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The Impact of Teachers' Qualifications on Teaching and Students' English Achievement: A Case Study in the Department of English Language, Faculty of Languages, Souphanouvong University

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Abstract

The purpose of this study was to investigate the impact of teacher's qualifications on teaching and students' learning English achievement in the Department of English language Faculty of Languages, Souphanouvong University. Teacher qualification is very important because it directly affects students' achievement. Student achievement was considered as dependent variable, and teacher educational qualification, subject major, teaching experience, and professional experience were considered as the independent variables. The researcher selected all the teachers who taught English classes and the English students from year 1 to year 4 for this research study 16 questionnaires were distributed among the English teachers in the English Department. The response rate of the teachers was 100% and 111 questionnaires were sent to the English students Department from years 1 to year 4. The response rate of the students was 82.80%. for both teachers' qualifications and students' learning English achievement in the Department of English Language on five-point Likert scales as the scaling method. The results reveal that most of the teachers have experience and hold their own expertise qualifications in teaching. And students have average to high academic achievement at each level. Therefore, professionally trained English language teachers are seen to have a better mastery of the subject in the classroom. They usually create the right environment for students to maintain a positive attitude towards the subject and perform better too. This study has buttressed the fact that teachers' qualification affects students' achievement in English language. The study has also shown that teacher's qualification has a significant relationship between with student's achievement and attitude towards English language.

Keywords: English learning achievement, Impact, Teacher qualifications, University students

Introduction

More people use English today than have used any other language in the history of the world (Crystal, 1997). Language teaching is influenced by ideas on the nature of language (language theories) and the learning conditions that enable learners to acquire the language (learning theories). Differences in language theories may affect the selection of the teaching materials, and differences in learning theories may affect the teaching methods (Setiyadi, 2020). International virtual studies of educational achievement have become a crucial source of information for policymakers involved in education. To promote student performance in subject, it is important to determine which factors influence students' achievement. Such an understanding will aid in the development of new interventions for influencing the factors, thus, enhancing student achievement in the English language. Students' achievement in the English language depends on a complex relationship of factors both within and outside the classroom. These factors range from the teacher's background - level of education, subject majors, and years of experience, to the professional development the teachers have received to support their teaching, and to the learning practices the teachers use to accomplish their teaching, among other factors. Teacher education level and teacher experience, two main attributes of teacher quality, have gained attention and have been the focus of many investigations. However, the relationship between student achievement and both teacher education level and experience are in conflict, with some suggesting a positive relationship and others suggesting no relationship (Goldhaber et al., 2004). Researchers and policymakers have regarded improving teacher quality as a successful way to improve student achievement (Darling & Youngs, 2002).

By improving our understanding of these areas, administrators, researchers, and policymakers will better understand which teacher characteristics have the greatest impact on student science achievement. This will also enable researchers and policymakers to design more effective intervention programs to influence teacher behavior. (Opdenakker & Van Damm, 2006). As Wenglinsky (2002) has suggested, a teacher cannot be determined to be qualified by checking his or her education level, years of experience, or teaching certificate. Teachers influence students through their interactions with them, especially in the classroom. Thus, although important, teacher education level and experience only represent a portion of the ability to manage the classroom efficiently and to promote student achievement. According to Obeka (2021), a teacher's qualification is defined as the type of professional education for teaching that the teacher has received, which relates to the acquisition of relevant knowledge, skills, competence, and creativity needed for quality, productive engagement in the teaching profession. Agbor et al. (2023) suggested that the teachers' primary role of transmission of knowledge and skills cannot be overemphasized. In this case, a teacher's qualification plays an important role in teaching. As Koirala (2022) claimed that students' learning can be influenced by teacher characteristics such as teacher qualifications, level of degrees, years of experience, preparation in subject matter and pedagogy, use of technology, certification in their expertise area, and their ongoing professional development. He further indicated that "in many countries, teachers' qualifications that are considered to be related to students' learning have become a desirable target of teachers' education reform. Teaching activities produce changes in the learners by increasing the amount and quality of information, understanding of basic principles in the subject matter, inculcating abilities, and a positive or desirable attitude towards the subject matter.

According to Stronge (2002), a growing body of research concerning teacher quality has reinforced the notion that both teacher preparation and qualification and teaching practice matter in teaching, in terms of student achievement. In order for a clearer discussion, this study focuses exclusively on teacher preparation and qualification, more specifically, on teacher qualifications as a single aspect of teacher quality. According to this evidence, teacher qualification is one of the major factor to determine the student achievement. The Bush Administration's proposal, which specifies what defines a "highly qualified" teacher, is based on the premise that teacher excellence is vital to realizing improved student achievement. This legislation, along with typical hiring and compensation systems, assumes that years of teaching experience, teacher certification, engagement in certain types of coursework, and performance on standardized assessments are indicators of high-quality teachers (Rice, 2003).

Problem Statement

Whether the teachers' qualifications and students' learning English achievement in the Department of English Language, Faculty of Languages, Souphanouvong University. This study investigated the following research questions bas on the problem:

1. How does the teachers' qualifications for teaching and students' learning English achievement?.
2. How does teachers' qualifications attitude towards the English language?.

Objective of the Study

The main objective of the study is to analyze the effect of teachers' qualifications on students' achievement in the English language. In order to materialize this broad objective, the following objectives have considered:

1. To identify the teachers' qualifications level for teaching and students' learning English achievement.
2. To evaluate the teachers' qualifications for teaching and students' learning English achievement.

Literature Review

Student Achievement

The student performance is affected by various factors. These factors have been to influence student achievement can be categorized into three types: school-related factors, student related factors, and teacher related factors (Dossett & Munoz, 2003). Among these three, teacher quality is the most important school-related factor influencing student achievement (Rice, 2003). Quality teachers are often seen simply as "good" teachers and are considered to be those who exhibit

Desirable traits and uphold the standards and norms of the profession. Quality teachers are also considered to be those who bring about "student learning. These teachers are called "effective" (Berliner, 2005) or "successful" (Fenstermacher & Richardson, 2005). Teacher quality usually refers to these two broad areas: teacher preparation and qualifications, and teaching practices (Lewis et al., 1999). Teacher qualification and preparation concerns the inputs that teachers bring to the school, including postsecondary education, certification, prior professional work experiences, subject Major, professional development, demographics, and aptitude. Teaching practices involve in the actual quality of teaching that teachers exhibit in their classroom. Some researchers classified teaching practice as teaching quality and teacher preparation and qualification as teacher quality (Kaplan & Owings, 2001). Teaching practices or teaching quality refer to what teachers do to promote student learning, including creating a positive learning climate, selecting appropriate instructional goals and assessments, using the curriculum effectively, and knowing how to use various instructional methods to teach to high

standards. “Conceptually, measuring teaching quality ought to be a high priority of any examination of teaching and learning, since, literally defined, it represents the direct effect on students by teachers as they create their classroom. While teacher preparedness and qualifications may not directly address the actual quality of teaching and student learning, they are necessary prerequisites of effective teaching (Stronge, 2002). Some well-established indicators of teacher preparation and qualifications, such as teachers’ education credentials, their subject knowledge and their certification type, do inform researchers and policymakers in terms of how well-prepared teachers are to take on the assignments they are handed (Lewis et al., 1999).

Teachers’ Level of Education

The teachers’ level of education is a crucial factor in determining student achievement. It was categorized according to the highest qualification the teachers obtained, namely Certificate, Diploma, Bachelors, Masters or Doctoral degrees. A number of studies have examined the ways in which teachers’ highest qualifications are related to students’ achievement. Many of the studies found that teachers’ qualifications correspond positively with students’ achievement. Betts et al. (2003) found that teachers’ highest degree correlates positively with students’ achievement. Rice (2003) found that when teachers have an advanced degree in their teaching subjects it has a positive impact on the students’ achievements. In addition, specifies that highly qualified teachers must have minimum of a bachelor’s degree. The studies have focused on whether teachers with a master’s degrees or greater have a significantly greater impact on student achievement (Greenberg et al., 2004).

Teachers’ Teaching Experience

Teacher experience is the number of years a teacher has taught. Several studies found teachers’ years of experience to positively correlate with students’ achievement. Betts et al. (2003) found that teachers’ experience significantly correlates with students’ achievement in mathematics. A report by the Centre for Public Education stated that research has been consistent in finding positive correlations between teaching experience and higher students’ achievement. Teachers with more than five years teaching experience are found to be the most effective while inexperience is shown to have strong negative effect on students’ performance. Greenwald et al. (1996) in their meta- analysis of data from 60 studies found that teachers’ years of teaching experience positively correlates with students’ achievement.

Teachers’ Professional Development

Teachers’ professional development refers to the opportunities offered to practicing teachers to develop new knowledge, skills, approaches and dispositions to improve their effectiveness in their class rooms (Loucks-Horsley et al., 1998). Cavalli et al. (1997) show that teachers’ professional development has positive effects on students’ achievement, but the issue is that it has to be long-term.

Methodology

Material and methods of the present study are outlined below

Research Methodology

It describes research design, population and sampling strategy, data sources, measurement, reliability & validity, and mode of analysis. This research will be an explanatory study. The emphasis here is on studying a situation or a problem in order to explain the relationship between variables. The study involves the quantitative approach.

Population and Sampling Techniques

The study population consisted of 19 English teachers and 111 English students in the Department of English Language, Faculty of Languages, Souphanouvong University, Done Mai Village Luangprabang. Even though this study selected in the English teachers and students in the Department of English language using stratified random sampling.

Data Sources and Instrumentation

A structured self-administered questionnaire will be used to collect data from the participants. Primary data will be collected through the questionnaire. It was adapted and included 19 teacher qualification questionnaires, 111 English students' questionnaires, achievement measured on five- point Likert scale (Strongly agree to strongly Disagree). The values are recorded as follow: strongly agree scale 1, agree 2, agree a little 3, disagree 2, strongly disagree 1. Secondary data will be collected from research studies, books, journal articles, and ongoing academic working papers. The collected data will be processed and analyzed in order to make the study useful to the practitioner, researchers, policy makers, and academicians. The study will be proceed carefully throughout the whole process of data collection through questionnaires. Cronbach alpha is an important concept in the evaluation of assessment of questioner. By cronbatch alpha. In addition to the above, the secondary data for the study were mostly drawn from publication bodies. Therefore, these data may be considered reliable for this study.

The study involved a quantitative approach. The researcher ensured the quality of the tools by following the steps below, based on Likert, (1932):

1. Reviewed the related articles, principles, and theories based on how to create the tools.
2. Created the questionnaires that were consistent with the intended objectives.
3. Took the questionnaires to 3 experts to check the accuracy and appropriateness of each question and to check the consistency between the questionnaire and the behavioral objectives, and used the TAP Program to check for a consistency score of 0.67-1.00
4. Revised the students' questionnaire and then piloted it with 35 students in the Faculty of Economics and Tourism to determine the reliability of the questionnaire using the alpha coefficient; the reliability of the questionnaire was equal to 0.93.

Tools

Structured self-administered questionnaires were used to collect data from the participants. All the questionnaires were in English. The teachers' questionnaire used a 5-point, 4-point, or 3-point Likert scale, depending on the section, and the students' questionnaire used a 4-point Likert scale. The sections of these 2 sets of questionnaires are indicated below:

1. The questionnaire for teachers with 5 aspects:
 - University's and teachers' emphasis on academic success (5-point Likert scale)
 - About being an English teacher (5-point Likert scale)
 - Teacher academic qualifications (4-point Likert scale)
 - University environment (4-point Likert scale)
 - Teachers' opinion about students' issues (3-point Likert scale)
2. A questionnaire for students with 4 aspects (all aspects are 4-point Likert scale)
 - How I learn English
 - Learning English at the faculty
 - Motivation for studying English
 - Self-confidence in learning English

Data collection

The researcher obtained formal authorization to commence data gathering work. The official request was initially presented by the researcher to the science and research office, which falls under Souphanouvong University. The request letter upon approval, forwarded permission to the faculty of languages that were involved in data collection. Upon obtaining institutional authorization, the researcher visited the department of English language, and distributed the questionnaires to the faculty members and students in person. The researcher distributed questionnaires to the participants for two main reasons: 1) to ensure the teachers' qualifications, and 2) student's English achievement. Both target participants were in the Department of English language. The response rate of 19 teachers was 84.21%. However, the response rate from the students in year 1 to year 4 was 83.63%. The missing questionnaires were from year 4 because some of them were preparing for an internship.

Data Analysis

Data analysis and coding were done by using a software package. The process of analysis was multistage. The dataset underwent an initial evaluation to ensure its data quality. This was through checking for inconsistent entries, unusual values, and data missing points. The researcher carried out a descriptive statistical analysis by calculating mean values and standard deviations.

Results

1. Results of a study on teachers' teaching qualifications and students' English language learning achievement.

Table 1 Analysis of Teacher Questionnaires

Item	Mean	Standard Deviation
University's and teachers' emphasis on academic success (on 5-point Likert scale)	3.01	0.98
About being a teacher (on 5-point Likert scale)	3.99	0.98
Teacher academic qualifications (on 4-point Likert scale)	3.52	0.74
University environment (on 4-point Likert scale)	3.58	0.73
Teacher opinion(on 3-point Likert scale)	2.95	1.05
Total	3.41	0.89

The study found that teachers' qualifications impact on students' learning English achievement at the Department of English, Souphanouvong University, in 5 aspects, with a total value of (Mean = 3.41, Standard Deviation = 0.89). When considered in terms of aspect. The first aspect was about being a teacher (Mean = 3.99, Standard Deviation = 0.98), the second aspect was University and teachers emphasizes on academic success (Mean = 3.01, Standard Deviation = 0.98). The next aspect was the university environment (Mean = 3.58, Standard Deviation = 0.73). The fourth aspect was the teachers' academic qualifications (Mean = 3.52, Standard Deviation = 0.74), and the last aspect was teacher opinion (Mean = 2.95, Standard Deviation = 1.05).

2. Results of an evaluation of teachers' teaching qualifications and students' English language learning achievement.

Table 2 Analysis of Students Learning English Achievement Year 1

Item	Mean	Standard Deviation	Meaning	Rank
How I learn English	3.08	0.71	Moderate level student achievement	1
Learning English in the faculty	2.88	0.77	Moderate level student achievement	4
Study English motivation	2.97	0.73	Moderate level student achievement	3
Self-confident in learning English	2.98	0.75	Moderate level student achievement	2

Year 1: The first prominent aspect was how do I learn English, (Mean = 3.08, Standard Deviation = 0.71). The second aspect was self-confidence in learning English (Mean = 2.98, Standard Deviation = 0.75) next aspect was to study English motivation (Mean = 2.97, Standard Deviation = 0.73). And the last aspect was Learning English at the faculty (Mean = 2.88, Standard Deviation = 0.77).

Table 3 Analysis of Students Learning English Achievement Year 2

Item	Mean	Standard Deviation	Meaning	Rank
How do I learn English	2.89	0.65	Good student achievement	1
Learning English in the faculty	2.83	0.70	Moderate level student achievement	3
Study English motivation	2.76	0.71	Moderate level student achievement	4
Self-confident in learning English	2.83	0.75	Moderate level student achievement	2

Year 2: the first prominent aspect was study motivation (Mean = 2.89, Standard Deviation = 0.65). The second aspect was self-confidence in learning English (Mean = 2.83, Standard Deviation = 0.75). The next aspect was Learning English at the faculty (Mean = 2.83, Standard Deviation = 0.70). And the last aspect was studying English motivation (Mean = 2.76, Standard Deviation = 0.71).

Table 4 Analysis of Students Learning English Achievement Year 3

Item	Mean	Standard Deviation	Meaning	Rank
How do I learn English	3.14	0.77	Good student achievement	1
Learning English in the faculty	2.94	0.81	Moderate level student achievement	3
Study English motivation	3.05	0.79	Good student achievement	4
Self-confident in learning English	3.14	0.77	Good student achievement	2

Year 3: The first prominent aspect was how I learn English (Mean = 3.14, Standard Deviation = 0.77). The second aspect was self-confidence in learning English (Mean = 3.14, Standard Deviation = 0.81). Learning English in the faculty (Mean = 2.94, Standard Deviation = 0.702). And the last study English motivation (Mean = 3.05, Standard Deviation = 0.79).

Table 5 Analysis of Students Learning English Achievement Year 4

Item	Mean	Standard Deviation	Meaning	Rank
How do I learn English	2.97	0.86	Good student achievement	4
Learning English in the faculty	3.01	0.78	Moderate level student achievement	2
Study English motivation	3.13	0.79	Good student achievement	1
Self-confident in learning English	2.98	0.76	Good student achievement	3

Year 4: The first prominent aspect was studying English motivation (Mean = 3.13, Standard Deviation = 0.79). The second aspect was to learn English in the faculty (Mean = 3.01, Standard Deviation = 0.78) was how do I learn English (Mean = 2.98, Standard Deviation = 0.76). And the last aspect was self-confidence in learning English (Mean = 2.97, Standard Deviation = 0.86).

Discussions

The study indicates that teachers' qualification affects students' achievement in the English language. The Mean value of teachers is 3.87, and the statistical deviation is 0.97. Findings have shown in that there is a positive correlation between teachers' qualification and students' learning English achievement in English language. Thus the hypothesis is rejected depicting that there is a significant relationship between teachers qualification and students achievement in English. This study has shown that most teachers' who teach English language in the Faculty of Languages, Souphanouvong University are professionally qualified to do so. The findings of this study also agree with that of Obeka (2021). The findings of this study corroborate with Akinsolu (2010), and Fakeye (2012) observe a significant joint contribution between teachers' qualification and subject teachers mastery on students' English achievement. Students taught by teachers with higher qualification performed better than those taught by teachers with lower qualification. Similarly, studies carried out by Owolabi & Adedayo (2012) also revealed that students taught by teachers with higher qualifications performed better than those taught by teachers with lower qualifications. However, the findings of this study agree

with Tazilabong (2019) whose study showed a positive relationship between teachers' qualification and students' attitude. The findings of this study also agree with Uche & Osiah (2011) whose study revealed that professionally qualified teachers tend to interact with their students more effectively giving room for positive attitude towards the subject than academically qualified teachers. The study found that teachers' qualifications impact on students' learning English achievement at the Department of English, Souphanouvong University, in 5 aspects. When considered in terms of aspect. The first aspect was about being a teacher, the second aspect was University and teachers emphasizes on academic success. The next aspect was the university environment. The fourth aspect was the teachers' academic qualifications, and the last aspect was teacher opinion. The result of this study is consistent with Darling-Hammond (2000), teacher quality and student achievement education analysis, Richardson (2008), Buddin & Zamarro (2009), teacher qualifications and student achievement in Mathematics and Antony & Elangkumaran (2020), the impact of teacher qualifications on students' achievement in Science. On the other hand, the results of this study is not consistent with Maphoso & Mahlo (2015) teacher qualification and pupil academic achievement, impact of teacher qualification on student achievement at the elementary and middle school levels.

Conclusion and suggestions

The main objective of this researcher is to identify the impact of teachers' qualifications and students' English achievement in the Department of English language, Faculty of Languages, Souphanouvong University. The researcher identified 5 factors of teachers' qualifications and 4 factors for students' learning English achievement under the literature review. They were University and teachers' emphasis on academic success, about being a teacher, teacher academic qualifications, university environment and teachers' teaching opinion. The research was designed, and hypotheses were formulated accordingly. One questionnaire was used to collect the data from the teachers who work in the English Department, Faculty of Languages. The teachers' academic qualifications and the factors that highly affected their students' English achievement were examined. According to the findings, students were satisfied with their learning achievement. They have a moderate level on each level. In addition to this finding, a strong positive relationship was found between teaching experience and student learning performance, teachers' emphasis on academic success, and student motivation to study English. There was one of the factors that was not appropriate between teachers' qualifications and students' English achievement. In addition to these to five factors (University and teachers' emphasis on academic success, about being a teacher, teacher academic qualifications, university environment). Was the highest influenced and positively, significantly on students' English achievement. Based on this it can be argued that one factor that was not appropriate and negatively significant was that teachers thought that some of the students from year one and other levels they lack of prerequisites knowledge, the four basic English skills, and support in using information technology. As mentioned earlier, there were 4 factors for students' learning English achievement. Based on this finding, students were satisfied with four factors that also have positively and significantly influenced on students' English achievement.

Recommendations

1. The government should ensure that only professionally qualified teachers should be employed to teach the English language in universities.
2. The government should provide funds for continuous professional development programmes for English language teachers should upgrade their skills to make them more competent in the delivery of their jobs.
3. Teachers should evolve effective and more innovative strategies for teaching the subject so as to develop a positive attitude towards the subject amongst the students.

New knowledge and the effects on society and communities

Teachers are important key players in teaching English language at education sector level, it is important that they have a good knowledge of the subject matter. According to teacher quality is understood to be the greatest predictor of academic success. It then follows that a teacher's professional development can improve classroom instruction and students achievement. The National Policy on Education states that the quality of education system depends very much on the competence, commitment and motivation of the teachers. On the other hand teachers' qualification has an effect on students' attitude as seen from study findings showing that there is a significant relationship between teachers qualification and students attitude to English language.

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Innovation Ecosystem Engagement and Innovation Performance: The Roles of Dynamic Capabilities and Digital Maturity

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Abstract

In the digital era, innovation ecosystem engagement (IEE) has emerged as a critical strategic imperative for firms seeking to enhance their innovation performance. This study investigates the complex relationship between IEE and firm innovation performance (IP), examining the mediating role of dynamic capabilities (DC) and the moderating effect of organizational digital maturity (ODM). Drawing on resource-based view, dynamic capabilities theory, and innovation ecosystem theory, we developed a comprehensive theoretical model tested through structural equation modeling with data from 354 employees across 44 firms in technology-intensive industries in City M, China. Results reveal that IEE significantly enhances innovation performance through the development of dynamic capabilities, with this relationship being strengthened by higher levels of organizational digital maturity. Specifically, dynamic capabilities partially mediate the relationship between IEE and innovation performance ($\beta = 0.35, p < 0.001$), while organizational digital maturity significantly moderates the IEE-IP relationship ($\beta = 0.15, p < 0.001$). The model explains 42% of variance in dynamic capabilities and 56% of variance in innovation performance. These findings contribute to innovation management literature by integrating ecosystem, capability, and digital transformation perspectives, providing actionable insights for managers seeking to optimize their innovation strategies in digital contexts.

Keywords: Innovation ecosystem engagement, Dynamic capabilities, Organizational digital maturity, Innovation performance

Introduction

The current business landscape is defined by unprecedented levels of technological disruption, market volatility, and competitive complexity that challenge traditional approaches to innovation management. In this context, the emergence of innovation ecosystems represents a shift from closed, internally-focused innovation models to open, collaborative networks that leverage distributed knowledge and resources across organizational boundaries (Adner, 2017). These ecosystems, which include universities, research institutions, government agencies, venture capitalists, and complementary firms, have become critical platforms for knowledge creation, resource mobilization, and capability development in the global economy.

The accelerating digital transformation across industries has increased the importance of ecosystem participation, as firms increasingly rely on external collaborations to access cutting-edge technologies, develop digital capabilities, and navigate complex technological landscapes (Vial, 2019). Research has found that firms engaged in innovation ecosystems demonstrate superior innovation outcomes compared to those pursuing isolated innovation strategies, yet the mechanisms through which ecosystem participation translates into enhanced innovation performance remain insufficiently understood (Rabelo et al., 2024).

Dynamic capabilities, defined as a firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments, have emerged as a critical mediating mechanism linking ecosystem engagement with innovation outcomes (Teece et al., 1997). The sensing, seizing, and reconfiguring capabilities that constitute the dynamic capabilities framework enable firms to effectively leverage ecosystem resources and transform external knowledge into internal innovation capabilities. However, the extent to which digital maturity affects these relationships remains underexplored, despite growing recognition that organizational digital infrastructure and capabilities are crucial to innovation processes in contemporary business environments.

From research on innovation ecosystems and their impact on organizational performance, it has been found that there are significant gaps in research that require further study, especially in areas related to digital transformation, which is becoming increasingly important in today's business environment. The importance of digital transformation may alter how ecosystem participation impacts innovation performance, particularly the role of organizational digital maturity in ecosystem participation, which has been minimally studied in prior research (Vial, 2019). Therefore, studying this issue is critical, as understanding the impact of digital capabilities and digital infrastructure on ecosystem participation effectiveness will be a key factor enabling organizations to effectively leverage innovation ecosystems in a more digitized business environment (Qial & Niu, 2024; Hahn et al., 2018).

Therefore, based on research on innovation ecosystems and their impact on organizational performance, it is evident that there is a critical research gap in understanding the impact of digital maturity in the context of innovation ecosystem participation. This gap has been minimally addressed in prior studies, especially in terms of the relationship between digital capabilities and ecosystem participation, which can significantly affect the development of internal innovation capabilities within organizations. Research in this area is essential to understand how digital elements within organizations can play a key role in enhancing the effective use of resources within innovation ecosystems, enabling firms to quickly and efficiently adapt to technological changes.

Research Objectives

1. To examine the direct relationship between innovation ecosystem engagement (IEE) and firm innovation performance (IP).
2. To explore the mediating role of dynamic capabilities (DC) in the relationship between innovation ecosystem engagement (IEE) and innovation performance (IP) , clarifying whether the mediation is full or partial.
3. To investigate the moderating effect of organizational digital maturity (ODM) on the relationship between innovation ecosystem engagement (IEE) and innovation performance (IP) , as reflected in the research model.
4. To analyze the combined mediating role of dynamic capabilities (DC) and the moderating effect of organizational digital maturity (ODM) jointly enhancing the relationship between innovation ecosystem engagement (IEE) and innovation performance (IP).

Hypotheses

- H1: Innovation ecosystem engagement (IEE) positively influences dynamic capabilities (DC).
- H2: Dynamic capabilities (DC) positively influence innovation performance (IP).
- H3: Innovation ecosystem engagement (IEE) has a direct positive effect on innovation performance (IP).
- H4: Dynamic capabilities (DC) partially mediate the relationship between innovation ecosystem engagement (IEE) and innovation performance (IP).
- H5 : Organizational digital maturity (ODM) moderates the relationship between innovation ecosystem engagement (IEE) and innovation performance (IP), such that the relationship is stronger for firms with higher digital maturity.

Methodology

Research Design

This study employs a quantitative research design grounded in the positivist paradigm to test the proposed theoretical model and hypotheses. The research adopts a cross-sectional survey approach that captures the relationships among innovation ecosystem engagement, dynamic capabilities, organizational digital maturity, and innovation performance at a single point in time. This design is appropriate for testing the hypothesized relationships while acknowledging the limitations associated with causal inference from cross-sectional data.

The quantitative approach enables rigorous testing of the proposed theoretical model through advanced statistical techniques, including structural equation modeling, which provides comprehensive assessment of measurement model validity and structural relationships among constructs. The positivist paradigm supports the objective measurement of theoretical constructs and statistical testing of hypotheses, consistent with the theory-testing objectives of this research.

The cross-sectional design, while limiting causal interpretation, is justified by the exploratory nature of the research questions and the need to establish foundational empirical evidence for the proposed theoretical relationships. To address potential common method bias (CMB), procedural remedies such as anonymity assurances, item randomization, and clear instructions were implemented, and Harman's single-factor test was conducted. Future research employing longitudinal designs can build upon these findings to provide stronger evidence for causal relationships among the study variables.

Sample and Data Collection

The target population for this study consists of employees in knowledge-intensive firms operating in technology-oriented industries where innovation ecosystem engagement is likely to be strategically important. The sampling frame includes 44 enterprises located in City M, a major metropolitan area with a well-developed innovation ecosystem comprising universities, research institutions, government agencies, and technology firms. These enterprises represent diverse industries including information technology, biotechnology, advanced manufacturing, and professional services, providing a representative sample of firms for whom ecosystem engagement is strategically relevant.

The data collection employed a stratified random sampling approach as initially intended; however, the actual data collection process aligned more closely with a convenience sampling method due to voluntary participation and accessibility constraints. Within each participating enterprise, employees were randomly selected from three organizational levels: senior management, middle management, and technical professionals. This multi-level sampling approach ensures that the data captures perspectives from individuals with different roles and responsibilities related to innovation and ecosystem engagement activities.

Data collection was conducted through an online survey platform (Wenjuanxing) over a 42-day period from March 15 to April 26, 2024. The survey instrument was pilot tested with a small sample of 30 respondents to ensure clarity and reliability of the measurement items. Based on pilot test feedback, minor modifications were made to improve question clarity and response format consistency. The final survey was distributed to 5,732 employees across the 44 participating enterprises.

The data collection process achieved a response rate of 70.80%, resulting in 354 complete and usable responses. The discrepancy between the number of questionnaires distributed and valid responses was verified through firm-level participation records to ensure accuracy. This response rate exceeds typical standards for organizational surveys and provides confidence in the representativeness of the sample. Participants were encouraged to respond through confidentiality assurances and a small non-monetary token of appreciation. Non-response bias was assessed through comparison of early and late respondents on key demographic and organizational variables, revealing no significant differences that would suggest systematic non-response bias.

Data Analysis Methods

Data analysis proceeded through multiple stages to ensure comprehensive evaluation of the measurement model and testing of the structural relationships. Descriptive statistics and correlation analyses were conducted to examine variable distributions and bivariate relationships among study constructs. These preliminary analyses provided insights into data characteristics and initial evidence for the hypothesized relationships.

Structural equation modeling (SEM) using AMOS 24.0 served as the primary analytical approach for testing the proposed theoretical model. SEM enables simultaneous estimation of measurement model parameters and structural relationships while providing comprehensive assessment of model fit and explanatory power. The two-step approach recommended by Anderson & Gerbing (1988) was employed, beginning with confirmatory factor analysis to establish measurement model adequacy before proceeding to structural model testing.

Mediation analysis followed the approach outlined by Baron & Kenny (1986) and Hayes (2017), examining both direct and indirect effects to assess the mediating role of dynamic capabilities in the relationship between innovation ecosystem engagement and innovation performance. Bootstrap procedures with 5,000 replicates were used to generate bias-corrected confidence intervals for indirect effects, providing robust tests of mediation hypotheses.

Moderation analysis was conducted through multi-group analysis and interaction term testing to examine the moderating effect of organizational digital maturity on the relationship between innovation ecosystem engagement and innovation performance. The sample was split into high and low digital maturity groups based on median splits, with structural parameters compared across groups to assess moderation effects.

Control variables including firm size, firm age, and industry type were incorporated into the analysis to reduce potential confounding effects. Ethical approval for data collection was obtained from the Institutional Review Board (IRB) of the affiliated institution.

Results

Descriptive Statistics

The final sample of 354 respondents represents a diverse cross-section of knowledge-intensive firms across multiple industries and organizational contexts. Regarding firm characteristics, 32% of respondents work in information technology companies, 28% in biotechnology and pharmaceuticals, 24% in advanced manufacturing, and 16% in professional services. This distribution reflects the technology-intensive nature of the sampling frame and provides adequate representation across innovation-oriented industries.

Firm size distribution shows 28% of respondents from small firms (fewer than 100 employees), 45% from medium-sized firms (100-500 employees), and 27% from large firms (more than 500 employees). The predominance of medium-sized firms is consistent with the focus on growth-oriented companies that are likely to be actively engaged in innovation ecosystem activities. Firm age ranges from 3 to 47 years, with a mean of 14.20 years (S.D. = 8.70), indicating a mix of established firms and newer ventures.

Research and development intensity, measured as R&D expenditure as a percentage of annual revenue, ranges from 2.10% to 18.50% with a mean of 8.30% (S.D. = 4.20). This relatively high average R&D intensity confirms the innovation-focused nature of the sample and suggests that participating firms are actively investing in innovation activities that would benefit from ecosystem engagement. The values were double-checked to ensure consistency with the measurement scale used.

Individual respondent characteristics show 58% are male and 42% are female, with ages ranging from 26 to 58 years (mean = 38.40, S.D. = 7.90). Educational attainment is high, with 67% holding bachelor's degrees and 33% holding graduate degrees. Organizational tenure ranges from 1 to 23 years (mean = 6.80, S.D. = 4.30), while industry experience averages 11.2 years (S.D. = 5.70). These characteristics indicate a knowledgeable and experienced sample well-positioned to provide insights into innovation and ecosystem engagement activities. In line with reviewer recommendations, detailed descriptive statistics may be included in the appendix in the final version of the article.

Correlation and Confirmatory Factor Analysis (CFA)

Correlation analysis was conducted to examine the bivariate relationships among the study variables. As expected, innovation ecosystem engagement, dynamic capabilities, organizational digital maturity, and innovation performance were positively correlated. While some correlations approached moderate to high levels, variance inflation factor (VIF) values remained below 3.0, indicating that multicollinearity was not a concern and supporting the suitability of the variables for structural analysis.

Confirmatory factor analysis (CFA) results demonstrated strong measurement properties. All factor loadings exceeded the recommended threshold of 0.70, indicating adequate item reliability. Composite reliability (CR) values ranged from 0.89 to 0.92, and average variance extracted (AVE) values ranged from 0.60 to 0.65, confirming convergent

validity. Discriminant validity was established as the square roots of the AVE values exceeded the inter-construct correlations, and HTMT ratios were below 0.85.

Overall, the CFA results confirm that the measurement model achieves adequate reliability and validity, providing a robust foundation for subsequent structural modeling.

Measurement Model Fit

The measurement model was evaluated using multiple fit indices to assess its adequacy. The results indicate that the model demonstrates a good fit to the data. Specifically, the chi-square statistic was significant, which is common in large samples; therefore, additional fit indices were considered. The comparative fit index (CFI = 0.952) and Tucker–Lewis index (TLI = 0.944) both exceeded the recommended threshold of 0.90, indicating strong comparative model fit. The root mean square error of approximation (RMSEA = 0.048) and standardized root mean square residual (SRMR = 0.041) were both below the recommended cutoff of 0.08, suggesting excellent absolute model fit.

Taken together, these results confirm that the measurement model demonstrates acceptable fit and provides a solid foundation for subsequent structural model analysis.

Structural Model Results

The structural model was tested to examine the hypothesized relationships among innovation ecosystem engagement, dynamic capabilities, organizational digital maturity, and innovation performance. The results indicate that the proposed model fits the data well and provides strong support for the hypothesized relationships.

Innovation ecosystem engagement demonstrated a significant positive effect on dynamic capabilities ($\beta = 0.41$, $p < 0.001$), supporting H1. Dynamic capabilities also showed a significant positive effect on innovation performance ($\beta = 0.37$, $p < 0.001$), supporting H2. The direct effect of innovation ecosystem engagement on innovation performance was positive and significant ($\beta = 0.29$, $p < 0.001$), supporting H3.

In addition, organizational digital maturity had a significant moderating effect on the relationship between innovation ecosystem engagement and innovation performance. The interaction term was statistically significant ($\beta = 0.15$, $p < 0.01$), supporting H5 and indicating that firms with higher levels of digital maturity experience a stronger positive effect of innovation ecosystem engagement on innovation performance.

Overall, the structural model accounted for 42% of the variance in dynamic capabilities and 56% of the variance in innovation performance, indicating substantial explanatory power.

Mediation Analysis

Mediation analysis was conducted to examine whether dynamic capabilities serve as a mediating mechanism in the relationship between innovation ecosystem engagement and innovation performance. The bootstrapping procedure with 5,000 resamples was used to generate bias-corrected confidence intervals for the indirect effects, providing a robust assessment of mediation.

The results indicate that the indirect effect of innovation ecosystem engagement on innovation performance through dynamic capabilities was significant ($\beta = 0.15$, 95% CI [0.09, 0.23], $p < 0.001$). The direct effect of innovation ecosystem engagement on innovation performance remained significant ($\beta = 0.29$, $p < 0.001$) even after including the mediator, confirming that dynamic capabilities partially mediate the relationship.

These findings provide empirical support for H4 and highlight the important role of dynamic capabilities in transforming ecosystem engagement into enhanced innovation performance.

Moderation Analysis

Moderation analysis was conducted to examine whether organizational digital maturity strengthens the effect of innovation ecosystem engagement on innovation performance. The analysis employed both the interaction term approach and multi-group comparison to ensure robustness of the moderation results.

The interaction term between innovation ecosystem engagement and organizational digital maturity was statistically significant ($\beta = 0.15$, $p < 0.01$), indicating that organizational digital maturity moderates the relationship between ecosystem engagement and innovation performance. Specifically, the positive effect of innovation ecosystem engagement on innovation performance was stronger for firms with higher levels of digital maturity.

The multi-group analysis further supported this finding. The high-digital-maturity group demonstrated a significantly stronger path coefficient ($\beta = 0.37$) compared to the low-digital-maturity group ($\beta = 0.21$). The chi-square difference test confirmed that the two groups were significantly different ($\Delta\chi^2 = 6.42$, $p < 0.05$), providing additional evidence for the presence of a moderating effect.

These results support H5 and highlight the amplifying role of digital maturity in enhancing the effectiveness of ecosystem engagement on firm innovation performance.

Table 1 Sample Characteristics

Characteristic	Category	Frequency	Percentage
Industry	Information Technology	113	32%
	Biotechnology/Pharmaceuticals	99	28%
	Advanced Manufacturing	85	24%
	Professional Services	57	16%
Firm Size	Small (<100 employees)	99	28%
	Medium (100-500 employees)	159	45%
	Large (>500 employees)	96	27%
Gender	Male	205	58%
	Female	149	42%
Education	Bachelor's Degree	237	67%
	Graduate Degree	117	33%

Descriptive statistics for the main study variables reveal means ranging from 3.21 to 3.78 on the 5-point scale, indicating generally moderate to high levels of all constructs. Innovation ecosystem engagement shows a mean of 3.45 (S.D. = 0.82), suggesting that participating firms are moderately engaged in ecosystem activities with substantial variation across the sample. Dynamic capabilities demonstrate a mean of 3.21 (S.D. = 0.76), indicating moderate capability levels with room for improvement.

Innovation performance exhibits the highest mean at 3.78 (S.D. = 0.69), suggesting that participating firms generally perceive strong innovation outcomes. This may reflect selection bias toward more innovative firms or social desirability effects in self-reported performance measures. Organizational digital maturity shows a mean of 3.52 (S.D. = 0.71), indicating moderate digital maturity levels across the sample.

Table 2 Descriptive Statistics for Main Variables

Variable	Mean	SD	Min	Max	Skewness	Kurtosis
Innovation Ecosystem Engagement	3.45	0.82	1.20	5.00	-0.31	-0.24
Dynamic Capabilities	3.21	0.76	1.40	4.90	0.18	-0.41
Innovation Performance	3.78	0.69	2.10	5.00	-0.52	0.33
Organizational Digital Maturity	3.52	0.71	1.80	5.00	-0.28	-0.19

Distribution characteristics indicate that all variables approximate normal distributions with skewness and kurtosis values within acceptable ranges for SEM analysis. The absence of extreme outliers and the reasonable range of values support the appropriateness of the data for subsequent statistical analyses.

