge the presence of centralized structures, they also perceive some degree of flexibility in administrative decision-making. This is because many private colleges in Chongqing, although maintaining hierarchical control over major decisions, are gradually decentralizing minor operations and allowing departmental autonomy in less critical areas. This shift reflects an adaptive response to growing institutional complexity, digital workflow integration, and demands for administrative efficiency. From the local reality, the following scenarios exist. Delegation of routine decisions: for example, student affairs like leave approvals, event coordination, and minor budget allocations are often handled directly by faculty offices or student service departments without requiring senior-level approval. Digital platform-driven decentralization: colleges increasingly rely on office automation (OA) systems that allow mid-level administrators to process workflows such as procurement or scheduling independently, thereby reducing reliance on top-down directives. According to by Dewi et al. (2025), decentralizing operational functions while maintaining strategic control at the top enhances institutional responsiveness and reduces administrative bottlenecks. Also, Jerab et al. (2023) highlight the effectiveness of hybrid structures, where decision-making power is selectively distributed to improve agility without compromising oversight.

Finally, the composite mean of all three sub-variables remains at 3.18, with a unified interpretation of Agree, indicating an overall coherent organizational design. The moderate yet consistent assessment reflects an evolving yet structured environment within Chongqing's private colleges.

Table 3

Summary Table of Decision-making Mechanism

Indicators	Weighted Mean	Verbal Interpretation	Rank
Decision-making Modes	3.18	Agree	1
Decision-making Procedures	3.14	Agree	2.5
Decision-making Efficiency	3.14	Agree	2.5
Composite Mean	3.15	Agree	

Legend: 3.50-4.00=Strongly Agree; 2.50-3.49=Agree; 1.50-2.49=Disagree; 1.00-1.49=Strongly Disagree

Table 3 presents the assessment of the respondents on Decision-Making Mechanism in terms of Decision-making Modes, Procedures, and Efficiency. The composite mean of 3.15 indicates that the respondents Agree in general. This implies that private colleges in Chongqing have implemented decision-making mechanisms that are generally systematic, participatory, and operationally responsive. This is because these institutions, though privately funded, are increasingly aware of the need to formalize internal governance and foster timely, transparent, and participative decision-making frameworks. From the local reality, the following scenarios exist. In Pass College of Chongqing Technology and Business University, administrative decisions on budget allocations are typically reviewed through inter-departmental meetings, allowing for more inclusive dialogue and reducing conflict due to lack of transparency. At Chongqing College of Humanities, Science and Technology, decision-making structures emphasize both performance data and collective input from middle-level managers to improve operational response to enrollment and staffing issues. According to Taherdoost et al. (2024), structured decision-making frameworks improve organizational outcomes by offering clarity, consistency, and timely implementation.

Supporting this, Oluoha et al. (2022) argue that organizations that leverage clear decision-making processes supported by analytics are more agile and effective in adapting to dynamic challenges.

Among the items cited, “Decision-making Modes”, ranked first with a mean score of 3.18 and verbal interpretation of Agree. This implies that the respondents generally perceive decision-making styles in their institutions to be inclusive and appropriately designed to meet organizational goals. This is because a hybrid of top-down and bottom-up decision-making patterns is gradually being adopted in Chongqing's private colleges, balancing control and flexibility. From the local reality, the following scenarios exist. At Chongqing College of International Business and Economics, major policy adjustments involve consultation meetings where department heads and administrative officers co-evaluate proposed reforms. In Chongqing College of Mobile Communication, decision-making integrates data from student feedback and academic departments, especially on course evaluations and digital innovation initiatives. According to Wang et al. (2022), participative leadership enhances employees’ engagement in institutional decision-making, leading to higher operational efficiency and morale. Supporting this, Taherdoost et al. (2024) note that a participatory decision-making model empowers organizations to handle complexity through shared perspectives and diverse input.

The metric with the lowest weighted averages are “Decision-making Procedures” and “Decision-making Efficiency”, both with a mean of 3.14.

“Decision-making Procedures” with a mean score of 3.14 and verbal interpretation of Agree. This implies that respondents generally agree that the decision-making procedures in their institutions are structured, formalized, and reasonably transparent. This is because private colleges in Chongqing, while operating in a competitive and semi-marketized education environment, have developed internal governance frameworks with layered approval processes, standardized workflows, and documented protocols to ensure accountability and reduce arbitrariness. From the local reality, the following scenarios exist. In Chongqing College of Mobile Communication, administrative decision-making—such as funding allocation or staff deployment—follows a predefined hierarchical structure involving proposal writing, department vetting, and final executive approval. This structured path minimizes ambiguity in responsibilities. At Pass College of Chongqing Technology and Business University, formal procedures are used for decisions related to new academic programs, which require cross-functional meetings, written justifications, and evidence-based feasibility reports before being approved by the senior council. According to Taherdoost et al. (2024), effective decision-making procedures include clear stages—such as problem identification, evaluation of alternatives, and implementation planning—which collectively lead to more consistent and accountable outcomes. Canco et al. (2021) point out that the Analytic Hierarchy Process (AHP) and other structured decision-making models help organizations prioritize decisions through rational, transparent criteria, enhancing process integrity and legitimacy.

“Decision-making Efficiency”, also with a mean score of 3.14 and verbal interpretation of Agree. This implies that while the institutions recognize and implement efficient mechanisms, there may be occasional procedural delays or bottlenecks in executing timely decisions. This is because efficiency in decision-making often depends on coordination across units, and private colleges with relatively lean staffing structures may face internal communication lags. From the local reality, the following scenarios exist. In Pass College of Chongqing Technology and Business University, cross-departmental budget decisions sometimes encounter delays due to approval layering and the need for inter-college validation. In Chongqing College of Humanities, Science and Technology, infrastructure projects experience procedural slowdowns because of fragmented coordination between finance and facilities management teams. According to Oluoha et al. (2022), decision-making efficiency is enhanced when organizations adopt real-time analytics and reduce unnecessary bureaucratic steps through digital platforms. There is also research that emphasizes the need to align procedural steps with practical outcomes to avoid decision fatigue and executional lags (Taherdoost et al., 2024).

Table 4*Summary Table of Talent and Culture Practices*

Indicators	Weighted Mean	Verbal Interpretation	Rank
Performance Management and Incentives	3.17	Agree	1
Business and Operating Principles	3.16	Agree	2
Leadership and Development	3.15	Agree	3
Composite Mean	3.16	Agree	

Legend: 3.50-4.00=Strongly Agree; 2.50-3.49=Agree; 1.50-2.49=Disagree; 1.00-1.49=Strongly Disagree

Table 4 presents the assessment of the respondents on Talent and Culture in terms of Performance Management and Incentives, Business and Operating Principles, and Leadership and Development. The composite mean of 3.16 indicates that the respondents Agree in general. This implies that talent and cultural mechanisms are moderately present and accepted among administrative staff in private colleges in Chongqing. This is because these colleges, though private, are increasingly adopting structured governance and standardized management models, influenced by both market competition and regulatory pressures. From the local reality, the following scenarios exist. In Chongqing private institutions like Pass College or Chongqing College of International Business and Economics, the competition for enrollment has encouraged stronger internal governance and alignment of staff incentives with institutional performance. Administrative departments are under pressure to balance high service efficiency with limited resources, making performance-linked incentive schemes more common but not uniformly implemented. According to Maley et al. (2024), performance management is central to talent strategies in dynamic environments. There is also research that emphasizes the importance of aligning organizational culture with talent retention strategies, such as Urme (2023), who argues that employees are more likely to remain with institutions that acknowledge and reward their contributions effectively.

Among the items cited, the highest weighted average indicator is “Performance Management and Incentives”, with a mean score of 3.17 and verbal interpretation of Agree. This implies that private colleges are relatively consistent in offering performance-related incentives to administrative staff. This is because performance evaluation and related rewards are now being recognized as practical tools to improve productivity and morale among non-academic staff. From the local reality, the following scenarios exist. Many colleges have adopted KPIs (Key Performance Indicators) or performance appraisal systems for administrative staff, often tied to bonus distribution. Staff perceive tangible benefits—such as promotions or additional allowances—being linked to their annual performance reviews. According to Armstrong (2022), structured performance systems are essential for boosting individual accountability. A research that confirms this by Gumilang et al. (2025), who found that reward-linked development systems can reinforce goal alignment and institutional commitment.

“Business and Operating Principles”, with a mean score of 3.16, ranked second, having a verbal interpretation of Agree, indicating that respondents generally agree with the consistency and standardization of operational principles and business processes in their respective institutions. This may be attributed to the growing adoption of enterprise-style management models by private colleges in Chongqing in recent years. By clarifying organizational rules and regulations and optimizing internal procedures, these institutions aim to enhance administrative efficiency—particularly in key areas such as admissions, finance, and human resources. Such principles help ensure operational stability in the face of fluctuating educational policies and market conditions.

The metric with the lowest weighted average is “Leadership and Development”, with a mean score of 3.15 and verbal interpretation of Agree. This implies that although leadership training and career development exist, they are not as emphasized as performance or operational principles. This is because professional development opportunities for administrative staff may lack consistency, and leadership pipelines are not always clearly structured in private institutions. From the local reality, the following scenarios exist. In colleges like Chongqing College of Humanities, Science and Technology, most training resources are focused on teaching staff, leaving administrative personnel with limited leadership development channels. Promotions for administrative staff often follow tenure-based or relationship-driven patterns, rather than structured leadership development programs. According to Barkhuizen et al. (2022), a leadership talent mindset significantly boosts retention and performance

in public institutions. There is also research that highlights similar concerns in university settings, such as Nuraini (2023), who emphasized that employee performance is suboptimal without leadership development aligned with compensation strategies.

Table 5*Relationship Between Organizational Design and Decision-making Mechanism*

Variables	rho	p-value	Interpretation
Formalization			
Decision-making Modes	.768**	<.001	Highly Significant
Decision-making Procedures	.644**	<.001	Highly Significant
Decision-making Efficiency	.712**	<.001	Highly Significant
Specialization			
Decision-making Modes	.796**	<.001	Highly Significant
Decision-making Procedures	.649**	<.001	Highly Significant
Decision-making Efficiency	.764**	<.001	Highly Significant
Centralization			
Decision-making Modes	.799**	<.001	Highly Significant
Decision-making Procedures	.659**	<.001	Highly Significant
Decision-making Efficiency	.793**	<.001	Highly Significant

Legend: Significant at $p\text{-value} < 0.01$

Table 5 presents the relationship between key dimensions of organizational design—namely formalization, specialization, and centralization—and components of the decision-making mechanism, including decision-making modes, procedures, and efficiency. The results reveal highly significant positive correlations across all variable pairs, with all p-values below 0.001. This indicates a robust and consistent association between structural design elements and the quality and effectiveness of institutional decision-making processes.

Formalization exhibits strong positive correlations with decision-making modes ($\rho=.768$), procedures ($\rho=.644$), and efficiency ($\rho=.712$). These findings suggest that a higher degree of formalization—reflected in standardized procedures, clear documentation, and codified rules—enhances the consistency and reliability of decision-making practices. When decision boundaries are predefined and processes are routinized, organizations reduce discretionary variability and promote operational predictability. Formalization improves the transparency of decisions, facilitates organizational learning, and serves as a control mechanism to align decisions with institutional goals. As argued by Evanthi et al. (2021), formal structures reduce ambiguity and foster procedural discipline, while MacDonald et al. (2022) highlight the role of formal decision pathways in increasing accountability and stakeholder trust in multi-actor environments.

Specialization shows even stronger positive relationships with decision-making modes ($\rho=.796$), procedures ($\rho=.649$), and efficiency ($\rho=.764$). This underscores the critical role of differentiated roles and expertise in improving the quality and timeliness of decisions. Specialization allows for the distribution of decision authority to those with domain-specific knowledge, thereby improving the accuracy, speed, and relevance of decision outputs. It also minimizes redundancy and task overlap, contributing to better workflow integration and reduced decision delays. These outcomes are consistent with the insights of Joseph et al. (2025), who assert that functional specialization enhances both vertical and lateral coordination within organizations. Shang et al. (2024) emphasize that clearly delineated roles enable more responsive and strategically aligned decisions, particularly in complex institutional settings.

Centralization demonstrates the strongest correlations overall, with decision-making modes ($\rho=.799$), efficiency ($\rho=.793$), and procedures ($\rho=.659$) all showing highly significant and substantial associations. This implies that centralized authority structures contribute decisively to decision alignment, coherence, and control. Centralization concentrates decision rights at higher levels of the hierarchy, which, while potentially limiting responsiveness, can reduce interdepartmental conflict, eliminate decision duplication, and reinforce institutional strategy. Especially in environments where consistency and compliance are prioritized, centralized systems help ensure that decisions reflect overarching organizational values and risk preferences. Eriksson et al. (2025) note,

centralized decision-making improves strategic integration and reduces internal fragmentation. Settembre-Blundo et al. (2021) highlight its role in reinforcing resilience and continuity in contexts of institutional uncertainty.

In sum, the results confirm that organizational design exerts a profound influence on the configuration and effectiveness of decision-making mechanisms. All three structural dimensions contribute positively and significantly, but their relative impacts vary. While formalization strengthens rule-based and procedural alignment, specialization enhances technical and functional precision, and centralization maximizes strategic control and consistency. These findings reinforce the argument that robust organizational frameworks are a prerequisite for high-quality governance, especially in institutional contexts that demand both efficiency and accountability in decision-making.

Table 6

Relationship Between Organizational Design and Talent and Culture Practices

Variables	rho	p-value	Interpretation
Formalization			
Performance Management and Incentives	.684**	<.001	Highly Significant
Business and Operating Principles	.676**	<.001	Highly Significant
Leadership and Development	.663**	<.001	Highly Significant
Specialization			
Performance Management and Incentives	.745**	<.001	Highly Significant
Business and Operating Principles	.740**	<.001	Highly Significant
Leadership and Development	.692**	<.001	Highly Significant
Centralization			
Performance Management and Incentives	.780**	<.001	Highly Significant
Business and Operating Principles	.810**	<.001	Highly Significant
Leadership and Development	.748**	<.001	Highly Significant

Legend: Significant at p-value<0.01

Table 6 presents the relationship between three dimensions of organizational design—formalization, specialization, and centralization—and the components of talent and culture practices, including performance management and incentives, business and operating principles, and leadership and development. All relationships are statistically highly significant, demonstrating that structural characteristics of an organization exert a substantial influence on how talent and cultural practices are conceived, implemented, and sustained.

The correlation between formalization and all three aspects of talent and culture is strong and positive: performance management and incentives ($\rho=.684$), business and operating principles ($\rho=.676$), and leadership and development ($\rho=.663$). These results indicate that organizations with well-defined rules, procedures, and standardized workflows tend to have more consistent and coherent talent management practices. Formalization serves as a mechanism to institutionalize cultural values and expectations, reduce ambiguity in employee roles, and promote fair and objective performance assessment. From a theoretical standpoint, formalization supports the internal alignment of human resource practices by anchoring them in predictable frameworks. Saleh et al. (2021) emphasized that sustainable talent practices depend heavily on a stable organizational culture, which in turn is fostered by clear and codified structures. Setyawan et al. (2021) argue that formalization enhances knowledge sharing and supports the integration of human resource systems with strategic culture initiatives. Therefore, when procedures are formalized, talent-related programs are more likely to be implemented uniformly across departments and levels, enhancing transparency and organizational equity.

Specialization demonstrates even stronger correlations with talent and culture dimensions: performance management and incentives ($\rho=.745$), business and operating principles ($\rho=.740$), and leadership and development ($\rho=.692$). These findings suggest that a clear division of labor and role-specific responsibilities contribute to the effectiveness of talent initiatives, particularly in aligning individual competencies with organizational goals. Specialized structures allow employees to be evaluated and developed within their areas of expertise, ensuring that training, motivation, and rewards are contextually relevant and practically impactful. Scholars have widely recognized the benefits of specialization in talent systems. For instance, Jooss et al. (2024) argue that role clarity

and task specialization are fundamental for building strategic agility in talent deployment. Rožman et al. (2023) further note that aligning job design with employee strengths fosters engagement, accountability, and innovation. In this sense, specialization does not merely enhance operational efficiency—it also enables talent practices to be more personalized, measurable, and development-oriented, reinforcing the cultural infrastructure of the organization.

Among all three organizational design variables, centralization exhibits the strongest correlations: business and operating principles ($\rho=.810$), performance management and incentives ($\rho=.780$), and leadership and development ($\rho=.748$). These results highlight the critical role of centralized control in shaping and maintaining cohesive talent strategies and a unified organizational culture. When decision-making authority is concentrated at higher hierarchical levels, it allows for tighter control over policy enforcement, goal alignment, and the uniform application of cultural norms across the organization. Centralization, in this context, functions as a strategic enabler of cultural consistency and performance direction. Faugoo (2024) emphasizes that centralized talent management frameworks are crucial in organizations aiming for global competitiveness and internal cohesion. Bermeo et al. (2023) stress that an inclusive and strategically directed organizational culture can be more effectively developed when top leadership sets the tone and direction for talent practices. This top-down coherence fosters not only cultural uniformity but also supports the institutionalization of leadership development pathways aligned with organizational vision.

Overall, the results strongly suggest that organizational design plays a foundational role in enabling and shaping talent and culture practices. Formalization provides the structure for consistency and rule-based fairness, specialization ensures that practices are technically relevant and targeted, while centralization strengthens top-level alignment and strategic coherence. The statistically significant correlations across all dimensions support the view that without a deliberate and strategically crafted organizational design, talent and culture systems are unlikely to achieve sustainable impact. These findings are consistent with broader literature that emphasizes the interdependence between structure and culture in organizational development. As noted by Lazarević-Moravčević et al. (2023), both organizational structure and culture act as joint levers for driving innovation, cohesion, and performance. In designing governance frameworks for educational institutions, special attention must be given to the structural foundations that support and enhance talent cultivation and cultural resilience.

Table 7

Relationship Between Decision-making Mechanism and Talent and Culture Practices

Variables	rho	p-value	Interpretation
Decision-making Modes			
Performance Management and Incentives	.801**	<.001	Highly Significant
Business and Operating Principles	.781**	<.001	Highly Significant
Leadership and Development	.741**	<.001	Highly Significant
Decision-making Procedures			
Performance Management and Incentives	.756**	<.001	Highly Significant
Business and Operating Principles	.731**	<.001	Highly Significant
Leadership and Development	.711**	<.001	Highly Significant
Decision-making Efficiency			
Performance Management and Incentives	.782**	<.001	Highly Significant
Business and Operating Principles	.781**	<.001	Highly Significant
Leadership and Development	.716**	<.001	Highly Significant

Legend: Significant at p-value<0.01

Table 7 presents the relationship between decision-making mechanisms—comprising decision-making modes, procedures, and efficiency—and talent and culture practices, including performance management and incentives, business and operating principles, and leadership and development. All relationships are statistically highly significant at $p < 0.001$, indicating strong and reliable associations across variables.

Among the three dimensions of decision-making, decision-making modes exhibit the strongest correlations: performance management and incentives ($\rho=.801$), business and operating principles ($\rho=.781$), and leadership and

development ($\rho=.741$). These findings highlight the importance of how decisions are approached—whether participatory, top-down, or consensus-driven—in shaping and sustaining talent-related strategies and cultural norms. Inclusive or consultative decision-making fosters a sense of ownership among employees, which enhances their commitment to performance goals and organizational values. Decision modes that encourage dialogue and shared accountability contribute to a more adaptable and responsive talent management system. As Cai et al. (2023) observe, in dynamic organizational settings, talent strategies are most effective when embedded in participatory decision contexts. Patra et al. (2024) emphasize that decision models that align with the principles of learning organizations promote continuous talent development and innovation-friendly cultures. In sum, the decision-making style is not merely a governance issue but a strategic factor in how effectively an organization can engage, motivate, and retain talent.

Decision-making procedures are also positively and significantly correlated with all talent and culture variables: performance management and incentives ($\rho=.756$), business and operating principles ($\rho=.731$), and leadership and development ($\rho=.711$). This suggests that structured, formalized, and transparent decision making processes support the institutionalization and consistency of human resource and cultural practices. Organizations that establish clear procedures for planning, feedback, resource allocation, and evaluation are more likely to implement fair and coherent talent policies. Procedural clarity minimizes confusion and subjective interpretation, ensuring alignment across departments and levels. According to Sehatpour et al. (2022), procedural rationality is critical to overcoming implementation gaps in talent systems, especially in large or bureaucratic organizations. Ramachandran et al. (2023) note that robust decision procedures—potentially enabled by digital tools or frameworks—help eliminate bias, increase traceability, and support evidence-based HR decision-making. Therefore, decision-making procedures act as enablers of trust and legitimacy in both performance systems and cultural frameworks.

Decision-making efficiency also shows strong and significant correlations with performance management and incentives ($\rho=.782$), business and operating principles ($\rho=.781$), and leadership and development ($\rho=.716$). These results suggest that speed, responsiveness, and decisiveness in decision-making processes play a crucial role in maintaining an agile, aligned, and performance-driven organizational culture. Timely decisions are essential for addressing evolving talent needs, responding to employee feedback, and implementing developmental initiatives. Delays or inefficiencies in decision-making can demotivate staff, slow down performance appraisal cycles, and create disconnection between institutional values and everyday operations. As Pandita (2022) argues, responsiveness in organizational processes enhances employer branding and talent satisfaction, particularly for new-generation employees who value adaptability and clarity. Furthermore, Kwon et al. (2022) emphasize that high-performing organizations exhibit a dynamic decision rhythm that supports the timely execution of HR and cultural strategies.

In summary, the results affirm that decision-making mechanisms are integral to the success of talent and cultural practices. Decision-making modes influence the inclusiveness and alignment of people strategies; procedures ensure consistency and procedural justice; and efficiency guarantees responsiveness and agility. Collectively, these mechanisms create the governance infrastructure necessary for talent systems to thrive. These findings reinforce the view that talent management is not isolated from institutional governance—but embedded within it. As highlighted in the literature, strategic talent outcomes are best achieved in organizations where decision-making structures are not only clearly defined, but also agile, transparent, and inclusive. Therefore, optimizing the decision-making framework is a prerequisite for cultivating high-performance cultures and sustainable human capital systems.

Based on the analysis of data collected from 400 administrative personnel across five private colleges in Chongqing, the study revealed significant insights into the relationship between organizational design, decision-making mechanisms, and talent and culture practices.

The findings indicate that the respondents generally agreed that their institutions exhibit a moderate to high

level of formalization, specialization, and centralization. Among these, centralization yielded the highest composite means and strongest correlation values with the other variables, highlighting that clear hierarchical authority and concentrated decision power contribute to institutional order and strategic alignment. Formalization was also positively assessed, reflecting the importance of standardized rules and processes in administrative work. Results from the survey further showed that decision-making modes, particularly those that are participatory and consultative, were positively correlated with both performance outcomes and leadership development. Decision-making efficiency was another strong area, suggesting that respondents perceive decision implementation as timely and responsive to operational needs. Overall, the data confirm that structured and transparent decision processes support governance effectiveness in private educational institutions. The assessment of talent and culture practices shows general agreement among the respondents, with relatively high mean scores in areas such as performance management and incentives, business and operating principles, and leadership development. The strongest associations were found between decision-making modes and performance management, suggesting that inclusive and fair decision environments contribute to better staff engagement, retention, and productivity.

There is a strong and significant correlation between organizational design (especially centralization) and the structure of decision-making mechanisms. Decision-making mechanisms are closely linked to the effectiveness of talent and culture practices. The three dimensions—organizational design, decision-making, and talent systems—mutually reinforce one another, implying that an optimized governance framework should integrate structure, process, and people-centered strategies. These results are consistent with the objectives of the study and support the conceptual framework that emphasizes the interdependence between institutional structure and the quality of human capital management.

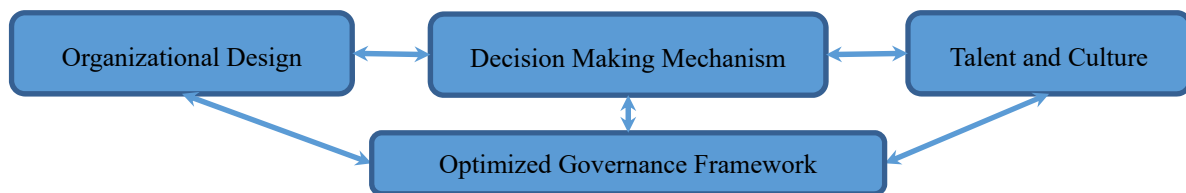


Figure 1. Proposed Framework for Optimized Governance

4. Conclusions and recommendations

The respondents moderately agreed on the organizational design in terms of formalization, specialization and centralization. The respondents moderately agreed on the decision-making mechanism in terms of decision-making modes, procedures and efficiency. The respondents moderately agreed on the talent and culture practices in terms of performance management and incentives, business and operating principles, and leadership and development; There is highly significant relationships among organizational design, decision making mechanism, and talent and culture practices. An optimized governance framework was developed that can be used by universities and colleges in China.

Private colleges may strengthen centralized governance structures to improve strategic alignment and ensure consistency in talent-related decisions and institutional values. Administrative processes may be further formalized, including clear guidelines for performance management, policy implementation, and leadership training programs, to support institutional standardization. Specialization may be enhanced in administrative departments, ensuring that roles and responsibilities are clearly defined and that personnel with relevant expertise are empowered to lead talent initiatives. A holistic governance framework may be adopted for long-term institutional sustainability and effectiveness. Future studies may compare multiple universities (e.g., public vs. private, local vs. international) to determine how governance practices differ by institutional type or location, thereby enriching the findings and enhancing the generalizability of the framework.

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The effect of TeleCARE nursing on cardiac patients' adherence to discharge instructions and clinical outcomes: A randomized controlled trial

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Abstract

Continuity of care is essential to delivering high-quality healthcare, particularly during transitions such as hospital discharge. This study examined the impact of a telehealth intervention—Telephone-Call Assisted Reiteration of Client Education (TeleCARE)—on cardiac patients' adherence to discharge instructions and key clinical outcomes, including readmission and mortality rates. TeleCARE leverages communication technology to support patients and families in the critical transition from hospital to home. The study was a randomized controlled trial in which consenting participants were assigned to either a control group or an intervention group. Both groups received standard discharge instructions. The intervention group additionally received the TeleCARE protocol, involving two follow-up calls: one within 24 to 72 hours post-discharge to reinforce instructions and schedule check-ups, and another at 30 days to assess compliance and outcomes. The control group received a single follow-up call at 30 days to evaluate adherence to standard discharge instructions. This study demonstrated that the TeleCARE program improved medication adherence and follow-up attendance while achieving high patient satisfaction. The program was accessible and beneficial across diverse demographic and clinical groups, though economic status influenced participation, indicating a need for targeted support. These results align with recent research supporting telehealth's role in managing chronic diseases. TeleCARE enhances the continuity, quality, and safety of postoperative care by supporting medication adherence, reducing readmission rates, and improving overall patient outcomes.

Keywords: TeleCARE, telenursing, cardiovascular patients, patient care, patient outcomes, specialty hospital

The effect of TeleCARE nursing on cardiac patients' adherence to discharge instructions and clinical outcomes: A randomized controlled trial

1. Introduction

The transition from hospital to home is a critical phase in the continuum of care, particularly for patients with cardiovascular conditions. After discharge, these patients face a high risk of complications, including medication non-compliance, poor lifestyle adherence, and avoidable readmissions. Several studies among discharged patients reported the occurrence of at least 1 adverse event in 5 patients (Forster et al., 2023; Forster et al., 2024). Moreover, approximately 20% of readmissions are recorded among discharged adult patients. Similarly, readmission within 30 days is noted among geriatric patients, which may be considered scheduled, expected repercussions of disease and treatment management, or may be due to missed nursing care or mishaps on diagnosis and treatment. Regardless of the reasons for hospital readmission, most cases are attributed to consequences of transitions in patient care (Jencks et al., 2021; Epstein et al., 2022). During vulnerable period, the success of recovery heavily depends on the patient's understanding of discharge instructions and their ability to follow through with prescribed treatment regimens. However, various factors such as information overload at discharge, limited caregiver support, and gaps in communication often hinder optimal self-care.

The time after discharge from the hospital presents crucial health issues for patients as well as for primary care providers. In response to these issues, TeleCARE (Telephone Call-Assisted Reinforcement of Client Education) has emerged as a promising strategy to enhance post-discharge care. Transitions in patient care within the hospital setting entail consideration of the patient's history of previous admissions and provisions of care in the emergency department or visits in the outpatient department (Naylor et al., 2021). By providing structured follow-up via phone calls, TeleCARE reinforces key health education, supports medication adherence, and offers a direct line of communication for clarifications and early identification of complications. This approach is particularly valuable in a cardiovascular hospital setting, where patients are often discharged with complex regimens and lifestyle modifications critical to preventing further cardiac events. Healthcare interventions provided to inpatients or outpatients in the hospital involve varied patient management, which may be equated with preventable adverse events upon discharge. These unwanted consequences after hospital discharge may be reduced through enhanced discharge instructions, improved health teaching and home follow-up communication via phone calls (Naylor et al. 2021; Coleman et al., 2023; Jack et al., 2022).

Postdischarge telephone calls by a trained hospital-based provider allows direct contact with the patient or care provider in less time and at a lower cost to the hospital than a home visit. These calls identify and resolve postdischarge issues such as problems in understanding discharge instructions, problems obtaining outpatient appointments, issues relating to medication management and new or worsening symptoms (Dudas et al., 2021; Koehler et al., 2024; Rennke et al., 2021). Research studies on telecare and telehealth among discharged cardiac patients are primarily anchored on telephone-based health monitoring (Mistiaen & Poot, 2023; Riegel et al., 2022).

Cardiovascular patients, including those who have undergone procedures such as coronary artery bypass grafting (CABG), angioplasty, or valve replacement, require meticulous post-operative management. Studies have shown that structured telehealth interventions can significantly improve patient outcomes by reducing hospital readmissions, increasing follow-up compliance, and enhancing overall satisfaction with care. Recognizing the need for improved continuity of care, The Philippine Heart Center integrated TeleCARE as part of their post-discharge protocol. This initiative aims to bridge the care gap between discharge and the patient's first follow-up visit through timely, personalized, and evidence-based telephonic support.

This study explores the implementation and impact of the TeleCARE program in a cardiovascular specialty hospital. It seeks to assess its effectiveness in improving patient compliance, reducing readmission rates, and

enhancing patient satisfaction—ultimately contributing to better health outcomes and a more efficient healthcare delivery model.