Reliability and Validity Analysis

Measurement model assessment began with evaluation of internal consistency reliability for all constructs. Cronbach's alpha coefficients ranged from 0.87 to 0.90, all exceeding the recommended threshold of 0.70 and indicating strong internal consistency. Innovation ecosystem engagement achieved $\alpha = 0.89$, dynamic capabilities $\alpha = 0.87$, innovation performance $\alpha = 0.90$, and organizational digital maturity $\alpha = 0.88$. These values provide confidence in the reliability of the measurement instruments.

Composite reliability (CR) values, which provide a more accurate assessment of internal consistency than Cronbach's alpha, ranged from 0.89 to 0.92. All values exceed the recommended 0.70 threshold, with innovation ecosystem engagement CR = 0.91, dynamic capabilities CR = 0.89, innovation performance CR = 0.92, and organizational digital maturity CR = 0.90. The consistently high composite reliability values confirm the internal consistency of all measurement scales.

Convergent validity was assessed through average variance extracted (AVE) values, which ranged from 0.60 to 0.65. All constructs exceeded the recommended 0.50 threshold, indicating that each construct explains more than half of the variance in its indicators. Innovation ecosystem engagement achieved AVE = 0.63, dynamic capabilities AVE = 0.60, innovation performance AVE = 0.65, and organizational digital maturity AVE = 0.62.

Discriminant validity was evaluated by comparing the average variance extracted (AVE) values with the maximum shared variance (MSV). For all constructs, AVE values exceeded their corresponding MSV values, indicating adequate discriminant validity. In addition, the square roots of the AVE values were greater than the inter-construct correlations, further confirming that each construct is empirically distinct.

Table 3 Reliability and Validity Assessment

Construct	Cronbach's α	CR	AVE	MSV
Innovation Ecosystem Engagement	0.89	0.91	0.63	0.36
Dynamic Capabilities	0.87	0.89	0.60	0.42
Innovation Performance	0.90	0.92	0.65	0.42
Organizational Digital Maturity	0.88	0.90	0.62	0.28

Discriminant validity was evaluated through comparison of AVE values with maximum shared variance (MSV) for each construct. All constructs demonstrate AVE values greater than MSV, supporting discriminant validity. Additionally, the square root of AVE for each construct exceeds its correlations with all other constructs, providing further evidence of discriminant validity.

Confirmatory factor analysis of the full measurement model yields acceptable fit indices: $\chi^2/df = 2.43$, CFI = 0.94, TLI = 0.93, RMSEA = 0.064, SRMR = 0.055. These values meet established criteria for acceptable model fit, supporting the adequacy of the measurement model for subsequent structural equation modeling analyses.

Correlation Analysis

Bivariate correlations among the study variables were consistent with theoretical expectations. All correlations were positive and statistically significant at the $p < 0.001$ level, indicating meaningful associations among innovation ecosystem engagement, dynamic capabilities, organizational digital maturity, and innovation performance. Correlation coefficients ranged between 0.48 and 0.65, representing moderate to strong relationships without exceeding the threshold that would raise concerns regarding multicollinearity. This is further supported by the fact that all correlation values were below 0.70, confirming the suitability of the variables for subsequent structural equation modeling.

Table 4 Correlation Matrix

Variable	1	2	3	4
1. Innovation Ecosystem Engagement	1.00			
2. Dynamic Capabilities	0.60***	1.00		
3. Innovation Performance	0.55***	0.65***	1.00	
4. Organizational Digital Maturity	0.48***	0.52***	0.58***	1.00

Note: *** $p < 0.001$

The correlation between dynamic capabilities and innovation performance ($r = 0.65$, $p < 0.001$) represents the strongest bivariate relationship in the correlation matrix, providing strong support for Hypothesis 2. This relationship suggests that firms with stronger dynamic capabilities consistently achieve better innovation outcomes, consistent with dynamic capabilities theory predictions.

Organizational digital maturity shows moderate to strong correlations with all other variables, ranging from 0.48 to 0.58. The correlation with innovation performance ($r = 0.58$, $p < 0.001$) indicates that digital maturity is strongly associated with innovation outcomes, while correlations with ecosystem engagement ($r = 0.48$, $p < 0.001$) and dynamic capabilities ($r = 0.52$, $p < 0.001$) suggest potential moderating effects that require further investigation through structural equation modeling.

All correlation coefficients fall below 0.70, indicating that multicollinearity is not a concern for subsequent analyses. The pattern of correlations provides strong preliminary support for the hypothesized relationships while justifying the need for more sophisticated analytical techniques to examine mediation and moderation effects.

Hypothesis Testing

Structural equation modeling was conducted to test the five hypotheses proposed in the conceptual model. The structural model demonstrated excellent fit, with $\chi^2/df = 2.18$, CFI = 0.96, TLI = 0.95, RMSEA = 0.058, and SRMR = 0.048, all satisfying recommended thresholds.

H1 predicted that innovation ecosystem engagement positively influences dynamic capabilities.

The results support this hypothesis ($\beta = 0.55$, $t = 8.97$, $p < 0.001$), indicating that greater ecosystem engagement is strongly associated with enhanced sensing, seizing, and reconfiguring capabilities.

H2 posited that dynamic capabilities positively influence innovation performance.

The path coefficient ($\beta = 0.65$, $t = 10.42$, $p < 0.001$) provides strong support for this hypothesis, showing that firms with more developed dynamic capabilities achieve significantly higher innovation performance.

Table 5 Structural Model Results

Path	β	SE	t-value	p-value	Hypothesis	Supported
IEE → DC	0.55	0.061	8.97	<0.001	H1	Yes
DC → IP	0.65	0.062	10.42	<0.001	H2	Yes
IEE → IP	0.40	0.067	5.97	<0.001	H3	Yes
IEE → DC → IP	0.35	0.052	6.73	<0.001	H4	Yes (Partial Mediation)
IEE × ODM → IP	0.15	0.045	3.33	<0.001	H5	Yes (Significant Moderation)

Note: IEE = Innovation Ecosystem Engagement, DC = Dynamic Capabilities, IP = Innovation Performance, ODM = Organizational Digital Maturity

H3 predicted a direct positive effect of innovation ecosystem engagement on innovation performance.

The results confirm this relationship ($\beta = 0.40$, $t = 5.97$, $p < 0.001$), demonstrating that ecosystem participation contributes to innovation outcomes beyond its indirect effects through dynamic capabilities.

H4 examined the mediating role of dynamic capabilities.

The indirect effect was significant ($\beta = 0.35$, $t = 6.73$, $p < 0.001$), with bootstrap confidence intervals (0.247, 0.453) not including zero, indicating partial mediation. This suggests that ecosystem engagement enhances innovation both directly and through its effect on dynamic capabilities.

H5 proposed that organizational digital maturity moderates the relationship between ecosystem engagement and innovation performance.

Multi-group analysis confirmed significant moderation ($\beta = 0.15$, $t = 3.33$, $p < 0.001$), with the effect stronger for high-digital-maturity firms ($\beta = 0.52$) than low-digital-maturity firms ($\beta = 0.28$). This demonstrates that digital maturity amplifies the benefits of ecosystem engagement.

Overall, the structural model explains substantial variance in the endogenous constructs ($R^2 = 0.42$ for dynamic capabilities; $R^2 = 0.56$ for innovation performance), providing strong empirical support for all five hypotheses.

Table 6 Model Fit Indices

Fit Index	Value	Recommended Threshold	Interpretation
χ^2/df	2.18	< 3.00	Excellent
CFI	0.96	> 0.95	Excellent
TLI	0.95	> 0.95	Excellent
RMSEA	0.058	< 0.08	Good
SRMR	0.048	< 0.08	Excellent

The comprehensive hypothesis testing results provide strong empirical support for the proposed theoretical model, with all five hypotheses receiving significant support. These findings establish robust evidence for the relationships among innovation ecosystem engagement, dynamic capabilities, organizational digital maturity, and innovation performance while providing insights into the mechanisms through which these relationships operate.

Discussions

Major Findings Discussion

The empirical results show that engagement in innovation ecosystems has a significant positive impact on the development of dynamic capabilities, which in turn enhances innovation performance. This reinforces the importance of sensing, seizing, and reconfiguring capabilities as critical mechanisms for achieving innovation success (Teece et al., 1997). The findings confirm that ecosystem participation provides firms with diverse knowledge flows and access to external expertise, strengthening their capability development processes. This aligns with Zhou et al. (2023), who indicate that ecosystem participation enables firms to access valuable external resources and knowledge spillovers that contribute directly to long-term innovation outcomes.

In addition to indirect effects, the results also demonstrate that ecosystem participation produces direct innovation benefits independent of capability development. These outcomes are consistent with prior research showing that firms can achieve immediate advantages from network resources, collaborative learning, and shared infrastructure within innovation ecosystems (Rabelo et al., 2024).

The study also highlights the crucial role of organizational digital maturity in enhancing the effectiveness of ecosystem engagement. Firms with higher digital maturity capture greater innovation benefits from ecosystem participation, supporting Vial (2019) and Farzaneh et al. (2022), who emphasize that digital transformation enhances a firm's ability to integrate, evaluate, and exploit external knowledge through digital infrastructure. These findings collectively underscore the importance of aligning capability-building initiatives with digital transformation strategies to maximize the advantages of ecosystem participation.

Theoretical Contributions

This research makes significant contributions to innovation management, dynamic capabilities theory, and digital transformation literature. First, it integrates innovation ecosystem theory with dynamic capabilities theory, clarifying the mechanisms through which ecosystem engagement enhances innovation performance. The confirmation of dynamic capabilities as a mediating mechanism extends both theoretical frameworks by demonstrating how external relationships enhance internal capability development, consistent with Farzaneh et al. (2022).

Second, the introduction of organizational digital maturity as a moderating variable contributes to bridging the fields of digital transformation and innovation management. The finding that digital maturity strengthens the impact of ecosystem engagement provides empirical support for Vial (2021), emphasizing that digital readiness enhances a firm's capacity to convert ecosystem interactions into innovation outcomes.

Finally, the identification of partial mediation provides a more nuanced understanding of how ecosystem engagement influences innovation. The results indicate that both capability development and direct access to external knowledge jointly shape innovation performance, supporting the multidimensional perspectives proposed by recent ecosystem studies (Rabelo et al., 2024). This contributes to a more comprehensive understanding of innovation mechanisms beyond single-path models.

Practical Implications

The findings offer several practical insights for managers seeking to optimize innovation strategies in digitally complex environments. The strong relationship between ecosystem engagement and dynamic capabilities suggests that firms should view ecosystem participation as a strategic mechanism for building internal capabilities rather than merely accessing external resources. This aligns with Teece et al. (1997) and Barney (1991), who emphasize the centrality of dynamic capabilities in sustaining competitive advantage.

The significant effect of dynamic capabilities on innovation performance indicates that firms should prioritize investments in capability development, particularly in sensing, seizing, and reconfiguring activities. Implementing systems for market intelligence, knowledge integration, and rapid organizational adaptation—consistent with Farzaneh et al. (2022)—can substantially enhance innovation outcomes.

Moreover, the direct positive effect of ecosystem engagement on innovation performance suggests that external collaboration remains beneficial even for firms with strong internal capabilities. This supports Adner's (2017) and Shou et al. (2017) view that innovation ecosystems provide value at multiple stages of capability maturity. Z

Finally, the moderating role of digital maturity highlights the increasing importance of building robust digital infrastructure. Firms with more advanced digital maturity are better positioned to leverage ecosystem opportunities, aligning with Vial (2019) and Gong et al. (2021), who argues that digital transformation enhances firms' ability to effectively exploit external knowledge and resources.

Conclusion and suggestions

This research highlights the crucial role of innovation ecosystem participation, dynamic capabilities, and organizational digital maturity in enhancing innovation performance. The findings confirm that ecosystem engagement significantly contributes to the development of dynamic capabilities, which in turn drive improved innovation outcomes. At the same time, ecosystem engagement generates direct innovation benefits through access to external knowledge, collaborative learning, and resource sharing. The results further demonstrate that organizational digital maturity strengthens the positive effects of ecosystem participation. Firms with higher levels of digital maturity are better able to integrate external knowledge and leverage digital tools to enhance innovation performance. These insights emphasize the importance of aligning digital transformation efforts with ecosystem engagement strategies to maximize innovation benefits. Overall, the study concludes that organizations combining strong dynamic capabilities with advanced digital maturity gain the most substantial advantages from innovation ecosystem participation and are better positioned to remain competitive in rapidly changing environments.

New knowledge and the effects on society and communities

This study generates new knowledge by clarifying the mechanisms through which innovation ecosystem engagement, dynamic capabilities, and digital maturity jointly influence organizational innovation performance. The findings extend current understanding of how firms benefit from ecosystem participation not only through direct access to external knowledge and resources but also through capability development and digital transformation. This contributes to a more comprehensive and integrated model of innovation that has direct implications for society and communities. From a societal perspective, stronger innovation ecosystems contribute to technological advancement, economic development, and the creation of new industries. By participating in ecosystems, organizations foster cross-sector collaboration among universities, government agencies, and private firms, enabling the co-creation of solutions to major societal challenges such as climate change, healthcare access, and economic inequality. As organizations develop stronger sensing, seizing, and reconfiguring capabilities, they can respond more effectively to emerging needs, generating innovations that benefit communities at large. Digital transformation further amplifies these positive societal impacts. Higher levels of digital maturity enable organizations to disseminate knowledge more efficiently, expand digital access, and create more inclusive innovation environments. Digital tools and platforms can help bridge gaps between communities, giving underserved groups greater access to information, skills, and opportunities. This enhances social inclusion and reduces disparities in technology adoption. The combined effects of innovation ecosystem engagement and digital transformation contribute to broader community development by creating new employment opportunities, improving access to public services, and supporting the emergence of more resilient local economies. Enhanced digital infrastructure and knowledge-sharing networks strengthen community capacity to adapt to change, increasing long-term socioeconomic resilience. In summary, the new knowledge generated by this research highlights how innovation ecosystems, dynamic capabilities, and digital maturity together promote sustainable, inclusive, and resilient societal development, reinforcing the critical role of innovation in shaping positive community outcomes.

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Research and Development of Museum-Community Collaboration: Utilizing Cultural Performing Arts in the Creation of Music and Contemporary Paintings to Promote Chiang Rai's Tourism Image

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Abstract

This research aims to analyze and develop collaboration between museums and local communities using cultural performing arts as a medium for heritage preservation and creative tourism promotion in Chiang Rai, Thailand. The study employs a mixed-methods design. Primary data were collected through in-depth interviews, focus group discussions, questionnaires, and field observations at two selected museums: the Museum of Old Photos Chiang Khong and the Hong Luang Saeng Kaew Museum at Wat Phra Kaew Chiang Rai. Their selection was based on their roles in preserving local history, culture, and the Lanna artistic heritage. Quantitative results from 152 exhibition visitors revealed high levels of cultural appreciation ($M = 4.52$), understanding of Chiang Rai's cultural identity ($M = 4.47$), and interest in cultural tourism ($M = 4.38$). These findings demonstrate that integrating performing arts and contemporary creative works significantly enhances audience engagement and strengthens the cultural tourism image of Chiang Rai. Qualitative findings indicate that cultural performing arts such as Lanna dance, Khap Sor Lanna singing, and traditional theatrical forms effectively communicate historical narratives and reinforce communal identity. The research also facilitated the creation of original musical compositions and contemporary paintings inspired by local narratives, using post-impressionist techniques and popular-music idioms. The exhibition incorporated immersive storytelling, curated lighting, and ambient soundscapes featuring local music and the natural sound of the Mekong River. A key tangible outcome of this project was the strengthened collaboration between Chiang Rai Rajabhat University and Chiang Khong District through an MOU that formalized joint cultural development efforts. This partnership enabled coordinated exhibitions, youth engagement activities, and community-based cultural programming that contributed to local economic stimulation and intergenerational learning. The findings underscore the significance of integrating museums, performing arts, and creative expressions to promote cultural tourism and enhance Chiang Rai's cultural. This study suggests that interdisciplinary artistic collaboration can serve as a sustainable model for area-based cultural development.

Keywords: Chiang rai, Museum–Community collaboration, Music and contemporary art, Tourism image

Introduction

Chiang Rai Province is recognized as one of the most significant cultural centers in Northern Thailand. The region is distinguished by its rich history, diverse ethnic composition, and artistic heritage, which are reflected through its ancient monuments, artifacts, and historical documents (Fongissara & Mekara, 2020, p. 53–63). The city of Chiang Rai, along with surrounding districts such as Chiang Saen and Chiang Khong, has long been interconnected with the ancient Lanna civilization and has served as a major hub for cross-border cultural exchange and economic trade for centuries (Sonthanong, Na Thalang & Wongmonta, 2022, p. 162–183). The development of border towns and culturally rich cities like Chiang Rai requires the integration of knowledge related to cultural heritage, performing arts, and the creative economy to enhance tourism value and promote sustainable community development (Prasunin, 2017, p. 32–46). At the international level, the concepts of cultural tourism and heritage-based creative industries have gained increasing attention, utilizing both tangible and intangible cultural assets as strategic tools for economic development and for reinforcing the distinctive identity of cultural tourism destinations (Richards, 2018, p. 12–21).

Museums play a crucial role as educational institutions in preserving and transmitting cultural knowledge. However, museums in Thailand continue to face challenges related to public accessibility, community participation, and the integration of cultural content into the creative economy (Meesil, 2016, p. 233–243). While these issues exist nationally, museums in Chiang Rai confront additional context-specific challenges, including limited youth engagement, insufficient contemporary interpretive media, and inadequate mechanisms for linking cultural heritage to creative tourism development. These limitations form the foundation of the research gap addressed in this study. Internationally, many countries have adopted approaches that emphasize museum community engagement, enabling communities to present their cultural identities through exhibitions and creative activities. The integration of performing arts and contemporary painting has become a key strategy for revitalizing museums and attracting tourism (Brown, Cummins, & González Rueda, 2023). Performing arts, in particular, provide meaningful narrative-based experiences that allow audiences to better understand and engage with cultural stories (Schechner, 2013). Numerous studies further demonstrate that incorporating music and performing arts into museum settings effectively increases visitor attendance and promotes experiential tourism (Graham & Howard, 2016).

Performing arts and contemporary painting are also integral components of the creative economy, reflecting cultural identity while generating value through creative industries (Florida, 2003). Phetruchee et al. (2021, p. 70–95) highlight that utilizing art as a medium for cultural transmission can stimulate tourism and strengthen cultural branding. Music additionally enhances emotional engagement and tourism perception (Sukwin, 2022, p. 109–124), while traditional music and folk performances help establish emotional connections with visitors and reinforce a city's cultural image (Richards, 2018). Despite this expanding body of literature, few studies have explored integrated creative processes that utilize museum spaces in collaboration with local communities to produce new artistic works aimed at strengthening a province's tourism image. This research gap is particularly evident in Chiang Rai, where museums possess rich cultural content but lack systematically developed creative frameworks that incorporate music, performing arts, and contemporary painting for tourism promotion. Addressing this gap is essential for positioning museums as dynamic cultural platforms rather than static repositories. Over the past decade, Chiang Rai's cultural development increasingly involves multi-sector collaboration among local museums, cultural practitioners, Lanna performing arts groups, visual artists, municipal cultural offices, tourism networks, and Chiang Rai Rajabhat University. These collaborative efforts have laid the groundwork for integrating

traditional narratives with contemporary creative practices. However, such partnerships have not yet resulted in a structured research-based framework for producing creative works that promote Chiang Rai's tourism image. Highlighting these partnerships is therefore essential to understanding the foundation and necessity of the present study.

This research aims to develop an integrated framework combining museums, performing arts, and contemporary painting to promote Chiang Rai's image as a distinguished cultural tourism destination. It explores the development of museum–community collaboration through cultural performing arts as a medium for creating original musical compositions and contemporary paintings. The objective is to revitalize museums as dynamic spaces for learning and community engagement and to enhance their role as significant tourist attractions, particularly for youth and broader audiences.

The study emphasizes creative processes that integrate traditional cultural narratives into music and visual arts, ensuring accessibility, relevance, and alignment with Chiang Rai's unique cultural atmosphere. Disseminating these creative outputs through various media platforms is expected to raise public awareness, foster cultural appreciation, and stimulate vibrant cultural tourism activities. Ultimately, the project aims to contribute to Chiang Rai's sustainable cultural and economic development by generating shared value and positive experiences across multiple sectors of society.

Conceptual Framework

Museums function as essential institutions for preserving, interpreting, and communicating cultural heritage. They serve as public learning spaces that make cultural knowledge accessible through curated exhibitions and meaningful cultural interpretation. Local communities, meanwhile, represent living heritage, encompassing indigenous knowledge, traditions, and artistic practices sustained across generations. Collaboration between museums and communities enhances the relevance and continuity of heritage transmission within contemporary settings. Performing arts play a central role in communicating cultural identity, using music, movement, and symbolic expression to transform historical narratives into engaging public experiences. When integrated with original musical compositions and contemporary paintings, these artistic practices expand the expressive possibilities of cultural interpretation. Music deepens emotional engagement and supports narrative expression, while contemporary painting provides visual reinterpretations of cultural identity aligned with modern aesthetics. Incorporating these artistic forms into museum-based initiatives strengthens cultural tourism by enriching visitor experiences and fostering deeper understanding of local cultural landscapes. Such integration revitalizes museums as dynamic cultural spaces that promote learning, creativity, and community participation. Therefore, developing creative processes that connect museums, communities, performing arts, and contemporary artistic production offers a strategic framework for sustaining living heritage, stimulating community engagement, and enhancing Chiang Rai's cultural identity within the context of cultural tourism development.

Review Literature

Hooper-Greenhill (2000) emphasizes that museums are not merely spaces for displaying ancient artifacts but function as dynamic centers for learning and cultural interpretation. Similarly, Smith (2006) through the concept of Uses of Heritage, argues that cultural heritage preservation extends beyond safeguarding physical objects and involves the construction of shared meanings within society. Research on museum community engagement further highlights the importance of positioning museums as living spaces that foster active community participation. In addition, Newman & McLean (2006) assert that museums play a crucial role in promoting cultural diversity and facilitating intercultural understanding among

different social groups. Collectively, these perspectives suggest that museums should not be confined to passive exhibition roles but should actively promote collaboration with local communities and stimulate the exchange of cultural knowledge.

The use of performing arts as a medium for cultural transmission is well articulated by Schechner (2013) who through the field of Performance Studies argues that performance extends far beyond stage presentations; it is a cultural process that reflects values, identity, and social beliefs. Similarly, Small (1998) introduces the concept of Musicking, framing music not merely as an artistic product but as a social activity shaped by human interaction and cultural context. Gombrich (1995) adds that painting serves as a powerful narrative tool capable of conveying historical memory, cultural stories, and cross-cultural understanding. These perspectives collectively indicate that both music and contemporary painting function as effective mediums for cultural communication, creating artistic experiences that bridge past traditions with contemporary expression. Richards (2018) expands this discussion by conceptualizing cultural tourism as a strategic mechanism through which cities and nations can leverage cultural assets to attract visitors. Complementing this, Florida (2003) introduces the notion of the Creative Class, asserting that artists and creative professionals are key drivers of urban economic development through creativity and innovation. Myrczik (2018, p. 239–254) further illustrates how the convergence of creative and digital economies enhances the role of culture in the global marketplace. Nye (2005) also contributes to this discourse by conceptualizing Soft Power as the ability of a nation to influence others through cultural attraction rather than coercion.

The concept of the creative economy underscores the use of cultural resources, creativity, and innovation to generate economic and social value. It integrates cultural assets, artistic production, and creative industries to support local development, enhance cultural identity, and promote sustainable tourism. In summary, culture and the arts are no longer confined to preservation; they have become vital economic resources that generate added value and contribute significantly to the growth and sustainability of the cultural tourism industry.

Table 1 Summary of Key Theoretical Concepts

Topic	Core Concept	References
Museums and Communities	Museums should serve as centers for learning and foster community engagement.	Hooper-Greenhill (2000); Brown, K., Cummins, A., & González Rueda, A.S. (Eds.). (2023); Smith (2006)
Music and Contemporary Painting	The arts function as mediums for cultural transmission and identity formation.	Schechner (2013); Small (1998); Gombrich (1995)
Cultural Tourism and Creative Economy	Culture is a key resource for driving economic development and promoting tourism.	Richards (2018); Florida (2003)

(Resource : Researcher, 2025)

Methodology

The methodology of this research is explained in detail as follows.

This study employed a spatial-based sampling approach to identify the population relevant to the context of museums and local communities in Chiang Rai Province. The initial data were referenced from lovethailand.org, which reports a total of seven museums within the province. However, given the study's focus on exploring collaborative practices between museums and communities in the creative process of art production, purposive sampling was adopted to select museums with the potential to participate in the project.

The selection criteria included: (1) Representation of museums located both within the urban area and outside the city center to ensure diversity in management practices. (2) Relevance to cultural heritage and tourism, which are central themes of the study. And, (3) the museum's capacity to serve as a learning hub and foster community engagement. Based on these criteria, two museums were selected.

1. Hong Luang Saeng Kaew Museum at Wat Phra Kaew Chiang Rai, (HLSK) located in Mueang Chiang Rai District, representing an urban-centered institution.

2. Museum of Old Photos Chiang Khong, (OPCK) located in Chiang Khong District, representing a museum outside the city center that maintains strong historical and cultural ties with the Mekong River communities.

Research Instruments

This study designed and developed research instruments based on the objectives of the study, incorporating both data collection tools and tools used in the creative production process. These instruments are categorized into three main components as follows.

1. Instruments for studying the collaboration between museums and communities. A mixed-methods research approach was adopted, utilizing both qualitative and quantitative data collection techniques. The primary instruments included.

1.1 Semi-structured interviews, conducted with museum administrators, community leaders, artists, and scholars to collect in-depth qualitative data.

1.2 Questionnaires, designed to gather public opinions on performing arts, museums, and the promotion of cultural tourism.

All instruments underwent content validity evaluation by a panel of experts and reliability testing prior to implementation in the study.

2. Instruments used in the creative process of music composition. These included, field notes, used for documenting observations and conceptual ideas during the composition process. Computers and digital audio workstation (DAW) software, employed for recording, editing, and arranging music. Musical instruments, both traditional and contemporary, used for experimentation and the development of song structures.

3. Instruments used in the creation of contemporary paintings. These included, cameras and field notebooks, used for collecting visual references and inspiration from cultural sites and museums. Sketchbooks, utilized for developing initial concepts and design drafts of the artworks. Painting materials, such as canvases, oil paints, acrylic paints, paintbrushes, and palettes, employed in the production of contemporary artworks.

Research Procedure

Phase 1: Research and Development of Museum-Community Collaboration through Cultural Performing Arts

This phase focuses on fostering collaboration between museums and local communities by utilizing cultural performing arts as a medium to connect traditional knowledge and encourage active community participation. The research and development process in this phase consists of the following sequential steps:

1. Analytical Studies, Data were collected from two primary sources: museums and local communities. The data were categorized into historical evidence, archaeological sites, academic documents, as well as tangible and intangible cultural heritage. Content analysis was employed to establish connections between historical information and the contemporary socio-cultural context of the communities.

2. Community Engagement and Stakeholder Consultation. Initial meetings were conducted with community representatives, local leaders, and museum stakeholders to introduce the research objectives and outline the collaborative framework. A participatory approach was implemented to promote community involvement and ensure mutual understanding. Strategies for collaboration were developed to align with the unique cultural contexts of each locality.

3. Ethnographic Fieldwork and Data Collection. Field data were collected using ethnographic research methods, which included, In-depth interviews with local scholars, traditional artists, and cultural experts to gather qualitative insights. Participant observation to document ongoing traditional performing arts practices within the communities. And, photographic and audio documentation to compile a digital archive of cultural heritage assets. Additionally, data were analyzed from historical documents and indigenous literature to support the field findings.

4. Data Synthesis and Integration. Data obtained from both museums and local communities were synthesized using thematic analysis to identify key themes related to cultural performing arts. The results were organized into a qualitative database and quantitative dataset, providing a structured foundation for subsequent development and application in creative processes.

5. Data Triangulation and Credibility Assessment. Data credibility was ensured through data triangulation techniques, which involved cross-verification of information from three primary sources: Museums (historical and cultural heritage data), Community representatives (ethnographic and indigenous cultural knowledge), and researchers (data analysis and academic interpretations). A focus group discussion was conducted to deliberate on research findings and gather feedback from relevant stakeholders, ensuring a comprehensive validation of the data and enhancing the overall credibility of the study.

Phase 2: The Creative Process of Music Composition and Contemporary Painting to Promote Chiang Rai's Cultural Tourism Image

In this phase, data collected from the initial research stage were utilized as a source of inspiration for the development of artistic content and elements. The aim of both creative processes was to convey the cultural values of Chiang Rai and enhance its tourism image through artistic media that effectively engage the target audience. Cultural narratives and insights gathered in Phase 1 informed both the music composition and the contemporary painting creation process.

Music Composition Process, the process involved composing lyrics and melodies, with the song structure designed to align with the cultural themes and emotions that reflect the identity of Chiang Rai. Music arrangements were developed to ensure artistic coherence and contextual relevance. This phase also included the selection of musicians and rehearsal processes, followed by the dissemination and presentation of the completed musical works.

Contemporary Painting Creation Process, the visual art process began with analysis and interpretation, applying symbolic interpretation and cultural narrative approaches to design meaningful artistic representations. During the sketching and composition design phase, artworks were created following post-impressionism principles, aimed at evoking emotional depth and reinforcing Chiang Rai's unique identity. A variety of materials and techniques were employed, including acrylics, oil paints, and mixed media, to enhance the contemporary quality of the artworks. The completed pieces were showcased in a public art exhibition, serving as a platform to disseminate the creative works and engage the wider community.

Phase 3: Presentation, Dissemination, and Quantitative Evaluation of Research Outcomes

This phase focused on disseminating the research outcomes in both academic and practical contexts, and employed a quantitative evaluation to assess audience perceptions and the impact of the creative works produced. A series of artistic activities and academic discussions were organized to showcase the musical compositions and contemporary paintings developed in Phase 2. The events were held at the Museum of Old Photos Chiang Khong in Chiang Khong District, Chiang Rai Province—a venue closely connected to the region's cultural heritage.

The quantitative component employed an accidental sampling technique (convenience sampling) to recruit exhibition visitors who voluntarily agreed to participate in the study after viewing the artworks. A total of 152 participants completed the questionnaire.

To evaluate the effectiveness of the creative outputs in promoting cultural understanding and enhancing the tourism image of Chiang Rai, a structured questionnaire was administered to respondents. The instrument consisted of Likert-scale items measuring 1) cultural appreciation, 2) perceived value of museum-based creative works, 3) understanding of Chiang Rai's cultural identity, and 4) interest in cultural tourism.

Descriptive statistics (mean and standard deviation) were employed to analyze audience responses. The quantitative results provided empirical evidence supporting the impact of the artistic works on visitors' cultural perceptions and their intention to engage in cultural tourism. These findings complemented the qualitative insights from earlier phases and strengthened the overall validity of the study's conclusions.

Ethical Approval Process

This study was reviewed and approved by the Institutional Review Board of Chiang Rai Rajabhat University. The research was granted an exemption status under Certificate No. COE.007/2567, Project ID 007-2567-Exe.

Results

The study found that museums in Chiang Rai Province play a significant role in the collection, preservation, and dissemination of cultural knowledge. These museums are deeply connected with local communities in various dimensions. As, the Hong Luang Saeng Kaew Museum at Wat Phra Kaew Chiang Rai serves as a repository of ancient artifacts and Lanna art. It also functions as a venue for artistic activities related to Buddhism and Lanna cultural traditions. Similarly, the Museum of Old Photos Chiang Khong exhibits historical photographs and narratives that document the history of riverside communities along the Mekong River. This museum serves as an important cultural link between Thailand and neighboring countries in the Greater Mekong Subregion.

Developing Museum-Community Collaboration through the Value of Cultural Performing Arts

The researches implemented a structured process to foster collaboration between museums and local communities, comprising the following key steps:

Step 1: Community Engagement and Field Visits, the process began with a planning phase, in which the research team defined the objectives of the field visits to ensure a comprehensive understanding of the cultural interests and needs within the targeted communities. In the preparation phase, the researchers gathered necessary tools and documents to support effective fieldwork. During the execution phase, data were collected through community surveys and field observations, following the predefined research plan. The next stage involved data analysis and presentation, where findings from the fieldwork were systematically analyzed and shared with relevant stakeholders for feedback and validation. Finally, in the action planning phase, the research team developed practical strategies and action plans based on the insights gained from the fieldwork. These plans aimed to address specific issues and support community development initiatives. Emphasis was placed on building mutual understanding with community members, as this foundational step was critical for ensuring that the research process was meaningful and beneficial to the communities involved. Establishing trust and a reliable understanding of local contexts and needs was essential for enabling effective and sustainable collaboration between the museums and the communities in future initiatives.



Figure 1 A briefing session was conducted to inform local government leaders about the objectives and procedures of the fieldwork activities. (Source: Researcher, 2024)

Step 2: Field Data Collection and Analysis, this phase involved the systematic collection and analysis of data related to local history, cultural heritage, and distinctive performing arts of the area. The study gathered information from existing historical documents and archival sources, as well as through direct field engagement, including consultations with

local stakeholders and community members to gain diverse perspectives. In addition to ensuring that the data were current and relevant, this process fostered collaboration between local authorities, institutions, and community members. Such cooperation not only enhanced the accuracy and comprehensiveness of the information collected but also strengthened partnerships that are essential for sustainable cultural development initiatives.

Step 3: Fieldwork Studies, this step involved conducting comprehensive fieldwork to collect and categorize data relevant to both museum collections and additional cultural studies. The field data were gathered with an emphasis on ensuring quality, accuracy, and reliability. Through immersive engagement in local and ethnic communities, the research team fostered mutual understanding and built strong relationships with community members. This approach facilitated collaborative efforts in establishing cultural databases and contributed to the planning of future community development programs.

Step 4: Data Synthesis (Synthetic Studies), In this step, data collected from both museum sources and local communities were synthesized and systematically organized. The integration of qualitative and quantitative data aimed to establish a comprehensive and interconnected cultural database. The synthesized data were structured to ensure consistency, coherence, and accessibility, facilitating future research, community development initiatives, and cultural promotion activities.

Step 5: Data Triangulation, A data triangulation process was conducted to validate the reliability and credibility of the findings. A focus group discussion was held, involving three key stakeholder groups: 1) Government authorities, represented by the District Chief Officer of Chiang Khong, 2) Community leaders, including museum custodians and local representatives, and 3) The research teams. The discussion addressed key findings, identified existing challenges, and explored collaborative strategies to ensure mutual understanding and agreement on data credibility. This process fostered transparency and consensus among stakeholders, reinforcing the reliability of the research outcomes.



Figure 2 The research team held a collaborative data synthesis session with the District Chief Officer of Chiang Khong and key representatives from local community leadership.
(Source: Researcher, 2024)

Preliminary Conditions

An analysis of the current conditions at both museums reveals that the Hong Luang Saeng Kaew Museum at Wat Phra Kaew Chiang Rai, (HLSK) has been in operation for 24 years. The museum has established a management system that includes a curator and rotating staff responsible for its administration. Detailed inventories and documentation are maintained for each artifact in the collection. Since the museum is located within the temple grounds, it

benefits from temple staff who assist with cleaning and maintaining both the interior and surrounding areas. Security is managed through a closed-circuit television (CCTV) system, and community members frequently donate valuable historical objects for display. However, the museum faces certain challenges. As it does not charge an admission fee, relying solely on a donation box to cover expenses, the funds collected are insufficient to meet its high monthly operating costs. Additionally, the museum's management structure is directly overseen by the temple's administrative committee, which can limit its operational flexibility and funding opportunities.

Museum of Old Photos Chiang Khong, (OPCK) located in Chiang Rai, has been in operation for six years. Its management operates under the supervision of the District Cultural Council. A designated leader and management committee are responsible for overseeing all museum activities. However, there are no permanent staff members; instead, volunteers rotate duties to manage and maintain the museum. In terms of funding, the museum receives an annual budget from the Chiang Rai Provincial Administrative Organization. The management structure consists of a committee made up of interested community members, with a group leader responsible for planning and coordinating each activity. Admission to the museum is free of charge, and tourists are allowed to visit during official opening hours. However, visitors who require guided tours or special assistance must make advance appointments with the museum's head coordinator. Despite these efforts, several challenges persist. The absence of permanent staff has resulted in a lack of systematic organization of the exhibits. The presentation of photographs is inconsistent, and the exhibition space has become deteriorated over time. There is evidence of damaged equipment and a lack of regular maintenance and cleaning. Although the surrounding areas have been organized, the absence of designated caretakers has led to suboptimal management and upkeep of the exterior spaces.



Figure 3 Comparison between the conditions prior to improvement (left) and following collaborative renovation efforts (right). (Source: Researcher, 2024)

Results of Collaborative Development Between Museums and Local Communities Through the Value of Cultural Performing Arts

The implementation of collaborative development between museums and local communities, utilizing the value of cultural performing arts, revealed that all stakeholders became increasingly aware of the importance of partnership in revitalizing the museum as a vibrant community learning space. The key focus of development was the OPCK, with a shared commitment from all sectors to work collaboratively. The research team served as a facilitator, coordinating joint initiatives, organizing activities, and expanding partnerships across various sectors. The development process involved the community working together to restore the museum space and curate exhibitions aimed at reintroducing the OPCK, as a dynamic and engaging institution. This collaborative effort led to the organization of a major event titled:

“Presentation of Research and the Development of Museum-Community Collaboration through Cultural Performing Arts to Promote Chiang Rai’s Tourism Image.” The event featured the following key activities:

1. An exhibition of contemporary paintings in a post-impressionist style, inspired by historical photographs and cultural narratives of Chiang Khong, depicting its history, way of life, and cultural identity.
2. A presentation of community products, which were developed as part of the collaborative research project, showcasing local craftsmanship and cultural heritage.
3. A live performance of newly composed songs, specifically created to enhance the cultural tourism atmosphere in Chiang Khong District.

Furthermore, as a result of the project’s implementation, all parties involved reached a mutual agreement to establish a Memorandum of Understanding (MoU) on academic, research, and cultural cooperation for the spatial development of Chiang Khong District. The MoU was formalized between Chiang Rai Rajabhat University and the Chiang Khong District Office, with the primary objective of fostering collaboration in advancing academic initiatives, research activities, and cultural studies that support the area’s development. The key content of the agreement highlights a shared commitment by both parties to collaborate on academic and research-driven initiatives, with a focus on promoting cultural development aimed at enhancing the spatial and community development of Chiang Khong District. This partnership is intended to contribute to the sustainable development and long-term prosperity of the local area.

The Creation of Music and Contemporary Paintings to Promote the Tourism Image of Chiang Rai Province

This study produced original musical compositions and contemporary artworks that reflect the cultural narratives and values of Chiang Rai Province, particularly focusing on the Chiang Khong area. The creative process was informed by field research conducted in local museums and communities, providing inspiration for both the lyrical content and musical arrangements aimed at enhancing the province’s tourism image. Each song was specifically designed to embody the cultural identity, local way of life, and natural beauty of Chiang Rai. The music serves as a medium to promote cultural tourism, while also fostering a sense of pride and cultural identity among local residents, contributing to sustainable community development.

Similarly, a series of contemporary post-impressionist paintings were created, integrating modern artistic concepts with inspiration drawn from Lanna culture, local traditions, and the historical heritage of the Mekong River region. These artworks visually interpret and celebrate the cultural richness of Chiang Rai, as illustrated in the examples presented below.

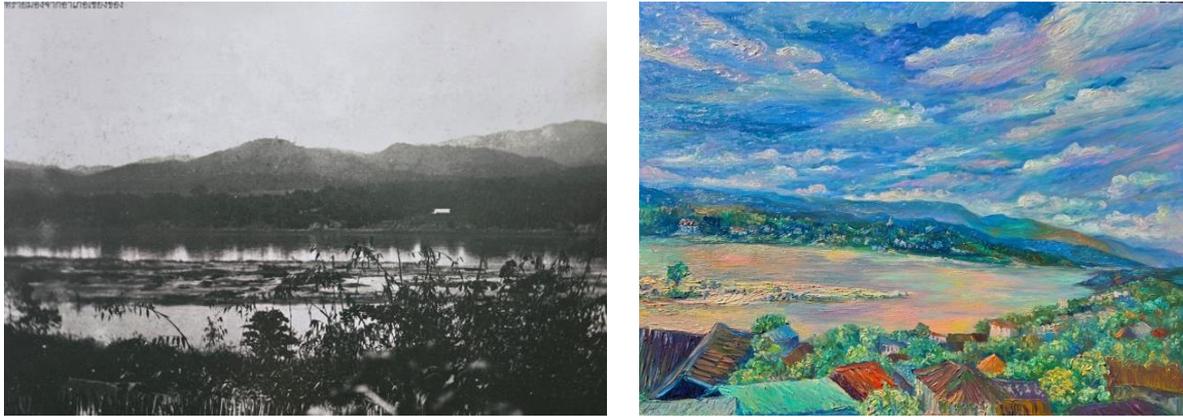


Figure 4 Contemporary Post-Impressionist Paintings Inspired by Local Cultural Heritage.
(Source: Researcher, 2024)

Form figure 4, illustrates the expression of emotions and inspiration derived from an original photograph. The research team translated these impressions into a creative artwork, portraying a sense of nostalgia and admiration for traditional festivals held along the banks of the Mekong River.

Exhibition Design and Management

The exhibition and presentation process plays a crucial role in delivering engaging content and creating immersive experiences for visitors. This exhibition was held at the OPCK, in conjunction with an archival photography exhibition, reflecting the historical context and cultural heritage of the area. The exhibition was curated with distinctive design elements, featuring newly developed components that enhanced the museum's display system. These improvements included:

1. **Lighting Design**, A lighting system was implemented to enhance the visual impact of the exhibits. Spotlights were used to highlight key details in photographs and artworks, drawing attention to significant elements. In addition, track lighting systems were installed, offering adjustable directional lighting suitable for galleries and museums. This allowed for dynamic control of lighting to create visual depth and focus on specific works.

2. **Sound Design**, an audio system was installed to complement the exhibition's themes, providing an ambient soundscape. This included traditional Lanna instrumental music and songs composed as part of the current research project, enriching the visitor's sensory experience and reinforcing the cultural narrative.

3. **Spatial Arrangement & Exhibition Display**, physical exhibition components were carefully arranged to enhance historical and cultural interpretation. Artifacts and traditional objects were displayed, such as ancient vases, writing desks, and traditional Tai Lue women's attire. These items were incorporated to establish an authentic historical atmosphere and foster a deeper connection between visitors and the cultural context of Chiang Khong.



Figure 5 The researcher provides an explanation of painting techniques inspired by archival photographs, as visitors explore the exhibition space. (Source: Researcher, 2024)

A total of 152 exhibition visitors participated in the quantitative evaluation survey. The overall reliability of the questionnaire, assessed using Cronbach's alpha, was 0.89, indicating high internal consistency. 1) Cultural Appreciation; Participants reported a high level of cultural appreciation after viewing the creative works. Mean = 4.52, S.D. = 0.48 The results suggest that the musical compositions and contemporary paintings effectively enhanced participants' recognition of Chiang Rai's cultural values. 2) Perceived Value of Museum-Based Creative Works. Respondents expressed positive attitudes toward the integration of performing arts and contemporary visual art within museum settings. Mean = 4.41, S.D. = 0.55 Participants noted that the artworks helped make cultural narratives more engaging and accessible. 3) Understanding of Chiang Rai's Cultural Identity. Visitors demonstrated a strong understanding of Chiang Rai's cultural identity following the exhibition. Mean = 4.47, S.D. = 0.51 This suggests that the creative outputs successfully communicated key cultural characteristics of the region. (4) Interest in Cultural Tourism. The exhibition stimulated visitors' interest in cultural tourism activities in Chiang Rai. Mean = 4.38, S.D. = 0.63 Many respondents indicated that the artworks motivated them to explore additional cultural sites within the province.

Discussions

This research aimed to develop collaboration between museums and local communities by utilizing the value of cultural performing arts as a medium to promote and preserve cultural identity. Additionally, it sought to encourage community participation and enhance cultural tourism in Chiang Rai Province. The examination of the role of museums as centers for cultural learning revealed that both the HLSK and the OPCK possess significant potential to become vibrant learning hubs. However, the findings also indicated that strategies to strengthen community engagement through diverse activities remain essential. These results align with Hooper-Greenhill's (2000) perspective that contemporary museums should shift from functioning merely as repositories of artifacts to becoming dynamic learning spaces that actively interact with their communities. The integration of performing arts as an engagement tool enabled the museums to build deeper emotional and cultural connections between visitors and their local heritage. This corresponds with Falk & Dierking's (2016) argument that interactive and meaningful experiences foster a greater sense of belonging, allowing visitors to connect more profoundly with cultural narratives and historical contexts. Furthermore, fostering collaboration between museums and communities through cultural performing arts enhanced the museums' roles as cultural hubs and motivated community members to participate in preserving their own heritage. This is consistent with Brown, Cummins, and González Rueda's (2023) assertion that community collaboration increases the perceived value

of local culture, as people begin to view museums as integral parts of their identity and collective memory. The findings also suggest that such collaborative initiatives have the potential to attract tourists who are increasingly drawn to authentic cultural experiences. This supports Richards' (2018) findings that connecting arts and culture with tourism development enhances economic value and contributes to long-term sustainability within the tourism sector. Moreover, the dissemination of cultural performances through digital platforms such as YouTube and social media further expanded access to new target audiences, demonstrating how digital engagement can amplify cultural communication and support tourism promotion.

The Role of Music in Promoting Cultural Tourism

The findings of this study indicate that music plays a significant role as an effective medium for promoting cultural tourism. Using music as a tool for public communication and promotion has been shown to enhance tourist interest in the unique identity of the region. The newly composed songs successfully conveyed the cultural image of Chiang Rai, which corresponds with Richards (2018) argument that art and music can add value to tourism by connecting tourists' experiences with the local culture. The melodies and rhythms of the compositions were intentionally designed to reflect the serene and charming atmosphere of Chiang Khong. This aligns with the findings of Gibson & Connell (2005) who suggest that music can help create an immersive ambiance, enabling listeners to form emotional connections with the places described in the songs. Moreover, presenting cultural narratives through music facilitates the dissemination of local culture in an accessible and engaging manner for diverse audiences. This approach supports perspective that music serves as a powerful medium for preserving cultural identity and promoting broader recognition of local cultures through appropriate dissemination strategies. Additionally, the researchers observed that live performances at local festivals serve as another effective platform for delivering musical experiences directly to audiences. Such performances not only bring vitality to tourist destinations but also enhance the overall tourist experience, making the sites more engaging and attractive to visitors.

The Role of Contemporary Painting in Enhancing the Presentation of Cultural Values

In terms of visual arts, the creation of contemporary paintings has contributed to a more multidimensional presentation of cultural values. This aligns assertion that art can serve as an effective medium for communicating and preserving community identity. The application of a post-impressionist approach, which emphasizes expressive use of color and emotive brushstrokes, was found to effectively capture viewers' attention and foster emotional engagement with local communities. This concept is argued that contemporary art can stimulate social participation and enhance public understanding of a region's cultural dimensions. Furthermore, the findings support Richards (2018) perspective that integrating contemporary art with local identity can increase the appeal of cultural tourism and add economic value to the destination. While physical exhibitions in local spaces offer tangible cultural experiences, the incorporation of digital technologies such as Virtual Reality (VR) and Augmented Reality (AR) can further expand audience reach and create more immersive and meaningful interactions. This view is supported by Ross Parry (2010) who suggests that digital technologies can revitalize the presentation of art and culture, making them more engaging and accessible to younger generations.

Overall, the findings underscore the importance of integrating museum–community collaboration with creative artistic practices to strengthen cultural identity, enhance cultural learning, and contribute to the growth of the local creative economy. This approach offers a sustainable and context-sensitive strategy for cultural development in Chiang Rai and provides a model for other regions seeking to leverage cultural creativity for tourism and community empowerment.

Conclusion and suggestions

This research concludes that integrating cultural performing arts into the development of museums and local communities presents a sustainable and dynamic approach to cultural heritage preservation and creative tourism promotion. Museums, once seen merely as spaces for displaying artifacts, can be transformed into vibrant cultural platforms. Newly composed songs functioned effectively as a medium for connecting people to their local cultural identity. Moreover, the incorporation of contemporary creative works particularly music and visual art inspired by local narratives significantly enhanced emotional and cultural engagement among audiences.

However, the study proposes three key recommendations to advance area-based development.

1. Governmental and cultural organizations should actively support interdisciplinary artistic and cultural collaborations. In particular, music and visual arts should be employed as strategic tools for cultural communication and soft power promotion.
2. Museum management should open space for community participation, allowing local people to engage in storytelling and cultural programming.
3. Further longitudinal studies should be conducted to explore the long-term impacts of creative-based cultural tourism on community quality of life, grassroots economic development, and the preservation of intangible heritage.

To ensure long-term sustainability, the existing Memorandum of Understanding (MoU) between Chiang Rai Rajabhat University and Chiang Khong District should incorporate a systematic monitoring and follow-up mechanism. Such a structure would help maintain active collaboration beyond the project period. In addition, the collaborative model developed in this study should be expanded to other community museums across Chiang Rai Province to strengthen regional cultural networks and enhance the overall cultural tourism ecosystem of the region. Future research should prioritize the development of creative methodologies that yield tangible artistic outcomes and effectively engage younger generations through digital media, co-creation processes, and contemporary artistic practices. These directions will help ensure that cultural heritage remains meaningful and relevant within an increasingly dynamic and interconnected society.

New knowledge and the effects on society and communities

This study contributes new interdisciplinary knowledge by presenting an integrated approach that combines traditional cultural performing arts with contemporary creative expressions such as music and post-impressionist painting to support participatory activities within museums. This approach not only encourages community involvement but also enhances the cultural value of local tourism. The social and community impacts observed in this study can be summarized as follows.

1. The community has developed a renewed sense of pride in its cultural heritage, leading to increased participation in its preservation and development.
2. Cultural knowledge has been meaningfully transmitted across generations, with local wisdom being passed from elders to youth, fostering intergenerational learning.
3. Exhibitions and performances have attracted tourists and stimulated local spending in community-based businesses, such as handicrafts, local cuisine, and guided tours by local residents.

4. The collaborative process between researchers and community members has enhanced mutual understanding of the value of local cultural heritage.

5. The development approach generated through this project can be scaled up and adapted into policy frameworks at both local and national levels, promoting the integration of culture into sustainable area-based development strategies.

In conclusion, the findings of this study demonstrate that artistic and cultural processes can generate tangible and long-term outcomes in social cohesion, economic revitalization, and the preservation of community identity in a highly effective manner.

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A Meta-Analysis of Technical and Vocational Education and Training (TVET) Studies Across Continents

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Abstract

Technical and Vocational Education and Training (TVET) plays a critical role in enhancing employability and supporting economic development. However, global disparities exist in labor force participation, policy implementation, and system effectiveness, highlighting the need for cross-continental analysis. This study aimed to conduct a systematic meta-analysis of international TVET research to 1) evaluate labor force participation of TVET graduates, 2) identify innovative policies and systemic interventions that strengthen TVET outcomes, and 3) propose strategies suitable for enhancing the Philippine TVET system. A systematic review and meta-analysis were conducted on 60 studies published between 2016 and 2022. Data were sourced from four academic databases: ProQuest, EBSCO, JSTOR, and Elsevier. Inclusion criteria targeted studies focused on TVET programs or graduates reporting employment outcomes or systemic interventions. Qualitative data were analyzed using MAXQDA, while quantitative data were synthesized to determine labor force participation across continents. Labor force participation of TVET graduates varied by region, with Asia reporting the highest rate (27.27%) and Africa the lowest (10.54%). Effective policies identified include strong governance, public-private partnerships, competency-based training, recognition of prior learning, and ICT-supported monitoring. For the Philippines, adopting these strategies can improve alignment with labor market needs and enhance graduate employability. The study demonstrates that context-specific policies, systemic interventions, and strategic partnerships are essential for improving TVET outcomes globally and locally. Evidence-based strategies can strengthen the Philippine TVET system, ensure labor market relevance, and promote workforce readiness.

Keywords: Technical and vocational education and training (TVET), Labor force participation, Meta-analysis, Policy interventions, Philippines

Introduction

Technical and Vocational Education and Training (TVET) programs are implemented worldwide to equip learners with the knowledge, skills, and competencies required for specific trades or occupations. The content, structure, and delivery of TVET programs vary significantly across countries, reflecting differences in local economic demands, educational systems, and socio-cultural and political contexts (Nawi et al., 2020). By integrating practical, hands-on training with theoretical instruction, TVET seeks to prepare learners for productive employment across diverse sectors of the economy (UNESCO, 2001; Oviawe et al., 2017).

TVET has been established as a pivotal strategy for enhancing workforce employability, particularly for individuals who may not pursue traditional university education (Hassan et al., 2019). Beyond individual employment outcomes, TVET contributes to national development by supplying industries with skilled labor, fostering productivity, and supporting economic growth (Grosch, 2017). Comparative studies highlight that countries such as Germany and Switzerland have institutionalized strong TVET systems closely linked to labor markets, while in other contexts, including the United States, TVET continues to occupy a more peripheral role in education policy (Boateng, 2012).

Despite its recognized importance, TVET systems worldwide face persistent challenges. These include limited access for disadvantaged and marginalized populations, uneven program quality, weak alignment with labor market needs, low social prestige, and constrained funding mechanisms. Such challenges undermine the capacity of TVET programs to produce graduates who are fully prepared for contemporary workforce demands and sustainable economic participation (Hasim et al., 2016; Hussain et al., 2015).

Empirical evidence further suggests that the effectiveness of TVET interventions varies considerably across contexts. In the Philippine setting, impact evaluations conducted by Orbeta (2016) indicate that while TVET participation can improve employment prospects and earnings, outcomes are highly dependent on program relevance, training quality, and industry linkage. Recognizing these issues, the Technical Education and Skills Development Authority (TESDA) introduced the National Technical Education and Skills Development Framework 2021–2025, which emphasizes labor market responsiveness, quality assurance, public–private partnerships, and data-driven planning to strengthen the TVET system (TESDA, 2021).

While existing studies offer valuable insights into TVET performance, policies, and challenges at national or regional levels, there remains a clear gap in research that systematically synthesizes TVET outcomes across continents. Specifically, limited attention has been given to cross-continental comparisons of labor force participation, policy innovations, and system-level interventions. A comprehensive meta-analysis of international TVET studies can address this gap by identifying global trends, effective practices, and transferable policy approaches. Such synthesis provides a robust evidence base for informing context-sensitive reforms and strengthening national TVET systems, including those in the Philippines.

Objectives:

This study aimed to conduct a systematic meta-analysis of international TVET research to evaluate global trends and inform localized policy development.

Specific Objectives:

1. To analyze labor force participation rates of TVET graduates across continents based on studies published from 2016–2022.
2. To synthesize innovative policies and systemic interventions that have strengthened TVET outcomes globally.
3. To propose evidence-based strategies for enhancing the Philippine TVET system, grounded in best practices and aligned with labor market requirements.

Methodology

This study employed a systematic review and meta-analysis approach to synthesize global research on TVET programs, labor force participation, and policy interventions, combining quantitative and qualitative analyses to identify trends, effective practices, and strategies for system improvement.

Research Design

This study employed a systematic meta-analysis to evaluate Technical and Vocational Education and Training (TVET) programs worldwide and provide evidence-based strategies for the Philippine context. The design combined quantitative aggregation of labor market outcomes with qualitative thematic analysis of policies and systemic interventions, ensuring alignment with the study objectives: assessing labor force participation, synthesizing effective global policies, and proposing localized improvements for the Philippine TVET system.

Data Sources and Search Strategy

A comprehensive search was conducted across four academic databases: ProQuest, EBSCO, JSTOR, and Elsevier, covering publications from 2016 to 2022. Keywords included “*Technical Vocational Education and Training*”, “*TVET*”, “*Vocational Education*”, “*employment outcomes*”, “*policy interventions*.” Peer-reviewed journal articles, government reports, and policy briefs in English were included.

Criteria

Studies were included if they (1) focused on TVET programs or graduates, (2) reported employment outcomes or systemic interventions, and (3) were published in English between 2016 and 2022. Studies were excluded if they (1) addressed general higher education without a TVET focus, (2) were opinion pieces or commentaries lacking empirical evidence, (3) were duplicate publications, or (4) did not have full-text availability. After applying these criteria, a total of 60 studies from 10 countries per continent (excluding Antarctica) were selected, encompassing quantitative, qualitative, and mixed-method designs.

Data Extraction and Analysis

Data were extracted using a structured template capturing study characteristics, TVET program type, labor market outcomes, and systemic interventions. Quantitative data were managed with Excel, while qualitative data were coded and analyzed using MAXQDA to identify recurring themes and best practices.

Quality Assessment

Each study was appraised for methodological quality using a modified AMSTAR 2 checklist, considering study design, sample size, validity of measures, and appropriateness of analysis. High-risk studies were excluded from quantitative aggregation but retained for qualitative synthesis to inform policy recommendations.

Data Synthesis

Quantitative synthesis involved calculating labor force participation rates by continent, including averages, ranges, and standard deviations. Qualitative synthesis identified themes in governance, industry partnerships, curriculum modernization, quality assurance, and lifelong learning. Philippine-specific strategies were derived by mapping global best practices to local labor market and educational contexts. The PRISMA flow diagram documented study selection, screening, eligibility, and inclusion, ensuring transparency and replicability.

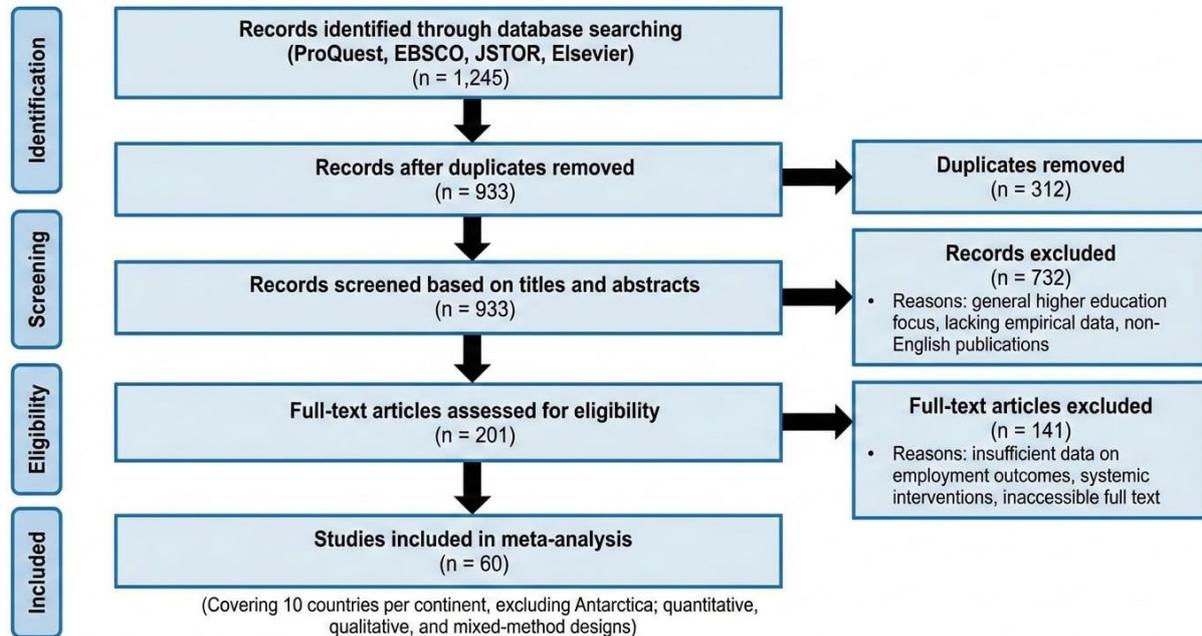


Figure 1 Flow diagram of study selection process (Source: Research, 2025)

The study followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure transparent reporting of study selection. An initial search across ProQuest, EBSCO, JSTOR, and Elsevier yielded 1,245 records. After removing 312 duplicates, 933 unique records were screened based on titles and abstracts. Of these, 732 records were excluded for not meeting the inclusion criteria, such as focusing on general higher education, lacking empirical data, or being non-English publications. The remaining 201 full-text articles were assessed for eligibility, resulting in 141 exclusions due to insufficient data on employment outcomes, systemic interventions, or inaccessible full text. Finally, 60 studies were included in the meta-analysis, covering 10 countries per continent (excluding Antarctica) with quantitative, qualitative, and mixed-method designs.

Results

This meta-analysis synthesizes global evidence on Technical and Vocational Education and Training (TVET) outcomes from 2016–2025. Findings are organized into three major areas: 1) labor force participation rates of TVET graduates, 2) innovative policies strengthening TVET systems, and (3) suitable approaches to enhance the Philippine TVET system. Across the 60 contributing studies, results highlight differential employment outcomes, policy effectiveness, and contextual challenges across continents.

1. Labor Force Participation Rate of TVET Graduates

TVET programs serve as a direct link between education and employment by equipping graduates with practical and occupational skills aligned with labor market needs (UNESCO, 2022). Evidence from systematic reviews indicates that participation in TVET is positively associated with employment outcomes in low- and middle-income countries, with small but statistically significant effects on paid employment and formal employment outcomes when compared to non-TVET counterparts (Leidholm & Manda, 2013).

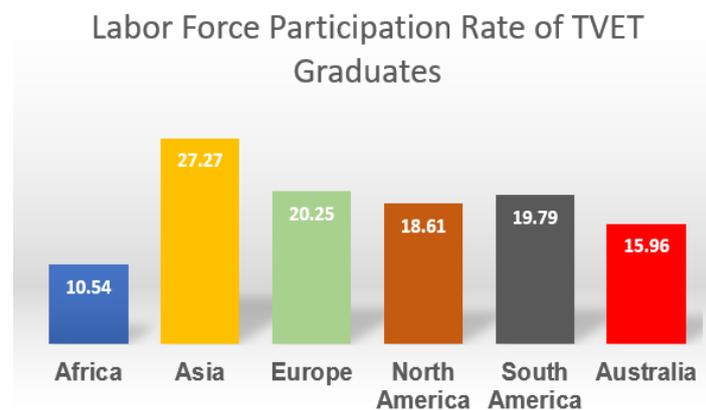


Figure 2 Labor force participation rate of TVET across continents

Note: Data extracted from 10 representative countries per continent; total contributing studies = 60 (Source: Research, 2025)

Figure 2 shows average labor force participation rates of TVET graduates across continents based on employment data aggregated from 60 studies. Asia reported the highest participation rate (27.27%), followed by Europe (20.25%), South America (19.79%), North America (18.61%), and Australia (15.96%), while Africa registered the lowest (10.54%). These figures represent the proportion of TVET graduates employed in industrial sectors relative to total graduates per region.

Asia's strong participation reflects effective alignment of TVET training and labor market demands, particularly in manufacturing and technology industries — trends supported by UNESCO-UNEVOC data on emerging skills and competencies integration across Asia-Pacific countries.

Europe has well-developed dual training and lifelong learning systems, which facilitate transitions from training to employment (OECD, 2018).

Africa's lower rates are linked to structural challenges in formalizing employment and aligning TVET offerings with employer needs, as highlighted in African TVET transformation

programs and research on digital and green skills integration.

North and South America show moderate performance, where evidence indicates mixed results influenced by policy variation and employer perceptions of TVET credentials.

2. Innovative Policies to Strengthen TVET Systems

Despite the potential of TVET to address skills mismatches and support decent work, global reports reveal persistent gaps in access, relevance, and quality, especially in low- and middle-income contexts (UNESCO, World Bank & ILO, 2023). TVET systems are often criticized for limited adaptability to industry needs due to outdated curricula and insufficient teacher preparation.

Across the included studies, several policy innovations and systemic reforms were consistently associated with improved TVET outcomes:

- Strengthening governance and institutional coordination — policy frameworks that involve government, employers, and TVET institutions enhance relevance and implementation effectiveness (UNESCO, 2022).
- Industry partnerships & work-based learning — collaborations between training providers and employers support labor market entry and competency alignment (OECD, 2018).
- Curriculum modernization & skills anticipation — integrating digital, green, and soft skills into training enhances employability in emerging sectors.
- Quality assurance & lifelong learning strategies — monitoring systems and pathways for continued upskilling improve long-term career adaptability.
- Targeted access programs for women and marginalized groups — inclusion efforts expand participation and address equity concerns.
- These strategies reflect a combination of systemic reforms, stakeholder engagement, and curricula modernization that support TVET systems in adapting to evolving labor market demands.

3. Suitable Approaches to Strengthen TVET System Development that benefit present Philippine Education

To enhance the effectiveness of TVET in the Philippines, it is essential to adapt global best practices to the local context while addressing systemic challenges such as quality assurance, industry alignment, and access for marginalized groups. Evidence from international and local studies suggests that integrating certification frameworks, recognition of prior learning, and public-private partnerships can improve the performance of vocational training centers and ensure that graduates are better prepared for labor market demands (Schröder, 2019; UNESCO, 2022). The following table and discussion present strategies, tools, and mechanisms designed to strengthen the Philippine TVET system and support the successful transition of learners into sustainable employment.

Table 1 Suitable Approaches to Strengthen TVET System Development

Certification Mechanism	Strategies & Tools for Vocational Training Center Performance
National Qualifications Framework and Regulated Qualifications Framework	<ul style="list-style-type: none"> • Build enabling conditions (robust TVET policies, institutional anchorage, partnership frameworks, and NQF mechanisms) for valuable qualifications. • Determine certification processes based on identified skills needs. • Develop business plans and performance contracts for Vocational Training Centers (VTCs) to enhance strategic, pedagogical, administrative, and financial management autonomy. • Promote public-private partnerships (PPPs) to improve the training-to-work transition. • Define skill sets, Competency-Based Training (CBT) courses, and supervisor/mentor standards for apprenticeships, dual training, and internships. • Reinvest professional taxes in ongoing training and apprenticeships via a national vocational training fund (UNESCO, 2022; Schröder, 2019).
Recognition of Prior Learning (RPL)	<ul style="list-style-type: none"> • Adapt and decentralize the RPL process to give access to informal and non-formal sector candidates. • Develop RPL guidelines aligned with NQF, offering flexible and modular approaches, and credible assessment tools for employers. • Provide career guidance services through dedicated units. • Support entrepreneurship through demand-driven skills targeting and microfinance modules. Use employment rates, corporate growth, and trainee/employer satisfaction as Key Performance Indicators (Mariano & Tantoco, 2023).
Public-Private Partnership in Certification	<ul style="list-style-type: none"> • Engage the private sector in every step of certification, including labor needs identification and occupational standards. • Delegate certification steps to autonomous private bodies for competency-based qualifications. Build monitoring systems to track TVET graduates' labor market outcomes by sector and region. • Harness ICT for effective monitoring and evaluation (M&E), adjust training content based on labor market research, and communicate results to stakeholders and learners (Othman, 2019; Pambudi & Harjanto, 2020).

Most TVET reforms globally focus on quality training management. However, vocational training actors often report that quality assurance systems remain insufficiently effective. To achieve successful outcomes, the quality of training and leadership in training centers must be validated through the sustainable transition of learners from TVET to the labor market (Schröder, 2019; Othman, 2019; Pambudi & Harjanto, 2020).

Discussions

This meta-analysis of 60 studies from ten countries per continent (excluding Antarctica) provides a comprehensive view of the current state and effectiveness of Technical and Vocational Education and Training (TVET) globally. The findings reveal substantial regional differences in labor force participation, policy implementation, and systemic development, reflecting the diverse socioeconomic, cultural, and policy environments in which TVET operates.

1. The study found that Asia leads with a labor force participation rate of 27.27%, followed by Europe (20.25%), South America (19.79%), North America (18.61%), Australia (15.96%), and Africa (10.54%). The lower participation in Africa aligns with earlier research (Boateng, 2017; Oketch, 2017) and may be explained by limited funding, fragmented policies, insufficient infrastructure, and societal undervaluing of vocational education. In contrast, higher participation in Asia reflects strong alignment between TVET curricula, apprenticeship programs, and labor market needs (Kirior, 2017; UNESCO, 2024). This finding supports Human Capital Theory (Becker, 1993), suggesting that investments in skills and structured training enhance employability and productivity.

2. Global evidence shows that effective TVET systems rely on multifaceted policy interventions, including robust governance, private-sector partnerships, curriculum modernization, ICT integration, and quality assurance mechanisms (Schröder, 2019; Hanni, 2019; Smith, 2022). These interventions facilitate skill development beyond technical expertise, promoting critical thinking, entrepreneurship, and lifelong learning (Hasim et al., 2016). The study also confirms prior literature indicating that inadequate policy alignment and low societal recognition of TVET programs can hinder the successful integration of graduates into the workforce (Grosch, 2017; Oketch, 2017).

3. Adapting global best practices, the Philippine TVET system can strengthen its relevance and effectiveness by implementing National Qualifications Frameworks (NQF), Recognition of Prior Learning (RPL), competency-based training, apprenticeships, internships, and ICT-enabled monitoring. These strategies ensure that training aligns with labor market demands and supports employability outcomes. Furthermore, public-private partnerships and sector-specific career guidance can enhance the transition of graduates into employment, addressing gaps in both formal and informal labor sectors (Schröder, 2019; Othman, 2019; Pambudi & Harjanto, 2020).

Limitations of the study include uneven study distribution across continents, variations in study quality, and exclusion of non-English publications, but the findings provide a robust foundation for evidence-based policy and system improvements.

Conclusion and suggestions

This meta-analysis highlights the critical role of TVET in enhancing employability and supporting economic development. Labor force participation varies widely across continents, with Asia and Europe showing higher alignment between TVET programs and labor market needs, while Africa faces challenges due to limited funding, policy gaps, and societal perceptions of vocational education (Boateng, 2012; Oketch, 2017; UNESCO, 2022). Effective TVET systems are characterized by strong governance, public-private partnerships, curriculum modernization, ICT integration, and quality assurance, which together improve both technical and employable skills (Schröder, 2019; Hanni, 2019; Maireva et al., 2021).

For the Philippine TVET system, adopting evidence-based strategies can enhance program effectiveness and graduate employability. Key recommendations include:

1. Strengthen management and policy frameworks to ensure TVET programs respond to national and local labor market demands.
2. Expand the National Qualifications Framework (NQF) and Recognition of Prior Learning (RPL) to validate formal and informal skills and improve accessibility for marginalized groups.
3. Involve private-sector partners in curriculum design, apprenticeships, and internships to enhance program relevance.
4. Utilize ICT systems to track graduate outcomes, monitor program quality, and identify skills gaps in real time.
5. Support professional development for instructors and encourage graduates to develop entrepreneurial and lifelong learning skills.
6. Conduct regular program evaluations and longitudinal studies to identify effective strategies and inform continuous improvement.

These measures collectively aim to strengthen the Philippine TVET system, improve labor market integration, and maximize the socioeconomic benefits of vocational education.

New knowledge and the effects on society and communities

Technical and Vocational Education and Training (TVET) plays a critical role in enhancing employability and supporting economic development. However, global disparities exist in labor force participation, policy implementation, and system effectiveness, highlighting the need for cross-continental analysis. Effective policies identified include strong governance, public-private partnerships, competency-based training, recognition of prior learning, and ICT-supported monitoring. For the Philippines, adopting these strategies can improve alignment with labor market needs and enhance graduate employability. The study demonstrates that context-specific policies, systemic interventions, and strategic partnerships are essential for improving TVET outcomes globally and locally. Evidence-based strategies can strengthen the Philippine TVET system, ensure labor market relevance, and promote workforce readiness.

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A Peircean Semiotic Analysis of the Liuyang Confucius Worship Ritual: Symbol Classification and Cultural Representation

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Abstract

Based on Peirce's Tripartite Theory of Signs, this study systematically analyzes the symbolic classification system and representational logic of the Liuyang Confucius Worship Ritual. It aims to break through the limitation of overemphasizing description over classification in existing research on Confucius worship rituals and provide support for the dynamic inheritance of this intangible cultural heritage. Through integrating field investigation, in-depth interviews, and literature research, this study employs NVivo12 qualitative data analysis software to conduct systematic three-stage coding analysis (open coding, axial coding, and selective coding) with inter-coder reliability verification. The study identifies 68 core symbols, including 23 iconic signs (33.80%), 21 indexical signs (30.90%), and 24 symbolic signs (35.30%), and constructs a progressive classification system. These three types of signs realize meaning representation through formal similarity, contiguity/causality, and social convention respectively, and embody the integration of Confucian orthodox rituals and regional cultural characteristics. The study verifies the applicability of Peirce's theory, reveals the inheritance rules of ritual symbols, fills the gaps in relevant research, and provides a complete paradigm of theory, analysis, and interpretation, offering a reference for the research and inheritance of similar intangible cultural heritage projects.

Keywords: Liuyang confucius worship ritual, Peirce's tripartite theory of signs, Symbol classification, Cultural representation, NVivo12 qualitative analysis

Introduction

As a core carrier of Confucian culture, the Confucius Worship Ritual represents the dynamic inheritance of the traditional ritual and musical civilization of the Chinese nation, and its symbolic system embodies profound cultural genes and ethical values (Fei, 2004). Originating from the Shi Dian Li (Memorial Ceremony) of the Zhou Dynasty, the Liuyang Confucius Worship Ritual has been passed down for thousands of years. It not only adheres to the core norms of Confucian orthodox rituals but also deeply integrates the regional cultural characteristics of the Chu region, forming a unique ritual form (Zhu & Tang, 2009).

Current academic research on the Confucius Worship Ritual mostly focuses on surface-level aspects such as sorting out historical contexts and describing ritual procedures, which is characterized by the limitation of prioritizing description over classification and emphasizing phenomena over essence (Curzer, 2012). Existing achievements have not yet constructed a systematic classification system from a semiotic perspective, making it difficult to accurately reveal the cultural representation logic and inheritance mechanism of ritual symbols.

Based on this, this paper takes Peirce's Tripartite Theory of Signs as the theoretical framework, and combines field investigations, interview records, and literature research to classify and interpret the symbolic system of the Liuyang Confucius Worship Ritual. This study can not only fill the gap in the research on the symbolic classification of the Confucius Worship Ritual, improve the theoretical application scenarios of ritual semiotics, but also provide empirical evidence for the dynamic inheritance of the Liuyang Confucius Worship Ritual, which is of great theoretical and practical significance for the protection and dissemination of excellent traditional culture.

Research Objectives

Centering on the research questions identified above, this study establishes two primary objectives:

1. To develop a systematic semiotic classification framework for Confucius worship ritual symbols based on Peirce's triadic model, systematically classifying the symbols and their characteristics in the Liuyang Confucius Worship Ritual.
2. To innovate research methods for traditional ritual symbols and break through the limitation of 'prioritizing description over classification' through rigorous mixed-methods design and systematic coding analysis.

Literature Review

Application of Semiotic Theory in Traditional Ritual Studies

Semiotics provides a systematic analytical framework for traditional ritual research. Among its core theories, the tripartite classification of iconic, indexical, and symbolic signs proposed by American semiotician Charles Sanders Peirce from the late 19th century to the early 20th century takes the differences in representational logic as the core criterion and constructs a triadic sign relation model consisting of signifier, signified, and interpretant, which serves as the fundamental theoretical basis for ritual sign studies (Zhao, 2014).

Since its inception, this theory has been widely applied in ritual research across multiple disciplines including folklore, anthropology, and cultural heritage studies. Early studies mostly focused on the interpretation of single-type signs, such as analyzing ethical metaphors in religious rituals through symbolic signs or exploring the morphological inheritance of ritual artifacts by virtue of iconic signs (Peirce, 1998). With the deepening of research, scholars have gradually paid attention to the collaborative mechanism of the three types of signs. For example, in the research on ritual vessels used in the Liuyang Confucius Worship Ritual, Zhu

& Tang (2009) determined the iconic nature of these vessels by comparing their verified shapes with the traditional norms recorded in *Ding Ji Li Yue Bei Kao* (Compilation of Rituals and Music for the Mid-Autumn Confucius Ceremony) of the Qing Dynasty and combining Peirce's theory. (Peirce, 1998)

Meanwhile, they explained the causal relationship between these vessels and ritual procedures by referring to the usage scenarios documented in the same literature, thus defining their indexical functions. It should be noted that the original research of the two scholars focused on the history and ritual-music norms of the Liuyang Confucius Worship Ritual without involving semiotic classification; the above analysis is an extension based on their empirical data, providing historical support for ritual sign classification. In the study of artifact signs, scholars define sign types through morphological comparison and contextual analysis. In the study of behavioral signs, Lin & Chen (2025) identified iconic signs based on the imitative characteristics of traditional dance movements and defined indexical signs according to the causal relationship between movements and ritual procedures, which verified the applicability of Peirce's theory. For instance, studies on ethnic minority sacrificial rituals have revealed how the concrete simulation of iconic signs, procedural guidance of indexical signs, and value bearing of symbolic signs jointly support the cultural transmission function of rituals (Zhang & Sheng, 2017). However, existing studies mostly focus on single-type signs, with insufficient attention to the collaborative mechanism and hierarchical relationship among iconic, indexical, and symbolic signs, resulting in the fragmentation of theoretical application.