Background of the Study - Health systems continuously strive to enhance the quality and value of care by improving both patient experiences and clinical outcomes. One critical avenue for achieving this is by strengthening the transition of care from hospital discharge to home. This transition process involves several key components, including discharge health education, medication reconciliation, and scheduling follow-up appointments. Identifying and addressing patients' needs during this period can lead to better health outcomes and reduce the risk of hospital readmission. However, the discharge process is often challenged by confusion, care gaps, inadequate resources, and poor communication between healthcare providers and patients. These issues can significantly impact a patient's ability to manage their care at home effectively. Continuity of care is widely recognized as a fundamental aspect of high-quality healthcare. Numerous studies have shown that it can lead to reduced hospital readmissions, less duplication of diagnostic tests, higher patient satisfaction, and improved adherence to treatment plans. Despite this, patients' experiences during care transitions vary, and many factors such as understanding of instructions, perceived importance of care directives, and support from caregivers can influence their compliance and overall outcomes.

After discharge, a patient's next contact with a healthcare provider is often not until their follow-up appointment, which may be scheduled days or even weeks later. During this gap, adherence to home care instructions relies heavily on the patient and their primary caregiver. Competing demands—such as packing belongings, organizing transportation, finalizing paperwork, and settling financial obligations—can create distractions during discharge, potentially leading to confusion and errors in self-care. To support a smoother transition, the Philippine Heart Center has implemented a standardized discharge process known as METHODS, which stands for Medication, Exercise, Treatment, Hygiene, Diet, and Social/Sexuality. This structured approach aims to provide patients with comprehensive and systematic guidance at discharge. Building on this commitment to holistic, expert care, the institution is introducing the TeleCARE Program—Telephone Call Assisted Reinforcement of Client Education. Designed as a tertiary prevention strategy, TeleCARE seeks to bridge the care gap from discharge to the first follow-up appointment by reinforcing key health instructions through post-discharge phone calls. The program focuses on promoting behavioral change, particularly in areas such as medication adherence, diet, and lifestyle modifications. Ultimately, it aims to reduce complications, hospital readmissions, and mortality while improving patients' quality of life.

Objectives of the Study - This study determined whether the TeleCARE nursing program has a significant effect on cardiac patients' adherence to discharge instructions and clinical outcomes. More specifically, it aimed: To determine the demographic data profile of cardiac patients and respondents To determine the effectiveness of the TeleCARE nursing program on the adherence of cardiac patients to prescribed home medication instructions, and Out-Patient follow-up check-up. To determine the effectiveness of the TeleCARE nursing program on the 30-day clinical outcomes of discharged cardiac patients as to mortality and readmissions, and To determine the relationship between the TeleCARE nursing program and the satisfaction of discharged cardiac patients and dependents.

2. Methodology

Randomized Controlled Trial research was utilized among randomly selected discharged patients from adult wards of the Philippine Heart Center. A total 67 respondents were included in the study and grouped as either intervention group (n=32) or control group (n=35). The implementation of the study had commenced after clearance was granted by the Institutional Ethics Review Board (IERB). All adult cardiac patients scheduled for discharge who met the inclusion criteria and provided informed consent were enrolled in the study. Demographic and vital information was documented using the Patient Contact Information Form, with patient permission. Each form was assigned an encrypted serial number, which was also used to track informed consent documentation. A designated Primary Data Keeper collected all completed forms and assigned participants to either the intervention

or control group using a code-sequenced randomization list based on the serial numbers. These forms were then securely stored in a locked cabinet, ensuring proper allocation concealment, which was maintained throughout the study.

Randomized Controlled Trial research was utilized. A total 67 respondents were included in the study and grouped as either intervention group (n=32) or control group (n=35). Both groups received the standard discharge process, which included health education and instructions based on the “M.E.T.H.O.D.S.” template—Medication, Exercise, Treatment, Hygiene, Outpatient follow-up, Diet, and Spirituality/Sexuality—delivered by the discharging nurse or physician. In addition to the standard discharge, respondents in the intervention group received two follow-up phone calls from the researcher. The first call, made 24 to 72 hours post-discharge, aimed to reiterate all discharge instructions as written by the attending physician and documented in the patient's chart. It also served to remind the patient of their scheduled follow-up appointment. The second call, placed 30 days post-discharge, assessed adherence to medication, compliance with follow-up appointments, clinical outcomes (including readmission and mortality), and included a satisfaction survey evaluating the effectiveness of the TeleCARE program.

Participants in the control group received only the standard discharge process. A single follow-up call was made 30 days after discharge to assess the same parameters as the intervention group—medication adherence, follow-up compliance, readmission, or mortality. However, no satisfaction survey was administered. One respondent from this group could not be reached, resulting in 35 participants completing the study in the control group. To maintain consistency and reduce bias, a standardized script and checklist were used during all telephone interactions. Compliance with follow-up appointments was verified using the Outpatient Department (OPD) logbooks. Participants who could not be contacted after multiple attempts were considered drop-outs and excluded from the final analysis. The study was supported by institutional resources, including office supplies (e.g., paper, ink, PPE) and essential IT equipment (desktop computers, internet access, and telephones). However, there were logistical challenges, especially concerning the availability of nurses due to their concurrent clinical duties. All data were handled with strict confidentiality. Forms were monitored and securely stored by the Primary Data Keeper. An independent adjudicator conducted periodic audits to ensure proper form completion, data accuracy, and secure storage practices.

Throughout the study, core ethical principles including confidentiality, informed consent, and nonmaleficence were upheld. In the context of telemedicine and health information technology, where patient data are particularly vulnerable, all personal information was handled with the highest level of security. Only participants who voluntarily provided informed consent were included. Voluntary consent was obtained without coercion, and only from individuals with the legal capacity to provide it. Respondents who missed follow-up appointments were still included in outcome monitoring. Any medical concerns identified during calls were referred to the appropriate physician or emergency department. Discrepancies between discharge instructions and actual prescriptions (e.g., incorrect or incomplete medications) were immediately addressed by the researcher and documented for patient safety.

Descriptive statistics were used to summarize the demographic and clinical characteristics of the patients. Frequencies and proportions were used for categorical variables, medians and interquartile ranges were used for nonnormally distributed continuous variables, and means and SDs were used for normally distributed continuous variables. Independent sample t tests and Fisher's exact tests and chi-square tests were used to determine the differences in the means and frequencies, respectively, between the control and intervention groups. The odds ratio and corresponding 95% confidence intervals from binary logistic regression were computed to determine significant factors associated with outcomes. All the statistical tests were two-tailed. The Shapiro–Wilk test was used to test the normality of the continuous variables. Missing values were neither replaced nor estimated. Null hypotheses were rejected at the 0.05α level of significance. STATA 13.1 was used for data analysis.

3. Results

As shown in table 1, the mean age of participants was approximately 52.8 years across both the TeleCARE and non-TeleCARE groups, with no statistically significant difference ($p = 0.970$). This suggests that age was neither a selection criterion nor a determinant of participation in the TeleCARE program. In terms of gender, the distribution was relatively balanced, with 68.75% of the TeleCARE group and 65.71% of the non-TeleCARE group identifying as male ($p = 0.792$). These results indicate that sex did not significantly influence participation in the intervention.

Religious affiliation showed that the majority of participants were Roman Catholic (82.09%). Although the difference between groups was not statistically significant, it approached marginal significance ($p = 0.053$), with a higher proportion of Roman Catholics in the TeleCARE group (90.63%) compared to the non-TeleCARE group (74.29%). This finding may suggest a subtle cultural or religious influence on program acceptance, warranting further exploration. Marital status also showed no significant group differences ($p = 0.606$), with 58.21% of participants being married. Similarly, the majority of respondents lived in family household settings (71.64%), with no significant variation between groups ($p = 0.556$). These findings indicate that marital and household structures were not associated with TeleCARE participation.

Regarding transportation, 65.67% of participants reported reliance on public commuting. Although not statistically significant ($p = 0.315$), a slightly greater proportion of the non-TeleCARE group depended on public transportation, suggesting a possible logistical barrier to attending physical follow-up visits—one that TeleCARE may help to mitigate. In terms of educational attainment, participants had varied backgrounds, with the largest group being high school graduates (34.33%). There was no significant difference between groups ($p = 0.568$), implying that education level did not influence enrollment in the TeleCARE program.

Table 1
Profile characteristics of the patients

	TOTAL (n=67)	With TeleCARE (n=32, 48%)	Without TeleCARE (n=35, 52%)	P-value
	Frequency (%)			
Age, years	52.82 ± 14.36	52.75 ± 14.87	52.89 ± 14.1	0.970
Sex				0.792
Male	45 (67.16)	22 (68.75)	23 (65.71)	
Female	22 (32.84)	10 (31.25)	12 (34.29)	
Religion				0.053
Roman catholic	55 (82.09)	29 (90.63)	26 (74.29)	
Other Christian	6 (8.96)	0	6 (17.14)	
Muslim	0	0	0	
Other non-Christian	6 (8.96)	3 (9.38)	3 (8.57)	
No religion	0	0	0	
Marital status				0.606
Single	16 (23.88)	8 (25)	8 (22.86)	
Married	36 (58.21)	18 (56.25)	21 (60)	
Separated	2 (2.99)	0	2 (5.71)	
Widow/er	10 (14.93)	6 (18.75)	4 (11.43)	
Household Structure				0.556
Lives Alone	1 (1.49)	0	1 (2.86)	
With Caregiver only	1 (1.49)	0	1 (2.86)	
With Partner only	9 (13.43)	3 (9.38)	6 (17.14)	
Primary Family	48 (71.64)	24 (75)	24 (68.57)	
Extended Family	8 (11.94)	5 (15.63)	3 (8.57)	
Modes of Transportation				0.315
With own vehicle	14 (20.90)	8 (25)	6 (17.14)	
Own vehicle with driver	0	0	0	
Family member vehicle	9 (13.43)	6 (18.75)	3 (8.57)	
Public Commute	44 (65.67)	18 (56.25)	26 (74.29)	

Educational attainment				0.568
Elementary Level/Graduate	13 (19.40)	4 (12.50)	(25.71)	
Highschool Level/Graduate	23 (34.33)	13 (40.63)	(28.57)	
Vocational Course	7 (10.45)	4 (12.50)	3 (8.57)	
College Level/Graduate	21 (31.34)	9 (28.13)	12 (34.29)	
Masters/Doctorate	3 (4.48)	2 (6.25)	1 (2.86)	
Economic profile				0.037
Below Php 5,000/month	18 (26.87)	4 (12.50)	14 (40)	
5,000 – 10,000/month	20 (29.85)	10 (31.25)	10 (28.57)	
10,000 – 30,000/month	25 (37.31)	16 (50)	9 (25.71)	
30,000 – 50,000/month	3 (4.48)	2 (6.25)	1 (2.86)	
50,000 and above/month	1 (1.49)	0	1 (2.86)	
Employment Status				0.195
White collar	1 (1.49)	1 (3.13)	0	
Blue collar	31 (46.27)	16 (50)	15 (42.86)	
Unemployed	26 (38.81)	9 (28.13)	17 (48.57)	
Retired	9 (13.43)	6 (18.75)	3 (8.57)	
Source of Income				0.592
Primary	25 (37.31)	13 (40.63)	12 (34.29)	
Secondary	42 (62.69)	19 (59.38)	23 (65.71)	
If secondary (n=42)				0.477
Business	8 (19.05)	4 (21.05)	4 (21.05)	
Dependent (family)	21 (50)	7 (36.84)	7 (36.84)	
Joint income (self + family)	5 (11.90)	(15.79)	(15.79)	
Retirement Funds	7 (16.67)	(21.05)	(21.05)	
Unspecified source	1 (2.38)	1 (5.26)	1 (5.26)	
Family member with medical background				1.000
Yes	9 (13.43)	4 (12.50)	5 (14.29)	
No	58 (86.57)	28 (87.50)	30 (85.71)	
Community support				0.449
Available ambulance	34 (55.74)	17 (56.67)	17 (54.84)	
Conducts Health Visits	(1.64)	1 (3.33)	0	
Available physician	(3.28)	1 (3.33)	1 (3.23)	
2/3	15 (24.59)	(16.67)	10 (32.26)	
3/3	9 (14.75)	(20)	3 (9.68)	
Diagnosis				0.084
Congenital	4 (5.97)	(6.25)	2 (5.71)	
Valvular CAD	4 (5.97)	(9.38)	1 (2.86)	
EPS	38 (56.72)	14 (43.75)	24 (68.57)	
Heart Failure	13 (19.40)	10 (31.25)	3 (8.57)	
Others	0	0	0	
	8 (11.94)	3 (9.38)	5 (14.29)	

Notably, a statistically significant difference was found in the participants' monthly income distribution ($p = 0.037$). A larger proportion of TeleCARE participants earned between Php 10,000 and 30,000, whereas the non-TeleCARE group included more individuals from lower income brackets. This suggests that economic status may influence both access to and engagement with telehealth services, potentially due to differences in technological access or perceived value of remote care. In terms of employment, blue-collar workers made up the largest group (46.27%), with no significant difference in employment status across groups ($p = 0.195$). Likewise, the source of income (primary or secondary) showed no significant variation between the groups ($p = 0.592$), indicating that neither employment type nor income source impacted TeleCARE participation.

A small percentage (13.43%) of participants reported having a family member with a medical background, with identical distribution between groups ($p = 1.000$), suggesting no influence on program enrollment. Similarly, just over half of the participants (55.74%) reported access to community support services, such as ambulance availability, with no significant difference between groups ($p = 0.449$). These findings indicate that community-level healthcare access did not affect TeleCARE utilization. Clinically, the most common diagnosis was coronary artery disease (CAD), present in 56.72% of the sample. Although the difference between groups was not statistically significant ($p = 0.084$), the TeleCARE group had a higher proportion of CAD patients, possibly

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reflecting a greater need for structured follow-up care in this subgroup. This observation aligns with findings from Brown et al. (2021), who reported that diagnosis alone does not strongly predict telehealth utilization, reinforcing the need to consider broader contextual and behavioral factors.

Table 2
Patient Outcomes

	TOTAL (n=67) Frequency (%)	With TeleCARE (n=32, 48%)	Without TeleCARE (n=35, 52%)	P-value
Adherence to prescribed home medications instructions				0.080
Yes	50 (74.63)	27 (84.38)	23 (65.71)	
No	17 (25.37)	5 (15.63)	12 (34.29)	
Adherence to outpatient follow-up Check-up				0.153
Yes	58 (86.57)	30 (93.75)	28 (80)	
No	9 (13.43)	2 (6.25)	7 (20)	
Mortality				-
Alive	67 (100)	32 (100)	35 (100)	
Expired	0	0	0	
Readmission				1.000
Yes	4 (5.97)	2 (6.25)	2 (5.71)	
No	63 (94.03)	30 (93.75)	33 (94.29)	

Results of the study illustrated that a higher proportion of participants in the TeleCARE group (84.38%) adhered to their prescribed home medications and instructions compared to the non-TeleCARE group (65.71%). Although this difference did not reach statistical significance ($p = 0.080$), the trend suggests that TeleCARE may positively influence medication compliance by reinforcing discharge education and addressing patient concerns during follow-up calls. Similarly, 93.75% of the TeleCARE group attended their scheduled follow-up appointments, compared to 80% in the non-TeleCARE group. While this difference was also not statistically significant ($p = 0.153$), it supports existing evidence that telehealth interventions may improve follow-up adherence. For instance, a recent study by the Mayo Clinic (2023) found that structured post-discharge communication significantly increased outpatient follow-up rates.

Incidentally, no participant deaths were reported in either group during the study period. Additionally, readmission rates were similar across both groups, with no statistically significant difference observed ($p = 1.000$). These findings suggest that TeleCARE is comparably effective to standard care in preventing early readmissions and mortality within the follow-up period. While the differences observed in adherence to medications and follow-up appointments did not achieve statistical significance, the TeleCARE group consistently demonstrated better adherence outcomes. These trends point to the potential clinical value of structured telephonic follow-up in supporting post-discharge recovery, particularly among patients with chronic cardiac conditions.

Table 3
Satisfaction of discharged cardiac patients and dependents

Q#	Parameters	Mean \pm SD
1	I could easily talk to the TeleCARE Nurse during the telephone follow-up.	4.91 \pm 0.30
2	I could hear my TeleCARE Nurse clearly during the telephone follow-up	4.94 \pm 0.25
3	My TeleCARE Nurse who called for the telephone follow-up was able to understand my healthcare condition	4.94 \pm 0.35
4	I was comfortable communicating with my TeleCARE Nurse during the telephone follow-up	4.97 \pm 0.18
5	I did receive enough attention during my telephone follow-up session	4.94 \pm 0.18
6	Telephone follow-up provided for my healthcare need	5.00
7	I found the TeleCARE service to be an acceptable way to receive reiteration of discharge instructions and health teachings in the comfort of my home.	4.94 \pm 0.25
8	I am willing to receive TeleCARE services again in the future.	4.97 \pm 0.18
9	Overall, I am satisfied with the quality of services being provided by the telephone follow-up	5.00

The findings of this study highlight the effectiveness of the TeleCARE program not only in providing clinical

support but also in significantly enhancing the overall patient experience. Through empathetic, accessible, and patient-centered communication, TeleCARE fostered meaningful engagement during the post-discharge period. Satisfaction scores were exceptionally high across all evaluated domains, with mean ratings ranging from 4.91 to 5.00 on a 5-point Likert scale. These results reflect a strong positive reception of the intervention and support its potential for broader implementation in post-discharge care models.

Patients consistently reported that they could easily communicate with their TeleCARE nurse, citing clear, audible, and respectful exchanges that facilitated effective understanding of their health needs. Respondents also felt that the nurse demonstrated a strong grasp of their medical condition, which contributed to a sense of comfort, reassurance, and trust during the interaction. In addition, participants noted that they received adequate attention and personalized support during the follow-up calls. The intervention was perceived as highly responsive to their needs, effectively addressing post-discharge concerns and reinforcing adherence to care instructions. Importantly, the TeleCARE program was rated as highly acceptable, with most patients expressing a strong willingness to use the service again in the future. These findings suggest that structured telephonic follow-up is not only feasible but also well-aligned with patient preferences for ongoing care and support.

4. Discussion

The findings of this study reveal that most sociodemographic characteristics—including age, sex, marital status, household structure, mode of transportation, educational attainment, employment status, and the presence of a family medical background—were comparable between the TeleCARE and non-TeleCARE groups. The primary notable difference was in economic profile, where patients in the TeleCARE group were more likely to fall within a higher income bracket (PHP 10,000–30,000/month), a difference that was statistically significant. These results are consistent with prior literature. Kvedar et al. (2020) found that telehealth adoption is widespread and not significantly influenced by age or gender, reflecting the inclusivity observed in the present study. This underscores TeleCARE's potential usability across demographic groups. However, it is important to note a limitation in the study's target population—the exclusion of pediatric patients. Since children typically rely on adult caregivers for communication and decision-making, similar outcomes may be anticipated, but this requires further validation in a pediatric-specific cohort.

As to religious affiliation and marital status, the results support findings by Ding et al. (2023), which indicated that these factors do not significantly influence telehealth utilization. Similarly, Nguyen et al. (2022) found that logistical factors, such as household structure and mode of transportation, do not meaningfully limit telehealth access—findings that align with this study's data. The difference in socioeconomic status—while not affecting clinical outcomes—suggests that income level may influence access to or initial participation in telehealth programs, possibly due to greater access to technology and digital literacy. This interpretation is supported by Smith et al. (2023), who noted that individuals with higher incomes are typically more equipped to participate in telehealth because of better access to devices, internet, and related resources.

Despite these differences in economic background, the clinical outcomes between groups did not significantly differ. Patients in the TeleCARE group did demonstrate higher adherence to prescribed medications and follow-up appointments (84.38% and 93.75%, respectively), compared to the non-TeleCARE group (65.71% and 80%). Although these differences were not statistically significant, the trend suggests that telephonic follow-up may promote positive behavioral outcomes, especially with respect to continuity of care. These results align with the work of Koehler et al. (2022) and Greenhalgh et al. (2022), who found that telehealth interventions are often associated with improved treatment adherence in patients with chronic conditions. Similarly, Basu et al. (2021) reported significant improvements in medication adherence and reduced hospital readmissions among chronic heart failure patients who received telehealth support.

Interestingly, mortality and readmission rates were equivalent between the two groups, mirroring findings from Hsia et al. (2022), who found that telehealth services did not significantly alter these outcomes when

compared to traditional care. Nevertheless, this should not detract from the broader value of telehealth. For example, Xu et al. (2022) found that patients who received telemedicine follow-up within 14 days post-discharge experienced lower 30-day readmission rates, particularly among those with heart failure, reinforcing the potential of timely telehealth intervention to influence outcomes.

A key strength of the TeleCARE program was its impact on patient satisfaction. Participants consistently rated their experience highly, with mean satisfaction scores ranging from 4.91 to 5.00 on a 5-point Likert scale. These findings are consistent with prior studies by Moore et al. (2022), Ekeland et al. (2021), and Andersen et al. (2023), which showed high levels of patient satisfaction with telehealth, particularly due to its convenience, accessibility, and improved communication. Furthermore, Dinesen et al. (2023) emphasized that patient engagement and satisfaction with telehealth are often highest in underserved or remote settings, adding to the relevance of TeleCARE in the local context.

An unanticipated benefit of the program was its role in identifying and rectifying errors in discharge instructions. During follow-up calls, the researcher identified discrepancies such as incorrect medication names or doses, or missing referrals for pending outpatient procedures. These errors were corrected in real-time, likely preventing adverse events and improving patient safety. Without this intervention, these issues may have only been discovered—if at all—at the next follow-up visit, possibly leading to delayed care or dissatisfaction. In this way, TeleCARE functioned not just as a communication tool but also as a quality control mechanism, reinforcing the accuracy of post-discharge instructions and ensuring continuity of care. This highlights an often-overlooked benefit of structured telehealth programs: their capacity to bridge system gaps and proactively support patient outcomes beyond what is possible with standard discharge protocols alone.

Although not part of the study's primary endpoints, several incidental findings emerged during the second follow-up call, offering valuable insights into the real-world challenges of post-discharge care among cardiac patients. These findings emphasize persistent behavioral, logistical, and system-level barriers that can undermine recovery—particularly in vulnerable populations—and demonstrate the practical utility of structured follow-up through the TeleCARE program. While medication nonadherence was present in both groups, the breadth and clinical importance of missed medications were notably greater among control group patients. Medications missed included critical cardiovascular agents such as antihypertensives, antiplatelets, statins, and anticoagulants. In contrast, those in the intervention group reported missed doses of only clopidogrel, suggesting that the TeleCARE program contributed to better adherence and medication management.

Patients cited multiple reasons for nonadherence, including forgetfulness, failure to refill prescriptions, perceived resolution of symptoms (e.g., stable blood pressure, absence of chest pain), financial limitations, and improper self-adjustments, such as double-dosing or skipping based on perceived need. These behaviors reflect gaps in health literacy, economic access, and self-management skills. Importantly, all patients who reported lapses were referred back to their attending physicians, and the follow-up call itself served as a corrective mechanism, reinforcing proper medication use and offering real-time guidance—a core advantage of structured telehealth support.

Regarding missed outpatient follow-up appointments, most absences were attributed to logistical and socioeconomic barriers, including inclement weather, lack of transportation or assistance, hospitalization, and financial difficulties. Missed follow-ups may also be attributed to voluntary transitions to private healthcare providers, suggesting patient choice rather than disengagement. This notable difference supports the idea that TeleCARE helps maintain continuity of care even in the face of potential disruptions, by proactively addressing barriers and keeping patients engaged.

The study also identified eight discharge-related process errors including illegible handwriting and ambiguous abbreviations leading to unclear medication instructions, errors in take-home medication lists, incomplete or missing discharge guidance, incorrect follow-up details, and delays due to electronic medical record (EMR) maintenance. While these incidents are likely due to increased scrutiny and follow-up rather than a higher inherent

error rate, the structured telephone follow-up allowed these issues to be promptly identified and corrected, thereby preventing potential patient harm and enhancing safety and satisfaction. These incidental findings reinforce the value of TeleCARE beyond its intended clinical support. By actively monitoring adherence, clarifying instructions, and facilitating post-discharge coordination, the program functions as a critical layer of oversight often missing from traditional care models. Its ability to identify, address, and resolve real-world care delivery issues in a timely and patient-centered manner makes it a valuable adjunct to existing healthcare systems, especially in settings where resource constraints and communication gaps persist.

5. Conclusions

The findings from the TeleCARE study demonstrate encouraging results in enhancing medication adherence and follow-up appointment attendance, alongside exceptionally high patient satisfaction. The absence of statistically significant differences in most demographic and clinical variables between the TeleCARE and non-TeleCARE groups suggests that the program is broadly accessible and applicable across diverse patient populations. However, the influence of economic status on participation highlights a potential barrier that warrants targeted interventions to ensure equitable access to telehealth services. This insight aligns with existing literature and supports the growing body of evidence advocating for telehealth integration in the management of chronic conditions, particularly cardiovascular diseases. Although no significant differences were observed in clinical outcomes (e.g., mortality or readmission rates) within the study period, the consistently higher adherence rates and patient satisfaction associated with TeleCARE suggest meaningful benefits in patient engagement and continuity of care. These aspects are increasingly recognized as vital components of quality healthcare delivery. Future research should investigate whether the observed improvements in adherence and satisfaction lead to long-term health benefits, and examine other potential factors—such as digital literacy, caregiver involvement, or system-level readiness—that may influence the effectiveness and scalability of TeleCARE. Additionally, exploring cost-effectiveness and integration strategies for resource-limited settings may further strengthen the case for its widespread adoption.

Recommendations - Further research on the TeleCARE program is recommended using a larger and more diverse sample over a longer period to enhance the reliability and generalizability of findings. The current study identified a significant disparity in economic profiles between groups, suggesting the need for covariate adjustments (e.g., logistic regression, ANCOVA) in future studies to better isolate the program's true effects. While economic status influenced access and participation, it did not affect short-term outcomes—warranting longitudinal studies and economic evaluations to explore long-term implications. To ensure the success and sustainability of TeleCARE, several implementation strategies are advised such as: Telehealth literacy training during discharge; Prioritization of high-risk cardiac patients for enrollment; and Tailored rollout based on institutional capacity and patient demographics. Incidental findings point to the need for standardized, digital discharge protocols to reduce errors and improve continuity of care. Supporting infrastructure should include: Trained telehealth personnel (nurses, coordinators, community health workers); Community partnerships to build trust and engagement; and Investment in rural connectivity and telehealth kits or hubs. Finally, ongoing monitoring and evaluation of TeleCARE is critical to track adherence, satisfaction, and outcomes. With thoughtful integration and sustained support, TeleCARE holds significant potential to enhance continuity of care and promote health equity, particularly in underserved populations.

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Psychological well-being, resilience and work productivity of emergency nurses in selected specialty hospitals in Anhui Province, China

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Abstract

This study investigated the psychological well-being, resilience, and work productivity of emergency care nurses in selected specialty hospitals in Anhui Province, China, with the aim of developing an inter-professional emergency team collaboration framework. Employing a descriptive-correlational design, data were gathered from 206 randomly selected emergency care nurses using Ryff's Psychological Well-Being Questionnaire, the Connor-Davidson Resilience Scale, and the Dulewicz and Higgs Work Productivity Scale. Psychological well-being was measured across autonomy, environmental mastery, personal growth, positive relations, purpose in life, and self-acceptance; resilience across active coping, cognitive flexibility, positive emotion, optimism, and spirituality; and work productivity across work engagement, work attitude, and work performance. Descriptive analysis revealed that nurses demonstrated strong psychological well-being by confidently making decisions, overcoming daily challenges, fostering positive relationships, setting meaningful goals, and valuing their achievements. They also showed high resilience through adaptability, optimism, persistence under pressure, and self-perceived strength when facing difficulties. In terms of work productivity, nurses actively engaged in their tasks, maintained positive attitudes, and strived to meet goals efficiently. Correlational analysis revealed strong positive relationships among psychological well-being, resilience, and work productivity. Further, multiple regression indicated that psychological well-being accounted for 76.6% of the variance in work productivity, while resilience explained 78.2%. These findings highlight the significant role of psychological well-being and resilience in enhancing the work productivity of emergency care nurses. The study underscores the importance of fostering supportive inter-professional collaboration to strengthen these attributes and improve healthcare delivery outcomes.

Keywords: psychological well-being, resilience, work productivity, nurses, emergency care, specialty hospital

Psychological well-being, resilience and work productivity of emergency nurses in selected specialty hospitals in Anhui Province, China

1. Introduction

The uncertainty and challenges in this new normal may pose a further threat to nurses' psychological well-being. Nurses are placed in stressful situations, fulfilling their roles on the front line while risking their lives to save others. Hospital emergency departments deal with every kind of medical emergency involving life-threatening conditions. Emergency care is available 24 hours a day, every day of the year and has special equipment and a highly qualified team of emergency care nurses including nurses to respond to every kind of medical emergency. Emergency response is a complex activity and emergency care nurses are like circus performers as they attend to simultaneous demands from various and multiple stakeholders such as administrators, patients, and colleagues. In addition to the time-bound interventions and parallel tasks required and it can be thought of no less than being chaotic in which their psychological well-being and resilience are critical factors of work performance among emergency care nurses.

Over the decades, Emergency Department (ED) has evolved in many ways, increasing work demands and placing extra pressure. Nurses have intrinsic exposure to psychological distress because they frequently encounter multiple ethical challenges and deaths while providing emergency care. The unique milieu and task complexity in emergency care settings pose a challenge to the analytic approach, particularly when confronted with a critically ill patient who requires immediate action (Moresky et al., 2019). Improving psychological well-being plays a significant role in maintaining the quality of care and clinical performance for emergency care nurses. Lifestyle changes often result in increased stress and affect resilience. In these conditions, emergency care nurses must take all necessary precautions to protect themselves, against feelings of emotional exhaustion which can have negative effects on their psychological well-being.

Emergency care nurses working in emergency department regularly attend to potentially traumatic incidents and regularly treat people who are in life-threatening conditions. Exposure to such experiences has been linked to adverse psychological conditions. The most prevalent factors related to psychological well-being issues include fear, anxiety, sadness, psychological and post-traumatic symptoms. These events may have a short and long-term influence on emergency care nurses in psychological well-being along with their resilience. While emergency care nurses, along with other healthcare practitioners, continue to provide care and fulfill their job roles, the question of how resilient they are in coping with difficulties during hospital emergencies remains important. Resilience enables emergency care nurses to maintain healthy levels of psychological and physical functioning during exposure to emergency events thus enhance their capacity for generative experiences and positive emotions. Individual resilience is an important skill and understanding can help to be strong in the face of emergency events. Resilience is regarded as a protective factor for psychological well-being of emergency care nurses involved in emergency medical response. If emergency care nurses are resilient, they are more likely to work well in their jobs and stay productive with their profession.