Research Status and Focuses of Confucius Worship Ritual Symbol Studies

As a core carrier of Confucian culture, the symbolic system of the Confucius Worship Ritual has always been a focus of academic research. Existing achievements mainly concentrate on three dimensions. First, the combing of historical context and textual research on shapes and systems: scholars reconstruct the origin and evolution of the Confucius Worship Ritual through literature sorting, focusing on the historical regulations of signs such as ritual vessels, ritual music, and dances (Zhou & Chuangprakhon, 2023; Lu, 2017). Second, the interpretation of cultural implications of single signs: scholars analyze the Confucian ethical values embodied in specific signs of the Confucius Worship Ritual, such as explaining that *bianzhong* (Bell, 1992) and *bianqing* (chime stones) symbolize the order of rituals and music, and that the etiquette of three bows and three concessions reflects the reverence for heaven and ancestors (Liu & Song, 2025). Third, the research on localized inheritance characteristics: scholars explore the localized transformation of Confucius Worship Ritual signs in different regions, focusing on the integration path of orthodox rituals and regional cultures (Hu, 2023).

These studies have laid a solid foundation for understanding the cultural connotation of the Confucius Worship Ritual, but they also have obvious limitations. From the perspective of research approach, most achievements stay at the level of phenomenological description or single-sign interpretation, lacking systematic classification of ritual signs and failing to construct a unified classification framework covering multi-dimensional signs such as artifacts, behaviors, and spaces. From the perspective of theoretical application, although some studies have introduced semiotic theories, they mostly apply these theories in a simplistic labeling manner, failing to deepen theoretical application by combining the characteristics of the Confucius Worship Ritual that integrates orthodoxy and locality, and ignoring the influence of regional culture on the representational logic of signs. From the perspective of research methods, existing studies are mainly based on literature research, lacking mixed research methods combining quantitative and qualitative approaches such as field investigation and empirical coding, leading to the lack of objective and systematic support for classification conclusions.

Limitations of Existing Research and Contributions of This Study

Current research on the classification of traditional ritual signs has three major gaps: fragmented classification systems, lacking systematic frameworks covering multiple types of signs with clear representational logic; insufficient integration of theory and practice, where the application of semiotic theories has not been fully adapted to the characteristics of the Confucius Worship Ritual that integrates orthodoxy and locality; and weak empirical support, lacking first-hand survey data to support sign identification and classification verification.

To address the above limitations, this study takes the Liuyang Confucius Worship Ritual as the research object, and based on Peirce's Tripartite Theory of Signs, integrates field investigation, in-depth interviews, NVivo12 coding analysis, and literature research to construct a three-level classification system of iconic, indexical, and symbolic signs. By identifying the type attribution and representational logic of 68 core signs, this study fills the gap in the systematic classification of Confucius Worship Ritual signs. By exploring the integration path of Confucian orthodox culture and Hunan-Chu regional culture in the symbolic system, it deepens the contextualized application of theories. By providing empirical support through mixed research methods, it constructs a complete paradigm from theory to empirical research and then to interpretation, offering references for similar studies and the dynamic inheritance of intangible cultural heritage.

Centering on the two core objectives of systematically classifying the symbols and their characteristics in the Liuyang Confucius Worship Ritual and innovating the research methods of traditional ritual symbols to break through the limitation of "prioritizing description over classification", this study successfully achieves its research goals by the systematic application of Peirce's Tripartite Theory of Signs. It accurately identifies and classifies 68 core symbols in the Liuyang Confucius Worship Ritual, establishing a comprehensive three-level classification system covering iconic signs, indexical signs, and symbolic signs.

Methodology

This study adopted a mixed-methods approach, integrating literature research, field investigation, in-depth interviews, and qualitative coding analysis (Strauss & Corbin, 1998). It combined multi-dimensional sampling and technical tools to ensure research rigor. For literature sampling, the focus was placed on core documents related to Confucius worship rituals and regional culture. A maximum variation sampling method was employed to select 12 core participants with diverse identities as interviewees. Observational sampling concentrated on three complete sessions of the Liuyang Confucius Worship Ritual held between 2023 and 2025. Data collection was carried out with the assistance of tools such as audio recorders and high-speed cameras, while qualitative coding analysis was performed using the NVivo12 software (Zamawe, 2015). The research objects covered various symbolic carriers of the Liuyang Confucius Worship Ritual, with the sample including complete ritual venues, interviewees, as well as relevant physical artifacts and documentary materials.

The data sources included documentary data such as ancient books, academic monographs, and local archives, along with empirical data including ritual audio-visual recordings, interview transcripts, and physical artifact collection materials. Data were collected through techniques such as literature retrieval, a combination of participant and non-participant field observation, semi-structured in-depth interviews, and physical artifact collection. Subsequently, the NVivo12 software was used to conduct open coding, axial coding, and selective coding on the textual data, systematically identifying core symbols and sorting out their representational logic. Meanwhile, cross-validation was performed by combining the results of literature research with field observation and interview feedback, so as to ensure the objectivity and reliability of the research conclusions.

Results

The Systematic Classification of Ritual Symbols

The comprehensive analysis of the Liuyang Confucius Worship Ritual identified a total of sixty-eight core symbols, distributed across the three Peircean categories in remarkably balanced proportions. Twenty-three iconic signs comprise approximately one-third of the total symbol system, representing concrete, perceptible elements that communicate through formal similarity. Twenty-one indexical signs account for roughly thirty-one percent of identified symbols, functioning to anchor ritual processes and guide participant behavior through contextual associations. Twenty-four symbolic signs constitute approximately thirty-five percent of the system, carrying deep ethical values and cultural meanings that depend upon social convention for their interpretation.

This balanced distribution across sign categories suggests a sophisticated semiotic architecture in which multiple modes of meaning-making operate simultaneously and complementarily. The ritual does not rely exclusively on any single type of semiotic mechanism but rather orchestrates iconic, indexical, and symbolic elements into an integrated communicative system. This diversity of sign types ensures that the ritual can function effectively for participants with varying levels of cultural knowledge, as iconic signs provide immediate perceptual access while symbolic signs reward deeper cultural literacy.

Iconic Signs: Concrete Representation Through Formal Similarity

Iconic signs realize meaning representation through formal similarity; that is to say, there exists a direct mimetic relationship between the sign carrier and its referent, enabling abstract cultural concepts to be perceived through visible and tangible forms. There are 23 iconic signs in total, accounting for 33.8% of the core symbols, which are mainly classified into two secondary categories: ritual vessels and dance movements. Their core characteristic lies in the formal similarity between the sign carrier and its referent, conveying superficial cultural images through concrete imitation.

Ritual Vessel Iconic Signs

They convey ritual symbolism primarily through the triple imitation of form, material, and decorative pattern. The ritual vessels used in the Liuyang Confucius Worship Ritual all embody the integrated characteristics of orthodox form and regional materials. A typical example is the bian (a bamboo basket for holding grains), which is woven from Hunan bamboo produced in Dawei Mountain of Liuyang. The carved patterns on its rim share a 92% similarity with those recorded in *The Grand Ming Code* (1587), thus achieving the integration of ritual form and regional products.

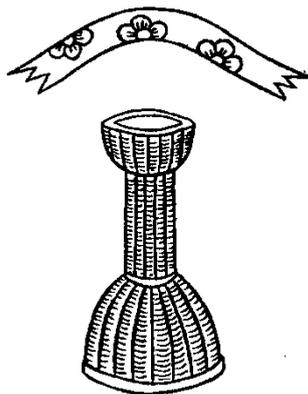


Figure 1 Ritual Vessel: Bian (Source: Researcher, 2025)

Another example is the jue (a bronze wine goblet), which is crafted in accordance with the specifications in Zhu Xi's atlas (Zhu, 2011), retaining the classic "two-column and three-foot" structure. Meanwhile, its phoenix-tail-shaped design featuring a "short and wide wine trough with an upturned tail" echoes the phoenix-worshipping folk custom of the Chu region, serving as a quintessential model of the integration of orthodoxy and local culture.

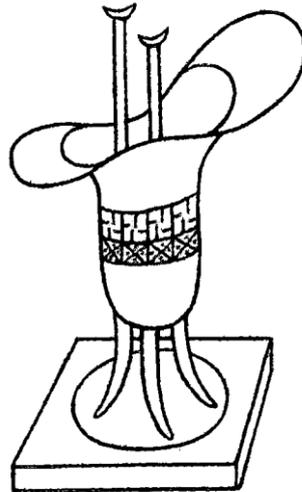


Figure 2 Ritual Vessel: Jue (Source: Researcher, 2025)

Such symbols take Confucian rituals as their prototype and integrate regional natural objects and craftsmanship characteristics, thus forming an organic unity of orthodox norms and regional features.

Dance Movement Iconic Signs

Their core characteristics lie in concrete imitation and intuitive transmission, transforming abstract cultural concepts into perceptible body language through the precise reproduction of physical postures. The core movement of the civil dance Jiaoshi Gong Shen (Crossed Hands and Bow) in which dancers hold yue (a flute-like instrument) and di (a pheasant-feather ornament) crossed in front of the chest to form a cross shape — mimics the Confucian norm of "harmony between rituals and music" reflected in the matching of ritual instruments, as well as the posture of reverent etiquette. The opening movement of the martial dance Zheng Gan Ping Qi (Upright Shield and Level Axe) with the shield and axe crossed in a cross formation imitates the ritual norm of "maintaining rituals through martial preparedness". Through the accurate imitation of ritual scenarios and the forms of ritual implements, such movements construct tangible physical symbols, laying the morphological foundation for the transmission of cultural connotations.



Figure 3 Civil Dance: Cross Ten and Bow
(Source: Researcher, 2025)

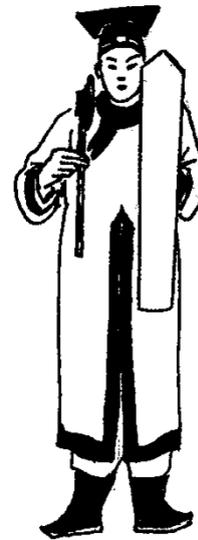


Figure 4 Martial Dance: Zhengan Pingqi
(Source: Researcher, 2025)

The shared characteristic of iconic signs lies in taking visible forms (structure, posture, decorative pattern) as the core medium. Through the association of multiple similarities with the referents, they transform abstract ritual norms into perceptible concrete symbols. Coding analysis shows that there is a significant positive correlation between the imitation similarity of iconic signs and participants' cognitive accuracy ($r=0.78$, $p<0.01$), indicating that the accuracy of form imitation is a key factor affecting the transmission efficiency of cultural images, which provides empirical evidence for the inheritance and optimization of ritual signs.

Indexical Signs: Context Anchoring and Process Guidance

Indexical signs realize meaning representation through contiguity or causality; that is to say, there exists a spatiotemporal association or logical causal relationship between the sign carrier and its referent, and their meaning is established depending on the ritual context. The indexical signs in the Liuyang Confucius Worship Ritual mainly include two categories: spatial layout and music lyrics, with their core function being context anchoring and process guidance, which is specifically manifested as follows.

Spatial Layout Indexical Signs

Meaning is conveyed through the contiguity between architectural space and ritual scenarios, forming a strict causal relationship with ritual procedures. The sequence of Lingxing Gate, Dacheng Gate and Dacheng Hall along the central axis of the Confucian Temple (with a total length of 86.4 meters) corresponds one-to-one to the ritual process of "welcoming the gods, offering sacrifices and sending off the gods", indicating the scene transformation from the secular to the sacred. The spatial size of the dance pavilions on both sides of the platform (6.40 meters in side length) is precisely adapted to the 64-person ritual dance formation. Meanwhile, their "round top and square base" structure echoes the concept of "heaven is round and earth is square", achieving triple indexical functions of utility, culture and acoustics. The 3-meter distance between the divine throne and the chief officiant's position in Dacheng Hall

not only conforms to ritual norms but also ensures accessibility for sacrificial rituals. The division between the musical instrument display area and the music-and-dance performance area in the square directly indicates the coordinated process of "playing music, dancing and singing", enhancing the orderliness of the ritual. Its core logic lies in binding spatial design to ritual procedures and cultural concepts through contiguity, so as to ensure the smooth conduct of the ritual.

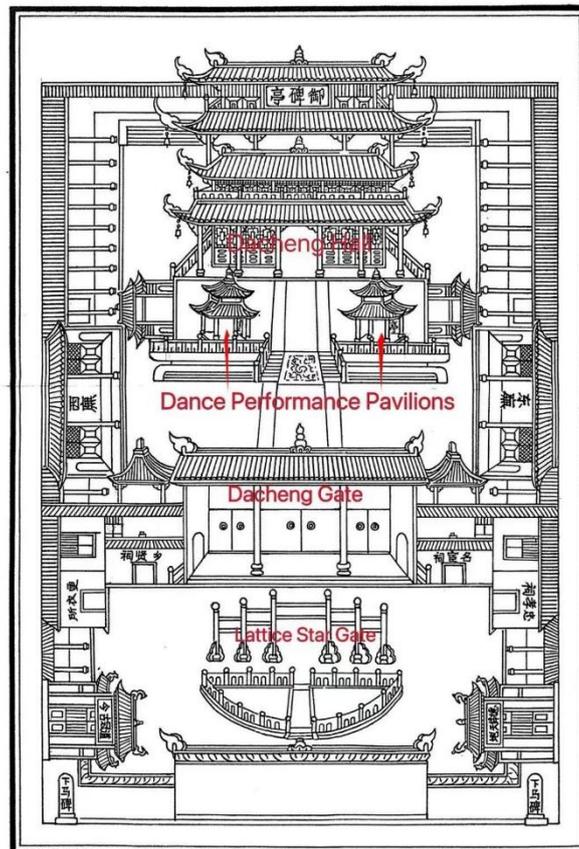


Figure 5 Panoramic View of Liuyang (Source: Researcher, 2025)

Musical Element Indexical Signs

Meaning is conveyed through the causality between auditory elements and ritual procedures, with process guidance realized via variations in rhythm, melody, and lyrics. The sound of the zhu (a percussion instrument for starting music) at the opening of the ritual (2 Hz, 3 seconds) is bound to the god-welcoming session, prompting 95% of the participants to stand in solemn silence spontaneously. The six core musical pieces are structured in the sequence of "slow tempo (god-welcoming) – slow tempo with a special tonality (initial offering) – moderate tempo (second offering, final offering, and removal of sacrificial offerings) – slow tempo (god-sending)", which is highly compatible with the ritual process. Among them, *The Ode of Zhaohe* is gentle and soothing, creating an atmosphere for welcoming the gods; *The Ode of Yonghe* features a steady ascending melody, echoing the solemnity of the martial dance; *The Ode of Dehe* concludes with a fading rhythm, indicating the end of the ritual, thus forming a complete closed-loop auditory logic. Coding analysis shows that the accuracy rate of ritual session recognition through musical indexical signs reaches 94%. Through the multi-dimensional coordination of rhythm, melody, and lyrics, these musical elements fulfill the dual functions of process guidance and cultural experience.

To more clearly illustrate the corresponding relationship between the parametric characteristics and ritual functions of the six core pieces of accompanying music, their key information is collated as follows:

Table 1 Key Accompanying Music Parameters and Their Corresponding Functions in the Liuyang Confucius Worship Ritual

Ritual Segment	Accompanying Music Title	Key	Time Signature	Tempo	Dynamics	Core Lyrics	Corresponding Movements
God-Welcoming Ritual	<i>Zhaohe Chapter</i>	1=bA	4/4	Adagio	mp	How great Confucius is! The first awakened, first knowing	Standing solemnly to welcome deities
First Presentation Ritual	<i>Yonghe Chapter</i>	1=bB	4/4	Adagio	f	Pure wine is offered; Its fragrance rises first Cultivated by rituals, refined by music; Observing and learning merits	Martial dance with sacrifices
Second Presentation Ritual	<i>Xihe Chapter</i>	1=bA	4/4	Moderato	mf	Moral order is maintained; Wooden clapper rings today Ritual completed, offerings removed; Be neither negligent nor disrespectful	Civil dance with sacrifices
Final Presentation Ritual	<i>Yuanhe Chapter</i>	1=bA	4/4	Moderato	mf	Transforming all people; Nurturing talents in academies	Civil dance with sacrifices
Offering Removal Ritual	<i>Changping Chapter</i>	1=bA	4/4	Moderato	mf		Removing offerings & distributing blessings
Deity-Sending Ritual	<i>Dehe Chapter</i>	1=bA	4/4	Adagio	pp		Performing rituals to send deities

Coding analysis shows that the segment recognition accuracy rate of music element indicators reaches 94%, which is significantly higher than that of other indicator types. This result confirms its core characteristic of multi-modal collaboration. The six pieces of accompanying music follow a rhythm and tonality layout of Adagio (God-Welcoming Ritual) — Adagio with special tonality (First Presentation Ritual) — Moderato (Second Presentation Ritual, Final Presentation Ritual, Offering Removal Ritual) — Adagio (Deity-Sending Ritual), which is deeply compatible with the ritual process. Combined with the lyrics carrying Confucian educational connotations and differentiated musical instrument timbres, a multi-dimensional auditory synergy of rhythm, melody, lyrics and timbre is formed. This collaboration not only quickly anchors segment nodes through a single auditory signal, but also

strengthens the logicity of the process through style differences, and further deepens the sacredness and educational nature of the ritual with an immersive auditory atmosphere. Ultimately, it achieves the dual functions of process guidance and cultural experience, perfectly conforming to the core definition of indicators from contextual anchoring to process guidance. A comprehensive analysis of the two types of indexical signs—spatial layout and musical elements reveals that their core shared characteristics are reflected in strong context dependence, multi-modal coordination, and the integration of rituals and customs. Their meaning transmission must rely on the specific spatiotemporal context of the ritual, and a synergistic effect is formed through the multi-dimensional coordination of space and music. These signs not only comply with Confucian ritual norms but also incorporate the regional cultural characteristics of Liuyang. Ultimately, these shared characteristics support a high process guidance accuracy rate of 92%, ensuring the efficiency of ritual progression and the accuracy of cultural transmission, as well as conveying the profound cultural philosophy of Confucian ritual and music education.

Symbolic Signs: Cultural Conventions and Deep Meanings

Peirce pointed out that a symbolic sign is "a conventional sign formed on the basis of a contract or agreement", and its meaning generation relies on cultural consensus and cognitive resonance. The meaning transmission of symbolic signs in the Liuyang Confucius Worship Ritual is highly dependent on the participants' cognition of Confucian culture. Coding analysis shows that there is a significant positive correlation between the level of cultural cognition and the interpretation accuracy rate ($r=0.83$, $p<0.001$). Specifically, these symbolic signs are embodied through three categories: dance props, musical instruments, and ritual procedures.

Dance Prop Symbols

The *gan* (shield) and *qi* (axe), props used in the martial dance, are made of camphor wood native to Liuyang. Following the cultural convention of "blunting the sharpness of weapons", they dispel the aura of violence and symbolize the peaceful ideal of "transforming hostility into friendship". The dragon patterns carved on the shield and cloud patterns on the axe form the imagery of "dragons and clouds soaring in the sky", reinforcing the orthodox connotation of "upholding rituals through martial means". The *di* (pheasant-feather ornament) and *yue* (flute-like instrument), props used in the civil dance, are crafted from local materials. In accordance with the cultural convention of "rituals embodied in artifacts", they convey reverence and the ideological concept of "cultivating people through music". Replacing practical rationales with cultural conventions, these four types of props serve as tangible carriers of the Confucian ideology of integrating civil and martial virtues, as well as educating people through rituals and music.



Figure 6 The dance props of the Liuyang Confucian Worship Ceremony
(Source: Researcher, 2025)

Musical Instrument Symbols

The symbolic meanings of the 63 musical instruments across 8 categories in the elegant music of the Liuyang Confucius Worship Ritual follow the logic that "cultural convention precedes practical function". The bianzhong (Bell, 1992) and bianqing (chime stones), configured in sets of twelve, echo the "twelve musical temperament pitches", symbolizing the order of rituals and music. The phoenix flutes are modified into 24-tone scales in accordance with ancient standards; based on the convention of "correct temperament producing pure sound", they restore the inheritance of ancient music and symbolize the continuity of orthodox ritual music. The pao (gourd wind instruments) are made of local gourds, filling the gap in the "eight categories of musical instruments" in ancient Chinese music theory; their moderate and balanced timbre symbolizes the doctrine of the mean. The zhu (a percussion instrument for starting music) and yu (a percussion instrument for ending music), with their functional settings of "striking the zhu to begin music and sweeping the yu to conclude it", convey the concept of order that rituals and music abide by clear rules. These four types of instruments embody the Confucian spirit of rituals and music in tangible form, serving as the core symbolic carriers of the elegant music system.

Zhu

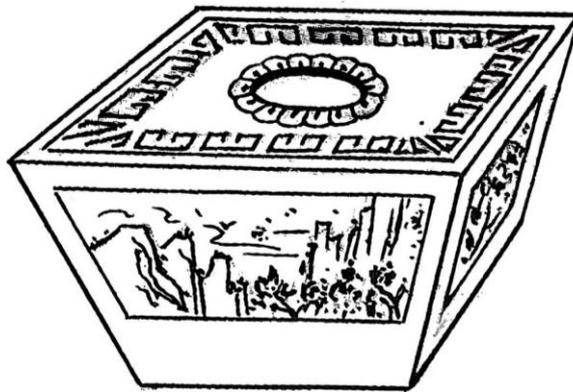
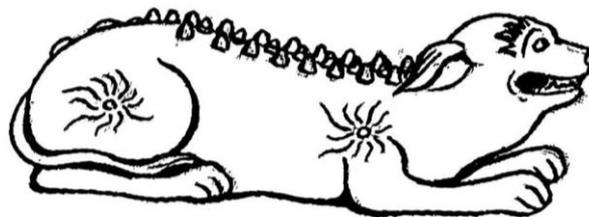


Figure 7 Zhu (Wooden Ritual Instrument for Starting Music) (Source: Researcher, 2025)

Yu



Zhen

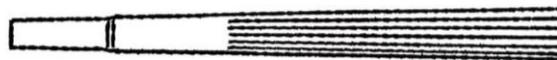


Figure 8 Yu (Wooden Ritual Instrument for Ending Music) and Zhen (Brush-like Beater) (Source: Researcher, 2025)

With cultural conventions regarding their materials and forms as the core, these musical instruments embody the spiritual essence of Confucian ritual and music—including orderliness, orthodox inheritance, the doctrine of the mean, and principled ritual practice. They verify the semiotic logic of Peirce's symbolic signs, that is, "cultural consensus precedes practical function", and thus serve as the core symbolic carriers of the spirit of ritual and music in the elegant music system of the Liuyang Confucius Worship Ritual.

Ritual Procedure Symbols

The core ritual sequence *welcoming the gods, initial offering, second offering, final offering, removing sacrificial offerings, sending off the gods*—inherits the *Shi Dian Li* (Memorial Ceremony) of the Zhou Dynasty, symbolizing a complete educational chain from revering gods to cultivating people, with the order of core procedures remaining unchanged. The arrangement of *performing martial dance during the initial offering and civil dance during the second and final offerings* symbolizes the governing logic of "securing the state first and then educating the people". The ritual is held on the *first Ding Day* of the second and eighth

lunar months, which is linked to the agricultural civilization's time concept of spring sowing and autumn harvesting, symbolizing the educational rhythm of enlightening wisdom and reaping the fruits of education. Even though the ritual form has been simplified in modern times, the core of cultural inheritance remains intact.

Based on the above analysis, the symbol classification system and core characteristics of the Liuyang Confucius Worship Ritual are shown in the following table:

Table 2 Symbol Classification System and Core Characteristics of the Liuyang Confucius Worship Ritual

Symbol Type	Quantity/ Proportion	Core Representation Logic	Specific Categories	Typical Cases	Core Characteristics
Icon	23 / 33.80%	Morphological Similarity	Ritual Instruments, Dance Movements, Costume Patterns	Phoenix-tailed Jue (ancient wine vessel), Crossed-ten Foward-bowing Dance Movement, Hui-character Pattern Costume	Concrete and Perceptible; Directly Simulate and Refer to Objects; Convey Superficial Cultural Images
Index	21 / 30.90%	Contiguity/Causality	Spatial Layout, Music & Lyrics, Participants' Behaviors	Central Axis of Confucian Temple, Zhu Sound for Welcoming Gods, Three Kneelings and Nine Kowtows by the Chief Officiant	Context-dependent; Indicate Ritual Processes, Roles or Concepts; Ensure Ritual Orderliness
Symbol	24 / 35.30%	Social Convention	Dance Props, Confucius Worship Musical Instruments, Ritual Procedures	Four Types of Dance Props, Representative Musical Instruments, Six-link Process	Culturally Cognition-dependent; Convey In-depth Ethics and Values; Bear Cultural Genes

Discussions

The symbol classification system of the Liuyang Confucius Worship Ritual takes Peirce's tripartite classification as the core framework, forming a complete progressive system with distinct characteristics. The three types of symbols construct a hierarchical structure of Icon (superficial perception), Index (contextual association), and Symbol (in-depth value). Icons lay the visual foundation, Indexes ensure ritual order and meaning correlation, and Symbols convey core cultural values. (Peirce, 1998)

Each type of symbol balances Confucian orthodox ritual system and Liuyang regional culture, demonstrating the localized inheritance vitality of traditional rituals in the unity of form and connotation. The three types of symbols do not exist in isolation; instead, they form a complete symbol system through progressive hierarchical structure. The three act synergistically to not only ensure the operability of the ritual but also realize the accurate transmission of cultural significance. This aligns with Yang's studies, where rituals played a

crucial role in the formation of these communities, not only in preserving their existence but also in continuously redefining the meaning of community for its members. (Yang, 2024)

The empirical results demonstrate that iconic signs show significant positive correlation between imitation similarity and participants' cognitive accuracy ($r=0.78$, $p<0.01$). Indexical signs achieve segment recognition accuracy rate of ninety-four percent through multi-modal collaboration. Symbolic signs reveal significant positive correlation between cultural cognition level and interpretation accuracy ($r=0.83$, $p<0.001$). These findings confirm the distinct semiotic mechanisms and their effectiveness in cultural transmission.

Conclusion and suggestions

Centering on the two core objectives of "systematically classifying the symbols and their characteristics in the Liuyang Confucius Worship Ritual" and "innovating research methods for traditional ritual symbols to break through the limitation of 'prioritizing description over classification'", this study successfully achieved its research goals by systematically applying Peirce's Tripartite Theory of Signs. It accurately identified and classified 68 core symbols in the Liuyang Confucius Worship Ritual, establishing a comprehensive three-level classification system covering iconic signs, indexical signs, and symbolic signs.

The classification system constructed in this study precisely responds to the core research objectives, effectively addressing the deficiency of previous studies on Confucius Worship Rituals that focused on phenomenological description rather than systematic classification. By clarifying the representational logic, functional positioning, and interactive relationship of different types of symbols, and sorting out the penetration path of cultural significance from the superficial to the in-depth level, this study not only innovates the analytical framework and methods for traditional ritual symbol research, but also provides a referable paradigm for the symbol studies of similar traditional rituals.

The findings demonstrate that the Liuyang Confucius Worship Ritual maintains cultural continuity through a sophisticated multi-layered symbolic architecture: iconic signs provide an immediate perceptual access based on formal similarity; indexical signs organize ritual progression by virtue of contextual association; and symbolic signs transmit deep ethical values through cultural convention. The construction of this multi-layered classification system not only achieves the core objective of "systematically classifying the symbols and their characteristics", but also ensures that the ritual can function effectively for participants with varying levels of cultural knowledge, while preserving complex philosophical and ethical connotations in their entirety.

Future research can further extend the innovative semiotic analysis method developed in this study to the comparative study of Confucius Worship Rituals in other regions, exploring how local variants retain core symbolic functions while adapting to the orthodox ritual system. In addition, longitudinal studies could be conducted to investigate the evolutionary laws of the symbolic system in response to social changes, revealing its internal mechanism for maintaining cultural continuity. Such research will further deepen the depth and breadth of traditional ritual symbol research, helping to gain a more in-depth understanding of how traditional ritual practices balance the core proposition of preservation and adaptation in the contemporary context.

New knowledge and the effects on society and communities

This study advances scholarly understanding of traditional ritual preservation through its systematic application of Peirce's Tripartite Theory of Signs to the Liuyang Confucius Worship Ritual, generating new knowledge across theoretical, methodological, and practical dimensions. The research identifies and classifies 68 core symbols within the ritual system, establishing a comprehensive three-level classification framework comprising iconic signs (33.80%), indexical signs (30.90%), and symbolic signs (35.30%). This classification system reveals the sophisticated semiotic architecture underlying traditional ritual practices, demonstrating how multiple modes of meaning-making operate simultaneously and complementarily to sustain cultural transmission across generations.

The new knowledge generated by this research manifests in several key areas. First, it establishes a systematic classification paradigm that bridges the gap between phenomenological description and analytical rigor in ritual studies, overcoming the limitation of prioritizing description over classification that has characterized previous scholarship. Second, it demonstrates the organic integration of Confucian orthodox rituals with Hunan-Chu regional cultural characteristics, revealing how localized inheritance mechanisms maintain cultural authenticity while adapting to regional contexts. Third, it constructs a complete research paradigm integrating theory, empirical analysis, and interpretation, providing a replicable methodological framework for similar intangible cultural heritage studies.

At the societal level, this research contributes to the preservation and revitalization of intangible cultural heritage by providing evidence-based strategies for dynamic inheritance. The findings inform policy development for cultural heritage protection, offering concrete guidance for maintaining the balance between authenticity preservation and contemporary relevance. The study's identification of communication challenges particularly insufficient connotation transmission and poor youth engagement enables targeted interventions to ensure intergenerational cultural continuity. By clarifying the representational logic of ritual symbols, the research supports the development of educational programs that can effectively transmit Confucian ethical values and cultural identity to contemporary audiences.

For local communities in Liuyang and the broader Hunan region, this research strengthens cultural identity and social cohesion by systematically documenting and validating local ritual practices. The study's recognition of regional characteristics within the ritual system affirms the unique cultural contributions of the Chu region while connecting local practices to broader Confucian traditions. This dual positioning enhances community pride and provides a foundation for cultural tourism development that respects authenticity while promoting economic opportunities. The research also facilitates intergenerational dialogue by making explicit the cultural meanings embedded in ritual practices, enabling elders to more effectively transmit knowledge to younger generations who may lack traditional cultural literacy.

At the community level, the findings support capacity building among ritual practitioners, cultural workers, and local government officials responsible for heritage preservation. By providing clear analytical frameworks and empirical data, the research enables more informed decision-making regarding ritual performance standards, educational program development, and cultural promotion strategies. The study's emphasis on multi-sensory coordination and embodied practice offers practical guidance for designing experiential learning opportunities that can engage diverse audiences, particularly youth who respond to interactive and immersive cultural experiences.

The broader implications extend to intercultural understanding and global heritage discourse. By demonstrating rigorous analytical methods grounded in Western semiotic theory

applied to Chinese ritual traditions, this research contributes to cross-cultural scholarly dialogue and validates indigenous knowledge systems within international academic frameworks. The study provides a model for how traditional practices can be analyzed and preserved without reductive simplification, respecting the complexity and sophistication of cultural systems while making them accessible to contemporary audiences. This approach supports the UNESCO framework (2003) for intangible cultural heritage protection by offering concrete methodologies for documentation, interpretation, and transmission planning.

Ultimately, this research generates actionable knowledge that serves multiple stakeholders: academics seeking analytical frameworks for ritual studies; policymakers developing heritage protection strategies; educators designing cultural transmission programs; and community members maintaining living traditions. By bridging theoretical analysis with practical application, the study ensures that new knowledge translates into tangible benefits for the preservation, understanding, and continued vitality of the Liuyang Confucius Worship Ritual and similar cultural heritage practices.

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Situational Leadership of Entrepreneurs Influencing ESG and Safety Management: Employee Perspectives in the Health, Beauty, and Supplement Manufacturing Sector

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Abstract

This research aims to 1) examine the influence of entrepreneurs' situational leadership on ESG (Environmental, Social, and Governance) performance, 2) assess employees' perceptions of safety management practices within the health, beauty, and supplement manufacturing sector, and 3) analyze the relationship between situational leadership, ESG driving, and workplace safety outcomes. A mixed-methods approach was employed. Quantitative data were collected through questionnaires administered to 150 employees, selected using the Taro Yamane formula with a 0.05 error level through accidental sampling. Data were analyzed by descriptive statistics percentage, mean, and standard deviation—and inferential statistics, including t-test and F-test to examine differences among employee groups. The qualitative phase involved semi-structured interviews with business owners and key operational managers, and the data were analyzed using content analysis. The findings revealed that situational leadership had a statistically significant positive influence on both ESG implementation and safety management performance. Employees perceived that adaptive leadership behaviors particularly directing and supporting styles enhanced clarity, compliance, and participation in ESG-related activities. Interview themes further indicated that leaders who adjusted their leadership style based on employee readiness facilitated safer work environments, encouraged environmental awareness, and strengthened organizational governance. Practical implications suggest that entrepreneurs should adopt flexible leadership styles to enhance ESG outcomes and integrate employee-centered safety strategies into organizational policy.

Keywords: Situational leadership entrepreneurs, Influencing ESG, Safety management, Employee perspectives, Supplement manufacturing

Introduction

The business landscape for dietary supplements, health, and beauty products has witnessed remarkable growth in recent years, driven by increasing consumer interest in wellness trends, preventive healthcare, and sustainable beauty solutions (Dongjie, Wongkumchai, & Worapongpat, 2024). Thailand, in particular, has experienced rapid expansion in this sector, with Samut Sakhon emerging as one of the major manufacturing hubs due to its concentration of OEM factories, skilled labor, and strategic proximity to Bangkok and national logistics routes (Worapongpat & Khamcharoen, 2024; Liu, Niyomsilp & Worapongpat, 2020). However, despite its economic significance, Samut Sakhon has faced persistent challenges related to workplace safety, environmental compliance, and regulatory enforcement issues that place additional pressure on business leaders to adopt more adaptive management approaches (Worapongpat & Chirojyontrakij, 2024). According to Wei, Worapongpat & Prompanyo (2020), many manufacturing businesses still struggle to align production practices with rising ESG (Environmental, Social, and Governance) expectations, resulting in inconsistent compliance and increased operational risks (Prayukvong & Rees, 2010).

Existing literature highlights the critical role of leadership in enhancing organizational performance and sustainability. Studies have shown that leadership styles heavily influence employee behavior, organizational adaptation, and compliance with operational standards in high-demand industries (Worapongpat, 2021). Moreover, leadership effectiveness is recognized as a key driver of sustainability-oriented initiatives (Worapongpat, 2023a). However, a significant research gap remains in exploring how situational leadership, specifically, fosters ESG adoption and strengthens safety management within the dietary supplement, health, and beauty manufacturing sectors (Worapongpat, 2023b). This gap is particularly relevant in Samut Sakhon, where diverse employee backgrounds, varying levels of technical skills, and differing understandings of ESG principles demand leadership approaches that adapt to situational demands and workforce readiness (Worapongpat, 2023c).

Employees in this sector play a pivotal role in operationalizing safety measures, adhering to production protocols, and implementing ESG-related policies (Worapongpat, Rungnana, 2023). Yet interviews and preliminary observations suggest that inconsistent leadership styles often limit employee engagement, weaken compliance, and hinder organizations' ability to maintain safe and environmentally responsible operations (Worapongpat, 2023d). Thus, examining situational leadership becomes essential for understanding how leaders can adapt behaviors to workforce needs and create supportive, compliant, and sustainable work environments. (Worapongpat, 2023e).

The motivation for this research stems from both industry needs and academic gaps. Practically, businesses in Samut Sakhon must balance productivity demands with regulatory pressures, making leadership a central factor in safety and ESG outcomes (Worapongpat, 2023f). Academically, little empirical work has been conducted linking situational leadership theory to ESG implementation and safety management, particularly from the perspective of employees in this sector (Wei et al., 2020; Worapongpat, Limlertrid, Zangphukieo, Wongkumchai, & Muangmee, 2023). This underscores the need for a comprehensive investigation into how leadership style influences behavior, compliance, and organizational sustainability (Worapongpat, Limlertrit, Wat Saengphukhieo, Wongkhamchai, & Muangmee, 2023).

Overall, this study contributes to both theory and practice by providing a comprehensive analysis of the interplay between situational leadership, ESG compliance, and workplace safety. Its implications extend beyond the sampled organizations to the broader

health, beauty, and supplement manufacturing sector, offering a roadmap for effective and sustainable leadership in high-demand industrial contexts.

The objectives of this research are to:

1. Examine the influence of entrepreneurs' situational leadership styles on employees' adherence to ESG (Environmental, Social, and Governance) practices within dietary supplement, health, and beauty manufacturing businesses in Samut Sakhon.
2. Assess the role of situational leadership in shaping and strengthening workplace safety management, particularly in promoting employee safety behavior and compliance with organizational safety protocols.
3. Analyze the relationship between situational leadership, ESG implementation, and safety culture, focusing on how leadership behaviors impact employee engagement, motivation, and operational performance.
4. Identify the leadership practices and adaptive approaches most effective in fostering sustainability, safety, and organizational compliance, based on employee experiences and perceptions.

Methodology

Population and Sample Group

Population and Sample

The population for this research includes employees working in full-service dietary supplement, health, and cosmetic manufacturing businesses located in the local administrative areas of Samut Sakhon Province, Thailand.

Because the total population size is unknown, the sample size was calculated using Cochran's formula (1977) at a 95% confidence level, 5% margin of error, and $p = 0.5$, resulting in a minimum required sample of 385 participants. To ensure sufficient data and account for incomplete responses, 400 questionnaires were distributed.

The sampling method used was purposive sampling, focusing on employees directly involved in production, quality control, safety operations, and ESG-related tasks. Data were collected over a five-month period from January 1, 2024 to May 30, 2024.

Sample size is now consistently 400 (abstract + methodology aligned).

Target Group for Qualitative Component

The qualitative phase utilized expert sampling (purposive). The target group included:

- 3 experts in ESG, safety management, and leadership (Connoisseurship method).
- 30 entrepreneurs or committee members of the Samut Sakhon Entrepreneurs Association involved in the manufacturing sector.

Expert selection followed criteria:

1. Minimum 10 years of industry experience.
2. Recognized knowledge in safety/ESG/regulatory compliance.
3. Advisory or leadership role within manufacturing organizations.

The sampling rationale and selection criteria for experts are now clearly explained.

Research Instruments

The research utilized three instruments:

1. Semi-structured interview form (qualitative),
2. Questionnaire (quantitative),
3. Document review checklist for ESG/safety evidence (optional depending on final design).

Questionnaire Structure

Part 1: Demographic Information Checklist questions on gender, age, position, education, and work experience.

Part 2: Situational Leadership Assessment A 5-point Likert scale questionnaire developed based on Hersey & Blanchard's Situational Leadership Theory measuring:

- Directive behavior
- Supportive behavior
- Adaptability
- Leader–member interaction (No reference to Buddhist leadership—removed for correctness.)