Work productivity is at the heart of every profession. Productivity entails a combination of skills, knowledge, attitudes, values and abilities that underpin effective work performance. The productivity of emergency care nurses is of great significance in determining their work performance since competency can be equated to standards of practice, and professionalism in the job. The emergency medical response service in specialty hospitals has been expected to become better. It is actually not unexpected that the emergency response in the country is far behind what other countries practice and provide, especially those who belong in the first world. The emergency care nurses maintain a coordinated system that provides emergency care when patients arrive in the hospital. The stressors and emotions involved in the emergency environment are immense based on what emergency care nurses encounter on most difficult moments in the job.

Today, emergency care system faces an epidemic of crowded emergency departments, patients boarding in hallways waiting to be admitted, and daily ambulance diversions. Hospital-based emergency care addresses the difficulty of balancing the roles of emergency care, safety net care for patients, disaster response, and adjunct care. The services emergency care nurses fill in the gap between the scene of increasing patient volume and limited resources, hence this study will explore the influence of psychological well-being and resilience on the work productivity of emergency care nurses in selected emergency department of specialty hospitals in Anhui Province, China. There is no question that the impact of the emergency department within the larger specialty hospitals and the efficiency of emergency care nurses are both demanding. There is also no question, however, that those challenges bring their own rewards. Undoubtedly hospital-based emergency care nurses are strongly impacted by the situations they encounter, and certainly those impacts yield meaning and strength more often than they engender psychological well-being, resilience and work productivity.

As exposed to emergency care situations, the researcher considers that emergency events require members of emergency medical response team to be flexible. Emergency care nurses working in the emergency department need to maintain the valuable characteristics of psychological well-being, resilience, and work productivity to successfully overcome the challenges of the job functions, increase the preparedness and quality of care to serve patients.

Objectives of the Study - The main objective of this study is to determine the psychological well-being, resilience, and work productivity of emergency care nurses in selected specialty hospitals in Anhui Province, China, with the ultimate goal of proposing a nursing framework that describes inter-professional emergency team collaboration. Specifically, the study seeks to assess the psychological well-being of emergency care nurses in terms of autonomy, environmental mastery, personal growth, positive relationships with others, purpose in life, and self-acceptance. It also aims to evaluate their resilience in terms of active coping, cognitive flexibility, positive outcomes, optimism, and spirituality, as well as determine their work productivity in terms of work engagement, work attitude, and work performance. Furthermore, the study intends to examine the relationship between psychological well-being and resilience, psychological well-being and work productivity, and resilience and work productivity. It also aims to determine the combined relationship of psychological well-being, resilience, and work productivity among emergency care nurses. Finally, based on the findings, the study endeavors to propose an inter-professional emergency team collaboration framework that describes the psychological well-being of emergency nurses in relation to their resilience and work productivity.

2. Methodology

Research Design - This study utilized descriptive-correlational research design which permits understanding of phenomena, meanings and personal values related to assessment of emergency care nurses working in selected specialty hospitals in Anhui Province, China. Structured self-administered survey questionnaire were used to gather quantitative data. This approach affords collection of quantitative data about assessment of care professionals. Quantitative design generates more rounded and objective understanding of a phenomenon (Creswell, 2019).

Population, Sample and Sampling Technique - The population of the study included hospital-based emergency care nurses assigned in emergency department in selected specialty hospitals in Anhui Province, China. The selected research locales have close resemblance with each other in terms of hospital category, medical services, bed capacity and staffing. These include: Hospital A, a 668-bed capacity specialty hospital with about 65 emergency care nurses; Hospital B, a 680-bed capacity specialty hospital with about 68 emergency care nurses; Hospital C, a 720-bed capacity specialty hospital with about 78 emergency care nurses. Hospital D, a 705-bed capacity specialty hospital with about 72 emergency care nurses; Hospital E, a 750-bed capacity specialty hospital with about 84 emergency care nurses; and Hospital F, a 710-bed capacity specialty hospital with about 75 emergency care nurses.

In determining study sample, using Gpower analysis power of 0.80, effect size of 0.50, and significance of 0.05, a minimum of 218 respondents were required for this study which were randomly selected. Using online random number generator, a simple random sample was used to represent the entire data population. Simple random sampling is known for its less chance of sampling bias and allows researcher to make generalizations about a specific population. This technique is meant to be an unbiased representation of a group and considered a fair way to select a sample from a larger population since every member of the population has an equal chance of getting selected. The following inclusion/exclusion criteria were considered in this study. The study included hospital-based emergency care nurses who are currently assigned in the emergency department, with at least six months of experience in their present assignment. Eligible participants were full-time employees directly involved in patient care or triage care, aged 23 to 59 years old. Excluded from the study were nurses who were on leave (sick, maternity, or vacation) at the time of data collection, as well as those undergoing on-the-job training.

Research Instruments - The research did refer to an open-access and validated tools adopted from Ryff's Psychological Well-Being Questionnaire; Connor-Davidson Resilience Scale; and Dulewicz and Higgs Work Productivity Scale. These instruments had been used in previously completed dissertation at Trinity University of Asia using four-point Likert scale including strongly agree, agree, disagree, and strongly disagree. All of these research instruments were subjected to validity and reliability test and presented Cronbach alpha values of 0.96 for Well-Being; 0.94 for Resilience; and 0.92 for Work Productivity. All items in the three questionnaires are positively stated. Using structured self-administered questionnaires, as the principal medium of gathering data, correlation is possible by assigning numerical values to the variables. Furthermore, they have standardized answers which allow compilation of data simple. Psychological Well-Being questionnaire has got 42 items focused on six domains including autonomy, environmental mastery, personal growth, positive relations, purpose in life, and self-acceptance. Meanwhile, Resilience has got 25 items focused on five areas including active coping, cognitive flexibility, positive emotion, optimism, and spirituality. Furthermore, Work Productivity has got 30 items focused on three domains including work engagement, work attitude, and work performance. Accomplishment of questionnaires will take approximately fifteen (15) minutes.

The 18-item version of psychological well-being comprises original items to assess each dimension. This shortened version's subscales have correlation coefficients ranging from 0.89 to 0.98 with their corresponding subscales in the original 120-item version. Moreover, the study that first examined the 18-item version using Confirmatory Factor Analysis (CFA), supported the six-factor original multidimensional model of psychological wellbeing in a cohort of elderly Canadians. Further studies using samples from different countries, such as Iranian, Portuguese, and Italian have also confirmed, using CFA, the goodness of fit of the 18-item version of Ryff's Psychological Wellbeing Scale. The short version tool showed that the internal consistency coefficients of Swedish 18-item version were higher than those of the original version, suggesting adequacy of the shortened version in a sample of white-collar Swedish workers. Hence, most studies suggest that the 18-item version is relatively valid and reliable for the measurement of Ryff's multidimensional model of psychological well-being.

The Resilience scale was developed as a self-report scale comprising 25 items and five dimensions. The structure of the questionnaire was found stable across social groups, healthcare workers, and cultures. Many attempts to revise the 25-item Resilience scale, to make it shorter and more reliable, have been made. To date, three versions exist: 25-, 10-, and 2-item scales. Resilience scale has been thoroughly investigated across many samples, cultures, and even continents regarding its reliability, structure, and content validity. Thus, it appears to work well in people of different demographics and occupations as well as in the special samples. As far as we know from literature, the translation of the scale's statements into foreign languages did not have any problems, since they were initially formulated very clearly and did not allow for discrepancies or misunderstandings. To date, there are more than 80 translations of different Resilience scale versions. In all versions, the unifactorial structure of the scale was preserved. Cronbach's alpha ranged from 0.88 to 0.96, which demonstrates the reliability of the tool. Content validity, examined by correlations with subjective and behavioral indicators of well- or ill-being, was also very convincing.

For a more defined interpretation of psychological well-being, strongly agree is being interpreted as “highly satisfied” described as being the best an individual can be in which the nurse is highly engaged with self-growth and feeling fulfilled. Agree is being interpreted as “satisfied” described as having important foundations of safety and physiological needs in which the nurse has got a sense of achievement, respected in all roles, and trusted to do things freely. Disagree is being interpreted as “not satisfied” being described as feeling just basic which implies that the nurse does not feel well associated to work functions. Strongly disagree is being interpreted as “highly not satisfied” described as rather fatalistic and the nurse perceives great dissatisfaction with every aspect of the work. Moreover, for better interpretation of resilience, strongly agree means “highly adaptive” where the nurses are very much flexible and able to withstand and manage stress. Agree means “adaptive” where the nurses are somewhat receptive and able to manage stress. Disagree means “not adaptive” where nurses are not able to adapt and see challenges as irritating episodes. Strongly disagree means “highly not adaptive” where nurses are very much incapable to adjust to any challenges. Furthermore, for more delineated work productivity, strongly agree refers to “highly performing” which implies that nurses are highly focused on the vital work and achieve their goals. Agree refers to “performing” which implies nurses manage their tasks. Disagree refers to “developing” which implies nurses are unable to manage their tasks efficiently. Strongly disagree refers to “beginning” which implies nurses are totally out of focus at work and do not care about efficiency.

With regard to the validity and reliability of the adopted research instruments, several studies have utilized the same tools on investigation psychological well-being, resilience, and work productivity among nurses in the hospital setting. Feller et.al. (2020) utilized Ryff’s Psychological Well-Being questionnaire among nurses in one hospital in Brussels. Study showed that psychological well-being improves resilience of nurses and appears to do so via changes in self-motivations that are reflected in flexibility in challenges in the clinical practice. In particular, psychological well-being leads to positive outcomes in emotion, cognition, and behavior which all enhances resilience. Goyal et.al (2019) also used Ryff’s Psychological Well-Being tool to evaluate the impact of meditation programs for nurses’ psychological stress and well-being in selected hospitals in India. The tool assessed the psychological well-being of nurses whether clinical environments affect achievement of nursing care outcomes, and have an impact on resilience and productivity with the nursing profession. Study showed that there has been some indirect evidence showing that psychological capacity can modulate responses to emotion-related stimuli and influence affective processing. While correlating psychological outcomes and functional resilience is somewhat challenging. Given the modest sample size, some encouraging findings have illustrated that nurses develop resilience that are related to improved psychological well-being outcomes.

Meanwhile, in the study of Weinstein et. al (2019), using Resilience scale, an analytical cross-sectional design was carried out on Over 500 nurses working in Stanford University hospital to investigate the role of resilience to predict the work productivity of nurses. Resilience is a complex construct that concerns optimal productive functioning and experience. Results of the study showed that resilience in nursing practice includes enjoyment, pleasure, meaning and fulfillment. Resilience improves coping, emotion regulation, and healthy problem solving. The elements of resilience include a sense of balance in emotion, thoughts, social relationships, and pursuits which necessitates active engagement of self-control processes such as emotion regulation. Resilience influence nurses’ emotions and experience. Using the same Resilience questionnaire, McConville et.al. (2022), studied resilience among practicing nurses in hospital setting to assess self-reported major challenges such as common fitting learning issues that are focused on systems-level drivers of stress. Resilience warrants how clinical nursing issues, personal health and wellness, and relationships impact nurses’ coping, performance, and productivity. Findings of the study suggested that resilience can be enhanced by mindfulness training which shares key components of coping and adaptation such as a systematic training of attention and self-control with an attitude of acceptance and openness to present experiences.

Ding et.al (2021) utilized the work productivity instrument developed by Dulewicz and Higgs Work Productivity Scale to determine the work engagement, work attitude, and work performance of nurses (n=200) in selected private hospital in Saudi Arabia as they went through overwhelming uploads on the challenges of clinical nursing practice. Findings of the study showed that the nurses have good work productivity as they were able to

effectively manage the professional demands of nursing practice. Study findings revealed that mentoring and good management in the hospital improved nurses' work performance and productivity. Another study by Kong et.al (2020) utilized the same instrument to assess the work productivity of nurses in special areas in a selected Irish hospital. Findings suggest to include strategies to enhance interpersonal-relationship levels and working confidence. The work productivity to nursing practice showed to be significantly correlated with creativity and social support. A stepwise regression model showed subjective interpersonal degree, satisfaction with clinical practice and work confidence were significant predictors of work productivity.

Professionally-certified translators, whose mother language is Chinese, a panel of experts who are knowledgeable about the research field and familiar with the target population, and with educational language translation experience were sought to conduct the translation. Brislin's back-translation model was used to guide the translation process of the adopted questionnaires into Chinese. This back-translation model is regarded as a reliable option for translating tools in cross-cultural research and is also appropriate for translating established questionnaires that have long been used in the original source language. Furthermore, Brislin's model emphasized attention to the semantics and technical aspects of translation during the forward and backward translation process, which enhances the conceptual and content equivalence of the translated instrument and the original version. Content validity was performed to ensure clarity and relevance of items in the instrument. Modified tools were piloted to determine their reliability.

Data Gathering Procedure - The researcher initially secured an approval from the Graduate School and Ethics Review Board to conduct the study. The researcher further sought administrative approval from the head of selected research locales that were included in the study. The researcher considered qualified emergency care nurses assigned in the emergency department of selected specialty hospitals in Anhui Province, China who are deemed principal participants in the study. After all approvals and permission had been secured, the researcher did start screening of eligible participants based on the inclusion criteria. The study was carefully explained to all participants. Voluntary participation was clarified among the qualified respondents. Cover letter was attached to the questionnaires to explain the nature and purpose of the study. Consent is implied should the respondent decide to accomplish the questionnaires. Confidentiality of all gathered data was assured. Privacy and anonymity of the study respondents were maintained by eliminating all potential identifiers. Researchers did facilitate distribution and collection of completed survey questionnaires and did provide mobile phone numbers to answer any clarification from the respondents. The study respondents took approximately fifteen minutes to accomplish the questionnaires. Completed self-administered questionnaires were immediately collected by the researcher which were eventually checked for completeness prior to statistical analysis. Descriptive statistics were used to describe numerical data as well as to analyze significant relationship in the gathered quantitative information on study variables. Data collection was carried out in 2023.

Ethical Considerations - The research study did ensure voluntary participation of the participants. Anonymity, confidentiality and privacy of all gathered information from this study were maintained until the completion of the study. Moreover, the study completely adhered to all ethical standards and data privacy throughout the conduct of the study. A cover letter was attached to the questionnaire to explain the details of the study. Consent is secured should the respondents decide to accomplish the questionnaires. It was also clarified to all participants that they are under no obligation to accomplish the survey questionnaires nor will receive monetary compensation for participating in the survey. All potential identifiers were eliminated in the questionnaire. While the risk involved in accomplishing the survey questionnaire was less than minimal, a waiver of informed consent was requested from the Ethics Review Board of the research locales. The researcher of this study collected no sensitive information. Survey questionnaires did not contain potential identifiers. There was no sensitive information collected. There was an assurance that all gathered information will not be reused or disclosed to any other person or entity, except as required by law, for authorized oversight of the research study, or for other research for which the use or disclosure of protected information would be permitted by the Privacy Rule.

Statistical Treatment of Data - In realizing the purpose of this study, the numerical data were treated on

Statistical Package for Social Science (SPSS) software. Shapiro-Wilk test confirmed normality of data distribution and considered parametric tests as the appropriate method to treat study data. The respondents' assessments of psychological well-being, covering autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance, were analyzed using weighted mean with corresponding verbal interpretation. Similarly, resilience, measured in terms of active coping, cognitive flexibility, positive emotion, optimism, and spirituality, as well as work productivity, measured in terms of work engagement, work attitude, and work performance, were also assessed through weighted mean and verbal interpretation. To examine the significant relationships between psychological well-being and resilience, psychological well-being and work productivity, and resilience and work productivity, Pearson's *r* correlation was employed. Furthermore, regression analysis was used to determine the combined influence of psychological well-being and resilience on work productivity.

The quantitative interpretation of the degree of linear relationship is reflected in specific ranges of values. A correlation coefficient of ± 1.00 indicates a perfect positive or negative correlation, while values from ± 0.91 to ± 0.99 denote a very high positive or negative correlation. Coefficients ranging from ± 0.71 to ± 0.90 are interpreted as high correlation, and those between ± 0.51 and ± 0.70 indicate a moderate correlation. A range of ± 0.31 to ± 0.50 corresponds to a low correlation, while ± 0.01 to ± 0.30 suggests a negligible correlation. Finally, a value of 0.00 indicates no correlation between variables.

3. Results and discussion

Table 1

Assessment on Psychological Well-Being of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China in Terms of Autonomy

Variables	Mean	SD	VI
I always stand firm with my decision and do not influenced by others' strong opinion.	3.62	0.51	SA
I have confidence in my own opinions, even if they are different from the way most other people think.	3.60	0.60	SA
I judge myself by what I think is important, not by the values of what others think is important.	3.41	0.58	SA
Overall Mean	3.54	0.43	SA

Legend: 3.26-4.00 (Strongly Agree -SA / Highly Satisfied) ; 2.51-3.25 (Agree-A / Satisfied) ; 1.76-2.50 (Disagree-D / Not Satisfied) ; 1.00-1.75 (Strongly Disagree -SD / Highly Not Satisfied)

Table 1 shows the summary of values showing the mean and verbal interpretation in the assessment of the emergency care nurses on their psychological well-being in selected emergency medical response units in selected specialty hospitals in Anhui Province, China in terms of autonomy with an overall mean of 3.54 verbally interpreted as "strongly agree". The assessment showed homogeneous response as depicted by standard deviation of 0.43. The strongest component of autonomy domain in which the majority of emergency care nurses strongly agree pertains to "I always stand firm with my decision and do not influenced by others' strong opinion" ($\bar{x} = 3.62$). Meanwhile, the weakest component of autonomy in which the majority of emergency care nurses strongly agree refers to "I judge myself by what I think is important, not by the values of what others think is important" ($\bar{x} = 3.41$).

Healthcare profession such as emergency care provider entails autonomy in the practice, hence decision-making is a very crucial part of emergency medical response practice. In most cases, emergency care entails a lot of independent functions in which the ability to work independently is being practiced. Objectivity is also another important consideration in practicing autonomy in this profession. Autonomy, open and honest communication are fundamental to creating trusting and supporting environments that can prevent burnout and create viable workflows during increased demand. Maintaining psychological wellbeing is always a shared responsibility. Emergency care nurses need to have an inherent understanding of their autonomous functions and adaptive coping mechanisms that work for them. Meanwhile, emergency care units need to manage the balance of support with increased autonomy among healthcare practitioners to manage emergency care nurses wellbeing especially during emergency situations.

To mitigate possible physical and psychological damage to the emergency care nurses, emergency medical facilities advocated autonomy in practice as psychological first aid and morale boosters. Interestingly, emergency professionals who are less exposed to fewer stations appeared to experience more autonomy than those on the actual front line. This implies that attention should be provided on strengthening autonomy, particularly to health and mental wellness interventions. Moreover, emergency professionals who are not able to exercise autonomy in direct patient care appeared to be more stressed and less fulfilled in their job compared to emergency professionals with greater autonomy in other areas of assignment.

Results of the study affirm the with the study of Azadnajafabad (2020) which delineates care professional's autonomy versus their obligations during an emergency is a controversial issue. Autonomy is one of the human rights to make decisions regarding the performance of healthcare-related tasks or to refuse to provide care. Incidentally, during emergency situations, care professionals join the front line to respond to patients in distress. Emergency care nurses have been present everywhere such as in hospitals, clinics, and treat patients. At times, emergency care nurses struggle with a shortage of equipment but they still must actively participate in combating the challenges of emergency medical response. Given the risk and challenges of emergency, there are also the concerns that cannot be ignored. Furthermore, if emergency care nurses are in a healthy state, they can also provide highly effective health care services to the patients (Zhang et al., 2020).

Meanwhile, emergency medical responders have the knowledge and skills to provide the health care services which are needed for all stages of illness. On the other hand, emergency care nurses also provide psychological support, such as reassurance, information for patients, and support for people outside the community who are living in fear and anxiety during emergency. Therefore, a right to maintain safety must be respected whenever a care professional is threatened. However, there are still scary things that care professionals must be in frontline of emergency, especially when they struggle with time to maintain the patients alive. Despite actively participating in the fight against time, emergency care nurses are experiencing fears of the unknown and anxiety for what lies ahead for themselves and colleagues. In addition to performing their roles at the emergency medical services, care professionals also must shoulder the additional responsibility of supporting and protecting themselves which is a psychological burden for care professionals during emergency situation (Ruiz-Fernández et al., 2020).

Table 2

Assessment on Psychological Well-Being of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China in Terms of Environmental Mastery

Variables	Mean	SD	VI
I feel I am generally in charge of the situation in which I live.	3.30	0.63	SA
I am good at managing the responsibilities of daily life.	3.52	0.62	SA
I remain strong in coping with the demands of everyday life.	3.54	0.60	SA
Overall Mean	3.45	0.62	SA

Legend: 3.26-4.00 (Strongly Agree -SA / Highly Satisfied) ; 2.51-3.25 (Agree-A / Satisfied) ; 1.76-2.50 (Disagree-D / Not Satisfied) ; 1.00-1.75 (Strongly Disagree -SD / Highly Not Satisfied)

Table 2 shows the summary of values showing the mean and verbal interpretation in the assessment of the emergency care nurses on their psychological well-being in selected specialty hospitals in Anhui Province, China in terms of environmental mastery with an overall mean of 3.45 verbally interpreted as "strongly agree". The assessment showed homogeneous response as depicted by standard deviation of 0.62. The strongest component of environmental mastery domain in which the majority of emergency care nurses strongly agree pertains to "I remain strong in coping with the demands of everyday life" ($\bar{x} = 3.54$). Meanwhile, the weakest component of environmental mastery in which the majority of emergency professionals strongly agree refers to "I feel I am generally in charge of the situation in which I live" ($\bar{x} = 3.30$).

Psychological well-being in the emergency care units is an essential characteristic of emergency care nurses especially in the hospital setting. Being well-motivated and healthy in emergency care practice allows emergency professionals to be able to adjust to their work routine much better. Psychological well-being equates with innovativeness which is an important component of environmental mastery. Familiarity with work affords greater flexibility in duties and responsibilities of emergency professionals. Emergency care nurses interact with patient

and the patient’s family environment and social net (friends, relatives and acquaintances) and familiarity with duties and responsibilities is essential. While emergency care nurses with immense exposure have to maintain social interaction and need to disintegrate from their social lives, having environmental mastery resolves practical difficulties in social activities. Managing the responsibilities of daily routines alleviates anxiety over changes associated with emergency crisis often result in increased stress, tension and irritation between family members; and a worsening of collegial relationships. Apart from coping with the demands of work duties, another aspect of medical emergency gruesome influence on quality of life takes place through environmental mastery.

According to Zhang et al. (2020) environmental mastery is important during emergency crisis as it can be associated to becoming more flexible with physical constraints on maintaining disruption of professional functioning, relationships and roles; increased social isolation and dependence; and deterioration of work prospects resulting in increased financial strain. Improved environmental mastery can reduce adverse emotional responses such as fear, anxiety, vulnerability, guilt, loss of confidence, anger, stress and self-perception issues. Catton (2020) explained that environmental mastery in healthcare practice allows emergency professionals to hurdle the social impact of emergency crisis which entails alteration in work productivity and work relationships.

A state of discomfort or fear caused by events or situations that threaten cognition, environmental mastery is common among care professionals directly involved in emergency care and management of distressed patients. Emergency medical respondents are one of the key experts outside hospital setting. Care professionals must be ready to face the pain and death of patient. These situations increase fear, anxiety and present a challenge in providing quality care to patients (Sim, 2020). In emergency cases, the workload increases, the working process may change from usual, and the lack of resources may lead to incorrect arrangement. The efficient use of resources is necessary and urgent. The scientific arrangement of shifts and reasonable workforce allocation will also optimize the delivery of supplements, reduce the workload, improve the quality of care, and promote the psychological well-being during emergency situations

Emergency care nurses have always played a significant role in public health and become one of the main healthcare providers for patients in the battle. In this case, emergency responders have required the ability to control the environment to maintain critical functionality and improve the quality of service. Working with the increased workloads can lead to work stress, reduced emergency performance, and quality of life (Brooks et al., 2019). Therefore, the responsibilities and working procedures of care professional in emergency response team must be adjusted immediately to reduce the workload.

Table 3
Assessment on Psychological Well-Being of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China in Terms of Personal Growth

Variables	Mean	SD	VI
I have strong determination in making big improvements or changes in my life	3.52	0.60	SA
I think it is important to have new experiences that challenge how I think about myself and the world.	3.54	0.54	SA
I believe life has been a continuous process of learning, changing, and growth.	3.66	0.43	SA
Overall Mean	3.57	0.34	SA

Legend: 3.26-4.00 (Strongly Agree -SA/ Highly Satisfied) ; 2.51-3.25 (Agree-A/ Satisfied) ; 1.76-2.50 (Disagree-D/ Not Satisfied) ; 1.00-1.75 (Strongly Disagree -SD/ Highly Not Satisfied)

Table 3 shows the summary of values showing the mean and verbal interpretation in the assessment of the emergency care nurses on their psychological well-being in selected specialty hospitals in Anhui Province, China in terms of personal growth with an overall mean of 3.57 verbally interpreted as “strongly agree”. The assessment showed homogeneous response as depicted by standard deviation of 0.34. The strongest component of personal growth domain in which the majority of emergency care nurses strongly agree pertains to “I believe life has been a continuous process of learning, changing, and growth” ($\bar{x} = 3.66$). Meanwhile, the weakest component of personal growth in which the majority of emergency care nurses strongly agree refers to “I have strong determination in making big improvements or changes in my life” ($\bar{x} = 3.52$).

Continuous life-long learning among emergency care nurses is an important factor of personal growth. Every

emergency care nurse should be afforded opportunities for advancement in order to grow in the profession. Nevertheless, emergency care nurses should be constantly motivated to pursue more, aim higher, and aspire for greater accomplishments even during tough challenges such as the emergency crisis. Trainings and updates for career growth must be sustained and further expanded for the benefit of enhancing personal and professional competency.

By being on the frontline of emergency cases, emergency care nurses assume the risk of contracting an infection. When responding to ill patients, they can be exposed to pathogens even when following all safety guidelines and procedures. While newer policies and upgraded equipment have lessened the risk to healthcare professionals in recent years, emergency professionals achieve personal growth for their sake. Despite the struggles, frustrations, and risks associated with their jobs, emergency care nurses may remain strong and steadfast in the face of overwhelming odds. Emergency professionals duck in and out of care facility by the hour, many of whose stories may never be told but will forever be appreciated by those who received their help. Emergency care nurses develop self-care strategies such as emotion regulation and self-compassion to lessen their vulnerability to care fatigue and to improve their psychological well-being and resilience. When fighting against critical emergency, managing stress and avoiding burnout becomes a top priority in which a lot of personal growth are discovered along the way. Therefore, emergency professionals must keep their opportunities open and take all the necessary precaution to protect themselves both physically and psychologically. The role of emergency professionals in an emergency situation begins even before a patient's condition provides an opportunity for new learning, new experience, and new innovation (Lee et al., 2021).

The emergency situations have created difficult and challenging issues for care professionals. As a large group of emergency healthcare workers, on the front lines of the system, the emergency care nurses along with other healthcare practitioners, instead of choosing to run away from this challenge, have acknowledged it as a growth and change. The emergency care nurses who had directly taken care of patients in close physical and mental tend to learn through experience. In addition, they are also called and challenged during unexpected emergencies (Raven et al., 2020). During emergency crisis, care professionals have matured psychologically under the pressure of dealing with medical response. Care professionals outside hospital setting can also re-evaluate their own worth and find the motivation to develop themselves by being grateful for the support of institution, friends, and colleagues. A survey showed that most emergency care nurses had a "good" to "extremely good" level of knowledge, receiving information about accidents in terms of the resources and time in which everyone must be fully prepared and receive specific education and guidance (Nahidi et al., 2021). Life-long learning is essential for career growth in emergency medical response profession and enhancing the effectiveness of health care services. Life-long learning is even more urgent during emergency situations when care professionals often must deal with an frequency in patient's deaths. Researchers also suggest that lifelong learning and personal and professional development are also reflected in membership in professional organizations (Liu et al., 2020).

Table 4 shows the summary of values showing the mean and verbal interpretation on the assessment of the emergency care nurses on their psychological well-being in selected specialty hospitals in Anhui Province, China. in terms of purpose in life with an overall mean of 3.60 verbally interpreted as "strongly agree". The assessment showed homogeneous response as depicted by standard deviation of 0.56. The strongest component of purpose in life domain in which the majority of the emergency care nurses strongly agree pertains to "I have always considered positive direction and important goals through life" ($\bar{x} = 3.68$). Meanwhile, the weakest component of purpose in life in which the majority of the emergency care nurses strongly agree refers to "I feel like I have done a lot of good accomplishments in life" ($\bar{x} = 3.55$). Having a strong purpose in life sets a definite direction on where emergency professionals are heading to. Career goals must be supported through effective mentoring from senior staff and other supervisors in order to enhance motivation to strive more and grow even further. The emergency professionals feel more inspired at work when they feel supported. The emergency care providers are indispensable component of emergency operation, hence must be well-guided towards their objectives.

Learning to respond compassionately to personal distress requires stronger recognition of purpose in life in

which self-acceptance in turn can strengthen the emergency professionals' ability to activate self-regulation systems in order to feel safe (i.e., self-soothing activities stimulate positive emotions like contentment, more secure attachment) rather than feeling under threat. Developing a greater sense of self-awareness including mindfulness meditation and compassion training plays a crucial role in discovering one's purpose in life. Focus, determination, motivation, and confidence must remain as the central component of nursing practice and, more importantly, must be provided with the time, autonomy and knowledge to act as patient advocates. Enhancing purpose in life requires critical thinking in order to evaluate facts and come to rational conclusions objectively. A disciplined and self-directed way of looking at things allows the emergency professionals to prioritize patient needs and troubleshoot difficult clinical issues quickly and accurately. The ability to think critically is an important quality because while emergency professionals most often function in collaboration with other healthcare practitioners, their practice is autonomous, and their professional decisions are their sole responsibility (Brooks et al., 2019).

Table 4
Assessment on Psychological Well-Being of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China in Terms of Purpose in Life

Variables	Mean	SD	VI
I feel like I have done a lot of good accomplishments in life	3.55	0.66	SA
I value living with a purpose and I focus about the future.	3.58	0.52	SA
I have always considered positive direction and important goals through life.	3.68	0.49	SA
Overall Mean	3.60	0.56	SA

Legend:3.26-4.00 (Strongly Agree -SA/ Highly Satisfied) ; 2.51-3.25 (Agree-A/ Satisfied) ; 1.76-2.50 (Disagree-D/Not Satisfied) ; 1.00-1.75 (Strongly Disagree -SD / Highly Not Satisfied)

The extreme experiences during emergency medical response can make care professionals afraid, losing the normality in life. In these situations, emergency medical staff, including nurses, are ready to do their stem the tide of emergency crisis. Care professionals must be prepared for the role of determining health system policies, preparedness, and recovery efforts to maintain health care services for patients, cooperation, and information sharing. This means that care professionals outside hospital are present in every position to save lives. Emergency responders have faced challenge of saving lives. Emergency care nurses are the ideal people for critical tasks because of their training and experience (Ji et al., 2020). When challenges during critical times, emergency care nurses not only directly treat and take care of vulnerable people but also provide psychological support, quelling the fear of the patients and the community, and addressing concerns. According to Lehman et al (2020), care professionals around the world were taking a supporting role in the response to emergency crisis. The emergency care nurses as part of the health care system have played a significant role in emergency preparedness, prevention, and response.

Table 5 shows the summary of values showing the mean and verbal interpretation in the assessment of the emergency care nurses on their psychological well-being in selected specialty hospitals in Anhui Province, China in terms of self-acceptance with an overall mean of 3.53 verbally interpreted as “strongly agree”. The assessment showed homogeneous response as depicted by standard deviation of 0.51. The strongest component of self-acceptance domain in which the majority of emergency care nurses strongly agree pertains to “I feel grateful in many ways about my achievements in life” ($\bar{x} = 3.61$). The weakest component of self-acceptance in which majority of emergency care nurses strongly agree refers to “I like most parts of my personality” ($\bar{x} = 3.44$).

Table 5
Assessment on Psychological Well-Being of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China in Terms of Self-Acceptance

Variables	Mean	SD	VI
I feel grateful in many ways about my achievements in life.	3.61	0.46	SA
I am pleased with how things in my life have turned out so far	3.54	0.55	SA
I like most parts of my personality.	3.44	0.52	SA
Overall Mean	3.53	0.51	SA

Legend:3.26-4.00 (Strongly Agree -SA/ Highly Satisfied) ; 2.51-3.25 (Agree-A/ Satisfied) ; 1.76-2.50 (Disagree-D/Not Satisfied) ; 1.00-1.75 (Strongly Disagree -SD / Highly Not Satisfied)

Recognition for emergency care providers' contribution in the healthcare practice create a stronger sense of collegiality. Good accomplishments must be valued and supported by organizational management so that they

would be more inspired. When novice emergency care nurses effort get valued, they feel accepted in the profession which brings more confidence. A confident emergency care nurse equates with greater productivity in the emergency practice. Self-acceptance as part psychological well-being is fundamental to the emergency care profession, with dissonance, as a result of surface acting in day-to-day practice, a potential contributing factor to stress and burnout. The challenge of working in emergency cases is likely to have an enduring impact on the psychological well-being of healthcare staff.

In the midst of emergencies, emergency care nurses are risking their lives to save the lives of others. Lee et.al., (2021) explained on the significance of self-acceptance for missed opportunities, misguided leadership, and missing supplies which all have led to balancing emergency care nurses' sense of duty with the increasing risks of the job. During medical emergencies, emergency care nurses can expect to work longer shifts, especially as the pathogens spread and healthcare workers themselves fall ill, leaving gaps in the workforce. The emergency care nurses must teach others everything they practice, from symptom awareness and sanitation to disease prevention. As the frontline of healthcare emergency, emergency professionals bear the additional responsibility of caring for their patients and the general public. The emergency professionals have a strong command when it comes to saving lives during medical emergencies (Lara et.al, 2021).

In emergency cases outside hospital, the care professionals expose their lives to save the patients' lives. Although there have been management improvements, supportive resources, and process compliance, care professionals were still at risk when performing their tasks. Emergency care nurses must accept challenges for their interests and society. Stress situations can lead to exhaustion, so when dealing with emergencies, the care providers must prioritize stress control and avoid exhaustion. The care professionals engaged in emergency response must take the necessary precautions to protect themselves in terms of physical and mental health. Emergency care nurses can use emotional and compassionate strategies to reduce the risk of psychological damage, Practicing self-acceptance will help nurture to develop greater awareness about healthcare careers. Psychological well-being, healthcare management systems should advocate in using mental health services, such as psychological first aid, crisis interventions, and access to social media (Kang et al.,2020). Care professionals play a significant role in preparation for a crisis and fighting against, so that their role in emergency situations begins even before serious adverse events may occur (Laosebiakn et al., 2021). Despite the difficulty and risk factors during an emergency, care professionals should remain steady and consistent, and use strategies such as clinical performance and self-esteem to improve psychological well-being during difficult situations.

Table 6 shows the summary of values showing the mean and verbal interpretation in the assessment of the emergency care nurses on their psychological well-being in selected specialty hospitals in Anhui Province, China in terms of relations with others with an overall mean of 3.41 verbally interpreted as "strongly agree". The assessment showed a homogeneous response as depicted by standard deviation of 0.62. The strongest component of relations with others domain in which the majority of emergency care nurses strongly agree pertains to "I am being described as a giving person and always willing to share my time with others" ($\bar{x} = 3.49$). Meanwhile, the weakest component of relations with others in which the majority of emergency care nurses strongly agree refers to "I always find it easy and comfortable to maintain close relationships" ($\bar{x} = 3.36$).

Table 6

Assessment on Psychological Well-Being of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China in Terms of Relations with Others

Variables	Mean	SD	VI
I always find it easy and comfortable to maintain close relationships.	3.36	0.67	SA
I am being described as a giving person and always willing to share my time with others	3.49	0.62	SA
I have always experienced many warm and trusting relationships with others.	3.38	0.56	SA
Overall Mean	3.41	0.62	SA

Legend:3.26-4.00 (Strongly Agree -SA/ Highly Satisfied) ; 2.51-3.25 (Agree-A/ Satisfied) ; 1.76-2.50 (Disagree-D/Not Satisfied) ; 1.00-1.75 (Strongly Disagree -SD / Highly Not Satisfied)

Collegiality in the emergency profession means a lot in collaborative endeavors. Collaboration makes more sense in emergency care practice in so far as continuity of care is essential in healthcare. Care must be properly

coordinated between emergency care nurses in order to ensure quality patient care. Interpersonal relationships also extend not just with colleagues but also with their patients. Emergency crisis may, unsurprisingly, make emergency professionals vulnerable to stress and can lead to feelings of compassion fatigue with the duties they perform. Relations with others allow emergency care nurses to cope with one’s everyday environment which may lead to increased levels of resilience and decreased burnout, resulting in an overall good quality of life, both personally and professionally (Liu et al., 2020).

Many emergency care nurses are working on the front lines. Although not the largest sector of the healthcare workforce, they are the backbone and lifeblood of emergency care. In hospitals, emergency professionals are sacrificing a great deal for the good of the whole, with some falling ill or even giving their very lives. Relations with others helps diminish workplace stress for any healthcare professional directly assigned in medical emergencies. Many emergency care nurses are accustomed to facing mortality and suffering on a daily basis, yet the scope of this emergency care is staggering in which keeping up the communication and stronger collaboration with colleagues makes a difference (Hong et al., 2020). Emergency care nurses continual exposure to rescues to accidents had the potential to threaten physical and psychological health. This can affect psychological well-being and reduce compliance with technical procedures, increasing stress and efficiency of healthcare services. In addition, care professionals may experience the effects of stress during emergency response, fear of negative outcomes and post-traumatic stress disorder symptoms (Zammiti et al.,2021). Zang et al (2020) showed that the emergency and disaster crisis and its effects are related to depression, increased isolation, and social dependence; poor job progress can affect their finances (Zhang et al., 2020). Exposure to emergency situations increase anxiety about maintaining psychological well-being or feeling burdened (Jiambo et al., 2020).

Table 7 shows the summary of values showing the mean and verbal interpretation of the assessment of the emergency care nurses on their resilience in selected specialty hospitals in Anhui Province, China in terms of active coping with an overall mean of 3.56 verbally interpreted as “strongly agree”. The assessment showed homogeneous response as depicted by standard deviation of 0.54. The strongest dimension of active coping domain that the emergency care nurses strongly agree pertains to “I am able to adapt when changes occur” ($\bar{x} = 3.68$). Meanwhile, the weakest dimension of active coping domain that the emergency care nurses strongly agree refers to “I am able to handle unpleasant or painful feelings like sadness, fear, and anger” ($\bar{x} = 3.39$).

Table 7
Assessment on Resilience of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China in Terms of Active Coping

Variables	Mean	SD	VI
I am able to adapt when changes occur.	3.68	0.47	SA
I can deal with whatever comes my way.	3.50	0.53	SA
Having to cope with stress can make me stronger.	3.60	0.57	SA
I like challenges	3.61	0.56	SA
I am able to handle unpleasant or painful feelings like sadness, fear, and anger.	3.39	0.56	SA
Overall Mean	3.56	0.54	Sa

Legend:3.26-4.00 (Strongly Agree -SA / Highly Satisfied) ; 2.51-3.25 (Agree-A / Satisfied) ; 1.76-2.50 (Disagree-D/ Not Satisfied) ; 1.00-1.75 (Strongly Disagree -SD / Highly Not Satisfied)

Active coping appears to play a significant role in the interaction between stressful situations and adaptations. Active coping can be behavioral or cognitive. Coping describes any behavior that is designed to manage the stresses and overwhelming feelings that come with tough situations. By learning and developing positive coping skills, a worker will be set up with an important skill for life. Active coping strategies increase long-term resilience. Resilience among emergency professionals in medical emergency units is enhanced when they are able to maintain long-term, meaningful relationships with residents. Collegial support that provides opportunities to debrief and validate experiences as well as the use of humor to defuse stress promotes and builds resilience in the workplace.

Resilience is often described as a factor that can mitigate against stress. It is frequently described as the ability to adapt positively in the face of stress and adversity, to recover from these difficulties, and to potentially gain strength from them. The need to demonstrate resilience is now an integral component of professional standards frameworks. The emergency professionals must be emotionally intelligent and resilient individuals, who are able

to manage their own personal health and well-being, and know when and how to access support.

According to Flesia et al. (2020), there are two different types of resilience: ‘One that is a protection from stress or pressure so that individuals can build their stress tolerance, and the second allows them to bounce back after difficulty so that they recover to their normal state of functioning more quickly. It is different from mental toughness in that resilience allows for adaptability when pressures arise, whereas mental toughness implies a level of single-mindedness and dogged determination. Odessa et al. (2019) explained that there is a certain amount of emotional awareness in resilience that allows for noticing the impact of stressful situations before they become critical, impact upon functioning and possibly lead to burnout.

Active environments and coping style are characterized by problem-solving, seeking information-social support-professional help, changing environments, and planning for activities. Raven et al.(2020) suggested that active coping as an adaptive stress response improves outcomes in medical and neuropsychiatric diseases. Because a positive attitude is the strongest protective factor against distress (Raven et al., 2020), the higher the positive attitude, the lower distress levels (Babore et al., 2020). The positive coping strategy had a significant role in the management of negative states such as anxiety during emergency crisis (Lara et al., 2021), because of the moderate associations among race-related stress, rumination, and depressive symptoms. Active-coping strategies and greater perceived control are associated with improved pain-related outcomes; and allows individuals to positively reinterpret negative situations, as it is related to self-efficacy, greater psychological well-being, and better quality of life (Flesia et al., 2020). On the other hand, active coping and perceived social support mediate the relationship between physical health and resilience (Swanson et al., 2021).

Healthcare workers who had positive coping strategies used active coping and help-seeking, related to high psychological well-being; and negative coping strategies, such as avoidance, related to low psychological well-being (McFadden et al., 2021). Previous studies also determined the relationship between stress and coping strategies (Cai et al., 2020), and interact with behavioral and cognitive efforts to reduce the pressure of a stressful situation. Thus, it can be deduced that active coping is a condition that is vital in sustaining resilience, and that the content of resilience evaluation cannot be devoid of active coping.

Table 8

Assessment on Resilience of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China in Terms of Cognitive Flexibility

Variables	Mean	SD	VI
In times of stress, I know where to find help	3.37	0.56	SA
Under pressure, I stay focused and think clearly	3.65	0.49	SA
I prefer to take the lead in problem-solving	3.38	0.59	SA
I make unpopular or difficult decisions.	3.26	0.60	SA
I have to guess based on emotions rather than facts	3.44	0.42	SA
Overall Mean	3.42	0.53	SA

Legend:3.26-4.00 (Strongly Agree -SA / Highly Satisfied) ; 2.51-3.25 (Agree-A / Satisfied) ; 1.76-2.50 (Disagree-D / Not Satisfied) ; 1.00-1.75 (Strongly Disagree -SD / Highly Not Satisfied)

Table 8 shows the summary of values showing the mean and verbal interpretation of the emergency care nurses on their resilience in selected specialty hospitals in Anhui Province, China in terms of cognitive flexibility with an overall mean of 3.42 verbally interpreted as “strongly agree”. The assessment showed a homogeneous response as depicted by standard deviation of 0.53. The strongest dimension of cognitive flexibility domain that the emergency care nurses strongly agree pertains to “Under pressure, I stay focused and think clearly” ($\bar{x} = 3.65$). Meanwhile, the weakest dimension of cognitive flexibility domain that the emergency care nurses agree refers to “I make unpopular or difficult decisions” ($\bar{x} = 3.26$).

The emergency care nurses who are resilient tend to be flexible in the way they think about challenges and flexible in the way they react emotionally to stress. They are not wedded to a specific style of coping. Instead, they shift from one coping strategy to another depending on the circumstances. Many are able to accept what they cannot change; to learn from failure; to use emotions like grief and anger to fuel compassion and courage; and to search for opportunity and meaning in adversity. Sometimes acceptance involves not only acknowledging the

reality of one's situation, but also assessing what can and cannot be changed, abandoning goals that no longer seem feasible, and intentionally redirecting efforts toward that which can be changed. Thus, acceptance is similar to cognitive flexibility which does not involve giving up or quitting. Instead, acceptance is based on realistic appraisal and active decision-making.

One of the most important actions emergency professionals can take is to cultivate awareness and attention, and this stretches across several domains. An awareness of emotions allows an individual to respond in a more rational way rather than being hijacked by automatic responses. Taking time to get to know the different feelings in the body created by different emotions will allow one to spot when the risk of hijacking is increasing. Using a technique such as the three-step breathing practice can help create space between feeling an emotion rising and reacting to it, which can be useful if it is difficult to regain from a stressful situation.

According to Babore et al. (2020), an awareness of alternative options to a problem and taking time to see things from novel perspectives can help build resilience. They asserted to listen to your internal voice (self-talk) and spot whether it is helpful or hindering. Moreover, they pointed to ask whether the voice is logical and true. Being aware of all the different aspects of life and knowing how times the things we love get neglected without us realizing, hence taking time for self-care is an important part of resilience as it allows fast recovery. While emergency professionals have mastered the art of caring for the physical and emotional needs of injured patients, they tend to forget to care for themselves and each other. Today it is common to find emergency professionals describe their lives as being stuck in 24/7 work mode. It is not only difficult for them to unplug from work but even more difficult to find opportunities to recharge physical and emotional banks.

During an emergency crisis, care professionals are perceived as the first-line health provider, having a public awareness role, and providing care for injured or distressed patients. Besides being responsible for their daily activities, care professionals have roles in ensuring the safety and contentment of their patients outside hospital. When emergency care nurses identify patient care needs, workload management, and reflecting on missed care opportunities; emergency medical respondents present several barriers to their decision-making (Anton et al., 2021). However, the public support and acknowledgment of care provider's role during emergencies positively influenced feelings of being valued (Ashley et al., 2021). This may cause most emergency care providers to remain positive about their roles and career decisions.

Emergency care response and health policy need to prepare well for any unpredicted emerging healthcare emergencies in the future. Preparation to respond to emergencies requires multilateral measures. First, care professionals must be provided adequate equipment and competent team should be the highest priority for healthcare policymakers around the world to combat emergency situations successfully. Second, care professionals outside hospital should have cognition and prepare for their role in emergency medical response. Because the preparation can reduce the damages to this group and maximize their efforts to protect the patients. Thus, emergency medical response services should try to promote the care professional's awareness and preparedness (Sharififar et al., 2021).

Measuring the care professional's preparedness can clarify the challenges in emergency measures taken to respond to the crisis. Evaluating the care professional, determining the challenges and priorities, and finding solutions to resolve them also improve performance in providing emergency health care services. On the other hand, the cognitive emotion regulation strategies of acceptance and positive refocusing contribute to reducing anxiety or depression. These strategies should be considered when implementing psychotherapeutic interventions to improve care professional's adverse emotional symptoms. The need to assess cognitive emotion regulation strategies used in screening for anxiety and depression should develop psychosocial interventions including appropriate strategies to help with adverse emotions during emergency care (Wang et al., 2021).

Table 9 shows the summary of values showing the mean and verbal interpretation on the assessment of the emergency care nurses on their resilience in selected specialty hospitals in Anhui Province, China in terms of positive emotions with an overall mean of 3.55 verbally interpreted as "strongly agree". The assessment showed

homogeneous response as depicted by standard deviation of 0.53. The strongest dimension of positive emotions domain that the emergency care nurses strongly agree pertains to “I make my best effort, no matter what” ($\bar{x} = 3.70$). Meanwhile, the weakest dimension of positive emotions domain that the emergency care nurses strongly agree refers to “I take pride in my achievements” ($\bar{x} = 3.31$).

Table 9

Assessment on Resilience of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China in Terms of Positive Emotions

Variables	Mean	SD	VI
Past successes give me confidence.	3.62	0.64	SA
I make my best effort, no matter what	3.70	0.43	SA
I have a strong sense of purpose in life	3.58	0.55	SA
I feel like I am in control.	3.54	0.43	SA
I take pride in my achievements	3.31	0.62	SA
Overall Mean	3.55	0.53	SA

Legend: 3.26-4.00 (Strongly Agree -SA / Highly Satisfied) ; 2.51-3.25 (Agree-A / Satisfied) ; 1.76-2.50 (Disagree-D / Not Satisfied) ; 1.00-1.75 (Strongly Disagree -SD / Highly Not Satisfied)

Positive emotions build the emotional resources needed for resilience. Positive emotions broaden awareness towards more options for problem solving. When positive emotions open us up to new possibilities, we are more able to learn and build on our skills. That leads to doing better on tasks. People who have plenty of positive emotions in their everyday lives tend to be happier, healthier, learn better, and get along well with others. Building positive emotions is especially important if we are already dealing with fear, sadness, anger, frustration, or stress. Positive coping strategies, such as positive reappraisal, problem-focused coping, and infusing ordinary events with positive meaning are related to the occurrence and maintenance of positive affect. The emergency care nurses respond to workload stress in different ways. There are certain emergency professionals that excel in the midst of intense stress, while others crash and burn out. Although stress is a normal occurrence in life, unmitigated chronic stress impacts energy and motivation levels, influencing the ability to effectively negotiate workloads and maintain social skills.

While studies have documented poor physical and psychological health among emergency professionals, Saks (2020) emphasized that there is evidence that emergency professionals also experience high satisfaction and positive returns from responding to emergencies. This disparity between observations across studies may be explained by other factors that could influence patient outcomes, such as resilience and social support. Zang et al. (2020) defined resilience as “positive adaptation to face adversity, flexibility, psychological well-being, strength, healthy life, burden, social network, and satisfaction with social support”. They described emergency professionals who have high resilience would experience low burden even when they experience high care demand. This perceived low burden could be attributed to effective coping strategies where resilience was associated with problem- and emotion-focused coping strategies and sense of self-efficacy. Therefore, resilience might be a key variable that explains the ability of some emergency care nurses to ‘bounce back’ and deal with the challenges of caring for their loved ones.

Care professionals can develop personal resilience in several ways, such as finding a meaningful purpose in life, believing that they can influence their surroundings and the outcome of events, and believing they can learn and grow from life experiences. Bright noted that “emotional awareness and self-care are important in developing resilience in emergency response, in addition to optimism, autonomy and empowerment” is essential (Duncan et al., 2020). During emergency response, positive emotions, and laughter promote resilience, care professionals working in emergency care develop resilience through self-nurturing, which included being self-aware, coping adaptively, and accepting limitations. They can support their own mental and spiritual well-being by sharing their experiences of vulnerability and resilience through reflective journals and debriefing.

Table 10 shows the summary of values showing the mean and verbal interpretation of the assessment of the emergency professionals on their resilience in selected specialty hospitals in Anhui Province, China in terms of optimism with an overall mean of 3.47 verbally interpreted as “strongly agree”. The assessment showed a

homogeneous response as depicted by standard deviation of 0.68. The strongest dimension of optimism domain that the emergency care nurses strongly agree pertains to “I believe I can achieve my goals, even if there are obstacles” ($\bar{x} = 3.68$). Meanwhile, the weakest dimension of optimism domain that the emergency care nurses strongly agree refers to “I tend to bounce back after illness, injury or other hardships” ($\bar{x} = 3.31$).

Table 10

Assessment on Resilience of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China in Terms of Optimism

Variables	Mean	SD	VI
I am not easily discouraged by failure	3.36	0.67	SA
I tend to bounce back after illness, injury or other hardships	3.31	0.67	SA
I believe I can achieve my goals, even if there are obstacles	3.68	0.71	SA
Even when hopeless, I do not give up	3.40	0.70	SA
I work to attain goals.	3.58	0.64	SA
Overall Mean	3.47	0.68	SA

Legend: 3.26-4.00 (Strongly Agree -SA/ Highly Satisfied) ; 2.51-3.25 (Agree-A/ Satisfied) ; 1.76-2.50 (Disagree-D/ Not Satisfied) ; 1.00-1.75 (Strongly Disagree -SD/ Highly Not Satisfied)

Learned optimism is a personal trait and optimistic emergency professionals use an adaptive style in order to explain adverse situations. In turn, dispositional optimism refers to a general belief that good things will happen rather than bad things in the future. Hence, optimism, understood as a personality trait reflects good expectations for the future. Resilience is related to effective adaptive resources to occupational stress. Hence, resilience, constructed in the positive optimism, can be understood as a protective factor since it prevents emergency professionals from maladaptive strategies reducing, in turn, occupational stress levels. Findings of the study have highlighted the benefits that optimism has on physical and psychosocial well-being such as reducing depressive symptoms and stress impact, enhancing self-esteem, forming and maintaining relationships, and favoring adjustment to the health profession. In a recent study, it was found that optimistic emergency professionals were more engaged than non-optimistic ones.

According to Swanson et al. (2021), resilience is generally understood as an optimistic outcome despite exposure to adversity or risk, and focuses on strengths rather than weaknesses. The emergency professionals draw on individual resources and interact with their environment by drawing on community and societal resources which may facilitate or hinder resilience. Sacristan (2021) identified the absence of resources may lead to poor outcomes or further caring challenges. Resilience can be described as ‘the process of negotiating, managing and adapting to significant sources of stress or trauma. Assets and resources within the individual, their life and environment facilitate this capacity for adaptation and “bouncing back” in the face of adversity.

Optimism is one factor in predicting preventive behaviors, and its effects on the beliefs, actions, and behaviors of care professionals while caring for the patients, especially during emergencies. Studies that determined care professional’s optimism during emergency crisis showed that care professionals had a high optimism level. For instance, Mishra et al. (2021) conducted research on the optimism of emergency care responders in India, the result showed that more than half of the participants had high optimism. On the other hand, HCW's confidence level against the length of service showed significantly better confidence than others in terms of confidence in performing high-quality chest compression and handling medical equipment; care professionals also confident in resuscitating, leading the resuscitation, managing the airway, and intubation attempt (Abd Samat et al., 2020). A sample of 120 care providers who participated in the research showed that there was a moderate level of self-confidence, and positive relationships were found between carers’ self-confidence with self-efficacy ($r=0.81$) and carer-patient interaction ($r = 0.79$). The results also indicated that there was a significant difference in self-confidence and carer-patient interaction (Abu Sharour et al., 2021). These results were proof that emergency medical response services should develop further strategies, such as training, organizational support, and preparing the availability of protective measures to increase self-confidence and the interaction with distressed patients.

Table 11 shows the summary of values showing the mean and verbal interpretation of the assessment of the emergency professionals on their resilience in selected specialty hospitals in Anhui Province, China in terms of spirituality with an overall mean of 3.45 verbally interpreted as “strongly agree”. The assessment showed a

homogeneous response as depicted by standard deviation of 0.59. The strongest dimension of spirituality domain that the emergency care nurses strongly agree pertains to “I think of myself as a strong person when praying with life’s challenges and difficulties” (\bar{x} = 3.70). The weakest dimension of spirituality domain that the emergency care nurses strongly agree refers to “I believe most things happen for a reason” (\bar{x} = 3.28).

Table 11

Assessment on Resilience of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China in Terms of Spirituality

Variables	Mean	SD	VI
I believe most things happen for a reason	3.28	0.63	SA
I think sometimes fate or God helps me.	3.31	0.66	SA
I think of myself as a strong person when praying with life’s challenges and difficulties	3.70	0.70	SA
I hold on to my faith and try to see more of my blessings of life when I am faced with problems	3.55	0.52	SA
I have one close relationship and secured spiritual values.	3.42	0.44	SA
Overall Mean	3.45	0.59	SA

Legend: 3.26-4.00 (Strongly Agree -SA/ Highly Satisfied) ; 2.51-3.25 (Agree-A/ Satisfied) ; 1.76-2.50 (Disagree-D/ Not Satisfied) ; 1.00-1.75 (Strongly Disagree -SD/ Highly Not Satisfied)

Spirituality potentially serves as a pathway to resilience. Religion as a source of meaning and grounding may become more important as people move throughout the life course. Many emergency professionals draw on their religion and faith when confronted with challenges associated with aging, illness, and various other life challenges. Religion and spirituality provide people with a source of hope, comfort, and resilience in the face of adversity. The emergency care nurses have a spiritual dimension by nature of being human, and therefore, each person has the capacity for spirituality. In essence, spirituality in life consists of finding core meaning in life, responding to meaning, and being in relationship with higher entity. For many people, as they grow older, these contemplations are translated into the search for life-meaning. Essentially, spirituality involves an intense awareness of the present moment, a belief in a Supreme Being or higher power, and/or the transcendence of self. Conceptualizations of spirituality and its relationship to resilience equates with experience of stress and hardship, while enduring adversity over the life course.

Ram et al. (2020) described the aspect of resilience where spirituality has the potential to be a major resource for emergency professionals as they age and as they expand their consciousness. They described spirituality as providing emergency professionals a framework that guides them through painful and joyful events, often facilitating positive discoveries amidst negative experiences. Consequently, spirituality is a powerful resource in late life providing emergency professionals with the ability to adapt to changing individual needs. Moreover, spirituality as conceptualized as a “realm of human experience, ” encapsulates an intense awareness of the present; transcendence of the personal self; and/or a feeling of connection with all of life, the universe or a “Supreme Being” (Swanson et al., 2021).

Spirituality is considered a fundamental aspect of emergency medical response team. Previous studies identified benefits of spiritual care, including supporting emotional well-being and strengthening relationships between care professionals and patients. For instance, to explore the effective spirituality affecting the resilience of care professionals, Rajabipoor et.al. (2021) conducted research, and the results showed that spirituality affecting the resilience of emergency responders were religious values, morality, self-awareness, patience and hope, wisdom, voluntary activities, and the otherworld belief. Atarhim et al (2019) also found that there was a positive relationship between perception of spirituality and spiritual care among the respondents. Most care professionals during emergencies felt that they required more education and training about spiritual aspects of care (Wais, 2019). These results were a demonstration that providing adequate curriculum and on-job training to equip emergency medical responders with knowledge and competence of spiritual care is urgent in a healthcare environment because the program has positive effects on the spiritual and resilience of care professionals.

Table 12 shows the summary of values showing the mean and verbal interpretation in the assessment of the emergency care nurses on their work productivity in selected specialty hospitals in Anhui Province, China in terms of work engagement dimension with an overall mean of 3.33 verbally interpreted as “strongly agree”. The assessment showed a homogeneous response as depicted by standard deviation of 0.65. The strongest component

of work engagement dimension which the majority of emergency care nurses strongly agree pertains to “I work hard to achieve established goals.” ($\bar{x} = 3.48$). Meanwhile, the weakest component of work engagement dimension in which the majority of emergency care nurses strongly agree refers to “I can multitask between several projects.” ($\bar{x} = 3.26$).

Table 12

Assessment on Work Productivity of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China in Terms of Work Engagement

Variables	Mean	SD	VI
I kept abreast of current developments pertaining to my job.	3.29	0.53	SA
I work in an organized manner.	3.32	0.62	SA
I work hard to achieve established goals.	3.48	0.67	SA
I can multitask between several projects.	3.26	0.67	SA
I am determined to meet productivity standards.	3.28	0.71	SA
I always listen to suggestions and articulate ideas effectively.	3.30	0.70	SA
I hold myself accountable to goals and objectives.	3.34	0.64	SA
I demonstrate effective leadership talents and skills.	3.31	0.63	SA
I positively motivate others to achieve goals and gain skills	3.34	0.66	SA
I understand my job requirements and responsibilities.	3.41	0.70	SA
Overall Mean	3.33	0.65	SA

Legend: 3.26-4.00 (Strongly Agree -SA / Highly Satisfied) ; 2.51-3.25 (Agree-A / Satisfied) ; 1.76-2.50 (Disagree-D / Not Satisfied) ; 1.00-1.75 (Strongly Disagree -SD / Highly Not Satisfied)

Work engagement of emergency professionals is extremely beneficial to any workplace. Work engagement has emerged as a critical driver of organizational success in today's competitive marketplace. High levels of work engagement promote retention of talent, foster customer loyalty and improve organizational performance. Work engagement can be affected by social cohesion, feeling supported by one's supervisor, information sharing, common goals and vision, communication, and trust. The emergency professionals want to feel valued and respected; they want to know that their work is meaningful and their ideas are heard. Highly engaged emergency professionals are more productive and committed to the organizations in which they work. Engaged emergency care nurses might report feeling focused and intensely involved in the work they do. They are enthusiastic and have a sense of urgency. Engaged behavior is persistent, proactive and adaptive in ways that expand the job roles as necessary. Engaged emergency professionals go beyond job descriptions in, for example, service delivery or innovation. Work engagement increases dramatically when the daily experiences of emergency care nurses include positive relationships with their direct supervisors or managers.