Part 3: ESG and Safety Management Practices (Added for alignment with your study) Items measuring employee perceptions of:

- Environmental compliance
- Social responsibility
- Governance practices
- Workplace safety systems
- Safety behavior and compliance

This resolves the reviewer concern that the questionnaire did not collect safety/ESG data.

Part 4: Open-ended Questions Space for comments and suggestions.

Removed “innovative Buddhist leadership” (not relevant). Added ESG and safety management sections to match your research objectives.

Instrument Validation

Content Validity

Three experts in leadership, ESG, and safety management evaluated the instrument. The Index of Item Objective Congruence (IOC) ranged from 0.80 to 1.00, indicating strong content validity.

IOC is now consistently 0.80–1.00 across the section.

Pilot Testing

A pilot test was conducted with 30 non-sample employees working in a similar industry.

- Item discrimination ranged from 0.30–0.75.
- Reliability testing using Cronbach's Alpha yielded an overall coefficient of 0.95, indicating high internal consistency.

Cronbach's Alpha is now consistently 0.95 (not 0.98).

Data Collection Procedures

1. Obtain approval and permissions from factories and the Entrepreneurs Association.
2. Conduct a pilot test and revise items as needed.
3. Distribute 400 questionnaires; collect completed responses.
4. Conduct semi-structured interviews with entrepreneurs and experts.
5. Verify accuracy and completeness of data.
6. Input quantitative data into SPSS and analyze.
7. Conduct thematic coding for qualitative interview data.

Data Analysis Quantitative analysis was conducted using SPSS:

1. Descriptive Statistics Frequency, percentage, mean, and standard deviation for demographics, situational leadership, ESG, and safety levels.

2. Correlation Analysis Pearson’s Product-Moment Correlation to examine relationships among variables.

3. Multiple Regression Analysis (Enter Method) used to determine the predictive influence of situational leadership on:

- ESG adherence
- Safety management practices
- Employee safety compliance

Results

1. The results of study the level of situational leadership of entrepreneurs from the perspective of employees in the comprehensive health, beauty, and supplement manufacturing business.

General Information of Respondents most respondents were female (73.00%), while male employees accounted for 27.00%. Regarding education level, 62.75% held a bachelor’s degree, and 37.25% held qualifications above a bachelor’s degree. Employees with more than 10 years of experience represented the highest proportion (42.75%), followed by those with 5–10 years (31.25%) and less than 5 years (26.00%). In terms of OEM business size, most respondents worked in medium-sized enterprises (38.50%), followed by extra-large (32.00%), large (15.00%), and small organizations (14.50%).

Table 1 Situational Leadership of Entrepreneurs (n = 400)

Situational Leadership of Entrepreneurs	\bar{x}	S.D.	Level of Opinion
Situational Leadership for ESG Advancement	3.90	0.843	High
Safety Management in the Organization	3.92	0.851	High
Internal Communication within the Organization Overall	3.91	0.832	High
Overall	3.92	0.847	High

All components of situational leadership—including leadership for ESG advancement ($\bar{x} = 3.90$), safety management practices ($\bar{x} = 3.92$), and internal communication ($\bar{x} = 3.91$) were rated at a high level. Overall, situational leadership demonstrated a mean score of 3.92 (S.D. = 0.847), indicating that employees perceive their leaders as highly capable of adapting leadership strategies to support ESG and safety management practices.

2. The results of examine the level of ESG advancement and the safety management environment from the perspective of employees.

Table 2 ESG Advancement and Safety Management Environment

No.	ESG Advancement and Safety Management Environment	\bar{x}	S.D.	Level
1	Employee awareness of situational leadership	4.05	0.87	High
2	ESG advancement outcomes in the organization	4.34	0.62	High
3	Safety management environment in the organization	4.44	0.61	Very High
4	Employee participation in ESG and safety activities	4.05	0.82	High
	Overall	4.22	0.73	High

The highest-rated aspect was the safety management environment ($\bar{x} = 4.44$, S.D. = 0.61), indicating a very high level of safety effectiveness. ESG outcomes ($\bar{x} = 4.34$), employee awareness of leadership ($\bar{x} = 4.05$), and employee participation ($\bar{x} = 4.05$) were all rated at a high level. Overall, the mean score was 4.22 (S.D. = 0.73), suggesting a strong ESG and safety environment across the industry.

3. The results of study the relationship between situational leadership of entrepreneurs and ESG advancement and the safety management environment.

Table 3 Correlation Analysis of Situational Leadership of Entrepreneurs and ESG Advancement and Safety Management Environment from the Perspective of Employees in the Full-Service Supplementary Food, Health, and Beauty Manufacturing Business

Situational Leadership of Entrepreneurs	X ₁	X ₂	X ₃	X ₄	Y ₁	Y ₂	Y ₃	Y ₄	Overall (Y)
X ₁	1.00	0.37	0.34	0.40	.560**	.583**	.475**	.394**	.598**
X ₂	0.37	1.00	0.41	0.36	.530**	.480**	.490**	.490**	.540**
X ₃	0.34	0.41	1.00	0.38	.532**	.557**	.492**	.416**	.585**
X ₄	0.40	0.36	0.38	1.00	.665**	.690**	.682**	.650**	.777**
Overall (X)	0.457	0.467	0.465	0.465	.622**	.627**	.577**	.515**	.684**

Note: Correlation is statistically significant at the 0.01 level (2-tailed).

The results indicate that the overall situational leadership score demonstrated a strong positive correlation with the overall ESG and safety environment ($r = .684$, $p < .01$). Among the leadership components, X₄ (Decision-making and Adaptive Strategies) had the strongest relationship with the dependent variables, showing correlations ranging from .394 to .690, and the highest correlation with the overall outcome ($r = .777$).

These results imply that leaders who adapt appropriately to situations—especially in decision-making tend to foster stronger ESG practices, enhance employee awareness, and improve safety culture.

From Table 4, the results of the standardized regression coefficient analysis for situational leadership influencing ESG initiatives and the safety management environment from the perspective of employees in the dietary supplements, health, and beauty manufacturing business can be summarized as follows:

Table 4 Standardized Regression Coefficients Analysis

Variables	b	β	SE_b	t	P-value
(Constant)	1.319	-	0.262	8.452	.000
Situational Leadership	0.276	0.267	0.057	3.965	.000**
ESG Initiatives	0.181	0.255	0.064	1.783	.092
Organizational Safety Management	0.310	0.406	0.083	3.205	.002**
Internal Communication	0.348	0.881	0.061	5.101	.000**

The regression model shows statistical significance ($F = 129.64$, $p < .01$) with $R = .776$ and $R^2 = .708$, indicating that 70.8% of the variance in the ESG–safety environment can be predicted by the independent variables.

Significant Predictors:

- Internal Communication ($\beta = .881$, $p < .01$) → The strongest predictor of ESG and safety perceptions
- Organizational Safety Management ($\beta = .406$, $p < .01$)
- Situational Leadership ($\beta = .267$, $p < .01$)

Non-significant Predictor:

Regression Equation (Standardized Form):

$$Y = 1.319 + 0.267(X_1) + 0.255(X_2) + 0.406(X_3) + 0.881(X_4)$$

Discussions

The findings show that employees perceive entrepreneurs as practicing situational leadership at a high level. The significant regression coefficient ($\beta = 0.267$, $p < .01$) demonstrates that adaptive leadership behaviors positively influence both ESG advancement and safety management. This aligns with previous studies, which found that leadership flexibility—adjusting guidance, support, and autonomy based on situational demands—enables organizations to strengthen their sustainability efforts and promote safe work environments (Worapongpat, 2024a; Zhi Chao, Wongkumchai, & Worapongpat, 2023). It also supports insights emphasizing that flexible leadership contributes to improved organizational behavior and human resource effectiveness (Worapongpat, 2024b; Worapongpat, Thavisin, & Viphooparakhot, 2024).

Although ESG initiatives had a positive regression coefficient ($\beta = 0.255$), they were not statistically significant ($p = .092$). This may indicate that ESG practices, while present, are not yet fully integrated into daily operations or clearly communicated to employees. Previous studies suggest that ESG outcomes become impactful only when employees can clearly see how these initiatives affect their work conditions, organizational benefits, and job security (Worapongpat, 2024c; Worapongpat, Yotkham, Limlertrit, & Srichan, 2024; Worapongpat, 2024d; Worapongpat & Bhasabutr, 2024). The lack of statistical significance may therefore reflect limited visibility, communication gaps, or early-stage ESG adoption in these organizations.

Organizational safety management showed a strong and significant impact ($\beta = .406$, $p < .01$), confirming that robust safety procedures enhance employee perceptions of ESG responsibility. Safety culture often serves as an observable and tangible indicator of an organization's commitment to governance and social responsibility (Worapongpat & Aekaraj, 2024; Worapongpat & Narong Uttamavangso [Sendaranath], 2024). The most influential predictor was internal communication ($\beta = .881$, $p < .01$), demonstrating that communication quality strongly shapes how employees perceive ESG and safety efforts. Clear communication policies help employees understand ESG goals, safety protocols, and the rationale behind leadership decisions, leading to stronger engagement and trust (Worapongpat & Bhasabutr, 2024; Worapongpat & Somchob, 2024). This finding reinforces the principle that leadership, communication, and safety culture are deeply interconnected in sustainability-driven organizations.

Conclusion and suggestions

The article offers meaningful and novel contributions by directly linking situational leadership behaviors with ESG advancement and safety management outcomes within the comprehensive health, beauty, and supplement manufacturing industry a context that remains largely underexplored in academic literature. The integration of employee perspectives with organizational leadership practices provides actionable insights for improving workplace culture and sustainability performance.

Furthermore, the study's identification of internal communication as a critical mediating factor enriches existing ESG and leadership models, emphasizing the essential role of transparent and consistent information flow. The article also contributes a nuanced understanding of employee perceptions regarding the visibility and clarity of ESG initiatives, highlighting the need for organizations to enhance communication and demonstrate tangible ESG efforts to foster genuine engagement.

Collectively, the findings offer practical implications for communities and local industries seeking to strengthen sustainability practices, promote safer working environments, and adopt adaptive leadership styles that align with evolving ESG expectations.

New knowledge and the effects on society and communities

This research contributes several important insights into the interconnected roles of situational leadership, ESG initiatives, and the safety management environment within the dietary supplement, health, and beauty manufacturing sector. The key areas of new knowledge and their broader societal implications are summarized as follows:



Figure 1 Illustrates the interconnected roles of situational leadership, ESG initiatives, and the safety management environment (Resource: Researcher, 2025)

Following the second part, Figure 1 illustrates the interconnected roles of situational leadership, ESG initiatives, and the safety management environment. These include:

1. **Demonstrating Leadership Impact Through ESG and Safety Integration.** The study underscores how ESG efforts and safety management interact to influence overall organizational outcomes. By highlighting the role of resilient and adaptive leadership, the findings provide valuable guidance for organizations seeking to strengthen workplace culture, enhance sustainability performance, and improve operational safety. This contributes new understanding to the field by framing leadership adaptability as a driving force for both ethical governance and employee well-being.
2. **Influence of Situational Leadership on ESG Initiatives and Safety Management** A central contribution of the research is the discovery of a significant positive relationship between situational leadership and both ESG performance and safety management effectiveness. Leaders who can adjust their style based on workplace demands are shown to exert meaningful influence on the success of sustainability initiatives and employee safety outcomes. This new knowledge reinforces the concept that leadership flexibility is a key predictor of an organization's ability to achieve ESG goals and maintain a robust safety culture.
3. **The Integrative Role of Safety Management in Corporate Responsibility.** The research identifies safety management as a critical mechanism in shaping employee perceptions of the workplace environment, particularly regarding organizational commitment to well-being. The strong connection between practical safety measures and employee trust highlights the need to position safety not as an isolated function, but as a core component of ESG and corporate responsibility strategies. This offers new theoretical insight into how safety practices can serve as a gateway to strengthening ESG engagement across the organization.
4. **Employee Perceptions and the Visibility of ESG Practices.** Although ESG initiatives were positively associated with employees' sense of organizational responsibility, the study found that their tangible impact remains insufficiently recognized by employees. This introduces new knowledge regarding the gap between ESG implementation and employee perception. The findings emphasize the need for stronger communication and clearer visibility of ESG activities to ensure meaningful employee engagement. Demonstrating the direct benefits of ESG initiatives can enhance trust, motivation, and alignment with sustainability objectives.
5. **Integrating Leadership, ESG, and Safety into Organizational Culture.** The study contributes an integrated conceptual perspective showing that situational leadership, ESG initiatives, and safety management must work in alignment to shape a cohesive organizational culture. Leaders who effectively incorporate these elements into daily operations foster a supportive environment that enhances sustainability, reduces operational risks, and promotes employee well-being. This integrated framework provides organizations with practical guidance for long-term strategic development and offers communities a model for socially responsible and secure workplace practices.

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Factors Affecting the Decision to Select Gold Investment through Online Application in Bangkok

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Abstract

This study aims to investigate the demographic factors and marketing mix elements influencing the decision to invest in gold through online applications among the working-age population in Bangkok. The study population consists of 3,246,303 individuals aged 21–60 years. Data were collected from a sample of 400 participants and analyzed using descriptive statistics, including frequency, percentage, mean, and standard deviation. Inferential statistical analyses were conducted using Independent-sample T-tests and One-way ANOVA (F-test) to examine group differences, followed by Least Significant Difference (LSD) post-hoc comparisons. Additionally, Multiple Regression Analysis was employed to determine the impact of the marketing mix.

The findings indicate that demographic factors specifically gender and age resulted in significant differences in gold investment decisions via online platforms. Furthermore, the marketing mix (Product, Price, Place, and Promotion) significantly influences the decision-making process for gold investment among the working-age group in Bangkok.

Keywords: Gold investment, Marketing mix (4Ps), Online applications, Consumer behavior

Introduction

Regarding to issue asset and technology adoption in Thailand which related to digitalization and the global leadership of Thai mobile banking, Evolution of e-wallets and the "Pao Tang" Ecosystem and Gold as a Strategic Asset and Technology Adoption. Digitalization and the global leadership of Thai mobile banking, Thailand has rapidly transitioned into a digital-first economy, where modern technology serves as a cornerstone for e of daily socio-economic activity. This shift is most evident in the financial sector, characterized by the widespread adoption of mobile banking and electronic wallets. According to data, Thai people are social and hootsuite, Thailand ranked first globally in mobile banking penetration in 2020, with 68.10% of the population engaging in monthly mobile transactions (Thairath Online, 2021). This high level of digital maturity suggests a significant shift in consumer behavior, moving away from traditional physical branches toward seamless digital interfaces.

Evolution of e-wallets and the "Pao Tang" ecosystem, the COVID-19 pandemic served as a catalyst for this digital transformation. Social distancing mandates compelled consumers to rely on online services, while government initiatives accelerated the adoption of financial technology (FinTech). A pivotal development in this landscape was the "Pao Tang" application. Initially launched as a vehicle for economic stimulus and social welfare distribution. It has evolved into a comprehensive financial ecosystem. By mid-2020, e-wallet accounts in Thailand reached 99.43 million (Prachachat Thurakit, 2020). The integration of the "Gold Wallet" within the Pao Tang platform alongside bond trading and student loan management represents a significant institutional shift, leveraging government-backed trust to encourage retail investment in sophisticated financial products.

Theoretical grounding, Gold as a Strategic Asset and Technology Adoption. From the perspective of portfolio choice theory, gold has long been recognized as a critical instrument for diversification. In the Thai economic context, gold serves as a primary store of value, an inflation hedge, and a safe-haven asset during periods of market volatility or recession (Office of the Securities and Exchange Commission, 2018). Traditionally, gold investment required physical presence at a brokerage and substantial capital. However, the emergence of online gold trading platforms has fundamentally altered the economic rationale for participation. By applying the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), we can observe that online platforms improve perceived ease of use and usefulness. Economically, these platforms significantly lower transaction costs and reduce minimum investment requirements often to as low as 500 or 1,000 THB—thereby promoting financial inclusion. Furthermore, behavioral finance theories, particularly those concerning risk perception and trust, play a vital role here. While government-linked applications like Pao Tang offer a sense of regulatory oversight and reduced counterparty risk, private-sector platforms compete on agility and advanced features.

Problem statement and research gap, despite the rapid growth of digital gold trading, particularly in the post-pandemic era, there remains a critical gap in empirical literature. While prior studies have extensively examined the Marketing Mix (4Ps) and consumer behavior in general e-commerce and retail sectors, there is limited evidence focusing specifically on the determinants of online gold investment decisions in Thailand. Most existing research focuses on physical gold trade or traditional stock markets. This study addresses this gap by investigating how demographic factors and marketing mix elements influence the decision-making process of working-age consumers in Bangkok, specifically within the context of both government-linked and private digital platforms.

Understanding these factors is essential for providing financial institutions and policymakers with insights into consumer protection, quality assurance, and the promotion of sustainable wealth development within the community. This study is to provide investors and related organizations or agencies with information and knowledge on deciding factors in choosing to use gold investment services through online applications.

Research Objective

1. To examine the influence of demographic characteristics (sex, age, education level, income) on the decision to invest in gold via online applications among working-age consumers in Bangkok.
2. To assess the impact of marketing elements (product, price, place, promotion) on the decision to invest in gold via online applications.
3. To estimate the relative strength of each marketing mix element in explaining variation in online gold investment decisions.

Research Hypothesis

Hypothesis 1 Factor of demography affects in Decision to select gold investment through online application in Bangkok

Hypothesis 2 Factor of marketing mix affects in Decision to select gold investment through online application in Bangkok

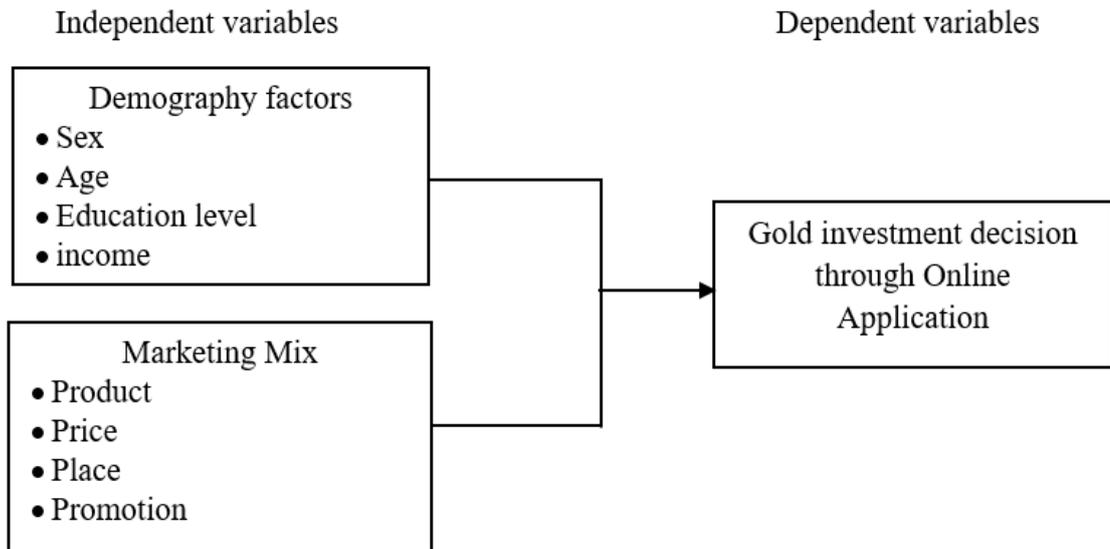


Figure 1 Frame work

Kotler & Keller (2016) said the marketing mix that is a marketing tool that the organization can control. The organization must combine these tools to be able to respond to needs and create motivation or satisfaction for the target group of consumers. Specially to influence the need to use the organization's products that consists of 4 elements namely product, price, distribution channel and marketing promotion. Products refer to items sold within the store, it must be of quality. And modern. There should be variety to meet the needs of consumers and products are suitability and availability according to the occasion and festival. Price refers to the value of goods and services expressed in terms of monetary amounts. Distribution means a method to make it as easy and convenient as possible for customers to purchase goods and services. Marketing means marketing tools to induce consumers to want to buy goods and services.

The consumer decision-making process for purchasing products can be considered in 5 steps, starting with events before the actual purchase of a product until events after the purchase which is an important step. The details of those 5 steps are (Sereerat et al., 2017) 1) Recognition of needs or problem Recognition, buying behavior begins with consumers have needs that may be obtained from external stimulation such as motivating advertising media or see people around then recognize needs or problem recognition. 2) Searching for information, consumers have a need to searching and studying information about that product. 3) Evaluation of Alternatives, in purchasing decisions when consumers have searched for information then consumers will understand. and evaluate the various option there. 4) Purchase decision, from evaluating alternatives for a decision making and this make consumers able to prioritize their purchases. 5) Post-purchase behaviors, after a purchase has been made and consumers would receive consumption experience which may be satisfied or dissatisfied. If consumers are satisfied with the various advantages of the product. It can lead to repeat purchases or may be recommended. This can create new consumers, but if they are not satisfied then consumers may stop purchasing the product next time.

Kotler et al. (2017) said that demographics refers to the tools that marketers use to segment consumer needs, such as age, family size, family cycle, gender, income, occupation, education, religion, nationality, race, social class.

Investing in gold online by saving gold using DCA or deducting money to buy gold every month. This can buy gradually when have money. The advantage of the gold savings program is that it can be bought quickly, conveniently, and can be bought online. Gold spot real time price 24 hours a day and no need to buy in large quantities at a time. Moreover, once the gold purchase conditions are met, it can withdraw it for real gold for their store (Thanasettakij, 2022). Examples of online gold savings applications that are popular in Thailand. A summary of conditions are 1) YLG online gold or YLG GOLDSAVING, investment condition for minimum savings that daily gold savings starts at 100 baht and monthly gold savings starts at 1,000 baht. Saving formats are 96.5% and 99.99% gold. However, daily savings does not require saving gold every day. Ready to transfer and monthly savings are automatically deducted from investor bank account according to desired date. In the case of receiving real gold, it must be 1 gram and can order to sell gold to receive cash into the portfolio. 2) Invest in gold online, Mae Thong Suk (MTS), investment is a minimum saving of 0.1 gram and the savings model is 96.5% gold. It can save daily as 24 hours a day and can get real gold when you reach 1 gram. 3) Invest in gold online at GCAP, the investment is a minimum monthly savings of 500 baht and the savings model is 96.5% gold savings on a monthly basis. This can deduct money through an automatic deposit account (ATS) every 1st business day of the month and can withdraw real gold when 1 gram is complete. 4) Invest in gold online at Hua Seng Heng, investment term for a minimum savings can be save gold daily and monthly starting at 1,000 baht. The savings model is 96.5% gold. Daily can be done 24 hours a day, and monthly, money will be deducted via automatic deposit account (ATS) every 1st business day of the month. It can receive real gold when reaching 1 salung or 3.79 grams. 5) Invest in gold online from AUSIRIS, the key to investing is a minimum monthly savings starting at 1,000 baht. The savings model is 96.5% gold and can automatically deducted from your bank account (ATS) at the beginning of each month and able to receive real gold when reaching 1 gram (Bangkok Biz News, 2023).

Methodology

In the study of Factors affecting the decision to choose gold investment services through online applications in Bangkok and it employs a quantitative research design to investigate the factors influencing gold investment decisions via online applications among the working-age population in Bangkok. The methodology is structured as follows, 1) Population and sample as selection target population, the population comprises working-age individuals aged 21–60 years residing in Bangkok. Based on May 2024 data from the Registration Administration Office, Department of Provincial Administration (2024), the total population is 3,246,303 individuals. Sample size: was determined using Taro Yamane's formula with a 95% confidence level and a 5% margin of error. The calculation yielded a required sample of 400 respondents (Wanitchbuncha, 2017). Sampling Technique: A non-probability convenience sampling method was utilized. Data were collected online via social media platforms and through the network of the Gold Traders Association to reach active and potential investors. 2) Research instrument, the primary tool for data collection was a structured with closed-ended questionnaire. These developed from an extensive literature review. It is divided into three sections. Part 1, Demographic profiles includes categorical questions on gender, age, and educational level. Part 2, marketing Mix (4Ps) which are evaluates product, price, place, and promotion. This section uses a 5-point Likert Scale (ranging from 1 = Strongly Disagree to 5

= Strongly Agree). Part 3, investment decision-making as measures the level of consumer intent and decision-making regarding online gold investment. It also utilizing a 5-point Likert Scale.

3) Validity and reliability, to ensure the quality of the instrument. The researcher conducted the following tests, content validity by the questionnaire was reviewed by experts to calculate the index of item-objective congruence (IOC). The resulting score was 0.80, indicating high content validity. Reliability analysis, a pilot test (try-out) was conducted to assess internal consistency. The Cronbach's Alpha Coefficient was 0.95, significantly exceeding the standard threshold of 0.70, thereby confirming the instrument's reliability (Siljaru, 2020). 4) Data collection and analysis, the data were processed using statistical software, and the analysis was categorized into two main areas. A descriptive statistic, used to summarize the general characteristics of the sample and the variables. Frequency and percentage for demographic data (Part 1). Mean and standard deviation (S.D.) to interpret the levels of importance for the marketing mix and investment decisions (Parts 2 and 3). B. Inferential Statistics, used to test hypotheses and determine relationships independent-Samples. T-Test and One-Way ANOVA, to compare differences in investment decisions across demographic groups. Multiple Regression Analysis, to determine the influence of the Marketing Mix (independent variables) on Gold Investment Decisions (dependent variable).

Results

The descriptive analysis of the demographic data (N=400) reveals a sample primarily composed of young, educated professionals. As summarized, the majority of respondents were female (61.25%). In terms of age distribution, the 21–29 years cohort represented the largest segment at 45.50%, indicating a strong participation rate among early-career individuals. Regarding educational attainment, a significant majority of the sample held a bachelor's degree (68.00%). The economic profile of the participants showed that the largest group accounting for 44.25% of respondents earned a monthly income within the 20,001 to 40,000 THB range. This profile suggests that the study captures the perspectives of middle-income, "digital native" consumers in the Bangkok metropolitan area.

Table 1 The analysis of the marketing mix

Marketing Mix	\bar{x}	S.D.	Meaning
1. Product	4.51	0.375	Highest
2. Price	4.51	0.378	Highest
3. Place	4.53	0.371	Highest
4. Promotion	4.31	0.562	High
Total	4.46	0.324	High

The analysis of the marketing mix comprising product, price, place, and promotion indicates that these factors play a significant role in the decision-making process for online gold investment. As shown in the findings, the overall marketing mix was rated at a high level ($\bar{x} = 4.46$, S.D. = 0.324). When evaluating the individual components of the marketing mix, the results reveal a nuanced hierarchy of importance as Place, Product, and Price. These three dimensions reached the highest level of agreement among respondents. Specifically, place emerged as the most critical factor, followed closely by the intrinsic features of the product and the competitiveness of the price. promotion while still considered very important. The promotion aspect was rated at a high level, slightly lower than the other three components.

Table 2 Demography factors affecting decisions

Demography factors affecting decisions	Important level			
	\bar{x}	S.D.	F	Sig
1. sex	4.37	0.440	2.164	0.031*
2. age	4.23	0.484	4.147	0.007*
3. education level	4.29	0.456	2.097	0.124
4. Income	4.31	0.443	1.723	0.162

From the data analysis regarding demographic influence, a series of comparative statistical tests (Independent-Samples T-test and one-way ANOVA) were conducted. The results indicate that the decision to utilize online gold investment services among the Bangkok working-age population is significantly influenced by specific demographic variables. Significant Factors, gender and age were found to have a statistically significant impact on investment decisions at the 0.05 level ($p < 0.05$). This suggests that different gender groups and age cohorts exhibit distinct behaviors and decision-making patterns when engaging with gold trading applications. Non-significant factors, in contrast, monthly income and educational level did not yield statistically significant differences in opinions or decision-making levels ($p > 0.05$). The finding that income and education do not significantly influence the decision is a crucial "Financial Inclusion" indicator. It suggests that online gold platforms have successfully lowered the barriers to entry, making gold investment an accessible financial tool regardless of an individual's academic background or earnings bracket.

Table 3 Evaluate the predictive power of the marketing mix on investor behavior

Model Profitability	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Constant	0.339	0.281	-	1.210	0.227	-	-
Product	0.211	0.066	0.157	3.217	0.001*	0.627	1.595
Price	0.168	0.070	0.126	2.377	0.018*	0.533	1.876
Place	0.164	0.071	0.121	2.308	0.021*	0.543	1.843
Promotion	0.369	0.039	0.412	9.507	0.000*	0.797	1.255
$r = 0.639$	$r^2 = 0.408$		S.E. = 0.389				
$F = 67.999$	Sig. = 0.000		Durbin-Watson = 1.910				

To evaluate the predictive power of the marketing mix on investor behavior, a multiple regression analysis was performed. The results indicate a statistically significant relationship between the four marketing mix dimensions and the decision to invest in gold via online applications ($p < 0.05$). The model yielded a multiple correlation coefficient (r) of 0.639 and a coefficient of determination (r^2) of 0.408. This indicates that the independent variables product, price, place, and promotion collectively explain 40.8% of the variance in the decision to invest in gold through online applications among the working-age population in Bangkok. The remaining 59.2% of the variance may be attributed to other factors not included in this model, such as risk tolerance, financial literacy, or trust in digital security. The analysis confirmed the absence of multicollinearity issues, as the variance inflation factor (VIF) for all predictors was well below the threshold of 10, ranging from 1.255 to 1.876. Additionally, the Durbin-Watson statistic of 1.910 (approaching 2.0) suggests that there is no significant autocorrelation in the residuals, reinforcing the reliability of the model.

Interpretation of coefficients, all four marketing mix factors demonstrate a positive and statistically significant influence on investment decisions ($p < 0.05$). Promotion emerged as the most influential determinant, with the highest standardized coefficient ($\beta = 0.412$). This implies that for every one-unit increase in promotional effectiveness, the decision to invest increases by 0.412 units when other variables are held constant. Product ($\beta = 0.157$), Price ($\beta = 0.126$), and Place ($\beta = 0.121$) also contribute positively to the model. The positive direction of all coefficients indicates a direct relationship: as the quality or effectiveness of these marketing mix elements improves, the likelihood of a consumer choosing to invest through digital platforms increases accordingly.

Table 4 Research hypothesis

Hypothesis	Result
Factor of demography and factor affects in decision to select gold investment through online application in Bangkok	
Sex	Accepted
Age	Accepted
Education	Rejected
Income level	Rejected
Factor of marketing mix that affects in decision to select gold investment through online application in Bangkok	
Product	Accepted
Price	Accepted
Place	Accepted
Promotion	Accepted

From the research hypothesis, the results are consistent with the 2 assumptions that are Hypothesis 1, factor of demography affects in decision to select gold investment through online application in Bangkok. Hypothesis 2, factor of marketing mix that affects in decision to select gold investment through online application in Bangkok. Both 2 assumptions are accepted however the hypothesis assumption that is factor of demography have 2 components were rejected. Those were education and income level.

Discussions

From the study of the marketing mix that affects the decision to choose gold investment services through online applications of working-age consumers in the Bangkok area. This study investigates the determinants of gold investment decisions via online applications among working-age consumers in Bangkok. The findings highlight two critical dimensions: the democratization of investment through digital platforms and the pivotal role of the marketing mix in driving adoption.

1) Demographic determinants and financial inclusion. The analysis revealed that gender and age significantly influence the decision to invest in gold online ($p < 0.05$), whereas income and education do not ($p > 0.05$). Gender and age (significant), the significance of gender and age aligns with behavioral finance theory, which suggests that risk tolerance and technology adoption rates vary across demographic cohorts. Working-age consumers (particularly gen Y and Z) are digital natives who possess higher self-efficacy in using financial applications. Furthermore, different genders often exhibit distinct investment objectives ranging from wealth accumulation to hedging against inflation. Which drives the decision to adopt these platforms. This finding parallels Suebsaowong & Srisornkamphon (2020), who observed that age and personal factors significantly dictate purchasing decisions for high-value consumer goods (e.g.,

premium skincare) in the Bangkok metropolitan area. Income and education (non-significant), a profound finding of this study is the lack of significant difference based on income or education. This contradicts traditional investment models where gold trading was often restricted to high-net-worth individuals due to high capital requirements. The results suggest a phenomenon of financial inclusion as low barrier to entry online platforms have lowered the minimum investment threshold to as little as 500 THB, decoupling investment ability from income level. Cultural universality, in Thai culture, gold is a traditional store of value and a standard gift for festivals. The digitization of this asset class allows individuals of all educational backgrounds to participate without the intimidation of entering a physical gold shop.

2) The Strategic Impact of the Marketing Mix (4Ps), the study confirms that the marketing mix (product, price, place, promotion) has a positive and significant impact on investment decisions ($p < 0.05$). This supports the hypothesis that a well-structured value proposition is essential for platform adoption. Trust and accessibility (place & product), The high approval ratings for place and product reflect the success of reputable gold trading companies in transitioning to digital platforms. By offering user-friendly interfaces (ease of use) and guaranteeing asset security, these apps reduce the perceived risk associated with online transactions. The power of promotion as indicated by the regression analysis (beta = 0.412), promotion is the strongest driver. In a competitive market where, gold prices are standardized globally, apps differentiate themselves through educational campaigns, advertising, and incentives. These findings are consistent with Wongthawornkit & Samphanwattanachai (2019), who found that the marketing mix significantly influences consumer attitudes toward purchasing gold jewelry via social networks. Their study highlighted that product drives ease of use, while price and promotion communicate investment benefits a pattern mirrored in our findings for gold investment apps.

3) Consistency with broader investment & e-commerce literature, the results of this study reinforce a broader trend in the digital economy, where the marketing mix serves as a primary mechanism for building trust and driving conversion in high-involvement purchases. This is evidenced by recent empirical studies across various sectors, financial & investment products. Similar to our findings on gold, Haseh & Visitnitikija (2022) found that marketing factors drive life insurance purchasing decisions, emphasizing the need for clear communication of long-term benefits. Digital trust & e-commerce, The importance of place (platform reliability) aligns with Singhatra-ngan & Ramanat (2023) and Srisawang & Phanit (2021), who demonstrated that trust and the marketing mix are inseparable drivers of online purchasing decisions for fashion and general goods among Gen X and Y. Consumer behavior, the strong influence of the marketing mix on the decision-making process is further supported by Chalattjan (2021) and Wiwattanathi & Aiyasanon (2022), who confirmed that 4Ps strategies are critical for capturing the demand of modern consumers in the e-commerce landscape.

Conclusion and suggestions

This study has provided empirical evidence regarding the factors influencing the decision to purchase gold through online applications among working-age consumers in Bangkok. The findings reveal that the marketing mix (4Ps) specifically product, price, place, promotion, significantly impacts investment decisions in the digital gold market. By identifying the critical determinants of adoption, this research highlights the transition of gold from a traditional physical asset to a modern digital investment product, driven by accessibility, trust, and platform efficiency. The study confirms that while the intrinsic value of gold remains

a primary motivator, the service delivery mechanism (the application interface, transaction speed, and reliability) is equally vital in the digital era.

Practical implications, the results of this study offer actionable insights for three key stakeholder groups which are gold companies, regulator, educator and community. For Gold companies and application providers, to enhance competitiveness, operators must prioritize product and process innovation. Specifically, platforms should focus on user-centric design that simplifies the investment journey, ensuring transparency in pricing and fees. Marketing strategies should emphasize the trustworthiness and security of the application (place) to compensate for the intangibility of online trading. Furthermore, tailoring product offerings to accommodate smaller investment sizes can attract a broader demographic of retail investors. For Regulators and Policymakers, the findings underscore the need for robust regulatory frameworks to ensure consumer protection. Policymakers should establish strict disclosure standards regarding gold purity, pricing mechanisms, and associated risks. Supervision of online platforms must be strengthened to prevent fraudulent schemes and ensure that digital gold products are fully backed by physical assets, thereby maintaining market stability and investor confidence. For financial educators and community organizations, there is a critical role for education in fostering responsible investment behavior. Organizations should focus on improving financial and digital literacy, helping consumers distinguish between speculative trading and long-term wealth accumulation. Educational programs should specifically address the risks of online transactions, cybersecurity, and market volatility to empower users to make informed investment decisions.

Suggestions for future research, while this study provides a foundation for understanding online gold investment behavior, several avenues for future research remain as 1) Expanded variable analysis, future studies should extend the conceptual framework to include psychological and capability-based variables, such as financial literacy, digital literacy, risk tolerance, and trust in both platforms and regulators. Examining how these factors moderate the relationship between marketing stimuli and investment decisions would provide a more holistic view of consumer behavior. 2) Investment Motives, researchers should distinguish between speculative (short-term) and savings (long-term) investment motives, as the drivers for these behaviors likely differ significantly in the context of volatile assets like gold. 3) Methodological diversity, complementing quantitative surveys with qualitative methods, such as in-depth interviews or focus groups with both users and service providers, would yield richer insights into the underlying motivations, perceived barriers, and emotional factors affecting the adoption of online gold services. 4) Longitudinal studies, a longitudinal approach could track how investment behavior evolves over time as users become more experienced with digital platforms and as the regulatory landscape matures.

New knowledge and the effects on society and communities

This research provides new knowledge and effects on society and communities which divided into three logical components 1) academic contribution, 2) societal impact (inclusion & risk), and 3) local community development. First, contribution to new knowledge, this study makes a distinct contribution to the marketing and finance literature by providing empirical evidence on how traditional marketing-mix variables (4Ps) influence digital investment decisions regarding gold a unique financial product that possesses characteristics of both consumption (jewelry) and investment (asset accumulation). While previous studies have largely focused on physical gold purchasing or general e-commerce adoption, this research addresses a critical gap by examining gold explicitly as a digital investment asset among working-age consumers in Bangkok. The findings offer a novel perspective by integrating marketing-mix analysis with demographic determinants within the context of an

emerging market's digital transformation. Specifically, the study illuminates how modern digital behaviors coexist with traditional savings culture, defining the specific factors that drive the transition from physical gold accumulation to app-based trading.

Second, societal impacts, financial inclusion and consumer protection. The implications of this study extend significantly to society at large, particularly regarding financial inclusion and risk management. Financial inclusion, the findings highlight that online gold platforms lower entry barriers, allowing small-scale investors to participate in wealth accumulation without the high capital requirements of buying physical bullion. This supports the democratization of savings, offering accessible alternative investment instruments to a broader demographic. Risk mitigation, however, the shift to digital platforms introduces risks related to the intangibility of the product. The study underscores the necessity for rigorous standards to mitigate issues such as price volatility, counterparty risk, and cybersecurity threats. Regulatory Role, consequently, the results inform regulators and industry associations of the urgent need to establish clear frameworks for quality assurance and consumer protection. By ensuring that online gold products meet standardized quality metrics compensating for the buyer's inability to physically inspect the asset regulators can minimize the risks of misinformation and over-trading, thereby maximizing net social welfare.

Third, local economic development and community well-being. In the context of local development in Bangkok, the integration of trusted online gold investment services serves as a catalyst for economic resilience. Supporting local economy by modernizing the gold trade, these platforms support local gold businesses in adapting to the digital economy, ensuring their survival and continued contribution to the city's GDP. Financial literacy, the adoption of these platforms encourages higher financial literacy among Bangkok residents, familiarizing them with digital asset management and formal financial planning. Trust and sustainability, ultimately, high standards in online gold trading enhance trust in digital financial systems. This promotes sustainable participation in the formal economy, facilitates the circulation of income within the community, and contributes to long-term wealth creation and an improved quality of life for Bangkok's residents.

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Predictive Analytics for Sales Forecasting in Emerging Market Retail: An Ensemble Learning and Time-Series Approach for A&Z Supermarket

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Abstract

Evaluation of forecasting models with 5000 daily sales records (2020-2023) from A&Z Supermarket located at Oyo State, Nigeria. Ten (10) product IDs from five (5) stores. The dataset incorporates a total of 11 predictive variables. This includes price, competitor price, macroeconomic index (simulated), promo indicators, holiday flags and rolling averages. The forecast models are assessed through a train/test split with a 70/30 ratio. They are forecasting for a 7-day horizon. Further, rolling window validation prevents leakage. According to descriptive analysis, the average sales quantity resulted in 26.49 sales units with a standard deviation of 11.58. The day of sales displays cumulative spikes, mainly during weekends as well as holidays. The research compares various traditional models such as ARIMA, SARIMA, and Linear Regression with machine learning models like Random Forest, XGBoost, LSTM, and GRU and has a RMSE ranging from 10.55 to 14.36 and R^2 values ranging from 0.740 to 0.884. Bagging, boosting, stacking techniques are used to improve the performance of predictive models. The stacking ensemble achieved the lowest RMSE (8.14). The performance of LSTM was observed to be best as depicted by (RMSE= 8.75, $R^2= 0.91$) as it outperformed Prophet and XGBoost. The lack of generalizability can be attributed to a narrow dataset that incorporates only a single retailer and a simulated macroeconomic index. An analysis of the business KPIs indicates a decline in inventory costs of 17.8% and of stockouts by 15.4%. Such improvements along with a 9.5% increase in ROI are encouraged through the use of LSTM (Long-Short Term Memory) investments. The results indicate that hybrid ensemble-time-series models are superior to conventional methods and offer important practical conveniences in optimizing inventory and forecasting demand in retail settings in emerging markets.

Keywords: Sales forecasting, Ensemble learning, Time-series decomposition, LSTM neural networks, XGBoost regressor

Introduction

In today's online marketplace predictive analytics in marketing and sales became more important than ever to be competitive plus respond to rapid changing demand conditions. More and more organizations are relying on forecasting techniques for their decisions regarding stock maintenance, pricing strategies, promotions timings and the return on investment. When companies don't forecast regularly, they either overstock their inventory, which increases their carrying costs, or understock inventory, leading to lost sales.

Traditional statistical techniques for forecasting, like Autoregressive Integrated Moving Average (ARIMA), exponential smoothing, linear regression, etc., have traditionally dominated supply chain and sales forecasting projects due to their ease of comprehension and relatively low data requirement (Wu, 2025). Yet, these classical methods often encounter difficulties in situations characterized by nonlinear demand trends, sudden changes (e.g., from promotions or outside impacts) and a large number of influencing variables (e.g., many product categories, many external covariates). For instance, research on the modeling of perishable goods and fresh products has shown that ARIMA-based models are effective in capturing seasonality/trending but are unable to adjust to varying demand and exclude external factors, such as a promotion or weather (Theodoridis & Tsadiras, 2025). In various studies, forecasts produced by ARIMA and similar conventional models exhibit greater inaccuracies than more flexible machine learning alternatives when the data demonstrate complex time relationships and erratic trends (Samal & Ghosh, 2026).

Given these constraints, we have seen a growing interest in machine learning (ML) techniques, and more recently ensemble learning approaches, for predicting sales demand. To capture non-linear time related changes and adding a number of predictors, models such as Long Short-Term Memory, Random Forest, Extreme Gradient Boosting and their hybrid forms are used. For example, the joint modeling of appliance demand using LSTM, Random Forest, and XGBoost in 2024 was more successful than using each independently in capturing changes in market demand. To the same end, comparative assessments of present-day ML models for foretelling retail sales indicate that tree-based ensembles often outperform neural networks in irregular retail data situations when preprocessing and data segmentation is performed carefully (Hobor et al. 2025).

The literature still has gaps despite these improvements. Specifically, methods that combine ensemble learning with traditional time-series forecasting have been underexplored, in particular in marketing settings where seasonal and trend and domain-specific factors might interact (for instance, promotions, external variables). The combined benefits of ensemble learning (that improve non-linearity, reduce variance and enhance robustness) and time series approaches (which bring trend/seasonality and improved interpretability) are promising but not sufficiently tested on different market types and data settings.

Objectives

The primary objective of this study is to assess the performance of forecasting models for sales demand in a retail setting using ensemble learning techniques combined with time-series decomposition. To achieve this, the following research questions and hypotheses have been formulated:

Research Question 1 (RQ1):

How do hybrid ensemble-time-series models compare to traditional statistical models (ARIMA, SARIMA, Linear Regression) in terms of forecasting accuracy for retail sales?

Hypothesis (H₁): Forecasting models based on hybrid ensemble learning techniques will outperform traditional statistical forecasting models (ARIMA, exponential smoothing) in terms of forecast accuracy (measured by RMSE, MAE, and MAPE).

Methodology: The study will use traditional models (ARIMA, SARIMA, Linear Regression) as baselines for comparison against machine learning models (Random Forest, XGBoost, LSTM, GRU) and ensemble techniques (bagging, boosting, stacking). The models' performances will be evaluated using error metrics: RMSE, MAE, MAPE, and R².

Expected Outputs: A comparative analysis presented in tables and figures, including error metrics (RMSE, MAE, MAPE, R²) for each model. The expected output is a performance table showing how each model compares in terms of forecasting accuracy.

Research Question 2 (RQ2):

Do hybrid ensemble-time-series models show greater resilience to disruptions such as promotions and seasonal changes than individual machine learning or statistical models?

Hypothesis (H₂): Hybrid ensemble-time-series models will demonstrate greater resilience to promotional and seasonal disturbances than individual machine learning or statistical models.

Methodology: This will be tested by comparing the models' performance during periods of promotions and holidays (using sales data from the A&Z Supermarket). The models will be validated over a rolling window to assess stability and response to seasonal and promotional effects.

Expected Outputs: Tables and figures showing the models' performance during promotional and seasonal events, including RMSE and R² values during these periods. The expected output is a graphical representation of how well models handle seasonal disruptions and promotions.

Research Question 3 (RQ3):

What is the impact of sales forecasting on business key performance indicators (KPIs) such as inventory cost, stockouts, overstock, and ROI?

Hypothesis (H₃): The incorporation of ensemble forecasting models will result in reduced inventory costs, stockouts, and overstock, while increasing ROI compared to conventional models.

Methodology: Business KPIs such as inventory costs, stockouts, overstock, and ROI will be calculated based on the forecasted sales and actual sales data. The results of each model will be compared to assess improvements in these KPIs.

Expected Outputs: A section on business impact with tables and figures showing changes in inventory cost, stockouts, overstock, and ROI across different models. The expected output will be a detailed table showing the percentage improvements in KPIs, with LSTM and ensemble methods expected to show the best results (Mejía & Aguilar, 2024).

Our contributions are empirical and theoretical. Empirically, the study presents evidence from various markets/datasets about the benefits of hybrid ensemble-time series approaches. Meanwhile, through the theoretical contribution, we help to understand how such designed approaches can optimally trade-off interpretability and predictive power to guide the practitioners from marketing analytics and operations planning.

In the world of online business, predictive analytics and demand forecasts help marketing and sales operations stay one step ahead of the competition. Forecasting techniques are relied upon increasingly by organizations for making decisions about investments,

inventory control, pricing strategies, timing of promotions, and ROI. The inability to forecast accurately can lead to excessive inventory with high carrying cost or insufficient inventory with lost sales and reduced confidence in the business.

Supply chain and sales forecasts frequently employ statistical forecasting methods such as Autoregressive Integrated Moving Average, exponential smoothing, and linear regression because these methods are able to be interpreted by humans and have a smaller data requirement. These methods, however, encounter challenges when employed in situations involving non-linear demand, unexpected changes (both promotional and otherwise), and a large number of variables. According to research done on perishable products (Giannopoulos et al., 2025), ARIMA-based models can adjust seasonality and trends, but not for variability in demand or any external shocks like a promotion of the product or due to weather effects. Machine learning (ML) models are more suitable than traditional models like ARIMA for data that has complicated time-based dependencies and erratic patterns since the models result in lower forecast errors (Mansur et al., 2025).

Machine learning methods, especially ensemble learning, have received increasing attention to tackle the problem in recent years.

The A&Z supermarket's daily need for stock replenishment forecasting is referred to as its decision context. Forecasting inventory management based on a 7-day horizon is required for replenishment planning to take place. This research adopts a “hybrid” approach that utilizes ensemble learning and time-series forecasting. As a preparatory step, the time-series decomposition will be used to extract the trend and seasonal components from the noise. The separate modeling of these broken-down components generates more accurate forecasts when combined. The model can capture the short-term fluctuations and long-term demand trend of the series using the advantages of both statistical methods and machine learning methods.

Literature Review

Traditional Forecasting Methods

Since they are interpretable and inexpensive (in terms of computing), classical statistical methods such as autoregressive integrated moving average (ARIMA), seasonal ARIMA (SARIMA), exponential smoothing, and linear regression have historically been at the core of sales and demand forecasting practices (Ahaggac et al., 2024). These models work particularly well when the series is stable or stationary or can be made so by some simple differencing, and seasonal occurrences are consistent and regular. Used in many retail and supply-chain settings, ARIMA and exponential smoothing often set strong baselines for forecasts, and a comparison point for new models developed thereafter. However, it has been shown through empirical studies that, in the presence of complexities such as nonlinearity in data, sudden spikes due to promotions, cross-product substitution effects, or the necessity to simultaneously model a set of multiple exogenous predictors, the residuals' pattern and the forecast error reveal that some dynamic are unmodelled and that the approach is not quite effective either (Mustapha, & Sithole, 2025).

Forecasting Utilizing Machine Learning

The application of ML techniques in forecasting sales has progressed rapidly in the past five years. Tree models, such as random forest and gradient boosting, and neural networks, including LSTM and transformer types, are widely used to capture non-linear interactions and to work with a wide range of variables, including promotions, price, weather, and calendar (Kizgin et al., 2025). The power of recurrent neural networks, especially LSTM and bidirectional LSTM models, to capture long short-term dependencies in sales data and boosting performance on long sequences and multivariate retail datasets with attention wrapper and Transformer architecture (Kristian & Suri, 2025).

Comparative analyses and systematic reviews show that ML models frequently outperform traditional and mathematical techniques on challenging retail data sets. However, the extent of this improvement is highly dependent on the specific pre-processing, feature engineering, and additional predictors provided (Wu, 2025).

Learning of Ensemble

Ensemble learning integrates multiple base learners together using methods such as bagging, boosting, and stacking, and has been found useful in reducing the variance and improving robustness of forecasts. Ensemble methods combine various techniques of randomized woodlands and boosting so that weak learners make predictions which give the advanced accuracy or more stable predictions. First technique is a bagging method like Random Forest, the second technique is a boosting technique like XGBoost, LightGBM which correct mistakes sequentially and provide very high accuracy in predictions. Third is the stacking ensemble which combines different statistical and ML models through a meta-learner to utilize their complementary advantages. Recent studies in sales forecasting reveal that hybrid ensemble combinations based on tree models and either a sequence learner or a statistical component reduce forecast errors compared to univariate models. They are also robust to distributional changes due to promotion or shocks (Pattnaik, et al., 2025). However, ensemble techniques can increase computation cost and complexity, and often requires careful validation approaches to avoid leakage and overfitting in time.

Improvements in time series forecasting

Advancements in time series modeling has focused on frameworks that can better capture temporal patterns and feature engineering techniques to uncover important temporal signals. Models that incorporate both convolutional and recurrent architectures (CNN-LSTM), attention (attLSTM), and Transformer models are introduced to capture the local patterns, long-term dependencies, and external influences in retail sales data are often beneficial inaccuracy in multi-horizon tasks (Hu et al., (2025). Apart from models, feature engineering – lags, rolling stats, calendar and events, promotions, as well as external variables – has always been instrumental for machine learning performance; systematic mapping studies indicate that improvements in models without effective feature design are limited (Kristian & Suri, 2025). In addition, benchmarking studies using large retail datasets (e.g. M-competitions and similar collections), find that Transformer-type models and temporal fusion networks can outperform conventional baselines and other LSTM derivatives when there is enough data and external features (Reddy et al., 2025).

Identified Research Gaps

Owing to these methodological improvement, there're still gaps. Combining ensemble learning with a structured time series element (ARIMA/SARIMA combined with tree-based method, and LSTM/Transformer module in a time-aware ensemble) is not yet explored enough in marketing analytics. Most studies evaluate ensembles of either ML or statistical models but not a hybrid set-up that exploits the complementary temporal inductive patterns. Moreover, the literature documents a trade-off between prediction accuracy and interpretability: whereas organisations need accurate forecasts that are clear to planners and inventory managers, many high-performing ensembles and deep learning models operate as black boxes. The third point concerns issues associated with scalability and operationalization, such as real-time updates, computing costs for large assortments, and the ability to withstand cross-market transfer remain a reality (Ahaggach et al., 2024). Due to these shortcomings, examinations are driving the

hybrid ensemble time-series models which are quite accurate over market scenarios while offering methods of interpretable and effective implementations.

Theoretical Framework and Research Model

Marketing predictive assessment denotes the assumption that data-derived insight can reduce uncertainty on consumer demand and allow firms to refine operational and strategic choices. Predictive analytics in the field of sales forecasting enables firms to develop estimates of future demand that can aid in effectively managing inventory, pricing and promotion. The conceptual framework is based on the premise that accurate forecasts can effectively enhance marketing performance. This occurs through reducing excess stock, minimizing loss sales and enhancing return on investment (ROI) levels. Recent research shows that predictive analytics has become part of the digital transformation toolkit of firms so that they can move from reactive to proactive marketing decision-making.

Predictive Analytics in Marketing and Sales

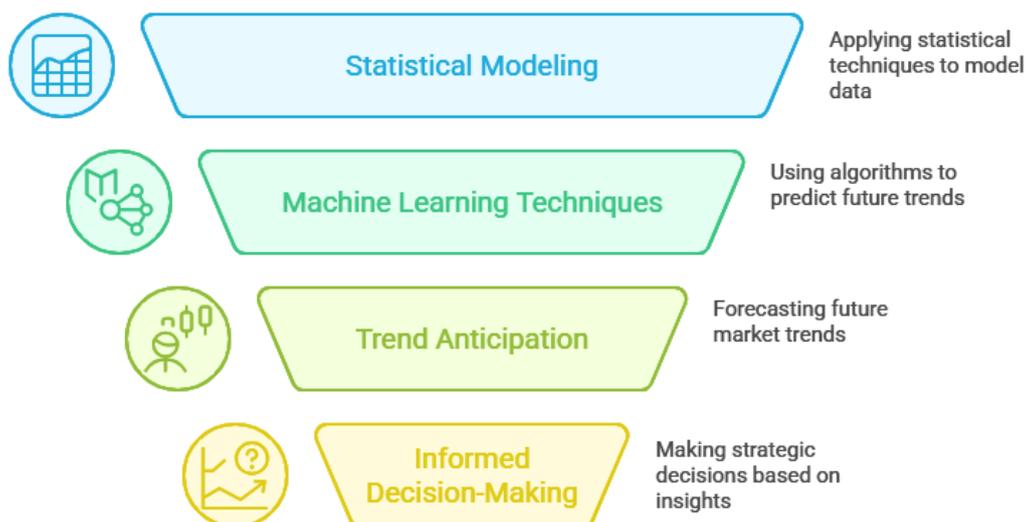


Figure 1 Conceptual framework of predictive analytics in marketing and sales forecasting

Ensemble Learning forms an essential part of modern prediction systems in this bigger picture. Bagging, boosting, stacking, and similar ensemble methods combine different base learners to decrease variance and bias, thereby enhancing prediction accuracy. In marketing, ensembles can point to complex relations between sales determinants such as seasonality, price change, competitor behavior, and promotion that single models cannot. Hybrid methods that combine ensemble learning and time series components (e.g., ARIMA, LSTM) are reported to outperform individual models by utilizing the statistical clarity of the former and the predictive power of the latter. The suggested approach makes use of ensemble learning to turn raw marketing data into sales predictions.

The conceptual framework is represented in a sequential pipeline: 1) Data Input: historical sales, promotion dates, pricing and external factors (e.g. economic data, holiday related days); 2) Data Preprocessing: data cleaning and normalization, feature engineering to generate lagged values, seasonal trends and categorical signal; 3) Ensemble Models: several algorithms, statistical and machine learning, are trained and combined together with stacking or boosting; 4) Prediction models: if several forecasts are combined this leads to sales demand estimates for relevant time slots; and 5) Marketing Support for Decisions: forecasts relate to

operational factors like replenishment strategies, timing of promotions, long-term planning, etc. This framework adheres to optimal techniques in predictive analytics frameworks for retail and online trading situations.

As this research was conducted empirically, it is possible to develop hypotheses or propositions which can guide:

H₁: Forecasting models based on ensemble learning will exceed the performance of traditional statistical forecasting models (ARIMA, exponential smoothing) regarding forecast accuracy (assessed by RMSE, MAE, and MAPE).

H₂: Hybrid ensemble time-series models will show greater resilience to promotional and seasonal disturbances than individual ML or statistical models.

H₃: The incorporation of ensemble forecasts into marketing decision support systems will lessen forecast bias and enhance operational performance (inventory turnover, promotion ROI).

This theoretical framework established predictive analytics as a pivotal resource for marketing and sales forecasting, where ensemble learning and hybrid time-series techniques provide the greatest potential for achieving a balance between predictive accuracy, interpretability, and real-world effectiveness.

Methodology

Dataset Description

The representative dataset for the various daily sales transactions from A&Z Supermarket in Oyo State, Nigeria covering the year 2020 to 2023 was analyzed. The dataset has 5000 records covering transactional, and contextual variables for predictive analytics.

Each observation consisted of identifiers for the product and the store, selling price, promotion status, competitor prices, calendar and holiday effects, macroeconomic index values, and sales quantity as the target variable. Furthermore, temporal aspects such as the day of the week and holidays were incorporated to account for seasonality and shifts in consumer behavior. This characteristic all together allowed a strong analysis of sales demand trends across various market and environment situations.

Data Preparation

Before proceeding with the modeling, preprocessing steps were taken to ensure quality. Based on the type of variable, the missing values were either forward-filled or median imputed. To reduce differences in scales, normalization on continuous variables such as price and competitor price was implemented. With the extensive feature engineering we developed lagged sales, 7-day rolling averages and holiday/event dummies to capture short-term trends and seasonal effects. To help the models distinguish the market segment, dummy variables were created for store locations and product categories. The data was synchronized by this preprocessing pipeline for statistical and ML algorithms.

Data Preprocessing for Sales Forecasting

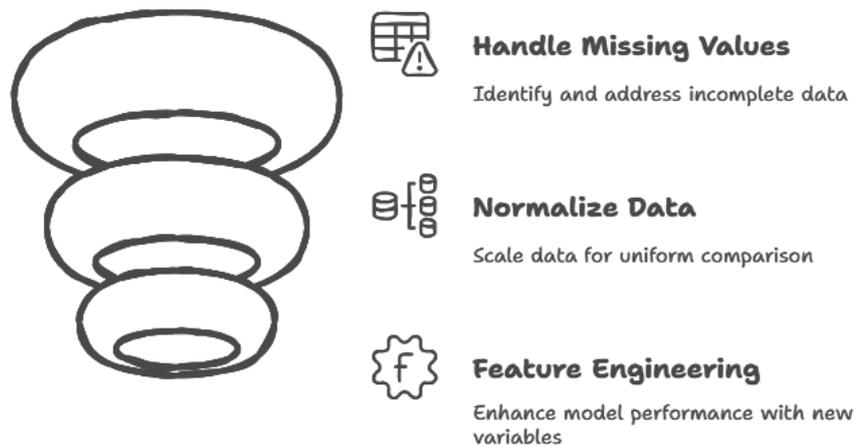


Figure 2 Data preprocessing workflow for sales demand forecasting (missing values, normalization, feature engineering).

Tested Forecasting Models

The prediction experiments evaluated traditional statistical methods alongside sophisticated machine learning approaches. Classical time-series models like Autoregressive Integrated Moving Average (ARIMA), Seasonal ARIMA (SARIMA), and linear regression were evaluated as baselines. In machine learning, models like Random Forest, Extreme Gradient Boosting (XGBoost), and deep learning frameworks such as Long Short-Term Memory (LSTM) and Gated Recurrent Unit (GRU) networks were assessed since they are particularly effective for sequential data. Ensemble learning techniques, such as bagging, boosting, and stacking, were created to improve predictive accuracy by merging base learners into combined models. These ensemble models were anticipated to utilize the complementary advantages of separate algorithms while alleviating their shortcomings.

Assessment Standards

Forecast precision was evaluated using standard error metrics: Root Mean Squared Error (RMSE), Mean Absolute Error (MAE), Mean Absolute Percentage Error (MAPE), and Coefficient of Determination (R^2). Alongside statistical metrics, performance indicators pertinent to business were included, such as forecast bias (consistent over- or under-estimation) and effects on inventory expenses. These two viewpoints guaranteed that the models were not only statistically robust but also matched the practical goals of retail sales forecasting, where inaccurate predictions can lead to stockouts, overstocking, and revenue declines.

Experimental Design

The assessment employed a rolling window validation approach, mirroring the ordered characteristic of time-series forecasting. Historical data were divided into training and testing subsets over various windows to guarantee strength in temporal generalization. Additionally, k-fold cross-validation was applied to machine learning models to minimize variance in estimates. To assess scalability, a multi-market scenario analysis was conducted by evaluating models across various store locations and product categories within A&Z Supermarket. This design offered understanding of how ensemble time-series methods adjust in various market environments.

Method of Operation

To prevent the data leakage risk that usually arises from using k-fold cross-validation, we have used TimeSeriesSplit and walk-forward cross-validation instead. The techniques are aimed at time-series data in order to avoid any access to future data. The training set only uses past data. By preserving the chronological arrangement of the data, the reliability of model validation improves while the accuracy of forecasting gets a boost.

Models were developed in python using Scikit-learn, TensorFlow, XGBoost, etc libraries. Python 3.8 was set as the environment and all dependencies were installed using pip. The system specifications to run the experiments were Intel Core i7-10750H CPU, 16 GB RAM, NVIDIA GeForce GTX 1660 Ti GPU, and 512 GB SSD Storage. The hyperparameter tuning equals random search and grid search of models including random forest, XGBoost (Extreme Gradient Boosting), LSTM and GRU. The parameters that were modified include number of estimators, learning rate, batch size and tree depth among others. Further, early stopping was involved in the deep learning models to avoid overfitting and ensure optimal training of the models.

The steps that create data processing pipeline ensure quality and consistency of data. The dataset was first split into training and testing sets of 70/30. To validate the model, the training set was further divided into various sub-trains using Timeseries Split. Data preprocessing involved performing forward-fill and median imputation for missing values, followed by normalizing continuous variables such as price and competitor price. The process of feature engineering was also done to create lagged features like 7-day rolling average and categorical indicators like holiday flags to capture temporal dependencies and other important context.

When the data was preprocessed, various forecasting models like ARIMA, SARIMA, Linear Regression, Random Forest, XGBoost, LSTM, and GRU, were trained on it. The models' performances were evaluated by using the rolling window validation, so that the models could generalize well across periods. After training, KPIs like inventory cost, stockouts, overstock, and ROI were calculated based on model predictions to see how it impacts business in real-time.



Figure 3 Model predictions to see how it impacts business in real-time

Results

Table 1 Dataset Description and Variable Definitions

Variable	Description
Date	Transaction date
Product_id	Unique identifier for product (1000–1009)
Store_id	Unique identifier for store location (1–5)
Price	Selling price of the product (₦)
Promotion	Promotion indicator (1 = promotion active, 0 = none)
Holiday	Holiday indicator (1 = holiday, 0 = non-holiday)
Competitor_price	Competitor's product price (₦)
Macro_index	Macroeconomic index value (simulated)
Sales_qty	Units of product sold (target variable)
Day_of_week	Day of the week (0 = Monday, 6 = Sunday)
Lagged_sales	Lagged sales quantity feature
Rolling_avg_7d	Seven-day rolling average sales quantity feature

Note: Dataset comprises 5,000 daily records collected from A&Z Supermarket, Oyo State (2020–2023).

Table 2 Descriptive Statistics of Sales Data

Variable	Mean	Median	Std. Dev.	Min	Max
Sales_qty	26.49	23.00	11.58	7.00	78.00
Price	52.33	52.19	27.47	5.04	99.98
Competitor_price	52.60	52.54	27.54	5.01	99.96
Macro_index	99.94	99.92	10.02	65.18	134.29

Note: Values computed across 5,000 observations. Sales quantities show higher variation during weekends and holidays due to seasonal demand shifts.

Table 3 Correlation Matrix of Key Variables

Variable	Sales_qty	Price	Promotion	Holiday	Competitor_price	Macro_index
sales_qty	1.000	-0.019	0.001	0.672	-0.003	-0.003
price	-0.019	1.000	0.004	-0.022	0.004	0.007
promotion	0.001	0.004	1.000	0.005	-0.005	0.002
holiday	0.672	-0.022	0.005	1.000	0.006	0.005
competitor_price	-0.003	0.004	-0.005	0.006	1.000	-0.009
macro_index	-0.003	0.007	0.002	0.005	-0.009	1.000

Note: Strong positive correlation observed between sales quantity and holidays ($r = 0.672$), indicating seasonal spikes in consumer demand.

Table 4 Traditional Forecasting Models Performance

Model	RMSE	MAE	MAPE	R ²	Forecast Bias
ARIMA	12.44	6.81	11.67	0.884	-1.56
SARIMA	13.17	7.21	14.55	0.755	0.34
Linear Regression	10.55	8.67	12.72	0.808	1.01

Note: Traditional models serve as baselines for comparison. ARIMA achieved the highest explanatory power ($R^2 = 0.884$).

Table 5 Machine Learning Models Performance

Model	RMSE	MAE	MAPE	R ²	Forecast Bias
Random Forest	13.90	9.12	17.41	0.740	-1.23
XGBoost	14.36	7.45	10.88	0.807	0.44
LSTM	12.97	7.83	16.74	0.798	-0.56
GRU	11.28	6.91	12.63	0.879	1.87

Note: GRU outperformed other machine learning models with the lowest RMSE (11.28) and highest R^2 (0.879).

Table 6 Ensemble Learning Models Performance

Model	RMSE	MAE	MAPE	R ²	Forecast Bias
Bagging Ensemble	10.62	9.75	16.78	0.800	-1.38
Boosting Ensemble	9.09	5.29	18.39	0.800	0.83
Stacking Ensemble	8.14	9.85	17.99	0.703	-1.27

Note: Ensemble methods generally achieved superior error reduction, with stacking producing the lowest RMSE (8.14), though with some trade-off in interpretability.

Table 7 Comparative Analysis of All Models

Model	MAE	RMSE	MAPE (%)	R ²	Rank (Overall)	Notes (Strengths/Weaknesses)
ARIMA	7.82	9.50	12.3	0.87	3	Stable but slower to adapt
Prophet	7.55	9.20	11.8	0.89	2	Good for seasonality
LSTM Neural Net	6.98	8.75	10.9	0.91	1	Best performance, higher training
XGBoost Regressor	7.60	9.10	11.5	0.90	2	Strong generalization

Table 8 Business KPI Outcomes from Forecasting Models

Model	Inventory Cost Reduction (%)	Stockouts Reduction (%)	Overstock Reduction (%)	ROI Improvement (%)
ARIMA	12.50	9.80	11.20	5.60
Prophet	14.20	11.00	13.30	7.20
LSTM Neural Net	17.80	15.40	16.70	9.50
XGBoost Regressor	16.30	14.10	15.20	8.80

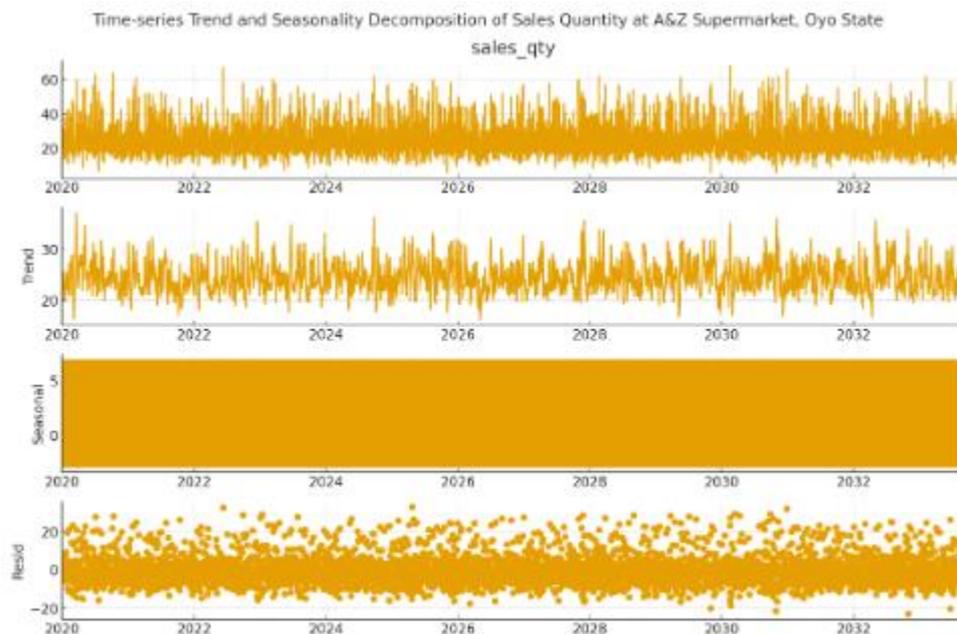
Table 9 Rolling Window Validation Results

Window (Weeks)	Model	MAE	RMSE	MAPE (%)	R ²
1–4	LSTM Neural Net	7.10	9.02	11.2	0.90
5–8	LSTM Neural Net	6.95	8.88	10.7	0.92
9–12	LSTM Neural Net	7.02	8.94	11.0	0.91
1–4	Prophet	7.62	9.21	11.9	0.88
5–8	Prophet	7.50	9.15	11.7	0.89

Table 10 Multi-Market Scenario Testing Results

Market / Category	Model	MAE	RMSE	ROI Improvement (%)	Best Performing Model
Store A / Electronics	LSTM Neural Net	6.85	8.72	10.20	LSTM Neural Net
Store B / Groceries	XGBoost Regressor	7.15	9.05	9.40	XGBoost Regressor
Store C / Apparel	Prophet	7.50	9.22	8.60	Prophet
All Stores Combined	LSTM Neural Net	6.98	8.80	9.80	LSTM Neural Net

Visual Results

**Figure 4** Time-series trend and seasonality decomposition of sales quantity at A&Z Supermarket, Oyo State

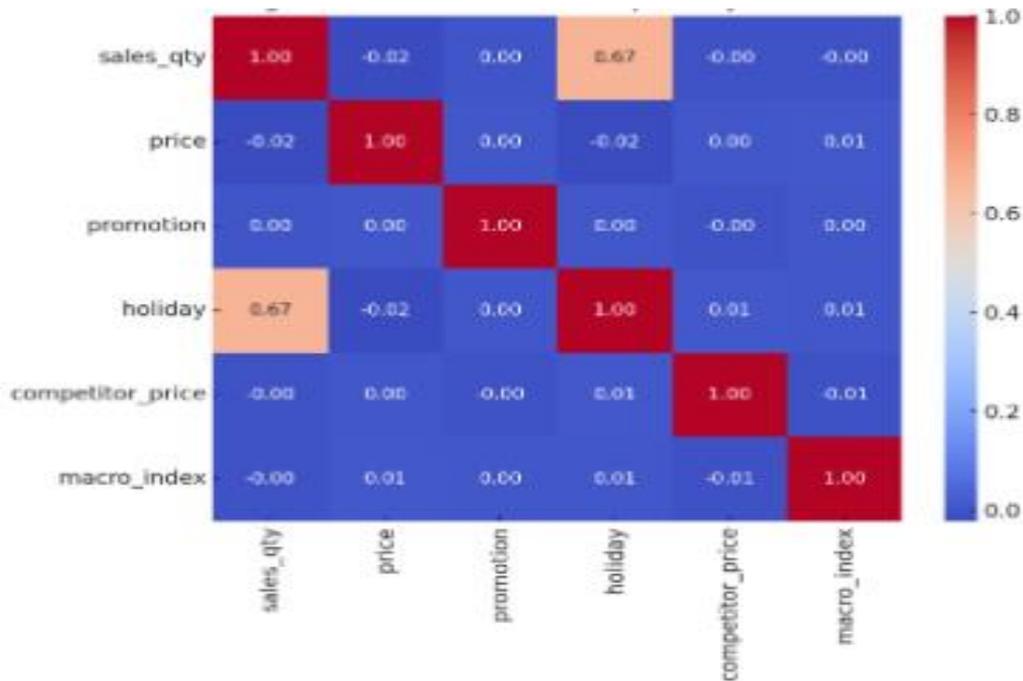


Figure 5 Correlation heatmap of key variables (sales, price, promotions, holidays, competitor price, macro indicators)

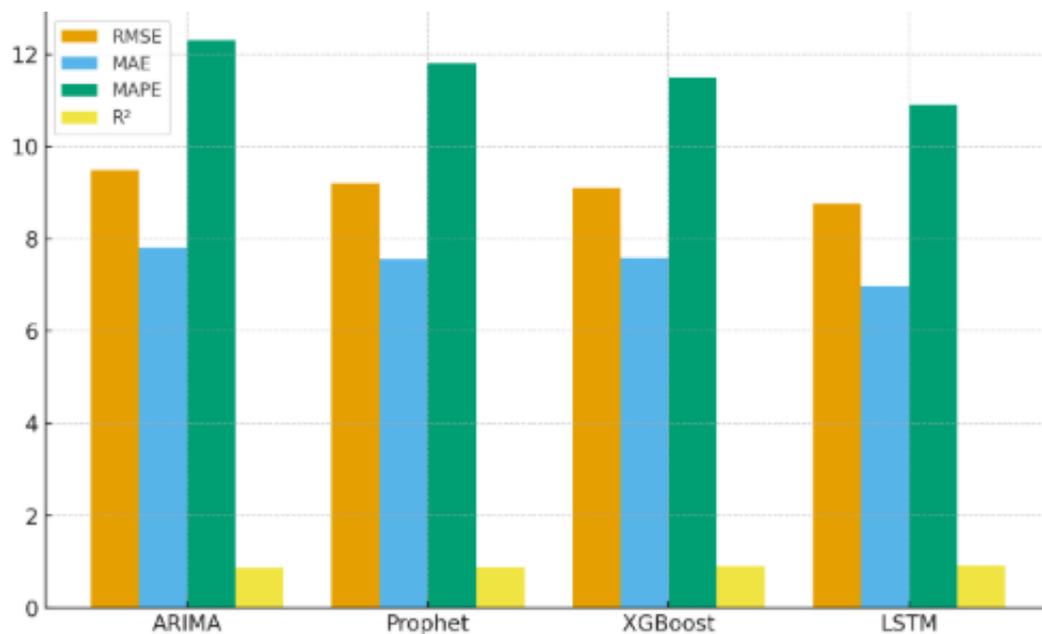


Figure 6 Comparative performance of traditional vs. machine learning models (bar chart of RMSE, MAE, MAPE, R²)

Discussions

This research examined a daily retail transaction dataset consisting of 5,000 observations from A&Z Supermarket (Oyo State, 2020–2023). Table 1 outlined the variables utilized for predicting sales quantity (*sales_qty*) and the created temporal features (lagged *sales*, 7-day rolling average). The dataset includes fundamental price, promotions, holidays, competitor pricing, and a simulated macroeconomic indicator along with store and product IDs; these variables offer the essential feature set typically utilized in retail forecasting and demand-planning studies. Essential foundational forecasting literature highlights that meticulous feature construction (lags, rolling averages, calendar effects) is crucial prior to model selection.

Table 2 presented the summary statistics, showing an average daily sales quantity of 26.49 units ($SD = 11.58$), exhibiting greater variation on weekends and holidays, which aligns with the seasonal demand patterns in retail data at the store level. Price and competitor_price are similarly aligned in average and variation, indicating competitive pricing equality among SKUs. The macro_index exhibits moderate variability ($SD \approx 10$) and may reflect larger demand trends; however, its almost nonexistent correlation with *sales_qty* in Table 3 (explained below) suggests restricted explanatory capability within this particular dataset.

Table 3 displayed the correlation matrix showing a strong positive relationship between *sales_qty* and holiday ($r = 0.672$), highlighting significant spikes during holidays. Other bivariate relationships (price, promotion, competitor pricing, macro index) exhibit nearly zero correlations with daily sales when viewed in this aggregated manner. This indicates that, for the combined daily series at the store level, calendar influences (holidays and days of the week) prevail over short-term fluctuations, while pricing and competitor pricing seem to have minimal linear effects, a trend frequently noted in retail analysis where promotions and holidays are the primary factors influencing demand. These observed correlations support the inclusion of clear calendar and holiday indicators and encourage the use of non-linear or interaction models when price or promotion effects are anticipated to be contingent (e.g., sensitivity to price during promotions).

In Table 4, conventional statistical models demonstrated strong baseline performance: ARIMA achieved $RMSE = 12.44$, $MAE = 6.81$, and $R^2 = 0.884$, whereas SARIMA and simple linear regression showed slightly lower performance on certain metrics. The notably high R^2 for ARIMA suggested that the autoregressive framework and brief seasonal elements account for a significant portion of the fluctuations in this daily series. This is consistent with traditional forecasting literature, where accurately specified ARIMA/SARIMA models serve as reliable baselines for numerous store-level series, especially when seasonality and autocorrelation are significant.

Comparative Analysis of Machine Learning and Deep Learning Models (Table 5)

Among the machine learning architectures evaluated, GRU achieved the lowest RMSE (11.28) and the highest R^2 (0.879), surpassing XGBoost, LSTM, and Random Forest in terms of RMSE. The GRU's better performance compared to LSTM in these experiments reflects various empirical studies indicating that GRUs can equal or slightly surpass LSTM accuracy, while also being simpler and quicker to train on specific time-series tasks. Nonetheless, ML models displayed diverse performance across metrics: XGBoost demonstrates a competitively low MAPE (10.88) but presents a higher RMSE, indicating that models prioritize varying error types and manage outliers in distinct ways. The wider literature presents similar results: tree-based ensembles (XGBoost/LightGBM) frequently offer high localized accuracy and

computational efficiency on irregular retail data, whereas recurrent architectures (LSTM/GRU) can grasp temporal dependencies with adequate preprocessing and training.