The emergency care nurses engagement to their work and to the organization reduces fatigue, burnout, and turnover while improving teamwork, the clinical experience, and organizational outcomes across multiple measures: technically (fewer public works acquired conditions), operationally (staffing and efficiency), culturally (positive work environment and empowerment), and behaviorally (ability to connect with customers and colleagues). A balanced, healthy and supportive hospital work practice environments and psychosocial work environments are all important to sustain stable engagement to work duty and high performance of the workforce. While emergency professionals often work in diverse practice environments, characterized with various difficulties and stress-factors, emergency care providers who have more work engagement, have better performance and are more interested in their job. Moreover, they are more stable when they are faced with difficulties and hardness of work, and this directly affects the success of the healthcare system.

According to Zimmerman (2019), engaged emergency professionals are typically thorough and responsive in their roles and responsibilities, they have a habit of producing quality output. Engaged emergency professionals are more committed to, and enthusiastic about working for the institution. They go the extra mile to provide great quality innovations, while disengaged ones may do bare minimum just to get through the day. As care providers perform incredible work in the face of adversity, clinical work engagement in professional emergency medical response practice is critically important to consider when addressing key challenges of having the required clinical training purposely to increase demands for quality healthcare and positive patient outcomes. Getting all the necessary training to improve clinical performance in the emergency setting is often used to describe commitment

to and productivity in the job. In reality, these are just two facets of engagement including a care professional's level of commitment to the organization that employs them and their commitment to the emergency medical response profession itself. Because engagement to clinical work correlates directly with quality patient outcomes, understanding the current state of work engagement and its drivers must be a strategic imperative (Foster, 2020).

Work engagement or emergency medical responders to their work duty and to the organization reduces compassion fatigue, burnout, and turnover while improving teamwork, the patient experience, and organizational outcomes across multiple measures: clinically (fewer hospital acquired conditions), operationally (staffing and efficiency), culturally (positive work environment and empowerment), and behaviorally (ability to connect with patients and colleagues). A balanced, healthy and supportive practice environment and psychosocial work environments are all important to sustain stable engagement to work duty and high performance of the workforce (Cruz et al., 2020). While emergency medical response team often works in problematic practice environments, characterized with various difficulties and stress-factors, care professionals who have more work engagement, have better performance and are more interested in their job. Engaged care professionals are typically thorough and responsive in their care, they have a habit of producing quality output. Engaged care professional are more committed to, and enthusiastic about working for the institution. They will go the extra mile to provide great quality care, while disengaged employees may do the bare minimum just to get through the day (Foster, 2020).

Emergency care engagement in healthcare is one stabilizing force that helps change adjustment and motivates more efficient performance. When care professionals are highly engaged, it is reflected in the patients' experiences. The commitment and emotional involvement is what enables them to function as the key quality control checkpoint that prevents errors and patient mortality. When care professionals feel engaged in their work duty, their work will be enhanced by the satisfaction of being good at their jobs and achieving work goals, by excitement about challenges and by appreciation in relationships with colleagues (Wais, 2019).

Table 13

Assessment on Work Productivity of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China in Terms of Work Attitude

Variables	Mean	SD	VI
I uphold my organizational culture and values.	3.41	0.33	SA
I make good use of my skills and abilities.	3.44	0.42	SA
I appreciate my career path in my organization.	3.38	0.47	SA
I efficiently utilize all necessary resources to perform my job well	3.66	0.37	SA
I value workforce diversity.	3.36	0.51	SA
I have very high regard for high standard work ethics.	3.35	0.60	SA
I have high regard to managers who communicate a clear sense of direction.	3.39	0.54	SA
I believe my organization adheres to fair and equitable promotion of employees.	3.48	0.43	SA
I am satisfied with fair career movement in the organization.	3.40	0.46	SA
I welcome real opportunities to improve my skills	3.46	0.50	SA
Overall Mean	3.43	0.46	SA

Legend: 3.26-4.00 (Strongly Agree -SA / Highly Satisfied) ; 2.51-3.25 (Agree-A / Satisfied) ; 1.76-2.50 (Disagree-D / Not Satisfied) ; 1.00-1.75 (Strongly Disagree -SD / Highly Not Satisfied)

Table 13 shows the summary of values showing the mean and verbal interpretation in the assessment of the emergency care nurses on their work productivity in selected specialty hospitals in Anhui Province, China in terms of work attitude dimension with an overall mean of 3.43 verbally interpreted as "strongly agree". The assessment showed a homogeneous response as depicted by standard deviation of 0.46. The strongest component of work attitude dimension which the majority of emergency care nurses strongly agree pertains to "I efficiently utilize all necessary resources to perform my job well" ($\bar{x} = 3.66$). Meanwhile, the weakest component of work attitude dimension in which the majority of emergency care nurses strongly agree refers to "I have very high regard for high standard work ethics." ($\bar{x} = 3.35$).

As a caring profession, emergency care nurses involve not only care for injured or critically-ill patients, but also care for one another. The emergency professionals may not fully appreciate the importance of interprofessional relationships if their ethical concern is solely on social and patient issues. Although challenging, emergency professionals' occupational interdependence demands a special relationship among the various levels. Inter-

professional collegiality and true collaboration between health practitioners has been proven to improve overall outcomes. Working together in a respectful relationship, rather than isolated silos ensures the patient remains the center of the most appropriate care. No single profession can do it all. Each professional group must work in close proximity with the other, having mutual respect for the knowledge, competence and skills that each brings to the provision of patient care. Such relationships result in better choice and outcomes for the patient. Ultimately collegiality enhances patient outcomes and respectfully acknowledges the competence and proficiency of each group involved in the delivery of care. Moreover, results of the study noted that collegiality and collaboration are both first lines of professional self-regulation. The emergency professionals much like other professionals tend to avoid conflict with peers, however, and particularly to avoid discussions of errors and problems. Collaboration with other members of the healthcare team certainly improves the quality of administrative and clinical innovations. Collegial relationship also allows emergency professionals to gain valuable experience on field endeavors from other healthcare professionals. Social support from supervisors is an important factor for work attitude, and leaders can support emergency professionals in several ways.

Regular interactions with the emergency professionals are necessary to have the opportunity to consider individual needs. It may be that some emergency professionals need extra training in certain technical procedures, or that some emergency professionals need further challenges. Feedback on work done is also important. Positive feedback on work well done is needed, as well as feedback on mistakes made. Collegiality provides a framework in which emergency professionals are expected to hold each other accountable for the assignment that is given, and for its congruence with standards (Odessa et al., 2019). The emergency professionals who are engaged with their colleagues are expected to hold each other accountable for the initiative, and for its congruence with local and national standards. Collegial relationships in the healthcare profession are important for several reasons: coordinating innovations across shifts or sites; ensuring quality and safety; and establishing and maintaining the standards of professionalism. Collegiality defines the relationships of colleagues working together. The emergency professionals often work in close physical proximity, share tasks and information, trade programs back and forth across shifts, seek each other out for problem-solving and assistance, and are, more than members of many professions, treated by others as a collective task (Ram et al., 2020).

Work attitude is the first line of professional self-regulation. Emergency medical responders much like other healthcare professionals tend to avoid conflict with peers, however, and particularly to avoid discussions of errors and problems. Collaboration with other members of the healthcare team certainly improves quality of care to patients. Work attitude also allows care professionals to gain valuable experience on patient care from other healthcare professionals. Social support from supervisors is an important factor for work engagement, and leaders can support emergency medical responders in several ways (Wang et al., 2021). Regular interactions with the care professionals in medical emergencies are necessary to have the opportunity to consider individual needs. It may be that some care professionals need extra training in certain procedures, or that some need further challenges. Feedback on work done is also important. Positive feedback on work well done is needed, as well as feedback on mistakes made. Collegiality provides a framework in which professionals are expected to hold each other accountable for the care that is given, and for its congruence with standards (Odessa et al., 2019).

Emergency medical responders who demonstrate good work attitude to their colleagues are expected to hold each other accountable for the care that is given, and for its congruence with standards. Work attitude in nursing are important for several reasons: coordinating care across shifts or sites; ensuring quality and safety; and establishing and maintaining the standards of professionalism. Work attitude defines the relationships of colleagues working together. Care professionals often work in close physical proximity, share tasks and information, trade patients back and forth across shifts, seek each other out for problem-solving and assistance, and are, more than members of many professions, treated by others as a collective task (Ram et al., 2020). A more collegial, unified relationship between emergency care responders has the value of enabling everyone to combine their power to improve patient care. A collegial work environment has a sense of belonging, open communication, cooperation and support among staff, effectively managed conflict, a high work satisfaction, and consequently a high staff retention. A combined approach to the challenges of collegiality is good for individual growth, work performance,

and can also facilitate cross-cover through increased workforce productivity. Clearly a collegial culture and work attitude have the advantage of improving work productivity among individuals in order to get the optimum benefit from care professional's potential to contribute (Zimmerman, 2019).

Table 14

Assessment on Work Productivity of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China in Terms of Work Performance

Variables	Mean	SD	VI
I am able to submit high quality work output.	3.36	0.56	SA
I deliver work on time and meet deadlines.	3.28	0.45	SA
I arrive to work on time.	3.44	0.49	SA
I keep myself in professional manner	3.52	0.58	SA
I take initiatives when working.	3.31	0.62	SA
I maintain positive attitude at work.	3.65	0.55	SA
I perform well in high pressure situation.	3.58	0.42	SA
I seek out opportunities for professional growth.	3.46	0.38	SA
I get along with my coworkers.	3.55	0.36	SA
I clearly communicate with others.	3.50	0.40	SA
Overall Mean	3.46	0.48	SA

Legend: 3.26-4.00 (Strongly Agree -SA / Highly Satisfied) ; 2.51-3.25 (Agree-A / Satisfied) ; 1.76-2.50 (Disagree-D / Not Satisfied) ; 1.00-1.75 (Strongly Disagree -SD / Highly Not Satisfied)

Table 14 shows the summary of values showing the mean and verbal interpretation in the assessment of the emergency care nurses on their work productivity in selected specialty hospitals in Anhui Province, China in terms of work performance dimension with an overall mean of 3.46 verbally interpreted as “strongly agree”. The assessment showed a homogeneous response as depicted by standard deviation of 0.48. The strongest component of work performance dimension which the majority of emergency care nurses strongly agree pertains to “I maintain a positive attitude at work.” ($\bar{x} = 3.65$). Meanwhile, the weakest component of work performance dimension in which the majority of emergency care nurses strongly agree refers to “I deliver work on time and meet deadlines.” ($\bar{x} = 3.28$).

Work productivity is centered on emergency care nurses and patients working together to improve health conditions. A patient's greater engagement in healthcare contributes to improved health outcomes. Patients want to be engaged in their healthcare decision-making process, and those who are engaged as decision-makers in their care tend to be healthier and experience better outcomes. Although closely related, work productivity is not the same as the patient experience. Work performance refers to the ability to interact with patients, while the patient experience refers to how the emergency professionals met the patient's expectations throughout the healthcare interaction. Better work performance often creates a better patient experience through communication and patient-centered care. At its core, work performance that emphasizes patient engagement is a dynamic, strategic approach taken by healthcare organizations looking to provide holistic care. Work performance with patients is aimed at improving emergency experience, job satisfaction and customer outcomes. Communication and education are both important keys to making it easier for emergency professionals and healthcare stakeholders to engage in patient care. When appropriate, every stakeholder should be included in decision making so that they have the opportunity to ask questions and gain clarification. Critical planning is another great tool for encouraging work performance. The emergency professionals should be invited to participate in healthcare opportunities to learn how to improve work performance.

According to Saks (2020), creating a culture of work performance with customers invites care professionals to participate in their work in ways that are meaningful to them as individuals. Added benefit is support and respect for achieving their own personal goals and affirming individual values, which could in turn result in greater satisfaction with their healthcare practice. Work productivity helps increase creativity and involvement through active participation. Building a culture that values stakeholders' engagement in all aspects of initiatives that affect work performance requires support and enthusiasm from the organizations' leaders at all levels. Work performance is aimed at improving the patient experience, patient satisfaction and patient outcomes. Communication and education are both important keys to making it easier for patients and families to engage in their care. When

appropriate, every patient and family member should be included in patient assessment so that they have the opportunity to ask questions and gain clarification. Emergency care planning is another great tool for encouraging engagement.

According to Zammiti et al. (2021), creating a culture of quality work performance with patients invites care professionals to participate in their work in ways that are meaningful to them as individuals. The added benefit is support and respect for achieving their own personal goals and affirming individual values, which could in turn result in greater satisfaction with their emergency care practice. Resiliency helps increase creativity and involvement through active participation. Building a culture that values patient engagement in all aspects of the initiatives that affect their clinical care or work environment requires support and enthusiasm from the organizations' leaders at all levels. Emergency care responders are better able to make good work performance about their care options. They can promote mutual accountability and understanding between the patients and other members of the team. Higher work performance yields improved patient outcomes. Involving patients in the redesign of health care can lead to improved effectiveness, efficiency and quality of health services, improved quality of life, and enhanced quality and accountability of health services (Fletcher et al., 2021).

Table 15a
Correlational Analysis on the Significant Relationship on the Assessment between Psychological Well-Being and Resilience of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China

Variables	Computed r correlation [95%CI]	Degree of Relationship	p value	Interpretation
Autonomy	0.820 [0.280; 0.535]			
Environmental mastery	0.830 [0.188; 0.481]			
Personal growth	0.863 [0.325; 0.541]			
Purpose in life	0.864 [0.223; 0.504]			
Self – acceptance	0.805 [0.263; 0.532]			
Relations with others	0.862 [0.196;0.509]			
Autonomy	0.881 [0.246; 0.510]			
Environmental mastery	0.890 [0.279; 0.531]			
Personal growth	0.862 [0.211; 0.513]			
Purpose in life	0.840 [0.336; 0.538]			
Self – acceptance	0.850 [0.332; 0.558]			
Relations with others	0.895 [0.339; 0.583]			
Autonomy	0.858 [0.351; 0.560]			
Environmental mastery	0.850 [0.332; 0.558]			
Personal growth	0.862 [0.350; 0.576]	High positive correlation	<0.001	with significant correlation
Purpose in life	0.896 [0.259; 0.514]			
Self – acceptance	0.886 [0.356; 0.575]			
Relations with others	0.881 [0.358; 0.593]			
Autonomy	0.882 [0.369; 0.591]			
Environmental mastery	0.895 [0.365; 0.550]			
Personal growth	0.870 [0.399; 0.605]			
Purpose in life	0.890 [0.285; 0.520]			
Self – acceptance	0.870 [0.388; 0.618]			
Relations with others	0.861 [0.333; 0.583]			
Autonomy	0.891 [0.267; 0.513]			
Environmental mastery	0.814 [0.314; 0.513]			
Personal growth	0.880 [0.273; 0.535]			
Purpose in life	0.852 [0.202; 0.491]			
Self – acceptance	0.850 [0.332; 0.558]			
Relations with others	0.838 [0.311; 0.551]			

Table 15a supports the analysis in determining the significant relationship between the psychological well-being and resilience of emergency care nurses in selected specialty hospitals in Anhui Province, China. The correlation coefficients between psychological well-being dimensions and resilience have a range from 0.805 to 0.896, (with p values of 0.001), indicating that there are statistically significant high positive correlations between psychological well-being and resilience dimensions.

Table 15b presents the summary of correlational analysis on the significant relationship between the self-

assessed psychological well-being and resilience of emergency care nurses in selected specialty hospitals in Anhui Province, China. It shows that there is a statistically significant relationship between self-assessed psychological well-being and resilience (p -value 0.001). The strength of their relationship exhibits high positive correlation which means that an enhancement in psychological well-being would highly improve resilience.

Table 15b

Summary of Correlational Analysis on the Significant Relationship on the Assessment between Psychological Well-Being and Resilience of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China

Variables	Computed r	Degree of Relationship	P value	Interpretation
Psychological Well-Being and Resilience	.864	High positive correlation	.001	with significant correlation

***.* Correlation is significant at the 0.01 level (2-tailed)

Psychological well-being can be a factor of optimal functioning of each individual which also be a predictor of individual resilience. As emergency care nurses are able to practice autonomy, they get to improve their self-determination and are able to regulate their behavior through internal locus of control, and become more coherent with one's own personal convictions. Also, environmental mastery enables their ability to create environments suitable to healthy conditions. Moreover, personal growth defines one's potentialities and underlines the importance of new challenges at different moments of life. Meanwhile, their purpose in life equates with the sense of goal directedness and intentionality. Self-acceptance consists of self-actualization, optimal functioning, and maturity. The awareness of personal limitation helps emergency professionals to express feelings of empathy and affection for human beings and to be capable of greater dedication to service.

Working in an emergency is an emotionally demanding job that can affect psychological well-being. Psychological well-being of emergency professionals refers to the positive emotional and psychological functioning of individuals. Resilience can also be trained through short, targeted interventions that can support emergency professionals in learning to deal with stressful work-related factors. Given the high job demands of emergency care and the importance of understanding the resilience of emergency professionals contribute to greater psychological well-being. Creating a resilient workforce takes commitment. The emergency care nurses who are supported, motivated and equipped are best positioned to overcome obstacles and distractions. Leadership is a key in establishing priorities, setting goals and allocating resources to strengthen workplace resilience. And, in communicating clearly and decisively the organization's commitment to resilience is promoted. Resilience is one of the positive emotions that will enhance emergency worker's ability to cope in adverse conditions, such as work intensification, organizational change, and work stress.

Emergency care nurses have always played a significant role in public health and become one of the main healthcare providers for patients in the battle. In this case, emergency responders have required the ability to control the environment to maintain critical functionality and improve the quality of service. Working with the increased workloads can lead to work stress, reduced emergency performance, and quality of life (Brooks et al., 2019). As the frontline of healthcare emergency, emergency professionals bear the additional responsibility of caring for their patients and the general public. According to Ji et al (2020), emergency responders have faced the challenge of saving lives. Emergency care nurses are the ideal people for critical tasks because of their training and experience (Ji et al., 2020). When challenged during critical times, emergency care nurses not only directly treat and take care of vulnerable people but also provide psychological support, quelling the fear of the patients and the community, and addressing concerns. According to Lehman et al (2020), emergency care nurses around the world were taking a supporting role in the response to emergency crises. The emergency care nurses which are part of the healthcare system, have played a significant role in emergency preparedness, prevention, and response. Psychological well-being, healthcare management systems should advocate in using mental health services, such as psychological first aid, crisis interventions, and access to social media (Kang et al., 2020).

According to Babore et al. (2020), an awareness of alternative options to a problem and taking time to see things from novel perspectives can help build resilience. The emergency professionals draw on individual resources and interact with their environment by drawing on community and societal resources which may

facilitate or hinder resilience.

Table 16a
Correlational Analysis on the Significant Relationship on the Assessment between Psychological Well-Being and Work Productivity of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China

Variables	Computed (r) correlation	Degree of Relationship	P value	Interpretation
<i>Psychological well-being to Work Productivity on Work Engagement</i>				
Autonomy	0.852 [0.018; 0.265]	High positive correlation	<0.001	with significant correlation
Environmental mastery	0.863 [0.021; 0.249]			
Personal growth	0.874 [0.053; 0.292]			
Purpose in life	0.897 [0.062; 0.326]			
Self – acceptance	0.868 [0.093; 0.325]			
Relations with others	0.875 [0.145; 0.399]			
<i>Psychological well-being to Work Productivity on Work Attitude</i>				
Autonomy	0.898 [-0.027; 0.225]	High positive correlation	<0.001	with significant correlation
Environmental mastery	0.824 [0.077; 0.374]		<0.001	
Personal growth	0.810 [-0.020; 0.239]		<0.001	
Purpose in life	0.884 [0.151; 0.414]		<0.001	
Self – acceptance	0.850 [0.093; 0.397]		<0.001	
Relations with others	0.825 [0.097; 0.367]		<0.001	
<i>Psychological well-being to Work Productivity on Work Performance</i>				
Autonomy	0.839 [0.201; 0.457]	High positive correlation	<0.001	with significant correlation
Environmental mastery	0.841 [0.222; 0.457]		<0.001	
Personal growth	0.885 [0.181; 0.477]		<0.001	
Purpose in life	0.849 [0.124; 0.382]		<0.001	
Self – acceptance	0.879 [0.242; 0.501]		<0.001	
Relations with others	0.885 [0.181; 0.477]		<0.001	

The degree of correlation based on Pearson coefficient:
r = 0.90 – 1.0: Very high; r = 0.70 – 0.89: High; r = 0.40 – 0.69: Moderate
r = 0.11 – 0.39: Weak; r = 0.01 – 0.10: Negligible; r = 0.0: No correlation

Table 16a supports the analysis in determining the significant relationship between the psychological well-being and work productivity of emergency care nurses in selected specialty hospitals in Anhui Province, China. The correlation coefficients between psychological well-being dimensions and work productivity have a range from 0.810 to 0.897, (with p values of 0.001), indicating that there are statistically significant high positive correlations between psychological well-being and work productivity dimensions.

Table 16b
Summary of Correlational Analysis on the Significant Relationship on the Assessment between Psychological Well-Being and Work Productivity of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China

Variables	Computed r	Degree of Relationship	P value	Interpretation
Psychological Well-being and Work Productivity	.858**	High positive correlation	.001	with significant correlation

***. Correlation is significant at the 0.01 level (2-tailed)*

Table 16b presents the summary of correlational analysis on the significant relationship between the self-assessed psychological well-being and work productivity of emergency care nurses in selected specialty hospitals in Anhui Province, China. It shows that there is a statistically significant relationship between self-assessed psychological well-being and work productivity (*p*-value 0.001). The strength of their relationship exhibits high positive correlation which means that an increase in the assessment of psychological well-being would equate with very good work productivity. Effective workplace and psychological well-being programs can have a positive impact on worker’s productivity as well as the health and psychological well-being of emergency professionals. In workplaces that are set up to foster psychological well-being, people tend to be more creative, more loyal, more productive, and perform better in terms of customer satisfaction. Psychological well-being improves productivity in the workplace which does not depend exclusively on external conditions in terms of the working and practice environment within which the emergency professionals operate, hence it could be promoted.

Liu et al. (2020) described healthcare professionals having a unique perspective of personal growth which strengthens their credibility in emergency conversations. The emergency professionals improve their communication by being an information broker, supporter, and advocate. Their role spans from translating technical medical details to advocating the patient and family's goals with the wider healthcare team through to navigating across the intricacies of the health system, and clarifying the need to prevent futile over-treatment.

Environmental mastery in healthcare practice allows emergency professionals to hurdle the social impact of emergency crisis which entails alteration in work productivity and work relationships. Many emergency professionals are accustomed to facing mortality and suffering on a daily basis, yet the scope of this emergency care is staggering in which keeping up the communication and stronger collaboration with colleagues makes a difference (Hong et al., 2020). A balanced, healthy and supportive practice environments and psychosocial work environments are all important to sustain stable engagement to work duty and high performance of workforce (Cruz et al., 2020). Clearly a collegial culture and work attitude have the advantage of improving work productivity among individuals in order to get the optimum benefit from care professional's potential to contribute (Zimmerman, 2019). According to Saks (2020), creating a culture of quality work performance with patient invites care professionals to participate in their work in ways that are meaningful to them as individuals.

Table 17a

Correlational Analysis on the Significant Relationship on the Assessment between Resilience and Work Productivity of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China

Variables	Computed (r) correlation	Degree of Relationship	P value	Interpretation
<i>Resilience to Work Productivity on Work engagement</i>				
Active coping	0.892 [0.133; 0.409]	High positive correlation	<0.001	with significant correlation
Cognitive flexibility	0.898 [0.150; 0.463]		<0.001	
Positive Emotions	0.895 [0.070; 0.370]		<0.001	
Optimism	0.896 [0.355; 0.575]		<0.001	
Spirituality	0.893 [0.200; 0.483]		<0.001	
<i>Resilience to Work Productivity on Work attitude</i>				
Active coping	0.895 [0.161; 0.442]	High positive correlation	<0.001	with significant correlation
Cognitive flexibility	0.889 [0.214; 0.529]		<0.001	
Positive Emotions	0.894 [0.210; 0.497]		<0.001	
Optimism	0.893 [0.200; 0.483]		<0.001	
Spirituality	0.895 [0.161; 0.442]		<0.001	
<i>Resilience to Work Productivity on Work performance</i>				
Active coping	0.892 [0.133; 0.409]	High positive correlation	<0.001	with significant correlation
Cognitive flexibility	0.896 [0.355; 0.575]		<0.001	
Positive Emotions	0.895 [0.161; 0.442]		<0.001	
Optimism	0.898 [0.150; 0.463]		<0.001	
Spirituality	0.892 [0.133; 0.409]		<0.001	

The degree of correlation based on Pearson coefficient:

*r = 0.90 – 1.0: Very high; r = 0.70 – 0.89: High; r = 0.40 – 0.69: Moderate
r = 0.11 – 0.39: Weak; r = 0.01 – 0.10: Negligible; r = 0.0: No correlation*

Table 17a supports the analysis in determining the significant relationship between the resilience and work productivity of emergency care nurses in selected specialty hospitals in Anhui Province, China. The correlation coefficients between resilience dimensions and work productivity have a range from 0.892 to 0.898, (with p values of 0.001), indicating that there are statistically significant high positive correlations between resilience and work productivity dimensions.

Table 17

Correlational Analysis on the Significant Relationship on the Assessment between Resilience and Work Productivity of Emergency Care Nurses in Selected Specialty Hospitals in Anhui Province, China

Variables	Computed r	Degree of Relationship	P value	Interpretation
Resilience and Work Productivity	.892	High positive correlation	.001	with significant correlation

***.* Correlation is significant at the 0.01 level (2-tailed).

Table 17 presents the summary of correlational analysis on the significant relationship on the assessment between resilience and work productivity of emergency care nurses in selected specialty hospitals in Anhui Province, China. It shows that there is a statistically significant relationship between self-assessed resilience and work productivity (p -value 0.001). The strength of their relationship exhibits high positive correlation which means that an increase in the perception of resilience would equate with very good work productivity. Resilience is a foundational work productivity tool which empowers the individual to feel capable of handling uncertainty. Resilience appears to be an important factor in helping emergency care nurses find meaning and develop positive outlooks on their professional roles. Resilience empowers them to deal with the stressors because they are able to adapt to life's misfortunes and setbacks. Moreover, resilience plays a decisive role in the response of emergency care nurses under pressure and can help them deal with emergencies more effectively. Resilience has a direct influence on work productivity which suggests that resilience has a direct impact on job performance. A possible explanation for this may be that the protective factors of resilience have also been found to be important factors for an individual's happiness. Family, social, and personal factors positively influence happiness, as well as act as protective factors that are related to higher levels of resilience.

Work productivity is a positive and fulfilling job-related disposition characterized by vigor, dedication, and absorption. Vigor alludes to a remarkable level of energy and resilience when at work. It is the inclination to put in effort in given tasks and perseverance when encountered with difficulties. Dedication is portrayed by a sense of meaning, enthusiasm, motivation, pride, and challenge. Vigor and dedication are regarded as the opposite of exhaustion and burnout. Productive emergency care nurses possess a sense of energetic and affective link to their occupational tasks. Moreover, productive emergency care nurses experience a stable condition of positive energy to their job and feel capable of meeting job demands.

During an emergency crisis, care professionals are perceived as the first-line health provider, having a public awareness role, and providing care for injured or distressed patients. Besides being responsible for their daily activities, care professionals have roles in ensuring the safety and contentment of their patients outside hospital (Amin et al., 2021). The commitment and emotional involvement is what enables them to function as the key quality control checkpoint that prevents errors and patient mortality. When care professionals feel engaged in their work duty, their work will be enhanced by the satisfaction of being good at their jobs and achieving work goals, by excitement about challenges and by appreciation in relationships with colleagues (Wais, 2019). Zang et al. (2020) defined resilience as “positive adaptation to face adversity, flexibility, psychological well-being, strength, healthy life, burden, social network, and satisfaction with social support”. He described emergency professionals who have high resilience would experience low burden even when they experience high care demand. Collegiality provides a framework in which professionals are expected to hold each other accountable for the care that is given, and for its congruence with standards (Odessa et al., 2019). According to Fletcher et al. (2021) higher work performance yields improved patient outcomes. Involving patients in the redesign of health care can lead to improved effectiveness, efficiency and quality of health services, improved quality of life, and enhanced quality and accountability of health services.

Table 18 utilizes multiple regression analysis to predict the sub-scales of psychological well-being and resilience predicting work productivity. Among the six dimensions of psychological well-being, the results indicate that autonomy, environmental mastery, personal growth, purpose in life, self-acceptance, and relationship with others, showed a positive relationship with work productivity (p -value <0.05). The outcome of the standard multiple regression analysis revealed that all dimensions of psychological well-being predicted 76.6% of the variance in work productivity ($R^2 = .766$, $F = 341.75$, $p < 0.000$). This result is entirely consistent with the definition of work productivity which entails work engagement, work attitude, and work performance among individuals taking different things in different contexts, especially with the rise of knowledge work and automation, they consistently and efficiently complete their tasks and accomplish their goals. Psychosocial well-being helps the emergency care staff become productive at work as they practice autonomy with environmental mastery and feel more in control of their personal growth, greater purpose in life. Having self-acceptance and good relationships with their colleagues make them more efficient and more likely to become more productive.

Table 18

Multiple Regression Analysis Between Factors of Psychological Well-Being, Resilience and Work Productivity of Emergency Care Nurse Respondents in Selected Specialty Hospitals in Anhui Province, China

Predictors	B	SE	β	t	p- value
<i>PSYCHOLOGICAL WELL BEING</i>					
(Constant)	0.858	0.052		16.418	.000
Autonomy	0.265	0.027	0.367	10.039	.000
Environmental Mastery	0.204	0.021	0.391	9.784	.000
Personal Growth	0.150	0.031	0.274	8.302	.000
Purpose in Life	0.135	0.029	0.153	5.052	.000
Self-Acceptance	0.220	0.020	0.367	11.268	.000
Relationship with Others	0.206	0.021	0.396	9.788	.000
$R^2 = .766$, $F = 341.75$, $Sig = .000$ ** $p < .01$, *** $p < .001$, * $p < .05$					
Predictors	B	SE	β	t	p- value
<i>RESILIENCE</i>					
(Constant)	0.119	0.082		0.072	.000
Active Coping	0.352	0.030	0.367	11.895	.000
Cognitive Flexibility	0.268	0.054	0.276	8.393	.000
Positive Emotions	0.132	0.026	0.152	5.050	.000
Optimism	0.219	0.019	0.365	11.265	.000
Spirituality	0.126	0.025	0.183	8.302	.000
$R^2 = .782$, $F = 276.39$, $Sig = .000$ ** $p < .01$, *** $p < .001$, * $p < .05$					

Moreover, among the five dimensions of resilience, the results indicate that active coping, cognitive flexibility, positive emotions, optimism, and spirituality showed a positive relationship with work productivity (p -value < 0.05). The outcome of the standard multiple regression analysis revealed that all dimensions of resilience predicted 78.2% of the variance in work productivity ($R^2 = .782$, $F = 276.39$, $p < 0.000$). This result also equates with the principles of measuring the amount of work done in a certain period. Resilient emergency care nurses tend to be more engaged, more motivated, and focus on their tasks and produce more results faster. Resilient emergency care nurses are productive care providers and they are usually more motivated, have higher levels of creativity and innovation, and produce better results. Their work productivity results from many factors of resilience including active coping, cognitive flexibility, positive emotions, optimism, and spirituality.