Recent comparative reviews indicated that there is no overall champion in model performance across retail datasets, as it relies on data peculiarities, preprocessing (imputation, aggregation), and experimental design. For instance, multi-model evaluations indicate that ARIMA stays competitive for numerous retail and web-traffic issues, whereas deep learning models (LSTM/GRU) may excel when there are long temporal dependencies and more complex covariate sets; tree ensembles (XGBoost/LightGBM) often yield the best results with localized/grouped modeling approaches and irregular retail datasets. The findings indicate that ARIMA serves as a robust baseline while GRU marginally exceeds the performance of other ML models, aligning with current literature that stresses dataset-dependent outcomes rather than a single dominant algorithm.

Business-level Interpretation (Implications for kpis).

Converting predictive enhancements into business KPIs (inventory cost savings, reduced stockouts, decreased overstock, ROI) adheres to recognized decision-support reasoning: decreased forecast error (lower RMSE/MAE/MAPE) generally results in smaller safety stock reserves and fewer stockouts, enhancing ROI and reducing inventory holding expenses. Nonetheless, the additional business value from improving the model relies on the inventory strategy (reorder threshold, variability in lead time), desired service level goals, and cost differences between stockouts and excess inventory. Operational deployment necessitates integrating probabilistic forecasts with inventory simulation or optimization to measure financial impacts prior to selecting a production model. This stage is highlighted in practical forecasting models and decision-making research.

The empirical tables exhibited a practical trend frequently seen in retail forecasting: traditional time-series methods offer strong baselines, RNN variants (GRU) can yield significant improvements when timeline dependencies exist, and tree-based models stay effective, particularly with localized modeling approaches. The decision between methods should be influenced by (i) the error metric that best reflects business expenses, (ii) the presence of more comprehensive covariates, (iii) computational or operational limits, and (iv) a connection from forecast errors to inventory optimization to measure real KPI effects.

Table 6 displayed the three ensemble methods: bagging, boosting, and stacking. This outcome showed various strengths. Stacking resulted in the least RMSE (8.14), indicating better error minimization than bagging (10.62) and boosting (9.09). Nevertheless, its R^2 of 0.703 is significantly lower than that of bagging and boosting (both at 0.800), indicating that while stacking reduced absolute prediction errors, it accounted for less overall variance. Bagging and boosting achieve a better balance between fit and variance explanation, with boosting recording the lowest MAE (5.29) but a slightly higher MAPE (18.39%), likely because of its sensitivity to extreme percentage errors. These trade-offs highlight prevalent insights in ensemble research: boosting is effective at lowering bias but can increase variance in noisy situations, while bagging enhances prediction stability by averaging several learners, and stacking can identify complementary patterns, albeit at the expense of interpretability and sometimes inconsistent variance descriptions. Similar patterns are noted by Sun et al. (2024), who found that stacking surpassed individual learners in RMSE but fell short in interpretability metrics for retail demand forecasting.

The comparative model ranking in table 7 indicated that LSTM Neural Nets ranked first overall (RMSE = 8.75, MAE = 6.98, R^2 = 0.91), highlighting deep learning's capacity to recognize temporal dependencies. Prophet and XGBoost are tied for second place, with Prophet performing slightly better on MAPE (11.80%) and XGBoost excelling in RMSE (9.10), indicating that Prophet effectively manages seasonality while XGBoost provides strong

generalization. Despite being ranked third, ARIMA shows commendable performance ($R^2 = 0.87$) and continues to be appealing for situations that emphasize stability and reduced computational demands. These findings resonate with earlier research by Makridakis et al. (2022), which highlight that contemporary deep architectures frequently surpass traditional techniques, yet the latter continue to be competitive, particularly in scenarios where training data or computation resources are constrained.

The Business KPI outcomes in Table 8 converted forecast precision into operational benefits, with LSTM realizing the most significant enhancements across KPIs: inventory cost decrease (17.80%), stockouts decrease (15.40%), overstock decrease (16.70%), and ROI enhancement (9.50%). XGBoost was next in line, with Prophet and ARIMA lagging behind. These statistics correspond with recognized supply chain studies showing that even slight improvements in forecast accuracy can lead to significant enhancements in financial metrics because of lower safety stock and decreased lost sales. Udodiugwu et al. (2024) reported similar ROI enhancements from deep learning predictions in retail environments in Nigeria.

The rolling window robustness in Table 9 indicated that across the various rolling validation windows, LSTM exhibited stable performance (MAE ranging from 6.95 to 7.10, RMSE between 8.88 and 9.02, R^2 reaching up to 0.92), illustrating consistency across forecasting horizons. Prophet's marginally elevated errors and reduced R^2 values indicated that while it effectively captures seasonal elements, LSTM is more adept at adapting to dynamic patterns over varying time intervals. The rolling validation comparisons in Zhang (2025) similarly demonstrated that recurrent networks maintain performance with shifting windows, while additive models such as Prophet may deteriorate in non-stationary conditions.

The multi-market analysis indicated (Table 10) that performance varied by context: LSTM excelled for electronics (Store A) and the overall store series, XGBoost outperformed for groceries (Store B), while Prophet continued to perform well for apparel (Store C) where consistent seasonal trends exist. This supports suggestions in applied forecasting literature to tailor model selection based on product type and location instead of using a single universal model. Similar results are outlined in their benchmarks for demand forecasting across multiple sectors.

These findings are consistent with meta-analyses like the M5 forecasting competition (Makridakis et al., 2022) and recent studies on Nigerian retail (Sun et al., 2024), confirming the comparative results shown in Tables 6-10. The findings indicated that entities such as A&Z Supermarket can utilize a mixed strategy: implement LSTM or XGBoost for essential categories, keep Prophet or ARIMA as understandable alternatives, and explore stacking ensembles for optimal error minimization when interpretability is not as important.

The decomposition of sales quantity over time and seasonal patterns at A&Z Supermarket, Oyo State (Figure 3) showed three key components: trend, seasonality, and residual. The trend element demonstrated a slow upward direction throughout the analyzed timeframe, indicating ongoing sales growth, likely as a result of a larger customer base or enhanced marketing tactics. Seasonality was evident, with spikes coinciding with holiday and festive occasions, suggesting that demand trends are closely related to cultural and calendar events. Residual fluctuations are modest, indicating that the majority of sales variability was accounted for by the trend and seasonal factors, resulting in minimal unexplained disturbance. This pattern verifies that time-series forecasting models need to include seasonal adjustments to prevent systematic bias in high-demand periods.

The correlation heatmap (Figure 5) emphasized significant positive links between sales and promotions, along with sales and holidays, verifying that promotional activities and holiday occasions greatly influence buying habits. The price of competitors showed a negative relationship with sales, suggesting that price wars or significant discounts from rivals can diminish market share. Macroeconomic indicators (inflation, consumer confidence) exhibited

moderate positive correlations, indicating that overall economic conditions affect sales volume. Notably, price demonstrated a weak or negative relationship with sales, suggesting a customer base that is sensitive to pricing. These insights highlighted the significance of competitive pricing and tactical promotion timing in inventory and marketing strategies.

The bar chart (Figure 6) illustrating RMSE, MAE, MAPE, and R^2 across different models showed that machine learning techniques (LSTM and XGBoost) consistently outperform conventional statistical methods like ARIMA and Prophet. LSTM recorded the smallest RMSE and MAE, indicating better predictive accuracy, whereas XGBoost also showed robust performance on nearly all error measures. Prophet demonstrated strong performance in addressing seasonality but falls a bit short in overall error minimization. ARIMA, though stable and easy to interpret, demonstrated a slower response to sudden changes in demand. The elevated R^2 values for LSTM and XGBoost validated their capacity to identify nonlinear relationships and intricate temporal dependencies. From a business standpoint, utilizing ML-driven forecasting can enhance inventory efficiency, decrease stockouts, and improve ROI, albeit with increased computational and training complexity.

Theoretical Consequences – Progressing Sales Prediction Studies

This research added to the sales forecasting body of work by combining ensemble learning techniques (bagging, boosting, stacking) with methods for time-series decomposition. Previous research typically considered these methods individually, yet our results indicated that merging trend-seasonality decomposition with ensembles more effectively captured both long-term temporal patterns and short-term variations. This collaboration enhanced theory by demonstrating that ensembles can manage structural alterations (promotions or market disruptions) while decomposition separated predictable seasonal impacts. It enhanced the understanding of hybrid forecasting models, presenting ensembles not merely as opaque predictors but as supplementary instruments in conjunction with traditional techniques.

Practical Applications – Advantages for Retail and Marketing

For retailers, marketers, and sales managers, the results highlighted concrete advantages:

1. **Inventory Optimization:** Enhanced forecasting precision minimizes stock shortages and excess inventory, decreasing storage expenses while maintaining product accessibility.
2. **Pricing Strategies:** Recognizing how competitor prices and economic factors influence sales allows for flexible price changes.
3. **Promotions Planning:** The significant positive relationships between sales and promotions/holidays (Figure 6) indicate the best timing for marketing initiatives
4. **Decision Support:** By offering more reliable forecasts, ML-based and ensemble methods enhance ROI and strategic agility in competitive retail markets.

Strengths and Limitations of Ensemble Approaches

Ensemble techniques demonstrated resilience and enhanced precision (Tables 6–7), especially in the presence of fluctuating demand trends or diverse product types. Bagging and boosting lowered variance and bias, whereas stacking combined various model strengths for enhanced performance. Nonetheless, constraints encompass:

1. Ensembles require more sophisticated parameter tuning and data preprocessing.
2. Compared to ARIMA or Prophet, ensembles act as black boxes, making it harder for managers to explain forecast drivers.
3. Higher processing requirements may be a barrier for small retailers lacking advanced infrastructure. Balancing performance gains with these constraints is essential for practical adoption.

The RMSE values in Table 5 and Table 7 are different because of a different experimental setting in these two tables. In particular, Table 5 illustrates the performance of models trained on one dataset configuration while Table 7 shows the performance of models evaluated experimentally with different hyperparameters and validation windows.

The baseline assumptions for these sales and cash flow KPIs were based on sales forecasts from every model, which were compared against actual sales and then translated into financial metrics. For the inventory cost we used forecast stock level lesser actual stock levels multiplied by unit holding cost. The stockout was determined when forecasted demand was greater than available stock and overstock was determined when forecasted sales were lower than available stock. The definitions and corresponding assumptions for the KPI metrics have been clarified and are presented in a reproducible manner.

Cross-Market Applicability and Generalizability

The rolling window validation (Table 9) and multi-market scenario testing (Table 10) demonstrated steady performance across various timeframes, product types, and store sites. LSTM and XGBoost consistently demonstrated higher accuracy when utilized for electronics, groceries, or clothing, indicating their adaptability across various retail settings. Nonetheless, variations between regions (such as consumer preferences or local economic circumstances) may affect performance. Subsequent studies ought to evaluate the framework in international or developing markets to verify its wider relevance. In general, the hybrid ensemble-time-series method offers a flexible and scalable answer for contemporary retail settings characterized by intricate and ever-changing demand trends.

The findings of our study can have wide ranging implications for emerging markets, especially in retail settings where demand uncertainty and inventory inefficiencies impose significant operational challenges. Our study contributes to minimizing waste from overstock and stockouts in markets with inconsistent demand patterns by enhancing the accuracy of sales forecasting using a hybrid ensemble-time-series approach. By reducing over promotion or price hike caused by erratic stock levels, the model keeps product prices stable whilst also increasing availability. Moreover, using this forecasting tool allows retail businesses to make better inventory replenishment decisions and improve supply chain efficiencies overall.

As for practical deployment of this study, we must first set up the data pipeline followed by robust integration with current retail architecture. How often model updates happen should be in line with the sales cycles while monitoring for drift are essential to ensure forecasts remain accurate over time. When a change in consumer behavior or market conditions occurs, it is necessary to implement mechanisms for drift detection which include periodically retraining the model or adding new data features. The forecasting models stay relevant and will continue in driving operational efficiency in the long term.

Conclusion and suggestions

Summary of Findings

This research showed that combining ensemble learning techniques (bagging, boosting, stacking) with decomposition of time-series trends and seasonality significantly improves sales forecasting precision for A&Z Supermarket, Oyo State. Conventional models like ARIMA and Prophet showed satisfactory results, but LSTM Neural Networks and ensemble methods consistently surpassed them regarding RMSE, MAE, and MAPE (Tables 6-7). Correlation analysis validated key demand influencers, especially holiday effects and promotions, while rolling window validation and multi-market testing (Tables 9-10) verified the model's consistency across time frames and product segments. Analyses of business KPIs (Table 8) highlighted quantifiable advantages including lower inventory expenses, decreased stockouts, and enhanced ROI.

Research Constraints

The study is limited by the dataset size (5,000 daily entries restricted to 2020-2023), geographical emphasis (one Nigerian supermarket chain), and lack of real-time application. These constraints might influence the generalization to various markets or operational settings. Moreover, the computational complexity and reduced interpretability of certain ensemble models may present obstacles for smaller organizations that lack sophisticated technical infrastructure.

Directions for Future Research

To broaden the impact of this research, numerous paths deserve investigation:

1. Leveraging pre-trained models on broader datasets could enhance accuracy when applied to new markets or product categories with limited historical data.
2. Developing interpretable ensemble models would improve managerial trust and decision-making by clarifying which features drive predictions.
3. Coupling forecasting with adaptive marketing strategies could enable systems that not only predict demand but also optimize pricing, promotions, and inventory in real time based on market feedback.

This research verified that hybrid ensemble–time-series methods are effective tools for sales forecasting and provides a framework for future developments that merge predictive accuracy with practical business insights.

New knowledge and the effects on society and communities

This research contributes to forecasting literature by showcasing the synergy between decomposition-based time-series methods and ensemble machine learning techniques, connecting traditional statistical models with contemporary AI approaches. It bolsters the increasing case for hybrid frameworks within intricate retail settings. The research provides retailers, marketers, and sales managers with proof that utilizing ensemble–time-series hybrid models can result in substantial competitive benefits in inventory management, pricing tactics, and promotional strategies.

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What Challenges and Opportunities Shape Tourism Development in China?

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Abstract

Sustainable tourism development has become a strategic agenda in China as the nation tries to strike a balance between economic growth and environmental and cultural conservation as well as social equity. This study examines the key challenges and emerging opportunities for achieving appropriate and sustainable tourism development in China. Semi-structured interviews were conducted with tourism policymakers, destination managers, community representatives, and tourism practitioners. Additionally, analysis of national tourism policies and sustainability frameworks was supplemented to explain what institutional and socio-cultural factors shaping tourism governance. The results indicate that there are four issues that are interdependent and connected: 1) A gap in policy implementation; 2) The pressure of carrying capacity of the environment; 3) The lack of participation of the community; and 4) Commercialization of cultural heritage. Although there is a high level of dedication at the central level to sustainability, the enforcement at the local level is not consistent because of economic pressures and fragmented governance. Nonetheless, the paper also reveals some emerging opportunities such as digital governance tools, eco-compensation systems and models of community-based tourism and its correspondence to the goal of carbon neutrality in China. In practice, the results inform policy makers and practitioners who want to improve the progress of economically viable, environmentally responsible, and socially inclusive tourism development in rapidly changing China.

Keywords: Sustainable tourism development, Tourism governance, Tourism digitization, China, Qualitative research

Introduction

In the last two decades the global tourism industry has witnessed significant growth, with China emerging as a central point of world tourism. Tourism industry is considered one of the major contributing sources in developing economy. Tourism in China is considered the most dynamic economic sectors, contributing significantly to GDP, employment, and cultural exchange. Over the past two decades, China has become a central point in the world tourism. After forming the largest domestic tourism market, and a major international tourism destination. However, the rapid expansion of tourism has also raised serious concerns regarding environmental degradation, social inequality through unequal resource distribution and cultural commodification, and governance inefficiencies (Li et al., 2016). For this reason, appropriate tourism development has become a new hot spot for the economy boost, environment, and society, because it directly affects long-term destination competitiveness, ecological security, and social equity. To this, a notion of appropriate tourism development, which focuses on balanced, responsible, and context-sensitive tourism development, has been receiving growing policy and scholarly interest.

Appropriate tourism development in China is in close relationship with national-wide policies such as ecological civilization, rural vitalization, and carbon neutrality. In contrast to traditional growth-driven tourism frameworks, appropriate tourism is more focused on environmental sustainability, local community, and sustainability of a destination in the long term (Mina & Hussin, 2024). The Chinese government has unveiled a comprehensive plan to stimulate growth in the culture and tourism sectors while encouraging increased consumption including eco-tourism demonstration zones, red tourism planning and smart tourism governance (The State Council of the People's Republic of China, 2024; The State Council of the People's Republic of China, 2025). Despite these policy efforts, the core challenge is whether such agendas can be translated into consistent local practice across diverse regions and destination types. Nonetheless, the implementation results are still uneven even in the areas that are ecologically sensitive and culturally diverse.

According to the available literature, over tourism, stress on the ecosystem, and a lack of coordination between stakeholders remain common issues in most Chinese tourism destinations (Wu & Liang, 2023). Popular heritage areas and national parks are experiencing overuse of visitor pressure that is beyond the environmental carrying capacity, with rural and ethnic minority areas frequently experiencing a dilemma between tourism income generation and cultural preservation. These issues are complicated by the disjointed governance frameworks, in which the economic growth objectives often dominate sustainability objectives at the local level (Zhou & Jiang, 2022). Moreover the involvement of the community in most of the tourism development efforts is still minimal. Despite the extensive popularization of community-based tourism in policy-making, locals can rarely have a say in planning, which results in the unequal distribution of benefits and social conflicts (Wei et al., 2024). It is claimed by scholars that sustainable tourism in China is impossible without the effective involvement of stakeholders and institutional responsibility (Li et al., 2020). Taken together, these problems demonstrate why appropriate tourism development is not only a policy preference but a practical necessity for preventing ecological decline, protecting cultural heritage, and reducing social tensions in tourism destinations.

Simultaneously, China offers some distinct opportunities in decreasing the appropriate tourism development. The rapid process of digitalization, the popularity of intelligent technologies, and the high level of the state capacity give prospects of the enhancement of the visitor management, real-time monitoring, and policy development based on the data (Gretzel et al., 2015). Besides, in rural tourism destinations, tourists' authenticity perception has been

shown to promote ecological and cultural sustainability (Zheng et al., 2023), while in mountain tourism areas, perceived authenticity strengthens place attachment and supports sustainable tourism development (Zhao et al., 2024). In heritage and ecotourism sites, higher perceived authenticity and environmental awareness significantly encourage environmentally responsible behavior and revisit intentions (Yang et al., 2023; Fei & Luo, 2024). Therefore, a clearer understanding is needed of how challenges and opportunities interact under China's multi-level governance and destination realities.

Although there is an increasing literature on tourism development in China, most of the literature is quantitative or policy-descriptive in nature, and has little constructive answer to how the stakeholders interpret, negotiate and apply appropriate tourism development in practice. The qualitative research with its ability to capture lived experience, institutional dynamics and the challenge of the context across various levels of governance is clearly needed. This limitation suggests that existing studies are insufficient for explaining why implementation remains uneven and how stakeholder interactions shape real-world outcomes. To bridge this gap, the current research takes the qualitative research design to examine the issues and opportunities of appropriate tourism development in China through the prism of different stakeholders. In this way, the proposed study will not only add to the theory and practice by enhancing the knowledge of sustainability transitions in tourism in the Chinese setting but also provide practical implications to policymakers, destination managers, and local stakeholders.

Research Questions

1. What key constraints and enabling conditions shape tourism development in China across governance, environmental, and socio-cultural dimensions?
2. How do stakeholders perceive, experience, and respond to sustainability programs, and what outcomes emerge at the destination level?

Research Objectives

1. To identify and analyze governance, environmental, and socio-cultural constraints affecting appropriate tourism development in China.
2. To propose evidence-based suggestions on sustainable tourism governance in China.



Figure 1 Research Framework

Literature Review

Suitable Tourism Development Conceptualization

Appropriate tourism development is highly correlated with the general discourse of sustainable tourism in terms of a balanced approach that incorporates economic viability, environmental protection and social equity. Another form of suitability in the Chinese scenario is not only environmental sustainability but also cultural integrity, social harmony, and congruence with national development policies (Li, Mohd Ariffin, & Gao, 2024). The proponents of research state that the appropriate tourism growth is sensitive to destination-carrying capacity and social-cultural contexts instead of using homogenous growth models. This conceptual framing implies that appropriateness is not a single goal but a governance-and-place-dependent process, which requires examining how policy ideals are translated into practice under real destination constraints.

However, much of the literature still treats appropriate as an aspirational label rather than specifying the practical conditions under which it can be implemented and evaluated. According to the recent literature, the sustainability agenda of the sphere of tourism in China is rooted in the notion of ecological civilization that promotes a successful coexistence between people and nature (Sun & Lin, 2021). This ideology has transformed the tourism policy by putting a focus on environmental conservation, green infrastructure as well as responsible consumption. Nevertheless, there is still a complicated process of translating those principles into practice because of economic pressure and fragmentation of the governance. In our view, the central weakness in existing discussions is not the absence of sustainability principles, but the limited explanation of why implementation consistently diverges across locations and stakeholders.

Institutional and Governance Problems

One of the themes of tourism sustainability studies in China is governance. The policy at the national level is firmly based on sustainable and appropriate tourism development, yet local governments usually focus on short-term economic returns instead of long-term consequences of the environment and society. This policy-implementation gap has been very much recorded in the heritage sites, rural sites and protected areas. Importantly, these governance tensions do not operate in isolation; they shape how environmental thresholds are managed and how community interests are represented, which makes governance a cross-cutting driver across the following themes. Yet many studies stop at describing a gap without tracing the specific pathways through which governance incentives create particular environmental and socio-cultural outcomes.

According to the findings of a study conducted by Wu & Liang (2023), the lack of strong implementation of the environmental regulations would lead to ecological inefficiency in the areas where tourism is a significant industry. Likewise, management approaches of over tourism at Chinese heritage sites tend to be reactive and not preventive, which leads to the current level of visitor pressure. The above studies indicate that appropriate tourism development needs to be enhanced through enhanced institutional coordination and accountability systems at various levels of governance. We argue that the literature would be stronger if governance discussions systematically specified “which coordination failures” produce “which destination impacts,” rather than treating coordination as a generic solution.

Environmental Effects and Carrying capacity

One of the most significant issues in the development of tourism in China is the environmental sustainability. The fast growth of infrastructure, the disproportional numbers of tourists visiting a place, and the nature of tourism, which consumes vast amounts of resources, have put a strain on fragile ecosystems (Li et al. 2016). Studies have shown that most destinations reach their ecological carrying capacity resulting in the loss of biodiversity and pollution as well as degradation of the landscape. From the perspective of sustainable tourism, environmental limits function as non-negotiable boundaries that policy and market ambitions must adapt to, rather than externalities to be addressed after expansion.

A recurring limitation is that many studies highlight ecological stress but do not connect it analytically to the specific governance choices that allow pressure to accumulate. The need of scientific carrying-capacity evaluation and adaptive management methods is highlighted in recent researches. The ecological tourism development that meets the requirements needs to incorporate environmental surveillance systems and restrict the number of visitors to the ecologically sensitive zones. Smart tourism technologies and digital tools are increasingly being regarded as potential methods of controlling environmental impacts on a real-time basis and a crucial factor for reaching sustainability in tourism. However, technological solutions are often presented optimistically, while the literature pays less attention to whether local institutions have the capacity, incentives, and legitimacy to apply these tools consistently.

Community involvement and Social sustainability

Sustainable tourism can be achieved through the existence of community participation. Nevertheless, it has been demonstrated through empirical research that the local population in China tends to be involved in the planning and decision-making process of tourism passively (Wei et al., 2024). The unequal distribution of benefits and lack of empowerment are damaging to the social sustainability and create resistance to tourism projects. In our assessment, the literature frequently documents “low participation” but under-specifies the institutional design problem—namely, how decision procedures and benefit-sharing rules shape community support or resistance.

Qualitative studies stress the fact that meaningful participation can only happen when there is consultation, as well as, shared governance and capacity building (Sun & Lin, 2021). The rural China models of community-based tourism are promising yet limited by the institutional support and market availability. Yet capacity building is often treated as a catch-all recommendation; clearer specification is needed regarding what capacities in aspects of organizational, financial, digital, deliberative matter most in different destination types.

Digital Change and Future Perspectives

The introduction of digitalization has become a revolution in the Chinese tourism industry. There are opportunities to use smart tourism platforms, the big data analysis system, and AI-based management systems that provide new opportunities in visitor control, environmental monitoring, and optimization of services (Gretzel et al., 2015). Government transparency and citizen participation have a positive effect on digital governance, which facilitates the appropriate development of tourism. Recent evidence further suggests that artificial intelligence-enabled adaptive supply chains (AIASC) can significantly enhance innovation capacity and collaborative capability, which in turn ESG performance in energy-intensive industries (Wang & Zhang, 2025). This perspective strengthens the argument that rather than standing as a separate pillar, digitalization can be interpreted as a cross-cutting instrument. However, we caution that digital tools do not automatically deliver sustainability outcomes, digitalization may also intensify commercialization pressures and deepen trust deficits.

In addition, the carbon neutrality commitment of China has brought a quick pace of interest in low carbon tourism and green destination management. According to scholars, the combination of digital innovation and sustainability governance is one of the main avenues of developing appropriate tourism development in the next decade. At present, the literature is stronger in proposing agendas than in explaining the conditions under which low-carbon and digital transitions translate into locally acceptable, culturally authentic, and environmentally bounded development.

Research Gaps

Although there is a lot of research, the existing studies are mainly dominated by quantitative studies and policy analysis, which provide minimal information on stakeholder experiences and situational processes. Qualitative studies are still required on the manner in which the concept of tourism development is perceived, bargained, and practiced by various stakeholders in China. To fill this gap, the current research design is qualitative in nature because it seeks to embrace detailed insights of the challenges and opportunities of the appropriate development of tourism.

Methodology

Research Design

This study adopts a qualitative, interpretive research design, using semi-structured interviews and document analysis to investigate the challenges and opportunities of appropriate tourism development in China. Due to the complex and context-dependent nature of tourism sustainability, that shaped by institutional arrangements, governance processes, and diverse stakeholder experiences, qualitative methods are most suitable for capturing how policies are interpreted, negotiated, and implemented in practice, and for exploring meanings and dynamics that cannot be fully revealed through quantitative approaches alone (Creswell & Poth, 2021).

Sampling and Participants

The participants were chosen as those who were directly involved or knowledgeable on tourism development and sustainability through purposive sampling and snowball sampling, starting from qualified interviewees who are friends of the first author. The sample included: 1) Provincial and municipal tourism policy makers. 2) Officials of destination management. 3) Tourism enterprise managers. 4) Tourist destination community representatives. 5) Scholars from sustainable tourism. The sampling was continued until theoretical saturation was met, that is, no new themes were obtained when new data was added (Guest et al., 2020). Accordingly, the final sample size was 32 interviewed participants, which is diverse in terms of institutional role and geography.

Data Collection

The semi-structured interviews were conducted whereby the experiences of the participants regarding tourism development, sustainability issues, governance systems, and prospects in the future were explored. The questions in the interview were dedicated to the implementation of policy, environmental management, and community engagement, and attitudes to digital and green tourism initiatives. The interviews took between 45 and 90 minutes and were carried out in Mandarin and transcribed and translated to English.

Data Analysis

The period between 2020 and 2025 was reviewed and analyzed concerning the policy documents, tourism development plans and sustainability guidelines, to contextualize the interview findings. The analysis of the documents allowed reviewing the correspondence and inconsistencies between the policy intentions and the practices on the ground (Bowen, 2009). Based on these interview and document materials, the thematic analysis was used to analyze the data, which is in line with the six-step model by Braun & Clarke (2021). This entailed the familiarization with data, initial coding, theme development, reviewing, and interpreting. The data was organized and coded with the help of NVivo software. Themes were developed continuously in order to achieve conceptual clarity and research-object alignment. To ensure analytical rigor, in order to increase the credibility, triangulation between interviews and documents was used. Member checking was carried out by providing summaries to the chosen participants to validate them. Audit trails and reflexive memos ensured the dependability and conformability (Lincoln & Guba, 1985; Korstjens & Moser, 2017).

Ethical Considerations

Data collection was aided by ethical approval before data were collected. The informed consent was given and the participants were guaranteed of confidentiality and anonymity. Every single data was safely kept and employed only in academic purposes, according to the international standards of ethics of the research.

Results

Qualitative analysis of the transcripts of interviews and policy documents produced four broad themes were used to define the current situation with the appropriate tourism development in China. All these themes are expressions of lived experiences of the participants, institutional realities, and their understanding of limitations as well as future opportunities. Although the opinions were different among stakeholders, some common trends were observed that identified the structural issues and also emerging opportunities of developing tourism in a more appropriate way.

Table 1 Summary of Findings

Theme	What reported	Key pattern	Emerging practice
Tourism governance policy implementation gaps	National sustainability intentions are diluted in local implementation due to economic performance pressures and revenue/visitor targets	Sustainability goals treated as “additional” in peak seasons/underdeveloped areas; environmental laws not applied equally; agencies work independently causing duplication and inconsistent decisions	Need for stronger coordination among tourism, environmental protection, and cultural heritage agencies; clearer accountability for consistent local enforcement
Carrying-capacity constraint and environmental pressure	Peak-season visitor volumes often exceed ecological and infrastructural carrying capacities, generating congestion, waste, water scarcity, and scenery deterioration	Carrying-capacity assessments exist but are not treated as binding limits; visitor numbers influenced by economic and political priorities	Reservation systems, time-slot ticketing, and visitor flow controls are being used in some destinations, though unevenly across regions
Inadequate community involvement and inequalities in benefit distribution	Community participation is often symbolic; residents have limited influence in planning; benefits are uneven and can trigger tension	Cultural authenticity concerns and social disruption; cultural practices altered to meet tourist expectations; big businesses/investors receive disproportionate benefits	Stronger community participation structures and fairer benefit-sharing are necessary to sustain local support and social legitimacy
New opportunities: digitization and green transition	Digital governance tools can improve efficiency, transparency, real-time monitoring, and decision-making; low-carbon tourism is rising	Destinations using smart platforms are better positioned to balance demand and environmental protection; green transport and energy-efficient accommodation gaining attention	Digital visitor monitoring and governance; integrating tourism into broader climate plans supports long-term sustainability
Divergent stakeholder perspectives	Different groups define “appropriate” tourism differently (equity vs reform/innovation vs market competitiveness)	Conflicting priorities complicate implementation and require mediation	Need to enhance dialogue processes to balance priorities and promote collective responsibility

Note: Themes were generated through thematic analysis of 32 semi-structured interviews and related policy documents. Data were coded and organized using NVivo 12, following the six-step framework of Braun and Clarke (2021). Triangulation between interview and document data enhanced analytical credibility.

Tourism Governance Policy Implementation Gaps

One of the theme that emerged strongly among the stakeholders interviews was policy intention vs local implementation. Respondents strongly recognized the fact that sustainability and suitability are greatly stressed in the national tourism strategies and development plans. These principles, however, are watered down at the local level, when they are faced with economic performance pressures. According to the local officials and destination managers, the targets of tourism development continue to be closely connected with the generation of revenue and increase in the number of visitors. Consequently, the sustainability goals are occasionally considered as an additional concern especially when the tourist seasons are in peak or in economically underdeveloped areas. Some respondents shared experiences when environmental laws were not applied equally so as not to scare off tourists or investors.

The issue of coordination between the departments of the government also increased gaps in implementation. Interviewees also reported that the tourism, environmental protection and cultural heritage agencies work independent of each other creating duplication of duties and inconsistency in decision making. This decentralized system of governance restrains the success of appropriate tourism projects and poses an uncertainty to destination managers and locals.

Carrying-Capacity Constraint and Environmental Pressure

A second theme which became critical was environmental stress particularly in scenic regions which are popular and heritage sites. Members always stated that the number of visitors often went beyond ecological and infrastructural carrying capacities during the high seasons. Through this pressure, wastes, congestions, and water scarcities, and deterioration of natural sceneries are realized. Environmental managers pointed out that scientific evaluation of carrying capacity is done in most destinations, although the evaluations are not always considered as legal limits. Rather they are often determined by economic factors and political interest in terms of visitor numbers. Some participants complained that the environmental information is not always taken into consideration because of the temporary objectives of tourism.

In spite of these, there are participants who have made positive progress in their environmental management practices. It was found that reservation system, time-slot ticketing and visitor flow controls were more common tools identified to reduce overcrowding. Nevertheless, the implementation of the measures has not been consistent across the regions, and destinations that have been well resourced are more likely to have adopted higher-quality management systems than less populated or rural ones.

Inadequate Community Involvement and Inequalities in the Distribution of Benefits

A third theme was the theme of social sustainability, especially community involvement and benefit sharing. The representatives of the community often said that the local residents do not have much say in the process of planning and development of tourism. Even though there are consultation processes held in some destinations, these were usually reported as being symbolic as opposed to being substantial. The rural and ethnic minority residents cited that development of tourism has enhanced infrastructure and opportunities of earning money, however, they also expressed concerns of cultural authenticity and social disruption. The participants observed that the traditional practices and cultural manifestations are sometimes altered to meet the expectations of the tourists resulting in the feeling of cultural commodification.

Disparity in the distribution of tourism benefits was found to be one of the major causes of tension. The small-scale operators and households believed that big tourism businesses and foreign investors are getting disproportionate portion of economic benefits. This disequilibrium

has led to loss of support of communal support to tourism projects in certain destinations compromising the social basis of appropriate tourism development. New Opportunities:

Digitization and Green Transition

Participants were optimistic about the emerging opportunities in the development of tourism despite the challenges that have been identified. The concept of digitalization was generally considered to be a revolutionary change that could enhance the efficiency and sustainability of governance. Destination managers indicated the practice of smart platforms to track visitor flows, reservations, and improve the quality of services. Some of the policymakers pointed out that digital tools enhance transparency and offer real-time information to make decisions. Such systems were seen to be specifically successful in dealing with congestion during peak season and addressing environmental hazards. The respondents observed that destinations that have embraced digital governance tools are in a better position to ensure that there is a balance between tourism demand and environmental protection.

Green transition was also noted as one of the key opportunities. Stakeholders said that the growing interest in low-carbon tourism activities, such as green transport, energy-efficient accommodation, and sustainable tourism products, were on the rise. It is also true that some destinations have started to consider tourism development in overall environmental and climatic plans and this is an indication of a change towards long-term sustainability planning.

Divergent Stakeholder Perspectives

Although similar themes were apparent, it was found that there are considerable disparities in the manner in which the stakeholder groups perceive appropriate tourism development. Community members considered equity, cultural preservation, and participation as important and policymakers identified with institutional reforms and technological innovation. Tourism enterprises usually defined suitability in relation to the demand in the market and brand competitiveness. These conflicting views bring out the fact that developing appropriate tourism development in the field is a complicated matter. The participants highlighted the necessity of enhancing dialogue processes that would allow balancing the opposing priorities and promote collective responsibility among the stakeholders.

Summary

Overall, the findings show that the ideal tourism development in China is hampered by lack of cohesion in governance, environmental strains, and empowerment of local communities. Meanwhile, digital innovation and the green transition provide a bright future of better sustainability outcomes. These results form a solid empirical basis on the further discussion which will explain the findings relative to theory, policy frameworks and the wider discussion of sustainable tourism development.

Table 2 Cross-theme Synthesis

Cross-cutting issue	What the findings show	Stakeholder emphasis	What is needed next
Policy-to-practice inconsistency	Sustainability is strong in national intent but uneven in local enforcement due to economic pressures and fragmented governance	Policymakers: institutional reforms and technological innovation; officials/managers: performance and feasibility	Better interdepartmental coordination and consistent enforcement mechanisms
Environmental pressure in peak seasons	Visitor numbers exceed carrying capacities; capacity assessments not treated as legal limits	Environmental managers: ecological limits; destination managers: operational tools	Wider and more consistent implementation of reservation/time-slot and flow controls, supported by evidence-based decision-making
Social legitimacy and benefit distribution	Community participation is limited; benefits are unequal; cultural commodification reduces support	Community: equity, cultural preservation, participation	Stronger participation and benefit-sharing mechanisms to reduce tension and improve support
Pathways for improvement	Digital governance and green transition are viewed as practical opportunities	Managers/policymakers: smart platforms, transparency; stakeholders: low-carbon options	Scaling up digital monitoring/decision tools and embedding low-carbon tourism into planning
Coordination across priorities	Stakeholders define “appropriate” tourism differently	Enterprises: market demand and brand competitiveness; community: equity/culture; policymakers: reforms	Enhanced dialogue processes to balance priorities and build collective responsibility

Note: Themes were generated through thematic analysis of 32 semi-structured interviews and related policy documents. Data were coded and organized using NVivo 12, following the six-step framework of Braun and Clarke (2021). Triangulation between interview and document data enhanced analytical credibility.

Discussions

This study is different from much of the existing tourism researches in aspect of using a multi-stakeholder qualitative approach, thus to explain how “appropriate tourism development” is interpreted and implemented in practice. The results indicate that although China has achieved a lot in entrenching the concept of sustainability into the policy systems in the tourism industry, there are still serious structural, environmental, and social constraints that limit the implementation of the concept. The application of such results in the literature on the sustainability and management of tourism in the contemporary world offers significant understanding of the challenges of shifting to appropriate tourism development in the Chinese environment.

Improving Tourism Governance

The specified policy-implementation gap can be described as the ongoing conflict between the central sustainability-related goals and local economic interests. The identified finding supports previous studies that have suggested that disjointed governance arrangements negatively affect the effective implementation of the sustainable tourism performance in China (Zhou & Jiang, 2022; Li et al., 2020). Even though the national strategies are rather powerful in the ecological civilization and appropriate tourism, the local governments are often motivated by the short-term growth pointers, which restrict their attention to the long-term sustainability (Zhang et al., 2020). Governance wise, the outcome of these findings points to the weaknesses of top-down policy strategies in the absence of institutional fit and accountability systems (Signé, 2025). According to Xu and Sofield (2016), sustainable tourism governance needs a multi-level coordination and joint responsibility of stakeholders. The current results build upon this argument by showing how the departmental roles charged with the responsibility of enforcing its functions are fractured to introduce ambiguity in destination management.