Emergency care nurses who are psychologically well and resilient are better equipped to provide high-quality, patient-centered care. A culture of well-being and resilience translates into improved communication, empathy, and overall job performance. Similarly, a high level of psychological well-being is linked to increased resilience which in turn, increases work productivity. Fostering a culture of psychological well-being is not just an ethical responsibility but a strategic imperative for healthcare organizations. By investing in the psychological well-being of emergency care nurses, resilience is nurtured in the workforce and also contributes to the overall health and vibrancy of the emergency care services.

According to Hong et.al. (2020), frontline nurses as those assigned in emergency care units may experience stress and anxiety because they often witness patients' suffering which has a significant impact on their psychological well-being. Resilience is the ability to cope successfully with stressful events and reduces the effects of workplace stressors, so it is an effective way to enhance employees' psychological well-being. High resilience has a close relationship with work productivity. Emergency care nurses play an important role in providing health services and direct patient care. Their psychological well-being and resilience are key components which are critical to ensuring safe patient outcomes (Cai et al., 2020).

The range of complexity of factors that influence the success of emergency response requires emergency care nurses from diverse health professions to work together in a comprehensive manner. Working together, the combined knowledge and skills of health professionals become a powerful mechanism to enhance work productivity. As the delivery of care evolves to become more interconnected, coordinating care between emergency care nurses has become increasingly important. In its simplest form, inter-professional collaboration is the practice of approaching patient care from a team-based perspective.

Improved inter-professional emergency team collaboration has a distinctive identity that members value in addition to their own professional allegiances. They appreciate each other's roles, and agree on the team's common purpose. The group climate is supportive rather than defensive, and conflicts are addressed openly in order to seek a satisfactory resolution. Inter-professional collaboration is also assisted through facilitatory leadership styles, the relatively equal status of members, and mutual respect.

Inter-professional emergency team collaboration is latent and relies on transparency of information, assessments, perspectives and strategies among all team members. The emergency care team is more likely to address the patient's needs successfully with continual performance of individual functions that maximize the likelihood of positive outcomes. In a nutshell, inter-professional emergency team collaboration can be enhanced by an interplay between self-esteem, adaptability, and efficiency. These dimensions are crucial factors that determine the outcomes of interventions. Figure 3 depicts how the components of psychological well-being, resilience, and work productivity interact with one another in terms of behavioral factors, personal factors, and environmental factors enhance interprofessional emergency team collaboration. By the very nature, all essential domains require synchronizing and combining individual team member contributions and providing performance expectations and acceptable interaction patterns involve continual process.

The interprofessional emergency team collaboration framework delineates the essentials of improved self-esteem, improved adaptability, and improved efficiency. The proposed framework includes elements that serve as guide for all members of the emergency team towards the delivery of enhanced person-centered care and improved patient and health outcomes. The framework involves a set of high impact team-based competencies and behaviors that can be easily referenced in complex, fast-paced collaborative environments and widely implemented at all levels of the emergency care. The orientation of the proposed framework is based on a pragmatic approach to maximize performance enhancement towards enhanced interprofessional collaboration in the hospital institution.

The proposed framework supports interprofessional collaboration which is placed at the center of the figure. The framework extends to three primary domains which encircle interprofessional collaboration in the figure: (1) improved self-esteem, (2) improved adaptability, and (3) improved efficiency. As interprofessional teamwork defines working together to deliver the highest quality of care, several healthcare practitioners come together to integrate strengths and capacities. The primary domains of the framework draw on the strengths and capacities of team members by being assertive, receptive and responsive, and goal-oriented. Moreover, in terms of improved adaptability, interprofessional team members need to be focused under pressure, energetic, and proactive. Furthermore, in terms of improved efficiency, interprofessional team members requires to be hardworking, resourceful, and maintain positive attitude.

Interprofessional emergency team collaboration framework recognizes the importance of having improved self-esteem because it encompasses the development of a variety of skill sets and characteristics. Interprofessional collaboration provides members with the perfect opportunity to foster both personal and professional growth. Interprofessional collaboration also encourages networking, which plays a significant role in one's self-esteem. Interprofessional collaboration combines different levels of knowledge, expertise, and experience to provide patients with the best possible care and, in return, improve patient outcomes.

Taking an active role in the process of interprofessional emergency team collaboration is an excellent way to enhance one's adaptability. The weight of every emergency care decision for a patient takes huge responsibility when it comes to patient care where the entire team of professionals efficiently collaborate to one another. Knowing that team members hold responsible for the patient gains access to resources including other staff members. By creating a mutually beneficial relationship among members of the interprofessional emergency team allows efficient resource utilization towards better care for the patients.

Interprofessional emergency team collaboration entails provision for physical, emotional, mental, social, and spiritual needs of the patient to enhance one's efficiency. This approach allows the whole patient care team to provide patients with a holistic care approach and working very closely with all members of the team ensures a

holistic approach is maintained and delivered. Within the framework of interprofessional emergency team collaboration, members of the team can foster a healthier work environment that encourages and promotes efficient teamwork. The dynamics of efficient teamwork helps strengthen the relationships between members of the interdisciplinary team.

Within established relationships, interprofessional emergency team members can rely on one another for guidance, fully utilize the available resources, and quickly resolve any conflicts that may occur. This directly impacts the self-esteem, adaptability, and efficiency of the interprofessional emergency team as well as helps achieve the common goal of safe and high-quality patient care. Interprofessional teamwork is a crucial component in the process of ensuring patient safety.

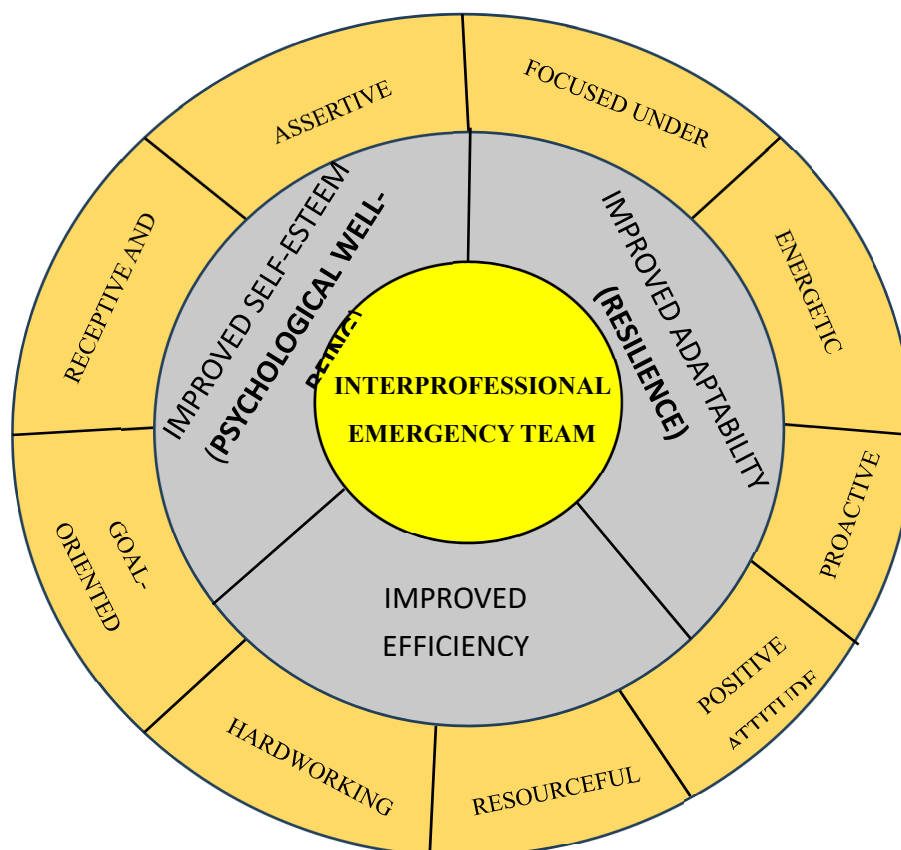


Figure 1. Inter-Professional Emergency Team Collaboration Framework

In order for emergency care nurses in medical emergency response units to become more productive, it is necessary to enhance the following:

Improved Self-Esteem - Investing on behavior is straightforward and demands establishing new habits since process levels have an impact on nurses' wellbeing and performance. Developing routines and outlets to sustain is essential to maintain boundaries so that work does not overly intrude into other aspects of life. It makes sense that we cannot be resilient at work without being on top of our everyday pressures and priorities. A key aspect of role clarity is having effective ways to manage the everyday challenges. It is also ensuring that work demands do not overly compromise personal life. Actively engaging with a challenge strengthens the brain's pathway for improved future coping. Good workload management such as prioritizing, scheduling or negotiating expectations.

Improved Adaptability - Maintaining perspective and positivity requires having adequate staffing to perform the job. Having enough workforce promotes greater work satisfaction which are anchored on resilience that entails the ability to manage one's mood, letting go of what cannot be influenced. In essence, it is positivity with a flexible plan, and engagement with work that is difficult, dynamic and unpredictable.

Improved Efficiency – Having a sense of connection and relationships with diverse professions who are digitally competent also strengthens positive technological connection which can improve nurses' mood and reduce distress response. Considering all the essential assistance and determining which technologies can foster both improve psychological well-being and resilience. Promoting mutual support for technological integration is a good starting point because it supports individual values and promotes a climate of openness and advancement. Technology promotes greater adaptability as anyone needs to achieve more efficient performance.

Organizing what can be done and having a sense of belonging promote work engagement, work attitude, and work performance of emergency nurses. Having a passion for the job and feeling connected to work enhance work productivity. Similarly, professional integrity promotes resilience. Personal strengths and leadership are both proactive elements of strategic management. This aspect often becomes more noticeable when accountability for personal resilience rests with every member of the emergency care team, and the outcomes are shaped by the unwritten rules of how things operate.

4. Conclusions and recommendations

The psychological well-being of emergency care nurses in selected specialty hospitals in Anhui Province, China confirmed that they need to sustain having firm decisions, staying strong in coping with demands of everyday life since life is a continuous process of learning, changing, and growth. They always consider having a positive direction, are grateful in many ways about achievements in life, and always experience warm and trusting relationships with others. The resilience of the emergency care nurses in selected specialty hospitals in Anhui Province, China confirmed that they are able to adapt when changes occur, stay focused under pressure, always make their best effort, always believe they can achieve their goals in spite of obstacles, and think of themselves as strong persons when praying with life's challenges. The work productivity of the emergency care nurses in selected specialty hospitals in Anhui Province, China confirmed that they work hard to achieve their goals, efficiently utilize all necessary resources to perform their job well, and maintain a positive attitude at work. The emergency care nurses who are supported, motivated and equipped are best positioned to overcome obstacles and distractions. Their purpose in life equates with the sense of goal directedness and the awareness of personal limitation helps emergency professionals to express feelings of empathy and to be capable of greater dedication to service. In emergency care workplaces that are set up to foster psychological well-being, nurses tend to be more creative, more loyal, more productive, and perform better in terms of customer satisfaction. Psychological well-being improves productivity in the workplace which does not depend exclusively on external conditions in terms of the working and practice environment. A balanced, healthy and supportive practice environments and psychosocial work environments are all important to sustain stable engagement to work duty and high performance. Resilience appears to be an important factor in helping emergency care nurses find meaning and develop positive outlooks on their professional roles. Resilience empowers them to deal with the stressors because they are able to adapt to life's misfortunes and setbacks. Moreover, resilience plays a decisive role in the response of emergency care nurses under pressure and can help them deal with emergencies more effectively. The high level of psychological well-being is linked to increased resilience which in turn, increases work productivity. Fostering a culture of psychological well-being is not just an ethical responsibility but a strategic imperative for healthcare organizations. By investing in the psychological well-being of emergency care nurses, resilience is nurtured in the workforce and also contributes to the overall health and vibrancy of the emergency care services.

Hospital emergency department to adopt fast-track systems using advanced triage protocols and enhanced coordination with other hospital departments. Understanding the current workflow and having an optimized process based on patient influx trends and involvement of multidisciplinary teams, an efficient triage system would allow proactive patient management. Hospital emergency care units to identify the bottlenecks, blockers, and dependencies in order to sustain rapid diagnostic and treatment procedures especially at the point-of-care testing. Enhancing decision support systems and standardized treatment protocols provides easier access to critical care resources and better coordination with intensive care units. Interprofessional emergency team members to have flexible staffing models and continuous staff training. Effective internal communication channels, training in

communication skills, regular team meetings, and feedback loops are essential to a positive practice environment. Interprofessional emergency team members to be well-prepared in handling high-pressure or dealing with difficult situations. Enhancing their self-motivation and promoting career development are both crucial for resilience. Aligning staffing with patient influx through predictive analytics for more efficient staffing, task delegation, wellness programs, and feedback-driven improvements are key factors to timely accomplishment of all tasks. Hospitals use advanced diagnostic tools, enhance communication with inpatient units, and implement multidisciplinary teams for comprehensive assessment. With state of the art technology in place in the emergency care, turnaround times can be reduced, information can be clearly provided, comfortable waiting areas and patient-centered care approach can be achieved. Hospitals to consider technology in dealing with complaint management systems, patient feedback analysis, and continuous service improvement. Having an efficient technology allows more efficient workload management, efficient administrative processes and supportive work environment which makes emergency care practice more productive and satisfactory. Hospital administrator and emergency care unit managers to sustain adherence to clinical guidelines, regular training in current standards, and use of evidence-based protocols, regular monitoring and auditing, patient feedback surveys, and staff training in quality improvement. Benchmarking against best practices and implementation of best practice guidelines would also improve customer service. Hospital administrator and emergency care unit managers to prioritize the psychological health of interprofessional emergency team members through social support, team building and human capital development. Having wellness programs would also improve morale and develop resilience that is more effective than a single strategy. Emergency care units to reduce wait times, provide clear information, comfortable waiting areas, and patient-centered care approach.

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Determinants of environmental factors and their effect on the entrepreneurial intention of senior high school students: A basis for a strategic management plan

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Abstract

Entrepreneurship is considered an essential component of economic growth, innovation, and job creation, providing various benefits for individuals, especially students, who can use it to pursue self-employment and personal fulfillment. However, despite its potential, challenges in business initiatives persist, hindering the achievement of entrepreneurial goals. Thus, using a correlational design and 293 senior high school business students from public schools, this study aimed to test the effects of demographic profile on environmental factors (desirability and feasibility) and on entrepreneurial intention. The study found no significant relationship between demographic profiles and environmental factors. This suggests that students' willingness to start a business is not dependent on their demographic characteristics. However, the results revealed a positive correlation between entrepreneurial intention and students' desirability, leading to the rejection of the null hypothesis; in contrast, feasibility showed no significant effect on students' entrepreneurial intention. Thus, desirability plays a more substantial role in shaping entrepreneurial intention than feasibility, highlighting the importance of motivating and inspiring students to establish and run their own business. The study also proposes a strategic management plan to encourage student entrepreneurial activities, emphasizing the importance of fostering an entrepreneurial mindset. Thus, the findings have implications for entrepreneurship education and policy, highlighting the need to foster students' desire to start a business and to provide opportunities to develop their entrepreneurial skills. The researcher recommends that the strand coordinators and teachers continue to provide students with the necessary skills and knowledge to start and run a business, including business planning, financial management, and marketing.

Keywords: business-minded, business planning, entrepreneurship, entrepreneurial skills, public schools

Determinants of environmental factors and their effect on the entrepreneurial intention of senior high school students: A basis for a strategic management plan

1. Introduction

In this age of global integration, a nation will have more chances to participate in the world's large playground if it is more innovative and proactive. Entrepreneurship is essential to a country's economy, especially in tackling unemployment (Gaddi et al., 2024). Despite the widespread perception that entrepreneurship benefits every aspect of society, especially young people, several obstacles are hindering the intention to start a business (Galay et al., 2023). Depending on the environment in which business operations are conducted, these obstacles may vary. The low rate of entrepreneurial activity persists despite its recognized importance for economic advancement. Previous studies have shown that a complex interaction between internal and environmental factors influences a person's intention to start a business (Shahzad et al., 2021; Galay et al., 2023). The substantial impact that entrepreneurs and business activities have on economic and social development in both developed and developing nations has led to increased interest in studying the factors that influence one's entrepreneurial purpose. This gap makes it difficult for decision-makers, instructors, and organizational leaders to develop a strategic management plan that effectively encourages entrepreneurship. According to Deep (2023), if the contextual elements that most significantly influence business objectives in the local context are not clearly understood, efforts may be ineffective or misguided. Thus, this study examines the specific determinants of environmental factors and their causal relationship with entrepreneurial intention to address this issue. By focusing on the most significant environmental factors, the results will subsequently form the foundation of a strategic management plan intended to foster a more resilient entrepreneurial ecosystem (Nguyen & Phan, 2024).

Research on entrepreneurial purpose has long been considered essential, especially for start-up initiatives. The decision to start a new business was greatly affected by intentions (Galay et al., 2023). Entrepreneurs are becoming increasingly significant in today's wealth-creation process. By studying their purpose, one can better understand the entrepreneurial activity that people planning to launch a firm are likely to pursue. In the study by Al-Qadasi et al. (2023), entrepreneurs are investors who help turn the economy around by introducing new concepts, innovative solutions, and employment opportunities. The traditional philosophy of entrepreneurship talks about personal qualities, particularly the capacity for innovation (Subhan, 2019). Even as innovation and technology improve society in every way, K-12 education is stagnating. Indeed, whether directly or indirectly, education is the main engine of every nation's economy. In fact, the majority of educational institutions have welcomed innovation, with students working in groups to solve problems, learning online, and fusing art and science. Moreover, Galay et al. (2023) state that the important role innovators and entrepreneurial endeavors play in promoting economic and social growth in both established and emerging countries is driving increased interest in studying the elements that contribute to one's entrepreneurial purpose. However, graduates continue to lack the sophisticated skills and creative thinking needed to meet the challenges of modern jobs. To gain real-world experience or new skills they can use in their future careers, some students would rather combine their education with work experience. Others wish to launch their own companies in order to become independent. Since they are regarded as the future and the factor that determines a country's economic sustainability, students and young people are important in any economy. The unemployment rate can be lowered, and the economy will grow more rapidly once young people recognize the value of entrepreneurship and are prepared to start their own businesses. Thus, this study aims to determine the effects of students' willingness (desirability) and belief (feasibility) on the choices they make that affect their business decisions.

Statement of the Problem - This study aimed to examine the effects of environmental factors on the entrepreneurial intention of senior high school students. More specifically, the specific objectives were to (1) test the significant relationship between demographic profile and the determinants of environmental factors in terms

of desirability and feasibility; (2) test the significant relationship between the determinants of environmental factors and the entrepreneurial intention of senior high school students; and (3) propose a strategic management plan to encourage SHS students to pursue their entrepreneurial activities.

Significance of the Study - The researcher believes that the findings of this study provide business students with a foundation for understanding environmental factors and making future decisions. The research will therefore be beneficial to the following individuals and organizations: First, the results of the study may provide business professionals with options for studying entrepreneurial intention and developing ways relevant to their field of expertise. Second, the study may help prospective young investors or entrepreneurs by highlighting environmental factors they can use to inform their decision to launch a business. The results of the study will contribute to the body of knowledge and literature about environmental factors and students' intention to pursue entrepreneurship. Third, the study's findings can assist business students in making informed decisions about their plans by providing valuable insight into the determinants of entrepreneurial intention. The Department of Education, which oversees education, will use the results to develop policies, initiatives, and legislative frameworks that enable all schools to develop curriculum guidelines that are both effective and efficient. Finally, future researchers interested in comparable structures may use the study's results as a reference.

Scope and Delimitation of the Study - The study focused on determining the effects of environmental factors on the entrepreneurial intentions of senior high school students. The environmental factors in this study were desirability and feasibility. Moreover, the respondents' demographics were used as predictors of environmental factors, including age, sex, household income, locality, parents' educational attainment, parents' jobs, and educational achievement. However, this study was limited to senior high school students enrolled in business subjects in public schools in San Jose, Occidental Mindoro, and did not cover private schools. The study covered the fiscal year 2022–2023.

2. Methodology

This study utilized a correlational research design to examine the effects of respondents' profiles on the determinants of environmental factors—desirability and feasibility—and on entrepreneurial intention. According to Creswell (2012), a correlational design is best suited to describe and measure the degree of relationship between two or more variables. To determine the number of senior high school students enrolled in each strand for the 2022–2023 academic year, the researcher asked the Learner's Information System (LIS) Coordinator assigned to each school for assistance. In the current school year 2022-2023, there are two thousand nine hundred eighty-two (2,982) officially enrolled students in three public schools in San Jose, Occidental Mindoro. However, only 1,221 students are enrolled in the three strands that have business subjects. The three strands were Accountancy, Business and Management, Humanities and Social Sciences, and General Academic. The researcher used the Raosoft calculator with a 95% confidence level and a 5% margin of error to determine the study's sample size, which was 293 out of 1,221. The researcher used stratified random sampling to select the final set of respondents, coming from three different strands in three other schools. They were chosen based on their similar characteristic of having business subjects offered in their strands.

Moreover, the proponent used a researcher-made instrument to collect the needed data for this study. The instrument consists of three parts: the profile, environmental factors, and entrepreneurial intention. To determine the validity of the researcher-made instrument, the researcher sought the help of five experts in the field of research and business from DWCSJ graduate school faculty members. In addition, the test-retest method was employed to assess the instrument's reliability. To ascertain the test's reliability, a group of people took it twice over time. Cronbach's Alpha was used to evaluate the consistency of three (3) components describing the determinants of entrepreneurial intention among senior high school students, using eight (8) item indicators. The survey was first tested with thirty (30) students, and then a week later, it was tested with the same respondents who were not included in the final administration of the questionnaire. Using the test-retest approach, the three instruments—feasibility, desirability, and entrepreneurial intention—were evaluated. The resulting Cronbach's alpha coefficient

for three variables was 0.766, indicating acceptable reliability. The last group of respondents was given the instrument since the calculated coefficients showed a generally acceptable level of dependability.

Furthermore, the researcher presents the first request letters from the research adviser to the school heads of three public schools before the start of the data-gathering procedure. Once approval was granted, the list of students who took part in the study was compiled. The researcher personally distributed and collected the surveys to preserve the privacy of the results. In addition, descriptive and inferential methods were used to analyze the collected data on the demographic profile, environmental factors, and entrepreneurial intention. Moreover, Pearson's *r* moment correlation coefficient was used to examine the effects of demographic profiles on environmental factors and the effects of environmental factors on entrepreneurial intention among senior high school students.

Lastly, to ensure the well-being of each participant, this study was committed to upholding strict ethical standards. Before gathering data, the researcher ensured that each participant provided voluntary, informed consent, following a thorough understanding of the study's goals, methods, risks, and potential results. There were no negative repercussions for anyone who chose not to participate; participation was entirely voluntary. To remove bias, the researcher also made a point of treating each respondent fairly and with respect, regardless of their background or job status. Furthermore, the study was conducted with utmost academic integrity, ensuring that no data were modified or distorted and that all sources were cited correctly in APA style, 7th edition. Additionally, the researcher obtained the necessary consents and permissions from relevant academic and institutional officials before commencing the research. Finally, participants were told they could request access to the study's results after it was over, and they could choose not to answer any questions that made them uncomfortable. These ethical guidelines were put in place to protect the privacy and respect of all participants as well as the credibility of the study.

Table 1

Correlation Coefficient (r) and p-values for Hypothesis Testing (1)

Variables	Correlation Coefficient (r)	<i>p</i> -value	Interpretation
Demographic Profile (Age) → Determinants (Desirability)	0.102	0.083	Not Significant
Demographic Profile (Age) → Determinants (Feasibility)	0.073	0.212	Not Significant
Demographic Profile (Sex) → Determinants (Desirability)	0.028	0.628	Not Significant
Demographic Profile (Sex) → Determinants (Feasibility)	0.043	0.456	Not Significant
Demographic Profile (Parents' Educational Attainment) → Determinants (Desirability)	0.019	0.741	Not Significant
Demographic Profile (Parents' Educational Attainment) → Determinants (Feasibility)	0.033	0.574	Not Significant
Demographic Profile (Parents' Job) → Determinants (Desirability)	0.012	0.837	Not Significant
Demographic Profile (Parents' Job) → Determinants (Feasibility)	0.009	0.878	Not Significant
Demographic Profile (Locality) → Determinants (Desirability)	0.083	0.156	Not Significant
Demographic Profile (Locality) → Determinants (Feasibility)	0.076	0.196	Not Significant
Demographic Profile (Household Income) → Determinants (Desirability)	0.033	0.571	Not Significant
Demographic Profile (Household Income) → Determinants (Feasibility)	0.092	0.115	Not Significant

Significant $p < 0.05$

A statistical analysis was performed to test the hypothesis regarding the demographic profile and environmental factors (desirability and feasibility). As shown in Table 1, the relationship between the demographic profile (age, sex, parents' educational attainment, parents' occupation, locality, and household income) and determinants of environmental factors in terms of desirability and feasibility shows a very weak positive correlation, as indicated by the *r* values. It supports the *p*-value result of less than 0.05 at the alpha level, indicating a non-significant relationship between the two variables. This suggests that the respondents' willingness to start their own business (desirability) and their belief in their ability to succeed in their chosen business (feasibility) are not dependent on their demographic characteristics, as they have diverse backgrounds and may still be influenced

by other factors that alter their mindset for running a business. The findings were similar to those of Gaddi et al. (2024) and Galay et al. (2024), which showed that there is no significant relationship between the profile and the environmental factors affecting senior high school students' intention to establish their own businesses. They found that desirability and feasibility are more dependent on individual experiences, perceptions, and attitudes than on respondents' profiles. Meanwhile, the results of this study were contradictory to the study of Dubey & Sahu (2022), who found that the demographic profile may contribute to the development of students' desirability and feasibility. They found that a person's decision to pursue a professional career as an entrepreneur is influenced by their profile, as the respondents shared comparable characteristics.

Table 2

Correlation Coefficient (r) and p-values for Hypothesis Testing (2)

Variables	Correlation Coefficient (r)	p-value	Interpretation
Determinants (Desirability) → Entrepreneurial Intent	0.071	0.031	Significant
Determinants (Feasibility) → Entrepreneurial Intent	0.126	0.224	Not Significant
Determinants → Entrepreneurial Intent	0.129	0.027	Significant

Significant $p < 0.05$

Results of testing hypothesis 2 are shown in Table 2. With calculated correlation coefficients (r) of 0.071 and 0.126, respectively, the study demonstrates a positive relationship between the variables desire (Desirab), feasibility (Feasib), and entrepreneurial intent (Entrepreneurial Intent). However, the determinants of respondents' feasibility (Feasibility) do not significantly affect their entrepreneurial intent (Intent), with a p-value of 0.224, which is below the significance level of 0.05, indicating that the determinants (desirability) alone have a direct and substantial impact on students' entrepreneurial intention. This study suggests that students' ambition or willingness to launch their own firm influences their entrepreneurial intention.

Moreover, the computed correlation coefficient of 0.129 for determinants to intention indicates a positive relationship also between variables, thus posing a direct significant relationship between the two variables, and backed up with the computed p-value of 0.027 denotes a significant relationship between variables, leading to the rejection of the null hypothesis, which states that there is a significant relationship between senior high school students' entrepreneurial intention and determinants. This result implies that environmental factors, specifically the desirability, significantly affect students' intention to start their own businesses. This is corroborated by the research of Gaddi et al. (2024) and Galay et al. (2023), who found that senior high school students' desire, feasibility, and impulse to proceed indicated their perceived entrepreneurial spirit and readiness to start a business. Additionally, they claim that students' willingness or interest in launching a business is correlated with their personal values and career choices; highly attractive students are more eager to launch a firm. By defining a desire that will materialize in a particular way, Sukavejworakit et al. (2018) emphasized that having an entrepreneurial mentality offers a way to both describe and anticipate entrepreneurship. In line with the theory of planned behavior, entrepreneurial intention can be explained and predicted by both desirability and feasibility (Wannamakok et al., 2020). Also, this finding is supported by the study by Mante & Abellanosa (2022), which states that an individual's entrepreneurial conduct is influenced by their entrepreneurial desirability. Given how much it affects entrepreneurial activity, the environment positively affects the growth of small businesses in society. Sukavejworakit et al. (2018) also stated that entrepreneurship is the capacity to seize fresh chances in the business sector. Further studies have shown that factors such as entrepreneurial activity influence perceptions of feasibility and desirability, which, in turn, affect intentions to engage in entrepreneurial actions (Al Ghafri & Malik, 2021; San & Khuong, 2019). However, the aforementioned results did not correspond to the Maheshwari et al. (2022) study's entrepreneurial event model (EEM), which highlights perceived feasibility as one of the main variables influencing a person's intention of starting an enterprise. Thus, perceived feasibility refers to an individual's perception of the viability of launching a new business (Elnadi et al., 2020).

Vision and Mission

Vision: To be a leading public senior high school ecosystem that develops young entrepreneurs who are resilient, creative, and prepared for the market.

Mission: To give each senior high school student the fundamental entrepreneurial mentality, information, and practical abilities needed to recognize opportunities, acquire income, and pursue jobs centered around innovation or self-employment.

Table 3

Strategic Management Plan

Strategic Plan	SMART Objective	Deliverables	Responsible Unit/Person	Timeline	Key Result Areas (KRAs)
Strategic Plan 1: Curriculum & Pedagogy	From 20% to 80% of SHS students should be involved in a live market-based business initiative.	Curriculum Mapping Examine and incorporate at least two entrepreneurial skills (such as opportunity seeking and critical thinking) into the curriculum for four non-business core topics (such as science, math, English, and Filipino)	Curriculum Coordinator, Department Heads Students	Quarter 1	Multidisciplinary mapping of the curriculum. The implementation of Project-Based Learning (PBL). Development of business incubation in schools.
Strategic Plan 2: Ecosystem & Partnerships	Make ten long-term alliances with nearby company owners, trade groups, and universities (HEIs) to share resources and mentorship.	Design the Signature SHS Venture (Culminating Activity) Develop a mandatory, year-long "Mini-Startup Challenge" module for all Grade 12 students across all strands (Academic, TVL, Arts, Sports), culminating in a school trade fair.	Entrepreneurship Teacher, ABM Teachers, Students	Quarter 2-3	The quantity of registered active business mentors. Exposure/internship days for students every year. Access to outside seed money and microgrants.
Strategic Plan 3: Entrepreneurial Intention	Add 30% to the average Entrepreneurial Intention Index (EII) score of SHS graduates compared to the baseline.	Resource Material Development Assemble and produce a digital library of entrepreneur biographies and local business case studies for use as teaching resources.	Library/ICT Coordinator, Research Team, Students	Quarter 4	Entrepreneurship is viewed as a desirable professional option. A propensity to take measured risks.

Monitoring and Evaluation

Evaluation is ongoing and goes beyond grades to include behavioral change (intention).

Assessment Tools

Pre- and Post-Program Survey: At the beginning of Grade 11 and the conclusion of Grade 12, administer a survey based on validated scales (Desirability & Feasibility).

Venture Quality Rubric: Assess student business ventures according to their creativity, financial feasibility, market validation, and reflective learning.

Table 3 comprises a strategic management plan that could encourage SHS students to pursue entrepreneurial activities. By coordinating the school's resources and day-to-day activities with its overall objectives, a Strategic Management Plan (SMP) is a structured, multi-year process that defines and pursues long-term excellence. The SMP outlines the vision and mission, which may guide students and teachers in cultivating senior high school entrepreneurs. It also includes specific target goals, possible deliverables, a responsible unit/person, and a timeline for curriculum alignment and implementation, which may help prevent problems and provide guidance on how an

individual or group may pursue a business career. Monitoring and evaluation, which falls under goal 3 of SMP, supports the person(s) involved in assessment tools and the review cycle. This SMP was aligned with the basic development plan of 2030, as adopted by DepEd order no. 24, s. of 2022 (https://www.deped.gov.ph/wp-content/uploads/2022/05/DO_s2022_024.pdf), ensuring that the curriculum is appropriate for creating competent, employable, active, and responsible citizens. It also provides senior high school students with comprehensive instruction in entrepreneurship, encouraging them to consider entrepreneurship as a career.

3. Conclusions and recommendations

Based on the findings, the following conclusions were drawn: The environmental factors such as desirability and feasibility are not significantly affected by the demographic profile of the respondents; this suggests that the students' willingness to start a business and belief in being successful are not dependent on their demographic characteristics; thus, other factors may play a more significant role in shaping students' intention to start a business. Desirability drives entrepreneurial intention, while feasibility is not a significant predictor of the students' intention. This suggests that fostering a strong desire to start a business is essential for promoting entrepreneurial intention among students. The strategic management plan was proposed to provide a structured approach to promote entrepreneurship education and encourage students to participate in entrepreneurial activities.

The following suggestions were made in relation to the conclusions derived from important findings. The researcher recommends that the teachers focus on providing opportunities and hands-on experiences, such as business plan competitions and internships, that develop entrepreneurial skills, knowledge, and mindset for all students. Strand coordinators may develop programs and activities to increase students' desire to become entrepreneurs, such as industry visits and success stories of entrepreneurs. Also, public schools may use a strategic management plan, aligned with the Department of Education curriculum and pedagogy, to create a supportive environment that fosters entrepreneurial skills and a mindset among senior high school students, preparing them to establish and manage their own businesses. Lastly, future researchers may explore students' psychographic profiles and perceived social norms to gain deeper insights into the entrepreneurial intentions of senior high school students.

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Sustainable development and employee efficiency in higher education institutions

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Abstract

This study investigates the significant relationship between sustainable development initiatives and employee productivity in Nigerian tertiary institutions, including universities. As global awareness of environmental challenges and social responsibility grows, higher education institutions are increasingly recognized for their role in promoting sustainable practices through initiatives such as green campus projects, curriculum reforms, and community engagement programs. The research explores how these sustainability efforts can enhance operational effectiveness, particularly in terms of employee motivation and productivity. Utilizing the triple-bottom-line theory, the study highlights the importance of aligning institutional objectives with environmental, social, and economic goals, emphasizing that engaged and empowered employees are vital for implementing effective sustainable practices. The study used a descriptive research design to assess sustainability practices in selected Nigerian higher education institutions and examine their relationship with employee efficiency. Data were collected from 249 faculty members using a reliable self-designed questionnaire (SDEEQ), and analyses—including composite means and Pearson correlation—were conducted through SPSS. Ethical protocols were strictly followed, ensuring informed consent, anonymity, and responsible data handling throughout the research process. The study found that faculty members generally agreed that sustainable development is practiced in their universities and that employees demonstrate efficiency, with a significant relationship identified between these two factors. A plan of action was proposed to help HEIs strengthen sustainability initiatives and further improve employee performance. The study also recommended enhancing communication, monitoring key performance indicators, integrating employee feedback, and expanding future research to include other stakeholders.

Keywords: social sustainability, environmental sustainability, employee efficiency, resource utilization, ethical practices

Sustainable development and employee efficiency in higher education institutions

1. Introduction

Globally, higher education institutions are recognized as important players in fostering sustainable practices. Initiatives such as green campus projects, curriculum reforms, and community engagement programs show efforts to align institutional operations with sustainability goals. Adopting policies and programs that fulfill current demands without endangering the capacity of future generations to meet their own is known as sustainable development in higher education institutions. In today's dynamic business landscape, organizations worldwide face mounting pressure to balance economic performance with sustainable practices. This twin focus stems from a growing international awareness of environmental challenges and social responsibility, which now significantly influence organizational strategies.

Sustainability in the workplace has become an integral part of modern management, particularly in areas that depend solely on human capital. In the context of Nigerian tertiary institutions, sustainable development comprises initiatives such as resource optimization, eco-friendly policies, and socio-economic inclusivity. Employee efficiency is a critical variable because it directly influences institutional performance and sustainability outcomes. Research has shown that "the relationship between empowerment and employee performance is a positive one. When employees feel empowered, they are more likely to take ownership of their work, push themselves to exceed expectations, and contribute to a company's success". According to García-Juan et. al. (2019). "There is a favorable correlation between employee performance and empowerment" According to García-Juan et. al. (2019). Nigerian universities and colleges, through their mandates, hold the potential to model sustainable practices, fostering resource efficiency, environmental consciousness, and inclusive educational policies. Studies also show the role of employee engagement in achieving sustainable development objectives. According to Malik and Weil (2021) noted that having access to decision-making and a forum to voice ideas can foster collaboration and help employees feel valued and appreciated. Employee empowerment provides workers with the authority and resources to make their own job-related decisions. This instills confidence and encourages crews to think of innovative solutions. As a result, the quality of their work improves, leading to higher performance and output. Despite progress, Nigerian tertiary institutions continue to face numerous challenges in attaining sustainability and optimizing employee efficiency. Major challenges include inconsistent funding, inadequate infrastructure, and the lack of comprehensive sustainability policies.

This study centers on Nigerian higher education institutions, which serve as the cornerstone of the nation's knowledge economy and employ a large segment of Nigeria's educated workforce. Faculty members possess the expertise that is valuable in administrative decisions, especially those related to curriculum development, research funding, or student advising. However, this benefit is easily outweighed by the drawbacks if not managed appropriately. On the other hand, many face challenges such as resource mismanagement, low employee motivation, and inadequate implementation of sustainable practices. Employees in these institutions frequently face inefficiencies due to outdated operational structures and limited participation in decision-making processes. This study was conducted to examine the relationship between sustainable development initiatives and employee efficiency, identify strategies to address challenges, enhance the institution's performance, and promote a more sustainable academic environment. The results of this study will contribute significantly to the body of knowledge by providing actionable recommendations for policy implementation and strategic planning in tertiary education.

Objectives of the study - This study examines sustainable development practices and employee efficiency in higher education institutions. It specifically, aims to; describe HEI's sustainable development practices as regards to environmental, social, ethical and economic Sustainability; describe HEI's employee efficiency in terms of; administrative efficiency, effective teaching and research and research utilization; examine the relationship between the variables of sustainable development practices, the measures of employee efficiency; and proposed

an action plan to enhance sustainable development practices and employee efficiency in higher education institutions.

2. Methods

This study used a descriptive research design to identify and assess key sustainability practices in Nigerian higher education institutions and their effect on employee performance. Specifically, it described the extent to which sustainable practices are implemented and how these initiatives correlate with metrics of employee efficiency. The study's target population consisted of all faculty members from specific Nigerian higher education institutions. Only academic staff from four carefully selected institutions in the south-south region of Nigeria were included. Only 249 of the 280 distributed questionnaires were recovered by the researcher. The data for this study on Sustainable Development and Employee Efficiency in Nigerian higher education institutions were gathered using a self-designed questionnaire named the Sustainable Development and Employee Efficiency Questionnaire (SDEEQ). The questionnaire consisted of three sections: A, B, and C. Section A contained the respondents' demographic information, while Sections B and C included items related to the research variables. Responses in Sections B and C were based on a four-point Likert scale consisting of Highly Practiced (HP), Moderately Practiced (MP), Practiced (P), and Not Practiced (NP), weighted as 4, 3, 2, and 1 point, respectively.

The questionnaire's reliability analysis is displayed in Table 1. The reliability test results indicate that all constructs in the research instrument have **acceptable to excellent** internal consistency. The first dimension under sustainable development is Environmental Sustainability ($\alpha = 0.910$), which shows excellent internal consistency. The items under this construct reliably measure environmental sustainability, suggesting strong coherence among them. Next is Social Sustainability ($\alpha = 0.887$), which reflects good reliability. The scale effectively captures the social aspects of sustainability, although it's slightly below the threshold for excellent. Another item is Ethical Practices ($\alpha = 0.916$), which also demonstrates excellent internal consistency, indicating that the items are highly correlated and effectively measure ethical practices. Meanwhile, economic sustainability also shows good reliability. The items sufficiently capture the economic aspect of sustainability, though with slightly less internal consistency than the environmental and ethical dimensions. On the other hand, the dimensions for employee efficiency measures show that Administrative Efficiency ($\alpha = 0.877$) indicates good reliability. The items are well aligned in measuring administrative efficiency. Moreover, Effective Teaching and Research ($\alpha = 0.720$) has acceptable reliability.

The research started by constructing the title together with variables and dimensions with the help and advice of his teacher. After the approval of the title from the panel during the oral defense, the researcher's data was collected through direct delivery and electronic means, with the assistance of two research assistants who were thoroughly briefed to address any questions from respondents. The parameters of employee efficiency and sustainable development practices were interpreted using the composite mean and weighted mean. Additionally, the researcher used Pearson Correlation to ascertain the connection between staff efficiency and sustainable development strategies. The direction and strength of the association between these two variables were evaluated using this test. The statistician used SPSS version 28 to run and analyze all of the data, ensuring the correctness of the statistical calculations and interpretations. The researcher sought approval from the university ethics review committee office before distributing questionnaires. There are several ethical considerations to ensure the research was conducted responsibly, respects participants' rights, and avoids harm. No names or contact numbers were asked since it is not necessary for this research.

3. Results and discussion

Table 1 displays the respondents' evaluation of Sustainable Development Practices. The composite mean of 3.13 suggests that respondents generally agree with these practices. Environmental sustainability received the highest weighted mean score among the items listed. The concept of environmental sustainability is vital for the well-being of our planet and the future of humanity. It involves the careful use and management of natural

resources to meet current needs without compromising the ability of future generations to satisfy theirs. The intricate networks within the planet's ecosystems provide essential services such as fresh water, clean air, fertile soil, and climate regulation. However, unsustainable activities threaten these habitats, leading to the extinction of species, loss of biodiversity, and disruption of vital ecological balances. It's interesting to note that green technology associated with foreign direct investment (FDI) can enhance environmental quality (Demena & Afesorbor, 2020). If resource-rich countries fail to diversify their economies and adopt greener technologies, they may experience a rapid increase in environmental degradation. According to Wang et. al. (2020)" several nations are considering the costs of adaptation in order to maintain their current emission levels and create an environmentally friendly future." Environmental sustainability is a fundamental pillar of a thriving and resilient future.

Table 1*Summary Table on Assessment of the Sustainable Development Practices*

Dimensions	Weighted Mean	Verbal Interpretation	Rank
1. Environmental Sustainability	3.19	Agree	1
2. Social Sustainability	3.10	Agree	3.5
3. Ethical Practices	3.10	Agree	3.5
4. Economic Sustainability	3.12	Agree	2
Composite Mean	3.13	Agree	

Legend: 1.00 – 1.49 Strongly Disagree; 1.50 – 2.49 Disagree; 2.50 – 3.49 Agree; 3.50 – 4.00 Strongly Agree

Next, Economic sustainability (3.12) verbally interpreted as agree ranks 2. Meanwhile, although Social Sustainability and Ethical Practices received the lowest tied weighted mean scores, they remain essential components of sustainable practices. Social sustainability is a vital concept that recognizes the interconnectedness of people, communities, and the environment. It extends beyond just economic growth and environmental conservation, emphasizing the creation of a society where all individuals can prosper and enjoy a high quality of life. Social sustainability focuses on the well-being of individuals and society through the management of social resources and aligns closely with corporate social responsibility (CSR) (Reyna-Castillo, et al. 2023)

Social sustainability empowers communities to better endure challenges such as economic recessions, natural disasters, and social unrest. It promotes diversity, inclusivity, and a shared sense of purpose that helps communities adapt and thrive. While ethical practices are the bedrock of a successful and sustainable organization, impacting every aspect of its operations, from employee relations to customer trust and public perception also create a culture of respect, fairness, and integrity, boosting employee morale and job satisfaction. This results in a more motivated and effective workforce, both of which are essential components of sustainable development strategies. According to Samuel, et al. (2023) there has been a notable shift in the global culinary landscape towards ethical and sustainable practices in recent times. Being the lowest rank implies that the majority of the employees perceive this initiative as less visible, impactful, or directly engaging compared to sustainable development practices within the organization. because these dimensions often face structural and cultural challenges that can hinder their realization.

Table 2*Summary Table on Assessment of Employee Efficiency Measures*

Dimensions	Weighted Mean	Verbal Interpretation	Rank
1. Administrative Efficiency	3.23	Agree	1
2. Effective Teaching and Research	3.17	Agree	3
3. Research Utilization	3.19	Agree	2
Composite Mean	3.20	Agree	

Legend: 1.00 – 1.49 Strongly Disagree; 1.50 – 2.49 Disagree; 2.50 – 3.49 Agree; 3.50 – 4.00 Strongly Agree

Table 2 displays a summary of the assessment of employee efficiency measures, which includes three key dimensions: Administrative Efficiency, Effective Teaching and Research, and Research Utilization. The composite mean of 3.20, interpreted as "Agree," indicates that employees generally agree with the efficiency measures being assessed. The table shows the weighted means for each dimension as follows: Administrative Efficiency (3.23), Research Utilization (3.19), and Effective Teaching and Research (3.17). The item with the highest weighted mean

is Administrative Efficiency, with a score of 3.23, categorized as "Agree." This dimension reflects how effectively administrative processes are arranged to ensure smooth operations in the organization. The high rating might be due to the direct impact of efficient administration on daily activities, which employees value. They draw attention to the administrative aspects of safeguarding economic entities' rights during quarantine and stress the government's involvement in providing business assurances (Slobodianiuk et. al. 2021).

Lastly, the item with the lowest weighted mean is Effective Teaching and Research (3.17), which, while still falling under the "Agree" category, scored lower than both administrative efficiency and research utilization. This dimension relates to the extent to which teaching methods are integrated with research activities to enhance the learning experience. The lower rating might suggest that while employees agree on the importance of combining teaching and research, there may be a perception that this connection is not as robust or effective as it could be. Maulana et. al. (2023) discovered that effective teaching supports students in developing the skills and mindsets essential for research success, highlighting the value of non-cognitive skills in education.

Table 3

Relationship Between the Business Development Practices and Employee Efficiency Measures

Environmental Sustainability Practices	r-value	p-value	Interpretation
1. Administrative Efficiency	0.608**	0.000	Significant
2. Effective Teaching and Research	0.640**	0.000	Significant
3. Research Utilization	0.635**	0.000	Significant
Social Sustainability			
1. Administrative Efficiency	0.691**	0.000	Significant
2. Effective Teaching and Research	0.680**	0.000	Significant
3. Research Utilization	0.696**	0.000	Significant
Ethical practices			
1. Administrative Efficiency	0.675**	0.000	Significant
2. Effective Teaching and Research	0.653**	0.000	Significant
3. Research Utilization	0.682**	0.000	Significant
Economic Sustainability			
1. Administrative Efficiency	0.760**	0.000	Significant
2. Effective Teaching and Research	0.715**	0.000	Significant
3. Research Utilization	0.735**	0.000	Significant

Legend: Significant at p-value < 0.01

The relationship between staff efficiency measures and business development practices is displayed in Table 3. The calculated p-values were below the alpha level, and the calculated r-values show a high direct connection. This indicates a strong correlation and suggests that staff efficiency is impacted by or influenced by company growth techniques. Employee productivity increases when the company adopts development strategies, and vice versa. It also suggests that there is a dependence between the two variables. Environmental sustainability practices are significantly and positively correlated with administrative efficiency ($r = 0.608$), effective teaching and research ($r = 0.640$), and research utilization ($r = 0.635$). This suggests that as environmental practices are adopted and improved, employee efficiency in these areas also increases.

Next is social sustainability, which shows a strong correlation with administrative efficiency ($r = 0.691$), effective teaching and research ($r = 0.680$), and research utilization ($r = 0.696$). These results imply that practices fostering equity, inclusion, and social well-being positively influence how efficiently employees work and collaborate. Shafaei, A., & Nejati, M.et.al (2023), emphasize that inclusive and socially responsive environments enhance staff motivation, collaboration, and productivity. When institutions prioritize diversity, well-being, and community engagement, employees experience a stronger sense of belonging, which enhances overall efficiency "Da Silva Almeida, A. P., Do Amaral, et.al (2024)". Additionally, the data shows that staff efficiency metrics and ethical sustainability have a strong positive correlation, administrative efficiency ($r = 0.675$), effective teaching and research ($r = 0.653$), and research utilization ($r = 0.682$). This highlights the role of ethical leadership and integrity in improving performance and trust within the organization. Fairness, transparency, and accountability are promoted by ethical governance, leading to greater employee trust and improved performance. Furthermore, the strongest correlations were observed between economic sustainability and employee efficiency; administrative

efficiency ($r = 0.760$), effective teaching and research ($r = 0.715$), and research utilization ($r = 0.735$). This suggests that when an organization manages its financial resources well, employees also perform more efficiently. Economic sustainability boosts an organization's resilience and optimizes resource use, leading to enhanced productivity. Institutions that maintain financial stability can invest in training, research, and operational systems that empower employees and boost performance.

Table 4

Proposed Action Plan to Enhance Sustainable Development Practices and Employee Efficiency in Higher Education Institutions

Key Results Area/s Objectives	Strategies	Key Performance Indicators (KPIs)	Person Responsible / Department
Sustainable Partnerships & Ethical Collaboration <i>To maximize talents and potential</i>	<ul style="list-style-type: none"> The organization collaborates with environmentally conscious suppliers and partners. Following ethical guidelines 	<ul style="list-style-type: none"> % of internal promotions across diverse demographic groups Time to promotion by gender, race, and age 	Top Management Human Resource
Ethics & Sustainable Governance <i>To Support Sustainable and Responsible Growth</i>	<ul style="list-style-type: none"> HR may revisit rules, regulations, and processes to align with sustainability goals Develop a personal code of ethics applicable across situations 	<ul style="list-style-type: none"> % of HR policies reviewed and updated with sustainability and ethics considerations Number of new policies introduced addressing ethics, diversity, and sustainability 	Top Management Human Resource
Employee Capability Building & Training <i>To improve Operational Efficiency</i>	<ul style="list-style-type: none"> The organization invests in employee training to improve productivity and efficiency Identify skill gaps before training through needs assessment Improve training effectiveness by targeting gaps 	<ul style="list-style-type: none"> Number of skill gaps identified and addressed Training satisfaction and effectiveness ratings Post-training performance improvement rates 	Top Management Human Resource
Teaching & Learning Enhancement <i>Foster Interactive and Inclusive Learning</i>	<ul style="list-style-type: none"> % of courses using multiple teaching modalities Increased use of multimedia learning tools Reduction in performance gaps caused by teaching style mismatches 	<ul style="list-style-type: none"> % of courses using diverse teaching strategies Learning tool utilization rate Reduction in performance gaps 	Dean Faculty Members
Resource Utilization & Audit Efficiency <i>Optimize Resource Allocation</i>	<ul style="list-style-type: none"> Prioritize resource allocation based on goals and project requirements Analyze resource allocation patterns Identify resource bottlenecks or delays 	<ul style="list-style-type: none"> Number of misaligned/low-impact projects identified and reallocated Employee workload balance score Process improvement actions taken based on resource audits 	Top Management Audit Department Human Resource
Sustainability Monitoring & Improvement <i>To improve Operational Efficiency</i>	<ul style="list-style-type: none"> Track progress towards sustainability goals Use data for informed decision-making and continuous improvement 	<ul style="list-style-type: none"> % progress achieved relative to sustainability goals Frequency and quality of sustainability reports generated 	Top Management

4. Conclusions and recommendations

The faculty member generally agree that sustainable development is being practiced in their university. The faculty members generally agree that employees in their university are efficient. There is a significant relationship between sustainable development practices and employee efficiency. A plan of action is suggested for higher educational institutions to enhance sustainable development practices and employee efficiency. **HEIs may improve communication and visibility** of sustainability efforts to raise awareness and reduce perception gaps, specifically in social and ethical issues. HEIs may implement regular monitoring of KPIs related to teaching quality, research output, and administrative responsiveness to assess. HEIs may use employee feedback to refine sustainability strategies and enhance operational efficiency. Future researchers may conduct studies in regards with sustainable development practices with all other stakeholders as the respondents.

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Leadership model in an agriculture cooperative: Challenges and best practices

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Abstract

Cooperative leadership is evident in how a particular social enterprise addresses the challenges in operations. Coop M in Pola, Oriental Mindoro recognizes the following challenges: low and inactive membership, lack of market and discoloration of fresh calamansi, lack of capacity for provision of all required monetary benefits for employees, and being dependent on external aid. Based on the Theory of Constraints, these are the most restricting aspect of the organization that prevent them from achieving their goals. To address these challenges, Coop M employs strategies such as productivity improvement, training and development for employees and members, partnership with academe, and plans for expansion. These strategies of Coop M demonstrate strategic leadership. This is also consistent with the Congruence model by Nadler and Tushman in the early 1980s, citing the importance of transformation process between inputs and outputs and how should these elements be integrated to improve the performance of the organization. Employees and members are generally satisfied from the benefits (mostly non-monetary) received from the cooperative which implies that they are being inspired by the management to reach common goals, elevate strategies for societal impact, and pass it on to the next generation. The study suggests that Coop M demonstrates Social Collective Leadership. The cooperative envisions to export their product to Europe once they have already secured appropriate license and permits consistent with the quality of their product. The study recognizes the importance of agriculture cooperatives' gearing more towards a combination of Social Collective and Strategic-Transformational Leadership Model as also evident in the current status and operations of Coop M. However, strict generalization is not applicable because of limited scope of the study. There is a need to review existing programs for agriculture cooperatives, particularly on market facilitation, minimizing barriers to trade, and enhancing potential for exports.

Keywords: agriculture cooperatives, social collective leadership, cooperative leadership, theory of constraints

Leadership model in an agriculture cooperative: Challenges and best practices

1. Introduction

Cooperatives in different forms promote the fullest participation of people for economic and social development (as cited by Roelants, n.d., p. 79) in the International Labour Organization's (ILO) publication of *The Promotion of Cooperatives* in June 2002. Cooperatives are considered as means to promote economic, social, and environmental sustainability by 2020 as it helps promote decent work (International Labour Organization, n.d.). One of the positive attributes of cooperatives is that they mostly deal with local issues such as their members' individual and communal concerns more than national and regional issues (International Labour Organization, n.d.). A cooperative is best explained to be a type of enterprise that reduces poverty and exclusion by creating economic opportunities for its members and translate individual risks into collective risks, reducing the cost for each member while maximizing the benefits that they can get (International Labour Organization, n.d.). For instance, an agricultural cooperative is helping its members to have access to raw materials used for production and help them process and market these produced.

Global sustainability can be achieved through promoting economic growth by creating local jobs and providing goods and services to improve the lives of the poor or reduce poverty rate (Kreiner, 2013). One of the main causes of poverty in the Philippines is the failure to develop the agriculture sector. The agriculture sector is considered a significant component of the Philippine economy as it provides employment to estimated thirty percent (30%) of labor force in the country despite its declining contribution to Gross Domestic Product (GDP) In 2008, the agriculture sector has 13.24% contribution to Gross Domestic Product (GDP), continuously declining to 9.28% in 2018 while the Services sector contributes the largest percentage in GDP (Philippine Statistics Authority, as cited by Plecher, 2020).

One of the high performing agricultural sub-sectors is Calamansi farming. Calamansi or Philippine lemon is considered as a major and high-value crop in the Philippines which has reached 66.76 thousand metric tons of production in July to September 2019 which was 24.6 percent higher than the 2018 same period having 53.56 thousand metric tons of production. (Philippine Statistics Authority, n.d.). MIMAROPA Region also had the largest share of area planted with Calamansi, equivalent to 33.2% in 2018 (Philippine Statistics Authority, 2019). Among the five provinces in MIMAROPA, Oriental Mindoro contributes 99% of the supply from 5,886-hectare land planted with Calamansi in 2016, thus, dubbed as the 'Calamansi King' of the country (Philippine Statistics Authority, n.d.). In Oriental Mindoro, a total of 2,802 farmers are engaged in Calamansi production distributed in the municipalities of Victoria, Naujan, Roxas, San Teodoro, and Pola, (Philippine Statistics Authority, n.d.).

Aside from Calamansi farming, the MIMAROPA region is also known for producing other types of agricultural crops. Agricultural cooperatives are encouraged to engage into agri-business or processing of raw materials in order to promote value-added local products and generate employment. The International Labour Organization (ILO) in its publication of *The Promotion of Cooperatives* in June 2002 recognizes that cooperatives or 'social enterprises' promote decent work and encourage people's participation for economic, social, and environmental sustainability (as cited by Roelants, n.d.). Various literatures' definition of a 'social enterprise' can be summarized into a concept: an organization producing specific products or services to obtain both social and financial returns.

In the Philippines, a cooperative is being led by the elected officers during the General Assembly. Thus, a democratic approach is used in choosing the leaders. The effectiveness of specific leadership models among cooperatives in the Philippines has limited number of studies as of the present. Studies suggest that leadership development initiatives should be linked to development strategies. The foregoing discussions prompted the researcher to conduct a study related to the leadership model that is eminent in an agriculture cooperative. This

helps determine existing efforts that can be replicated by other similar cooperatives in order to overcome business disruptions and challenges.

Theoretical Framework - This research is anchored on the Theory of Constraint and Congruence Model to guide the analysis and understanding of all the significant variables in this study. The Theory of Constraints is an approach used to find the most significant restricting aspect that prevents an organization from meeting its goals and progressively improves this weakness until it no longer exists (Pacheco, et al. 2019). The study recognizes that micro and small cooperatives experience various challenges in their operations, given the business environment and other factors that may threaten the sustainability of their operations. Also, the study will use the Congruence model by Nadler and Tushman in the early 1980s (Ando, 2023) citing the importance of transformation process between inputs and outputs and how should these elements be integrated to improve the performance of the organization. Similarly, the present study will look on how the factors and challenges affect the cooperative and how they respond to it.

Research Questions - This study on aims to provide discussions and explanations to the following Research Questions:

- 1 What are the different challenges being experienced by Coop M in their operations?
- 2 What are the strategies/best practices of Coop M that help address these challenges?
- 3 What are the monetary and non-monetary benefits being given by the management of Coop M to its employees and members?
- 4 How do these monetary and non-monetary benefits from the cooperative effect employees' and members' satisfaction?
- 5 What is/are the leadership model/s evident in Coop M?
- 6 What are the recommendations for improvement of leadership and management of Coop M?

2. Methodology

The study employed a phenomenological type of inquiry by which the researcher will ask the participants to discuss their experiences, particularly the challenges and observed changes in the operations of Coop M. The researcher will facilitate purposive sampling through personal interviews with the management, employees, and members of Coop M. Coop M's production team is composed of seven (7) regular employees, five (5) members, and 1 General Manager. The study will employ a semi-structured interview with all the regular employees. Recommendations of the study shall be supported with facts from data collection, observations, and compliance with other statutory and regulatory requirements related to logistics and productivity.

The researcher employed a purposive sampling with the following criteria of choosing the participants, particularly the employees from Coop M: regular employees of the association, male or female, at least 25 years old, and have direct involvement in Calamansi processing. The General Manager will serve as management representative to answer questions related to the challenges and strategies of Coop M. Snowball sampling will be used for choosing the members who have been with the cooperative since the beginning of its establishment. The following are the participants of the study since they are directly involved in the operation of the cooperative: seven (7) regular employees, five (5) members, and 1 General Manager. Face-to-face interviews and Focus Group Discussion were facilitated to ensure that all relevant information will be collected. Also, secondary data such as the development plans of the cooperative and financial statements were also included in the analysis.

The researcher utilized semi-structured interviews with participants, particularly the employees, management, and members. For the Focus Group Discussion, a guided discussion on the existing challenges of agriculture cooperatives in the Philippines was utilized, including the common strategies and best practices, and finally, the recommendations for better policies and programs for agriculture cooperatives. The researcher engaged professionals / experts to ensure that research instruments to be used are sufficient and appropriate to answer all the research questions.

The study employed a descriptive analysis of the experiences of Coop M's employees, management, and

members, including their perception on the challenges and best practices to overcome various disruptions and limitations in their operations. The study also explored on the leadership model/s that is/are evident in the current status and operations of the cooperative.

All the data and information collected through interviews and Focus Group Discussion were coded using thematic analysis for key points and patterns, particularly perceptions and experiences of participants. The researcher formed themes that answer the research questions. Below is the five-phase process of data analysis that was developed by Bingham & Witkowsky in 2022 as cited by Bingham (2023) which will also be adopted by the present study. For ethical considerations of the study, the researcher ensured that participants are provided with all the important information, including the purpose, benefits and potential risks of the study. The researcher also informed the participants that they have the right to withdraw their participation if deemed necessary and provided them with opportunity to ask questions related to their participation to the study.

3. Results and discussion

3.1 Challenges and Strategies

One of the cited challenges of Coop M is on membership wherein only 50% (162) of the total number of members (324) are active. Another is non-standard employment and limited monetary benefits for employees, majority are contractual (15 employees) and only seven (7) are regular. There is lack of market and discoloration of fresh calamansi and lack of capacity for provision of all required monetary benefits for employees, and being dependent on external aid. The cooperative also lacks self-reliance as they expect to receive assistance to be provided by Non-Government Organizations, Local Government Unit (LGU) and other National Government Agencies (NGAs). To be able to address challenges on membership, non-standard employment, and limited monetary benefits for employees, Coop M invests on enhancement of skills and technical assistance for employees and members, particularly on productivity improvement, training and development for employees and members, partnership with academe, and plans for expansion. These strategies on addressing the challenges can create a shared value as stated by Schlosser and Volkova (2022), demonstrating Strategic Leadership Model. The continuous commitment of employees and members helps the cooperative to develop more strategies and plans for expansion. They also target to become less dependent on assistance from government and non-government organizations.

Productivity improvement - Previously, the cooperative had a problem with discoloration of Calamansi but now that they have Four (4) freezers, they can already store the Calamansi (one week at most) to prevent discoloration. Also, they are encouraging the members to sign an agreement for off-season fruiting to establish sustainability of supply of Calamansi for processing of Calamansi concentrate and Ready-to-drink Juice. In addition, another support from the Provincial Government is the requirement that caterers within Oriental Mindoro shall utilize Fifty percent (50%) mineral/purified drinking water and fifty percent (50%) juice or other beverages produced locally. COOP M is also currently exploring the possibility of adding preservatives to Ready-to-drink Juice to be able to compete with the market and lengthen its shelf-life

Training and development - Coop M has developed partnership with different organizations to enable provision of training and development for its members and employees. Coop M is also a member of Mindoro Sustainable Agricultural Federation (MESAFED) that focuses on empowering Calamansi farmers in Oriental Mindoro. Starting August 2016, through the Asian Partnership for the Development of Human Resources in Rural Areas (AsiaDHRRA), Coop M was able to develop strategies to increase membership through clustering. Before the intervention of AsiaDHRRA, only the farmers in Brgy. Matulatula had the opportunity to join the cooperative. When AsiaDHRRA introduced this strategy on clustering, membership in cooperative increased and eleven (11) clusters were formed consisting of different municipalities. Cluster 1 to 5 consist of members from Brgy. Matulatula, Cluster 6 is for members from Brgy. Casiligan, Cluster 7 for members from Brgy. Panikihan, Cluster

8-9 for members from Brgy. Pahilahan, Cluster 10 for members from Mabuhay Dos, Socorro, and Cluster 11 for members from Antonio, Victoria. With assistance from AsiaDHRRA, member-farmers were also trained on farm productivity as well as pruning and rejuvenating of Calamansi trees to encourage off-season fruiting. Employees also learned the basics of bookkeeping, and food safety requirements. Last 2018, selected member-farmers of the cooperative was able to join the Learning Exchange Tour for Citrus Processing in South Korea, sponsored by AsiaDHRRA. They were also able to attend the Seminar on Agricultural Processing for the Philippines on May 19-25, 2019 in Beijing, China, sponsored by Ministry of Agriculture and Rural Affairs, P.R. China, organized by Administration and Management Institute, MARA, P.R. China.

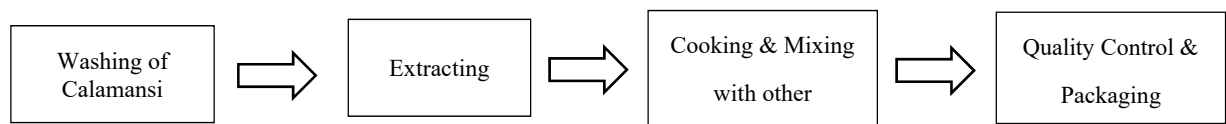
Partnership with academe - Prior to COVID-19 pandemic, the cooperative has contract agreement to deliver Calamansi Ready-to-drink juice in elementary schools within Matulatula, Pola, and Socorro. Due to implementation of Enhanced Community Quarantine (ECQ) wherein the schools also faced the “new normal” setting of conducting online or modular classes instead of the face-to-face traditional classes, the cooperative also has reduced market for Ready-to-drink juice. The cooperative is looking forward to the reopening of classes in schools. Initially, they are conducting sales promotion, selling 12 bottles of Rtd for PhP100.00 only which is 50% off from the Suggested Retail Price. There are also existing negotiations with Mindoro State College of Agriculture and Technology (MinsCAT) and University of the Philippines Los Baños through Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) for conduct of more research on Calamansi by-products and improvement of technology.

Plans for Expansion - It is priority of the cooperative to increase membership by 700 in the next two years. Also, at least 50% of these members shall be active in participation to general assembly, paying the subscribed capital as well as other financial obligation, and patronizing the products and services of the cooperative. Coop M also plans to assist its member-farmers in rehabilitation of their farm and identify other products that can be consolidated such as honey and banana. They shall continue to encourage the members to sign the contract for Off-season fruiting to ensure consistent supply of Calamansi even during lean season. It is also their priority to strictly implement their manual of operations. Currently, there is an increasing demand for Calamansi concentrate in the National Capital Region (NCR). Coop M has also secured the Food and Drug Administration (FDA)-License to Operate to be able to continuously market their product in Puregold and other supermarkets nationwide. The cooperative envisions to export their product to Europe once they have already secured appropriate license and permits consistent with the quality of their product.

3.2 Employees' and Members' Satisfaction from Monetary and Non-Monetary Benefits from the Cooperative

Nature of Work - There are four (4) employees assigned in the production. However, during observation, the secretary, treasurer, and driver also assist in packaging, particularly when there are bulk of orders from Metro Manila. Below is the process flow of production:

Figure 1. Process Flow for Calamansi Processing



Most of the employees are required to come to work for more than eight (8) hours, usually those who are assigned in the cooking process, quality control, and packaging. Three hundred (300) to five-hundred (500) bottles of Calamansi concentrate are being produced per day. Most of them said that there is no definite schedule of rest day (it can be any weekday) because they are only required to report for production upon availability of raw materials for processing and the desired volume of production. Some of them are only required to report to work twice a week so they have plenty of time for their family and other endeavors.

In terms of knowledge on tasks, majority are aware of their responsibilities and are confident in handling it.

One employee is still willing to perform other tasks. However, an employee assigned in finance has some concerns because of very high responsibility incorporated in the tasks assigned.

When asked regarding their perception of Coop M's objectives as an organization, most of them said that Coop M is significantly contributing to the community and knowing this helps them to willingly perform their tasks. However, the employee assigned in Quality control said that she's experiencing some difficulty in manually checking each bottle of concentrate if it is already free from Ginger residue and grains of sugar. As she stated, "*Mahirap din po ang trabaho ko kasi mainit hawakan iyong bote tsaka mahirap titigan kung may latak o may buong asukal o luya. Iyong mga di nakapasa sa Quality Control, ginagawa nalang naming Ready-to-drink juice. Maganda naman ang ginawa ng Coop M na nakipag-partner sa Global Organic Wellness Corporation (GlowCorp) kasi sila ang bumibili ng produkto namin at dinadala sa PureGold at All Days SuperMart*" (I find some difficulty with my job because the bottle is still hot but I have to constantly check if there are some residues of Sugar or Ginger. The Calamansi concentrate that did not pass the required quality can still be processed as Ready-to-drink Juice. Still, Coop M is doing a good job through its partnership with the *Global Organic Wellness Corporation (GlowCorp)* because it serves as distributor of our product to PureGold and All Days SuperMart). With what was stated by this employee, the cooperative needs capacitation on standard procedures for Quality control of Citrus by-products. Nevertheless, despite having some difficulty on Quality control, this employee is still committed with her job, knowing that the products that did not pass the Quality control can still be processed as Ready-to-drink Juice and they have good market for Calamansi concentrate through the cooperative's partnership with the private sector.

Salary or pay only ranked seventh (7th) on importance for employees. Meaning, intrinsic characteristics of the job can be more important for employees. Employees of Coop M that were interviewed declared that they like their job and they are doing it because they believe that the growth of the organization also entails additional income for them. As the Production Head said, "*Okay lang sa amin kahit anong work dito sa coop kasi sa amin naman ito. Di naman kasi sya trabaho kasi additional income naman sya para sa Coop M.*" (We accept whatever role is given to us because we are also owners in this cooperative. We do not treat it as work but additional income for Coop M). The flexibility of work schedule also allows them to have more time for their family and find other sources of income such as rice and vegetable production, poultry and livestock raising, and construction.

Monetary Benefits - Coop M has Seven (7) regular employees and they are being paid in piece rate/paid by results or paid based on the amount of work done. These employees are exempted from the provisions of Book III, Conditions of Employment, as stated in Article 82 of the Labor Code of the Philippines, and amended by the Wage Rationalization Act (the generally applicable minimum wage rates). In the provision of this Act, exemption is given to employees in Barangay Micro Business Enterprises (BMBE) and retail/service establishments regularly employing not more than Ten (10) workers upon application with and as determined by the appropriate Board in accordance with applicable guidelines to be issued by the Commission. Aside from the fact that coop M has only seven (7) regular employees, they must also secure a BMBE registration that provides exemption from payment of minimum wage to employees.

As per the National Wages and Productivity Commission (n.d.), the minimum wage in MIMAROPA region during the time of study is PhP294 per day for establishment with less than 10 workers under all sectors upon effectivity of Wage Order No. RB-MIMAROPA-09. Employees shall be receiving at least PhP6,468.00/month. Considering the current amount being given to employees of Coop M, only the driver is receiving an amount that is above the minimum wage while majority are receiving less than the minimum wage. Each employee receives PhP1.50 per bottle of Calamansi Concentrate & PhP0.50 centavo per bottle of Calamansi Ready-to-drink juice. According to the employees, their monthly wage/salary increases during peak season (July-December). Despite the amount of salary/wage they receive, majority of them said that this amount is enough to support their everyday life compared to the amount they receive when they were just involved in harvesting. They also value their close ties among other members of the cooperative than the amount of salary they receive. As one employee said, "*Kasya naman po kaysa kapag namimitas lang kami maliit lang talaga. Masaya pa din naman kasi parang magkakapatid*"

na kami dito kahit maliit lang ang kita". (I think the salary we receive is just enough to supply our daily needs, compared to the income we receive before, when we were just harvesting Calamansi. Also, we treat one another in the organization as siblings and it is important for us even if we only receive not as much of income.) Two (2) employees said that their salary is not enough. According to one employee, Ana (not her real name), her salary is not enough because they have two (2) children who currently have increasing demands with their studies while her husband is only working part-time as a construction worker. As she stated, "*Kulang ang sahod ko kasi dalawa and anak namin na nag aaral (Grade 7 at Grade 3) tapos sa construction lang naman nagtatrabaho ang asawa ko.*" (My salary is not enough because we have two children who are currently studying in Grade 7 & Grade 3 and my husband is only doing construction work.). However, given the fact that they are also members of the cooperative, she is hoping that when the cooperative is already earning more income, they will also benefit from it. As she stated, "*Masaya naman kasi napamahal na din sa akin ang coop. Tsaka member din naman kami ng COOP. Kapag yumaman ito, yayaman din kami.*" (I am still happy because I came to love what we do in the cooperative as we are also members. If the cooperative gets to earn higher income, we will also get our fair share of income). Another employee, Mira (not her real name), also said that the salary she currently receives is not enough. She emphasized that finding other sources of income is important.

In terms of social security benefits, according to the employees, they were assisted by the cooperative in recent registration to social security coverage (SSS & Philhealth) for the year 2020 but the processing and payment of their contribution was delayed due to implementation of Enhanced Community Quarantine (ECQ). Some employees also have Philhealth since they are 4Ps beneficiaries at the same time. They are newly enrolled in SSS through the assistance from Coop M. However, like the other employees, the processing and payment was delayed due to implementation of ECQ last 2020. One employee is voluntarily paying his/her contribution to SSS and Philhealth through other organizations such as CARD Bank, Inc./programs of the government such as 4Ps.

The General Manager, Ms. Marasigan admits that the cooperative is not yet able to pay the employees as much as they want to. As Ms. Marasigan stated, "*Alam naman ng mga employees ang sitwasyon kasi palagi naman silang kasali sa mga meeting namin o kaya sa planning. Members din sila kaya alam nila ang dahilan bakit ganon lang ang kayang ipasweldo ng coop sa kanila sa ngayon.*" (Employees know the situation because we always include them in meeting or planning. They are also members so they know the reason why they only receive such amount of salary at present). Whenever Coop M sees an opportunity to generate more income, employees are given other benefits such as Christmas groceries, etc.

Job security - All employees said that they will render services to the cooperative as long as they have the strength to carry on the tasks assigned to them. Most employees are certain that their services will not be terminated by the cooperative because their work is necessary to the operations of the organization. As one employee stated, "*Hindi naman siguro kasi di din sila makagawa nang wala ako*". (I think my services will not be terminated because they cannot operate without the expertise that I offer.) Another employee said, "*Di ko masabi pero tingin ko magsstay pa ako ng 20-30 years hanggang kaya.*" (I cannot tell but I think I can stay for twenty to thirty years more, as long as my services are needed.) Some of them are certain that their services will not be terminated because they do not engage in things that are against the policies of the cooperative, "*Malabo naman po na matanggal ako sa serbisyo basta wag lang gagawa ng di maganda*". (There is a very little chance that my services will be terminated by the cooperative as long as I am not doing anything that may harm the operations of organization.).

Previous study of Daud (2017) established that there is a significant relationship between job security and well-being of the employees that can be manifested into feelings of love, health, hospitality, and happiness. The employees of Coop M are satisfied with their job because they feel that they will be working permanently with the organization as they are vital part of the whole process, serving the functions of employees and members at the same time. From the study conducted by Artz & Kaya (2015), it was concluded that job security has a positive effect on job satisfaction, particularly for those with lower educational attainment since they perceive a longer period of job search in case of job loss and it is more important for them to be secured in their job. When they feel

secured with their job, they will also report job satisfaction. Promoting job security that leads to job satisfaction is important in order to reduce quits and absenteeism. This will then lead to increase in productivity of the organization. Majority of employees of Coop M have never reached tertiary level of education thus they may perceive longer period of job search in case of job loss. The feeling that they have permanent job in the cooperative is an important factor leading to job satisfaction. Also, given the current restrictions due to pandemic, employees would tend to give importance to their job since there will only be limited opportunities outside the community.

Relationship with Co-workers - Job satisfaction can be understood through areas such as satisfaction with the work itself, supervisor, relationship with co-workers, career growth, and security. Thus, the present study determined whether the employees maintain harmonious relationship with their co-workers by having no conflict or easily settling conflict among themselves even without intervention from the management. Only one among the employees declared having experienced conflict with their colleague and conflict resolution was immediately facilitated by the management. Majority of employees are also aware about conflict management procedure by the management. One employee said he/she chooses to settle the conflict among themselves. Some employees did not give comment on conflict resolution process of the cooperative.

Table 3

Employees' concept/sources of satisfaction from the job

Cooperative Themes
Ability to contribute to the achievement of cooperative's goals
Additional income for the family
Permanent work
Good relationship with colleagues & management

The first source of satisfaction for employees is **the ability to contribute to the achievement of cooperative's goals or its mission and vision**. All of the employees interviewed are aware that the organization aims to help its member-farmers to receive more income from processing and this enterprise helps prevent wastage/rotting of Calamansi when there is excess supply during peak season. Even the administrative staff said, *"Mahalaga ang ginagampanang tungkulin ng Coop M bilang kooperatiba kasi marami talagang Calamansi dito. Ako bilang driver alam ko yun."* (Coop M plays an important role as a cooperative since Pola has abundant sources and supply of Calamansi. Even me as a driver is aware of that). The cooperative also buys one (1) ton of Calamansi from each of eleven (11) clusters in the municipality of Pola, Victoria, and Socorro with competitive price of PhP10.00 per kilo. According to one employee, *"Malaki ang naitutulong ng coop kasi kahit peak season ay PhP10.00 per kilo pa din ang bili nila sa Calamansi. Samantalang sa iba ay bumababa ng PhP5.00 ang bili sa Calamansi pag peak season."* (The cooperative has its way of helping the farmers earn enough income because they buy Calamansi for PhP10.00 per kilo even during peak season, even if other traders buy them for only PhP5.00 per kilo during peak season.

Based on interview with management, she highlighted that this agricultural cooperative aims to continuously collaborate with other sectors in the society that promote community development and improve the livelihood of its members and the community. Coop M also aims to foster good relationships among the members and the management, as well as their relationship with the Creator and the community as a whole. The abovementioned goals of the cooperative is being achieved with its very nature. The cooperative helps prevent wastage/spoilage of Calamansi when there is excess supply during peak season. The processing of Calamansi also helps provide additional livelihood and income to its member-farmers, contributing to poverty reduction in rural areas.

Another theme that arises from the responses of employees is **additional income for the family**. When asked about their satisfaction with the salary that they receive, majority of the employees said that their salary is just enough to sustain their daily needs. In fact, being employed in the cooperative gives them additional income for their family compared with the previous amount that they receive when they were just selling their harvest of Calamansi to traders or by doing part-time construction work. An employee assigned in Quality control stated, *"Kasya naman po kaysa kapag namimitas lang kami maliit lang talaga. Masaya pa din naman kasi parang*

magkakapatid na kami dito kahit maliit lang ang kita.” (My salary is just enough and I think it is better compared to our income when we were just harvesting and selling Calamansi. We also treat one another like siblings and it is more important even if we receive a relatively low income).

Both the administrative staff and another production worker said that their salary serves as additional income for them since both of them also own an agricultural area for rice production. Compared to their income with rice production alone, being employee of the cooperative provides them additional income for their family. On the other hand, some employees allot a portion of their salary for capital share. As the Production Head stated, *“Para sa akin ay sapat lang kasi pag sumasahod ako, binabawas ko na agad iyong pangbigay ko as capital share dito sa coop.”* (For me, my salary is just enough because I automatically set a portion for my payment of capital share in the cooperative). Their satisfaction with the salary that they receive is in line with their understanding of being co-owner of the cooperative. When the cooperative becomes more prosperous in the coming years, these member-employees are aware that they too will benefit from it. At present, they are contented with what they receive and continuously perform the functions that they were tasked with.

Another theme that arises corresponds to the concept of job satisfaction that comes from employees’ perception of having **permanent work** in the cooperative or as long as they are willing to perform the tasks given to them. Interview with employees show that they are certain their services will not be terminated by the cooperative because their work is necessary to the operations of the organization. As one employee stated, *“Hindi naman siguro kasi di din sila makagawa nang wala ako”*. (I think my services will not be terminated because they cannot operate without the expertise that I offer.) Another employee said, *“Di ko masabi pero tingin ko magsstay pa ako ng 20-30 years hanggang kaya.”* (I cannot tell but I think I can stay for twenty to thirty years more, as long as my services are needed.) Some of them are certain that their services will not be terminated because they do not engage in things that are against the policies of the cooperative, *“Malabo naman po na matanggal ako sa serbisyo basta wag lang gagawa ng di maganda”*. (There is a very little chance that my services will be terminated by the cooperative as long as I am not doing anything that may harm the operations of organization.). In addition, the permanent work of employees also comes from being members of the cooperative, giving them the voting rights and opportunity for participation in decision making.

Good relationship with colleagues and management also serves as a source of satisfaction for employees. Majority of employees have not yet experienced conflict with their colleagues. In case of conflict, a conflict resolution strategy will be immediately facilitated by the management. According to a production worker, *“Wala namang away. Nagkakabiruan pa at nagkakatuwaan.”* (We did not experience a serious conflict. We mostly even tell jokes among us). Another employee said, *“Pag trabaho, trabaho. Pinupuna din sila pag sa trabaho. Para na rin kaming pamilya dito.”* (We only work professionally. We just honestly talk to one another in case of concerns about work. We treat one another as family). When it comes to employees’ relationship with the management, the researcher observed that all the employees respect the strict implementation of policies as they consider it important to ensure compliance with quality and principles providing direction to the operations of the cooperative. Employees also know the importance of being responsible to the tasks assigned to them. As stated by a production worker, *“Mahalaga kasi tinutulungan ka maging responsible tsaka dapat iyong mga tungkulin mo ay nagagawa mo din.”* (Policies are important because it instill in us the need to be responsible to perform our functions). Members were also interviewed to determine how satisfied they are in terms of the services availed from the cooperative and catch some unique success stories of members who stayed in the cooperative for a longer period of time, being able to observe and withstand all sorts of challenges, together with other members of the cooperative.

Table 4
Members’ concept/sources of satisfaction

Cooperative Themes
Raising Farmers’ Voice
Additional savings
Technical Knowledge on Improving Production

The first theme formed from the results of interview with members was **raising farmers' voice**. Most of these members who were interviewed have joined the cooperative because they are beneficiaries of the Comprehensive Agrarian Reform Program (CARP) and they wanted to have better coordination with other farmers as well as access to farm supplies and technology. Previous literature confirms that people's voices are better heard when they are in groups such as in cooperatives (Zeuli & Cropp, 2004). In order to validate this information, the researcher asked the members during interview whether their voices are heard better after joining the cooperative. Citing a member's answer, "*Oo naman kasi parang nakikipag-dialogue kami sa mga ahensya ng gobyerno gaya ng DA, DOLE, DTI, DAR, etc. Mas may boses kaming magsasaka. Hindi na ako nahihiya, di gaya noon. Mas kaya ko nang sabihin kung ano ang mga kailangan namin. Dahil din sa Coop M kaya ako nasanay na makikipag-dialogue sa iba lalo na sa matataas na tao. Noon ay wala kaming crop insurance. Ngayon sa tulong Coop M at DAR, nailapit namin sa PCIC. Noong nakaraang taon, naka-claim na din kami ng insurance Nasa Php5,000 to Php15,000 din ang claim depende sa porsyento ng nasira.*" (Yes, of course, because we engage in dialogue with government agencies such as Department of Agriculture (DA), Department of Labor and Employment (DOLE), Department of Trade and Industry (DTI), Department of Agrarian Reform (DAR), etc. We have raised our voices as farmers. I am not ashamed to speak in public, unlike before. It is also because of Coop M that I am able to engage in dialogue with other people, particularly those in authority. Before, we do not have access to crop insurance but now through the help of Coop M and Department of Agrarian Reform (DAR), we were able to avail from Philippine Crop Insurance Corporation (PCIC). Last year, we were able to claim insurance provision of Php5,000.00 to Php15,000.00 as percentage amount of typhoon damage to crops. Another member said, "*Oo. Merong Calamansi Congress gaya noong 2017. Imbitado ang NGOs. Nagsasabi kami ng hinaing doon. Simula noon, mas nabibigyan na kami ng tools at pananim. Madali kasing makarequest ng assistance kapag coop. Tsaka kapag may General Assembly (halimbawa sa December), nasasabi din namin ang concerns.*" (Yes, like in 2017 during Calamansi Congress. Non Government Organizations (NGOs) are invited. We were able to state our concerns. Because of that, we had better access to tools and seedlings. It is easier to access support if you are in a cooperative. Also, during General Assembly in December, we are able to voice out our concerns). In addition, a member-farmer also said, "*Oo kasi na-train din ako sa pagraraton para mas mapabata ang farm. Nabigyan ako ng kaalaman at yun din ang tinuturo ko sa iba pang members ng coop para sa off-season fruiting. Pag ganitong buwan, dapat may pruning na. May partner din kami na kinukuhaan ng magandang quality ng fertilizer para sa organic farms.. Kaya lang iyong ibang members ayaw mag-rejuvenate ng puno ngayon kasi nanghihinayang sila dahil namumunga na. Kapag niraton kasi, nasa 1 year and 3 months pa bago ulit ang harvest.*" (Yes, because I was trained on pruning and rejuvenating to maintain good quality of Calamansi trees. I learned additional knowledge and technology that I also teach to other member-farmers for off-season fruiting. During this season, there shall already be pruning. We also have partner organization for good quality of fertilizer.

The second theme on source of members' satisfaction is having **additional savings**. According to a member-farmer, "*Ay napakalaking tulong ng ibinibigay ng Coop M kasi di ko na bibilhin iyong gulok, sprayer, at seeds. Iyong nasasave dun pambaon nalang ng mga anak namin na nag aaral.*" (Coop M helps us a lot because we are able to save the amount of money that we supposed to spend for tools and seeds. The amount saved can serve as allowance of our children who go to school). Another member-farmer said, "*Oo naman malaking tipid din. Pero obligasyon din namin na umattend sa cluster meeting. Php50.00 ang binibigay kada meeting (capital share), tapos may savings ang cluster (for emergency), bukod pa sa savings sa Coop M na pwede ding withdrawin. Per cluster ay meron ding mga poultry at livestock na paalaga.*" (Yes we save a lot from being member but we also have responsibility to attend to cluster meetings. Every meeting, we are required to contribute Php50.00 as capital share. We also have separate savings in our cluster group aside from the savings that we can withdraw from Coop M. We also have poultry and livestock raising in our cluster group). In addition to these statements, another member-farmer also recognizes the important role of the cooperative in helping them save money that would rather be allocated for daily expenses and children's education. A member-farmer recognizes that being with the cooperative helps them with their livelihood, "*Malaking tulong din kasi halos iyong buong income naming mag-asawa ay galing sa Coop M. Napapag-aral din namin ng Engineering iyong isa naming anak na nasa college. Iyong isa naman ay Agriculture ang kukuning course.*" (It is a big help to us because majority of income of my wife (as

employee and member) and I (as member) comes from the cooperative. We are also able to send our son to college, currently studying Engineering. My other son will get an Agriculture course in college).

The third theme that serves as source of members' satisfaction is **technical knowledge on improving production**. This is a non-material source of satisfaction of members. As one member-farmer said, "*Sobra. Unang-una sa mga seminars at trainings mula sa coop gaya ng GAD (Gender and Development), Trainers' Training, Training on Production, etc. Meron ding mga di inaasahang benepisyo gaya ng para sa abono at ibang items. Ngayon Brgy. Kagawad na ako kaya kailangan na magresign sa pagiging Chairperson ng coop.*" (I am thankful. First, with the seminars and trainings from the cooperative such as Gender and Development, Trainers' Training, Training on Production, etc. There are also unexpected benefits such as fertilizer, tools, and other items. Now, I am already a Brgy. Councilor thus I have to resign from responsibility as Coop Chairman. Another member-farmer said, "*Oo kasi na-train din ako sa pagraron para mas mapabata ang farm. Nabigyan ako ng kaalaman at yun din ang tinuturo ko sa iba pang members ng coop para sa off-season fruiting. Pag ganitong buwan, dapat may pruning na. May partner din kami na kinukuhaan ng magandang quality ng fertilizer para sa organic farms.*" *Kaya lang iyong ibang members ayaw mag-rejuvenate ng puno ngayon kasi nanghihinayang sila dahil namumunga na. Kapag niraton kasi, nasa 1 year and 3 months pa bago ulit ang harvest.*" (Yes, because I was trained on pruning and rejuvenating of trees that I also teach to other member-farmers for off-season fruiting. During this season, there shall already be pruning.

3.3 Leadership Model/s Applicable for the Current Status and Operations of Coop M

Coop M explains to its employees the current status of operations, resources, and income of the cooperative while engaging and encouraging them to continue as active members of the cooperative by consistently attending monthly meeting and giving their capital share to the cooperative. It is consistent with the findings of the study of Prasetyo et. al (2016) that a complex organization such as cooperative can well communicate the mission and vision to each employee, involving them to share and contribute to the common goals, evident in social collective leadership model. Given that employees are also active members of the organization, they are able to participate in decision-making and strategic planning. Employees consider management policies as important to ensure compliance with quality and principles of food safety, providing direction to the operations of the cooperative. Employees consider Management policies as important to the overall operation of the cooperative and serve as guide in performing their tasks. All employees verbally declared that they willingly follow the policies set by the cooperative and the General Manager showed strict implementation of the policies of the cooperative. As one employee stated, "*Oo kasi accomplishment na iyong matapos ang mga trabaho at masunod and mga policy sa processing*". (Yes, because it is already an accomplishment to accomplish the work and follow the policy in processing.) One example of the implementation of cooperative's by laws and policies was during the construction of water tank to maintain water supply for off-season fruiting. It is required that the cooperative shall contract the services of members first to do the construction work, not to source out services of others outside the cooperative.

4. Conclusion and recommendation

Coop M recognizes the following challenges: low and inactive membership, lack of market and discoloration of fresh calamansi, lack of capacity for provision of all required monetary benefits for employees, and being dependent on external aid. Based on the Theory of Constraints, these are the most restricting aspect of the organization that prevent them from achieving their goals. To address these challenges, Coop M employs strategies such as productivity improvement, training and development for employees and members, partnership with academe, and plans for expansion. These strategies of Coop M demonstrate strategic leadership, similar with the result of the study by Schlosser and Volkova (2022). This is also consistent with the Congruence model by Nadler and Tushman in the early 1980s citing the importance of transformation process between inputs and outputs and how should these elements be integrated to improve the performance of the organization (Sabir, 2018). Training and development is also an important way of passing on the standard processing and operations of the cooperative to the next generation of farmers/processors through the approved Manual of Operations that serves as guidelines

and standard operating procedures for members and employees.

Employees and members are generally satisfied from the benefits (mostly non-monetary) received from the cooperative which implies that they are being inspired by the management to reach common goals, elevate strategies for societal impact, and pass it on to the next generation. The study suggests that Coop M demonstrates Social Collective Leadership, similar with the study by Prasetyo et al. (2016). Since Coop M has also secured the Food and Drug Administration (FDA)-License to Operate to be able to continuously market their product in Puregold and other supermarkets nationwide. The cooperative envisions to export their product to Europe once they have already secured appropriate license and permits consistent with the quality of their product. The study recognizes the importance of agriculture cooperatives' gearing more towards a combination of Social Collective and Strategic-Transformational Leadership Model. However, strict generalization is not applicable because of limited scope of the study. The study was also conducted during the pandemic, thus entailing limited movement and period of observations. There is a need to review existing programs for agriculture cooperatives, particularly on market facilitation, minimizing barriers to trade, and enhancing potential for exports.

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