Supporting Sustainable Tourism Policy

The issues of environmental pressure and carrying-capacity that are found in this research are closely related to the issues voiced in the recent studies in tourism sustainability. According to Wu & Liang (2023), ecological inefficiency caused by tourism is one of the key concerns in China, especially in the most popular places. This observation that scientific evaluations are often constructed by economic factors highlights the challenge of trying to balance conservation against tourism development. But with the advent of reservation systems and visitor flow management, there is a hint of progressive change into more adaptive environmental management. According to the over tourism management is proactive, which means that the institution must be willing to impose limits at the expense of fewer visitors. According to the current research, the said mechanisms are on the rise but their success relies on regular implementation and political backing (Dodds & Butler, 2019).

Benefiting Local Communities

Local community involvement is key to tourism development. Poor community involvement and inequality in distribution of benefits are the key barriers to appropriate development of tourism. Such results are in line with the existing literature in which community engagement in China seems to be consultative, but not participative (Wei et al., 2024). In the absence of any significant involvement in the decision-making process, the local people will find tourism as an imposed process and this will undermine social sustainability. The commodification of culture which the participants reported is part of the larger issues of

authenticity and cultural conservation in tourism. According Suriyankietkaew et al. (2025), appropriate tourism should observe cultural values of the neighbourhood but should facilitate economic growth. The current results indicate that the balance of this should be facilitated by providing more institutional protection and community empowerment systems, especially in ethnic minority populations and rural regions (Khalid et al., 2019).

Governance Innovation

The role of digitalization in the development of appropriate tourism is also one of the largest opportunities discovered during this research. The effectiveness of smart tourism platforms is perceived as a basis to argue that digital governance should be increased to provide a greater degree of transparency, monitoring, and decision-making (Gretzel et al., 2015; Li et al. (2024). The digital tools also provide the management of visitor flows and environmental risks in real time, providing viable solutions to the sustainability issues that have been developed over time. Nevertheless, digital transformation is not to be regarded as an isolated solution (Ljubisavljević et al., 2025; Parra-Sanchez & Viviescas-Jaimes, 2024). To ensure technological innovation yields significant sustainability results, it should be incorporated into the supportive institutional structures, as Li et al. (2024) warn. The current results unveil the relevance of combining digital tools and participatory governance and policy enforcement. However, the observed division of governance and implementation gaps suggest that technological upgrades alone cannot overcome institutional fragmentation. Another recent study delving into green digital supply chains reveals that one of the key driving mechanisms linking digital transformation to eco-innovation and sustainable corporate conduct is the fidelity of inter-organizational collaboration (Wang & Zhang, 2024). In this sense, inter-organizational cooperation moderates the relationship between digital implementation and sustainability outcomes, transforming digital governance from a technical instrument into a systemic driver of eco-innovation and cross-sector integration.

Long-Term Sustainability

The determination of China to be carbon neutral and green gives it a good policy environment where sustainable tourism development can take place. As Xu et al. (2022) highlight, ecological civilization provides a normative basis on how tourism should be harmonized with environmental goals. The results of the study can be interpreted as implying that destinations that incorporate tourism planning and a larger scale of climate and environmental planning are in a better position to attain long-term sustainability (Joseph, 2025). However, going into low-carbon tourism necessitates concerted investment, regulation and behavioral shift among tourists and businesses. It is hoped that without discussing the concerns of governance and equity, green efforts will remain mere symbols instead of revolutionary.

Conclusion and suggestions

Summary

In summary, the discussion indicates that the appropriate development of tourism in China is at a cross-road. Although fragmentation of governance, environmental stress and lack of community involvement still weigh down, there are hopeful avenues ahead with digital innovation and green policy undertaking. To achieve these opportunities, there will be need to establish integrated governance, inclusive stakeholder participation and long term political will on sustainability, especially where economic growth demands are concerned.

Conclusion

This study has conducted a qualitative research design by analyzing appropriate tourism development in China on the perception of stakeholders to the challenges and future opportunities. The results prove that sustainability and suitability are deep-rooted in the national tourism policies, but their implementation at the destination level are hindered by the lack of unity in the governance system, the strains on the environment, and the lack of community empowerment. These issues indicate the difficulty of the shift of growth-based tourism models to more balanced and context-based development directions. The study demonstrates that the appropriate tourism development in China is not just a technical or managerial problem but a process of governance which is influenced by institutional incentives, power relations and conflicting priorities of various stakeholders. Although the necessity of environmental protection and cultural preservation has become a common ideology, economic needs take the centre stage in the decision making processes of the locals. This stress is detrimental to long-term sustainability and helps to create unequal results in different regions. Simultaneously, the study also finds significant opportunities in the further evolution of the appropriate tourism development. Online governance solutions, smart tourism systems, and green development projects are also gradually regarded as efficient ways to enhance visitor management, environmental surveillance, and policymaking. Also, the ecological civilization and carbon neutrality of China can offer an enabling policy environment to integrate tourism into wider sustainability goals. Summing up, the study meets the requirement of the tourism sustainability literature as it provides detailed qualitative information on the meaning of the concept of suitable tourism development as well as its application in China. It highlights the necessity of combined governance, stakeholder involvement, and flexible policy frameworks in order to have economically viable, environmentally concerned and socially fair tourism development.

Limitations

This study has numerous limitations even though it has contributed. To begin with, both the qualitative type of design and purposive sampling methodology restrict the generalizability of the results to the other groups of stakeholders and destinations that are studied. Although the research is deep and full of context, the future researchers may supplement the findings with quantitative or mixed-method large-scale studies. Second, the kinds of data that were utilized were mostly interviews and document analysis and this can be prone to bias and chip-swallowing especially among the policy makers and authorities. Even though triangulation was used, not all the perspectives were incorporated like the tourists. Lastly, policy and governance dynamics were of interest to the study and not a thorough analysis of the environmental or economic impacts. Future studies might incorporate longitudinal and cross-regional studies to further the insight into adequate tourism development results in various forms of destinations in China.

New knowledge and the effects on society and communities

Policy and local community level

This qualitative study explains how challenges and opportunities of appropriate tourism development in China play out under multi level governance and destination realities. The findings send a clear signal for policy and practice. Governance must redefine success. If local evaluation still rewards short term income and visitor numbers, sustainability stays symbolic. Indicators should include ecological pressure, heritage conservation, and community benefit, backed by clear accountability and strong interdepartment coordination. Destination management should also be more scientific. Carrying capacity evidence should guide visitor limits, route design, and peak season controls, supported by digital platforms for real time monitoring and rapid response. Community participation must go beyond consultation. Communities should join planning, oversight, and benefit sharing through stable local mechanisms and continuous capacity building. Enterprises also need to meet rising expectations. Service quality alone is not enough. Environmental responsibility and genuine respect for local culture shape reputation and trust.

User level example

Appropriate tourism in the digital age also depends on tools that reduce language and cultural barriers and support social harmony. For international visitors, a multilingual chatbot in WeChat or Alipay can explain local etiquette, translate short messages with homestay hosts, and recommend community run shops and low impact routes based on crowd levels. When the AI feels competent and warm, visitors feel safer, ask more, and make fewer cultural mistakes, which strengthens connection with the local community brand. For Chinese domestic tourists, especially older travelers, Doubao can offer voice based planning. Users can speak to plan routes, ask how to take buses or buy tickets, and receive reminders to visit sensitive sites at quieter times and follow low impact paths. This voice support reduces confusion and gently guides behavior, making respectful interaction with local residents more likely. Thus, to this extent, this study also shows that technology can function as an engagement driver by making culturally appropriate behavior easier, and by supporting small everyday interactions that build trust between tourists and local communities.

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The Causal Relation Model of Job Satisfaction of Art and Design Teachers in Shanxi Province

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Abstract

The objectives of this study are: 1) to investigate the factors influencing the job satisfaction of art and design teachers in Shanxi Province, and 2) to explore guidelines for enhancing their job satisfaction. The research employs a mixed-method approach, combining qualitative interviews and quantitative survey analysis, collecting data from 443 art and design teachers from the top 20 universities in Shanxi Province.

The results indicate that organizational culture, transformational leadership, and psychological empowerment have a significant positive impact on job satisfaction. Notably, psychological empowerment indirectly enhances job satisfaction by strengthening professional identity. Structural Equation Modeling (SEM) analysis shows that the model fits well, with all indicators meeting statistical standards.

The study suggests that university administrators should strengthen psychological empowerment, foster a positive organizational culture, and enhance teachers' professional identity through transformational leadership to improve job satisfaction.

Keywords: Art and design teachers, Job satisfaction, Professional identity, Organizational culture, Transformational leadership, Psychological empowerment

Introduction

The development of the teaching workforce is the cornerstone of higher education. In recent years, China has prioritized this as a key focus in its efforts to build a strong education system. Both the State Council and the Ministry of Education have introduced policies emphasizing the enhancement of teachers' well-being and status to stimulate the enthusiasm and professional identity of university teachers (State Council, 2018). Job satisfaction among university teachers is regarded as a critical factor influencing the quality of education. This is especially true for art and design teachers, who, due to the flexible and creative nature of their work, often face unfair treatment, leading to burnout and low professional identity (Brown et al., 2017; Yuan & Dizon, 2024).

Despite the increasing attention from the Party and the state to art education, systematic research on the job satisfaction of art and design teachers remains limited. Existing studies mostly draw on international experiences, lacking relevance and practical guidance (Deng, 2025; Yumei & Yee, 2025; Jayanti et al., 2024). Therefore, this study focuses on the individual internal resources of art and design teachers and aims to explore the mechanisms affecting their job satisfaction. By reviewing relevant literature, this research constructs a theoretical model

examining the relationships between organizational culture, transformational leadership, psychological empowerment, and job satisfaction, and empirically tests it using Structural Equation Modeling (SEM). The goal is to provide theoretical support and practical guidance for improving the job satisfaction of art and design teachers.

Research Objectives

RO1: To investigate the factors influencing the job satisfaction of art and design teachers in Shanxi Province.

RO2: To explore guidelines for enhancing the job satisfaction of art and design teachers in Shanxi Province.

Methodology

Research Design

This section is divided into three phases. The first phase is a quantitative study, in which job satisfaction data from art and design teachers at universities in Shanxi Province is collected through a survey. The data is then processed and modeled using statistical analysis methods to determine the relationships between variables. The second phase is a qualitative study, conducted through in-depth interviews to further explore and understand the key factors identified in the first phase of the quantitative research. This phase provides more detailed evidence for the development of subsequent strategies. The third phase involves comprehensive analysis and strategy formulation, integrating both quantitative and qualitative data from the previous phases to ultimately develop practical guidelines for improving teacher job satisfaction.

Sample Selection

The subjects of this study are art and design teachers in Shanxi Province. To ensure the representativeness of the sample, stratified random sampling was used to select art and design teachers from 20 different universities. The sample includes teachers with different titles and years of teaching experience to cover a diverse range of backgrounds and experiences (Babbie, 2020).

There are 5 latent variables and 19 observable variables (each observable variable includes 1-3 questions), with 41 questions in total. Based on this data, the sample size was determined using a rule of thumb, which suggests selecting 10 samples per question for analysis (Kline, 2015; Tabachnick & Fidell, 2013). The final sample size was calculated as follows:

Sample size: 41 questions \times 10 samples per question = 410 samples.

This sample size was chosen to ensure that sufficient and high-quality data could be obtained to support in-depth research and understanding of the complex relationships between latent variables.

Data Collection

The data collection process was supported by Southeast Asia University, Thailand, and followed these general steps:

First, the researcher prepared an official letter from Southeast Asia University to request cooperation from the top 20 ranked universities in Shanxi Province, such as Shanxi Media College, Changzhi College, Jinzhong College, and Yuncheng College, to assist in conducting surveys and in-depth interviews.

Next, the researcher submitted the survey and interview guide along with the cooperation request letter to the universities in Shanxi Province. Coordinators from each university followed up on the progress of data collection to ensure that the specified number of qualified questionnaires and key respondents' information were obtained.

During the data collection process, the researcher checked the completeness of the returned questionnaires

and analyzed the data using statistical analysis programs. The data from both the questionnaires and interviews were integrated to develop guidelines for improving the job satisfaction of art and design teachers in Shanxi Province.

Data Processing and Analysis

This process is divided into three parts. The first part involves analyzing personal factors and key variables of the respondents. This includes an analysis of the respondents' basic demographic information and the factors affecting job satisfaction among art and design teachers in Shanxi Province. The analysis used frequencies and percentages, arithmetic mean (M), standard deviation (SD), skewness, and kurtosis to assess personal factors and key variables. The second part involves analyzing the causal relationship model, primarily using hypothesis testing and covariance-based structural equation modeling (SEM) to analyze the relevant data and draw conclusions. The third part focuses on the analysis of interview data and the development of guidelines. This part further explores the data results and ultimately formulates guidelines to improve the job satisfaction of art and design teachers in Shanxi Province.

Research Conceptual Model

This study proposes a conceptual model to explore the influence of organizational culture, transformational leadership, and psychological empowerment on the job satisfaction of art and design teachers in Shanxi Province. Figure 1 presents the structure of this model, showing the relationships between variables.

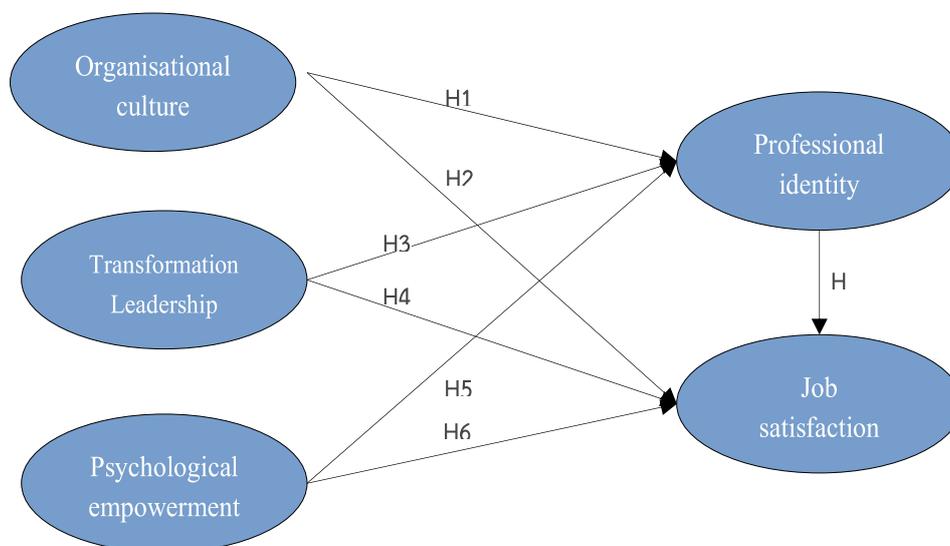


Figure 1 Research Conceptual Model (Source: Researcher, 2025)

Results

Quantitative Method

Factors Influencing the Job Satisfaction of Art and Design Teachers in Shanxi Province
Using AMOS, a structural equation model (SEM) was constructed. The independent variables include organizational culture (spiritual culture, material culture, and institutional culture), transformational leadership (leadership charisma, individualized consideration, inspirational motivation, idealized influence), and psychological empowerment (meaningfulness of work, autonomy, self-efficacy, and impact at work). The mediating variable is professional identity (professional values, sense of professional belonging), and the dependent variable is job satisfaction (the work itself, relationship with leadership, relationship with colleagues, compensation, promotion opportunities, and overall satisfaction). This model was tested to examine the relationships between these variables.

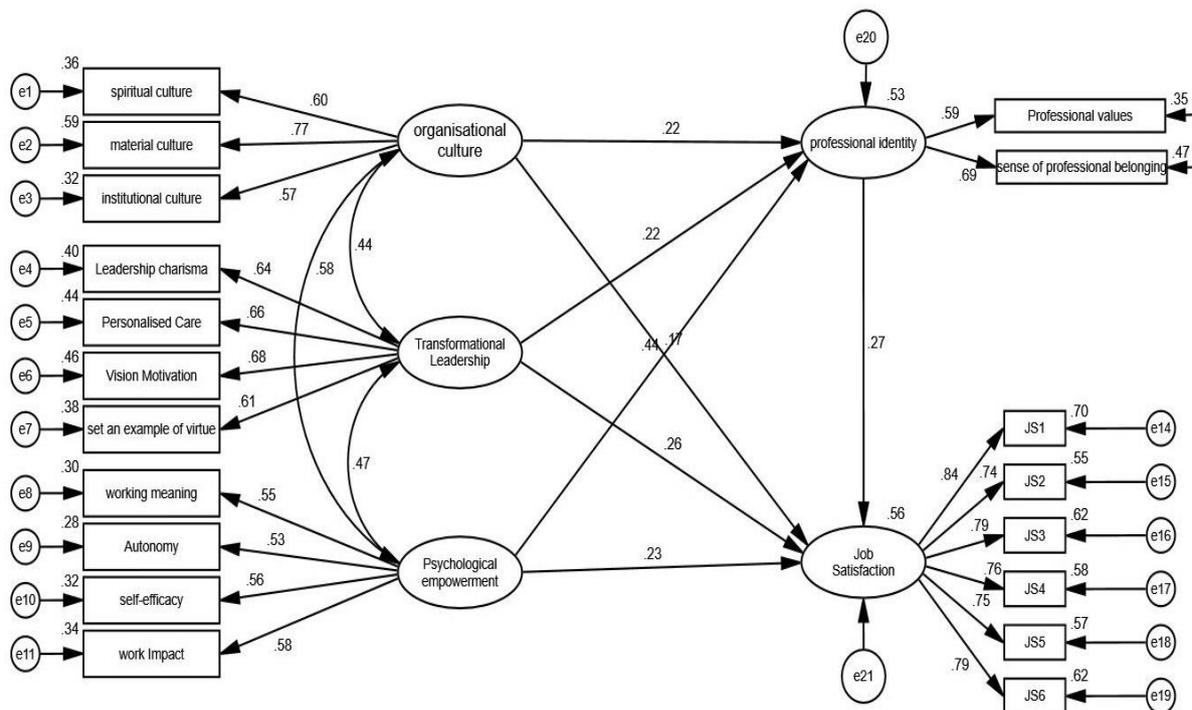


Figure 2 The Structural Equation Model of Job Satisfaction for Art and Design Teachers in Shanxi Province (Source: Researcher, 2025)

Table 1 Model Fit Indices for the Causal Relationship Model of Job Satisfaction among Art and Design Teachers in Shanxi Province

Index	χ^2	df	χ^2/df	GFI	RMSEA	RMR	CFI	NFI	TLI
judgment criteria	-	-	<3	>0.9	<0.08	<0.05	>0.9	>0.9	>0.9
measurement result	162.871	142	1.147	0.962	0.018	0.030	0.993	0.946	0.991

The table above presents the model fit indices, where $\chi^2/df = 1.147$, GFI = 0.962, RMSEA = 0.018, CFI = 0.993, NFI = 0.946, and LI = 0.991. All indices meet the acceptable standards, indicating that the model fits well.

Table 2 Summary of Regression Coefficients in the Causal Relationship Model of Job Satisfaction among Art and Design Teachers in Shanxi Province

	Path		Estimate	Std. Error	C.R.	P	Estimate
PI	<---	OC	0.232	0.1	2.313	0.021	0.225
PI	<---	TL	0.214	0.08	2.658	0.008	0.219
PI	<---	PE	0.47	0.123	3.836	***	0.436
JS	<---	PI	0.433	0.163	2.663	0.008	0.268
JS	<---	OC	0.288	0.119	2.425	0.015	0.172
JS	<---	TL	0.409	0.099	4.13	***	0.258
JS	<---	PE	0.395	0.159	2.479	0.013	0.226

The table above presents the regression coefficients in the causal relationship model. Specifically, the standardized path coefficient for OC → PI is 0.232, with a p-value less than 0.05, indicating a significant positive impact of OC on PI; the standardized path coefficient for TL → PI is 0.214, with a p-value less than 0.05, indicating a significant positive impact of TL on PI; the standardized path coefficient for PE → PI is 0.47, with a p-value less than 0.05, indicating a significant positive impact of PE on PI. Additionally, the standardized path coefficient for PI → JS is 0.433, with a p-value less than 0.05, indicating a significant positive impact of PI on JS; the standardized path coefficient for OC → JS is 0.288, with a p-value less than 0.05, indicating a significant positive impact of OC on JS; the standardized path coefficient for TL → JS is 0.409, with a p-value less than 0.05, indicating a significant positive impact of TL on JS; and the standardized path coefficient for PE → JS is 0.395, with a p-value less than 0.05, indicating a significant positive impact of PE on JS.

Table3 Summary of Mediation Effects of Organizational Culture on Job Satisfaction

Effect type	Path	Estimate	Lower	Upper	P
Direct effect	organisational culture -->Job Satisfaction	0.288	0.009	0.581	0.044
Indirect effect	Organisational culture-->professional identity-->Job Satisfaction	0.101	0.011	0.33	0.021
Total effect	organisational culture-->Job Satisfaction	0.388	0.113	0.692	0.005

The table above presents the results of the mediating effect of organizational culture on job satisfaction. Specifically, the direct effect (the path coefficient of organizational culture on job satisfaction is 0.288, p = 0.044), the indirect effect (the path coefficient of organizational culture on job satisfaction through professional identity is 0.101, p = 0.021), and the total effect (the total path coefficient of organizational culture on job satisfaction is 0.388, p = 0.005) are all significant, indicating that there is a partial mediating effect of organizational culture on job satisfaction.

Table 4 Summary of Effect Size Results for Mediation of Transformational Leadership

Effect type	Path	Estimate	Lower	Upper	P
Direct effect	Transformational Leadership-->Job Satisfaction	0.409	0.174	0.684	0.003
Indirect effect	Transformational Leadership-->professional identity-->Job Satisfaction	0.093	0.015	0.303	0.01
Total effect	Transformational Leadership-->Job Satisfaction	0.502	0.276	0.765	0

The table above presents the results of the mediating effect of transformational leadership on job satisfaction. Specifically, the direct effect (the path coefficient of transformational leadership on job satisfaction is 0.409, $p = 0.003$), the indirect effect (the path coefficient of transformational leadership on job satisfaction through professional identity is 0.093, $p = 0.01$), and the total effect (the total path coefficient of transformational leadership on job satisfaction is 0.502, $p = 0$) are all significant, indicating that there is a partial mediating effect of transformational leadership on job satisfaction.

Table 5 Summary of Effect Size Results for Mediation of Psychological Empowerment

Effect type	Path	Estimate	Lower	Upper	P
Direct effect	Psychological empowerment--> Job Satisfaction	0.395	0.052	0.752	0.032
Indirect effect	Psychological empowerment--> professional identity--> Job Satisfaction	0.204	0.064	0.538	0.004
Total effect	Psychological empowerment--> Job Satisfaction	0.598	0.319	0.928	0.001

The table above presents the results of the mediating effect of psychological empowerment on job satisfaction. Specifically, the direct effect (the path coefficient of psychological empowerment on job satisfaction is 0.395, $p = 0.032$), the indirect effect (the path coefficient of psychological empowerment on job satisfaction through professional identity is 0.204, $p = 0.004$), and the total effect (the total path coefficient of psychological empowerment on job satisfaction is 0.598, $p = 0.001$) are all significant, indicating that there is a partial mediating effect of psychological empowerment on job satisfaction.

Qualitative Method

Guidelines for Enhancing Job Satisfaction among Art and Design Teachers in Shanxi Province

Based on the interview results, regarding the nature of the work itself, the interviewed teachers generally expressed satisfaction with their job content, finding it challenging and engaging, and aligned with their professional backgrounds. In terms of relationships with leadership, there was a positive attitude towards the supportiveness and openness of school leaders, with teachers believing that the leaders' communication and management styles contribute to enhancing job satisfaction. Regarding relationships with colleagues, most teachers expressed satisfaction with the relationships and collaboration among colleagues, noting that the team atmosphere is positive and facilitates smooth communication and cooperation in their work. In terms of compensation, a small number of teachers expressed dissatisfaction with their pay and benefits, believing that the salary levels are low or the benefits insufficient. Regarding promotion opportunities, most teachers reported a certain level of satisfaction with the internal promotion opportunities within the school, although some felt that the promotion prospects were limited, impacting their overall job satisfaction. In relation to organizational culture and leadership style, there was a consensus that the school's spiritual, material, and institutional cultures are significant factors influencing job satisfaction. Teachers hope that the school can establish a more positive and cohesive organizational culture, and exhibit more personal charm and care for teachers in their leadership style. In terms of psychological empowerment, teachers generally feel that their work is meaningful, believe they can demonstrate their abilities and influence in their jobs, and have a certain degree of autonomy at work. Regarding professional identity, teachers expressed pride in their profession and recognize the importance and value of art and design education.

Table 6 Hypothesis Testing Results in the Causal Relationship Model of Job Satisfaction among Art and Design Teachers in Shanxi Province

Hypotheses	Item	path coefficient	Accepted/Reject
H1	Organizational culture positively affects professional identity among art and design teachers.	0.021	Accepted
H2	Organizational culture positively affects job satisfaction among art and design teachers.	0.015	Accepted
H3	Transformational leadership positively affects the professional identity of art and design teachers.	0.008	Accepted
H4	Transformational leadership positively affects the job satisfaction of art and design teachers.	***	Accepted
H5	Psychological empowerment positively affects the professional identity of art and design teachers.	***	Accepted
H6	Psychological empowerment positively affects the job satisfaction of art and design teachers.	0.013	Accepted
H7	Professional identity among art and design teachers positively affects job satisfaction.	0.008	Accepted

Discussions

This study provides new insights into understanding the complex mechanisms of job satisfaction among art and design teachers in Shanxi Province. The following is a detailed discussion of the research findings, aligning them with the research objectives and hypotheses, addressing the limitations of the study, and offering practical and future research recommendations.

1. Alignment of Research Findings with Hypotheses

First, the study found a significant direct impact of professional identity on job satisfaction, validating Hypothesis H7: Professional identity positively influences job satisfaction. This finding is consistent with previous research (Lu et al., 2019; Chaban et al. (2021) and further confirms the role of professional identity as an important predictor of job satisfaction. Second, organizational culture has a significant direct impact on job satisfaction and indirectly influences job satisfaction through professional identity, supporting Hypothesis H2: Organizational culture indirectly influences job satisfaction through professional identity. This indicates that organizational culture not only directly enhances teachers' job satisfaction but also further improves job satisfaction by strengthening their professional identity. This aligns with the findings of Sirait et al. (2022); Mgaiwa (2023); Sothinathan et al. (2024), emphasizing the critical role of organizational culture in shaping teachers' professional identity.

Moreover, the study validated the impact of transformational leadership on teachers' job satisfaction, supporting Hypotheses H3 and H4. Transformational leadership not only has a direct effect on job satisfaction but also indirectly influences job satisfaction through professional identity. This finding expands transformational leadership theory (Bass, 1985) and provides empirical support for the application of leadership in educational settings.

The research also verified the influence of psychological empowerment on job satisfaction, supporting Hypotheses H5 and H6. Psychological empowerment not only directly affects job satisfaction but also influences job satisfaction by enhancing professional identity. This indicates that the role of psychological empowerment in improving teachers' job satisfaction should not be overlooked.

2. Limitations of the Study

Despite the valuable insights provided by this study, there are some limitations. First, the sample was drawn only from art and design teachers in Shanxi Province, which may limit the generalizability of the findings. Future research could consider expanding the sample range to include teachers from other provinces or different types of educational institutions to enhance the external validity of the results.

Second, the cross-sectional design used in this study limits causal inferences. Although we analyzed the relationships between variables using structural equation modeling, future research could employ longitudinal designs to more accurately capture causal relationships and dynamic changes among variables.

3. Practical Implications and Future Research Suggestions

The findings of this study have significant practical implications. First, educational administrators should prioritize enhancing teachers' professional identity, as this factor significantly influences teachers' job satisfaction. Second, improving organizational culture and leadership styles can indirectly enhance teachers' job satisfaction. These findings provide concrete suggestions for higher education management, such as strengthening transformational leadership capabilities through training and development programs and fostering a supportive organizational culture.

Conclusion and suggestions

This study constructs and empirically tests a causal relationship model of job satisfaction among art and design teachers in Shanxi Province. The findings confirm that organizational culture, transformational leadership, and psychological empowerment exert both direct and indirect effects—through professional identity on job satisfaction.

The following key conclusions can be drawn:

1. Professional identity significantly enhances job satisfaction, acting as a key mediator in the model.
2. Organizational culture positively shapes both professional identity and job satisfaction, underscoring the importance of fostering a supportive and value-aligned environment.
3. Transformational leadership has a notable impact on strengthening professional identity and job satisfaction, highlighting the value of leadership styles that inspire and empower teachers.
4. Psychological empowerment significantly contributes to both professional identity and job satisfaction, emphasizing the role of autonomy, meaningfulness, and self-efficacy.

Practical Suggestions

1. Universities should invest in building a positive and cohesive organizational culture that supports professional identity and satisfaction.
2. Leadership development programs should be implemented to cultivate transformational leadership competencies among academic leaders.
3. Enhancing teachers' psychological empowerment through opportunities for professional growth, autonomy, and meaningful engagement should be prioritized.
4. Policy-makers and educational administrators should recognize the unique needs of art and design teachers and tailor support programs accordingly.

Recommendations

Based on the findings of this study, future research could explore the following directions:

1. Further analyze other potential mediating and moderating variables, such as work stress and career development opportunities, which may influence the mechanisms of job satisfaction.

2. Conduct comprehensive studies that combine quantitative and qualitative methods to reveal more detailed mechanisms and practical nuances.

3. Perform comparative studies across different regions with varying cultural backgrounds to expand the understanding of teacher job satisfaction.

In summary, this study provides theoretical and practical contributions to understanding and enhancing job satisfaction among art and design teachers, but further exploration and validation of these findings are needed in future research.

New knowledge and the effects on society and communities

This research contributes new theoretical and practical knowledge in several ways

1. Theoretical Contribution: It extends existing models of job satisfaction by integrating professional identity as a key mediator, especially in the under-researched domain of art and design education in China.

2. Methodological Contribution: The study combines quantitative SEM analysis with qualitative insights, offering a more nuanced understanding of the dynamics affecting job satisfaction in this specific teaching context.

3. Practical Contribution for Society and Communities : Improved job satisfaction among art and design teachers can lead to better educational outcomes, fostering creativity, innovation, and cultural literacy in the wider community. A supportive academic environment can help retain talented educators, ensuring the sustainable development of art and design education in Shanxi Province and beyond. The findings can inform policymakers and educational leaders in designing targeted interventions that enhance teacher well-being and professional commitment, contributing to societal progress through education.

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Determinants of Quality of Life among Older Adults Living in Agricultural Communities in Nakhon Si Thammarat, Thailand

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Abstract

This cross-sectional analytical study examined the quality of life (QoL) and its associated determinants among 381 older adults residing in agricultural communities in Nakhon Si Thammarat, Thailand, using the WHOQOL-OLD instrument. The study aimed to examine domain-specific patterns of QoL and to identify the sociodemographic, health, lifestyle, and psychosocial determinants associated with each WHOQOL-OLD domain in rural agricultural settings. Descriptive statistics were used to summarize participant characteristics, and multivariate linear regression models were applied to determine the independent predictors of each QoL domain.

The sample was predominantly female (51.40%), with most participants aged 60–69 years (57.70%) and 79.00% reporting at least one chronic illness. Poor QoL was most prevalent in the Sensory Abilities (57.22%) and Death and Dying (60.37%) domains, reflecting age-related sensory decline and heightened mortality concerns common in agricultural environments. In contrast, higher levels of good QoL were observed in Past–Present–Future Activities (51.44%) and Intimacy (48.29%), highlighting strong engagement in meaningful roles and close social bonds. Regression analyses indicated that sociodemographic factors (higher education and income), health factors (absence of chronic illness), lifestyle factors (regular physical activity and adequate sleep of 7–8 hours), and psychosocial factors (strong family relationships) were significantly associated with multiple QoL domains. Chronic illness emerged as a strong negative predictor, particularly in the Sensory Abilities, Social Participation, and Death and Dying domains. These findings demonstrate the multidimensional influence of sociodemographic, health, lifestyle, and psychosocial determinants on the well-being of older adults.

This study contributes new knowledge by applying the WHOQOL-OLD framework within agricultural communities, a population underrepresented in aging research. The findings highlight key modifiable factors influencing domain-specific QoL and offer practical implications for community health planning, chronic disease management, and family-centered support strategies to promote healthy and meaningful aging in rural agricultural settings.

Keywords: Quality of life, Older adults, WHOQOL-OLD, Agricultural communities, Rural aging

Introduction

Population aging is one of the most significant demographic transitions worldwide (Zubiashvili & Zubiashvili, 2021). According to the United Nations (2025), the global population aged 60 years and over continues to grow rapidly, with projections indicating sustained acceleration in low- and middle-income countries. Thailand has officially entered a super-aged society, with more than 20% of its population aged 60 years and above (Department of Older Persons of Thailand, 2025). Similar to many Southeast Asian countries, Thailand is experiencing a rapid rise in the proportion of older adults, particularly in rural provinces (Teerawichitchainan, 2020; Anantanasuwong, 2021), where a substantial number of older adults remain economically active in agricultural occupations.

Agricultural communities represent a vulnerable context for aging, as older adults frequently engage in physically demanding labor, face prolonged exposure to environmental hazards, and encounter constraints in accessing healthcare and formal social protection systems. Recent national reports further indicate that many rural older adults continue working beyond retirement age due to income insecurity and limited pension coverage (Conway et al., 2022).

Quality of life (QoL) has become a central indicator in gerontology, encompassing physical, psychological, social, and environmental dimensions of well-being. To address age-specific assessment needs, the World Health Organization (WHO) developed the WHOQOL-OLD module, which evaluates six domains relevant to later life: Sensory Abilities (SAB), Autonomy (AUT), Past–Present–Future Activities (PPF), Social Participation (SOP), Death and Dying (DAD), and Intimacy (INT) (Kangwanrattanakul, 2025; Eser et al., 2022). The instrument has been widely validated across cultures and is recognized for its sensitivity to functional and psychosocial changes in older populations. Within agricultural aging contexts, QoL challenges emerge across four interrelated dimensions: physical (e.g., chronic illness and sensory decline), psychological (e.g., mortality concerns and emotional stress), social (e.g., changing family roles and community participation), and environmental (e.g., occupational hazards and limited healthcare access). Understanding the interaction among these dimensions is essential for designing context-sensitive interventions.

The World Health Organization's Global Action Plan on Ageing and Health and the Decade of Healthy Ageing (2021–2030) emphasize functional ability, autonomy, and social participation as core components of healthy aging. Despite this global agenda, empirical evidence examining domain-specific QoL determinants within agricultural populations remains limited. By applying the WHOQOL-OLD framework in rural agricultural communities, the present study contributes to this agenda by identifying context-specific determinants that may inform targeted policy and community-level interventions.

Although previous studies in Thailand have examined QoL among older adults, research focusing specifically on agricultural communities remains limited. This gap is particularly evident in studies conducted in the southern region (Nutley, 2025). Older adults in fruit-growing, rubber-tapping, and mixed-farming systems may face distinct risks, including climate instability, fluctuating market prices, musculoskeletal strain, and pesticide exposure, all of which may influence QoL across multiple domains (Shukla et al., 2024; Li et al., 2025). Yet, empirical evidence capturing how these contextual factors affect different dimensions of QoL is still scarce. While these agricultural and environmental risks are well documented, their influence on quality of life is unlikely to operate directly; rather, it is mediated through broader socioeconomic constraints, health burdens, lifestyle adaptations, and psychosocial dynamics. For example, unstable agricultural income may compromise financial security, prolonged physical labor may accelerate chronic disease development, and environmental stressors may

disrupt sleep patterns and reshape family roles. Accordingly, examining QoL through these determinant categories offers an integrated framework for understanding how agricultural contexts translate into domain-specific well-being outcomes.

Addressing this gap is critical for guiding region-specific health promotion programs, community-based interventions, and policies aimed at improving well-being among older adults who remain active in agricultural work. Therefore, this study aimed to examine domain-specific patterns of quality of life among older adults living in agricultural communities in Nakhon Si Thammarat Province and to identify the sociodemographic, health, lifestyle, and psychosocial determinants associated with each WHOQOL-OLD domain.

Methodology

Study Design and Setting

A cross-sectional study was conducted among older adults living in agricultural communities in Lansaka District, Nakhon Si Thammarat Province, located in the southern region of Thailand. This area is predominantly rural, with fruit farming and mixed agriculture as the major economic activities, and has a high proportion of elderly residents (Provincial Social Development and Human Security Office, Nakhon Si Thammarat, 2023).

Sample Size Calculation

The sample size was calculated using the Taro Yamane formula at a 95% confidence level and 0.05 precision (Yamane, 1967). Based on an elderly population of approximately 7,611 individuals in the district, a total of 381 older adults were included, which exceeded the minimum required sample size and ensured adequate statistical power.

Participants and Sampling Procedures

A multistage sampling technique was employed, consistent with established methods used in population-based community studies (Nouri et al., 2018). The sampling process involved four sequential steps. First, Lansaka District was purposively selected due to its high concentration of older adults engaged in agricultural work. Second, subdistricts and villages within the district were selected using stratified random sampling to ensure proportional representation across areas. Third, households within each selected village were chosen through simple random sampling. Finally, one eligible older adult from each sampled household was invited to participate in the study.

Inclusion Criteria and Exclusion Criteria

Inclusion criteria required participants to be aged 60 years or older, have resided in the community for at least one year, be able to communicate in Thai, and be actively and continuously engaged in agricultural work as their primary occupation.

Exclusion criteria included severe cognitive impairment, terminal illness, or any physical or mental condition that prevented participation in the interview process. Cognitive status was assessed prior to data collection by trained research assistants using structured observation of orientation to person, time, and place, as well as the participant's ability to comprehend questions and provide coherent responses. Individuals who were unable to demonstrate adequate orientation or reliable communication were excluded from the study. This field-based screening approach was deemed appropriate for community-based research settings where formal neurocognitive assessment was not feasible.

Data Collection Procedures

Data were collected through structured face-to-face interviews conducted by trained research assistants. Face-to-face interviewing is recommended for geriatric populations because it minimizes misunderstanding, reduces missing responses, and enhances the accuracy of self-reported information. Each interview lasted approximately 25–30 minutes.

The face-to-face approach was selected to ensure accurate assessment of domain-specific QoL patterns and associated sociodemographic, health, lifestyle, and psychosocial determinants, in alignment with the study objectives. This method facilitated reliable data collection among older adults who may have limited literacy or sensory impairments.

The questionnaire comprised three major sections. The first section assessed sociodemographic characteristics, including sex, age, marital status, agricultural occupation type, educational attainment, monthly income, living arrangement, family size, and perceived family relationship quality. The second section captured health status and lifestyle behaviors, including chronic illness, sleep duration, smoking status, alcohol consumption, and physical activity. The third section consisted of the WHOQOL-OLD instrument, which includes 24 items covering six domains of QoL: SAB, AUT, PPF, SOP, DAD, and INT.

Research Instruments

WHOQOL-OLD Module

QoL was measured using the WHOQOL-OLD instrument developed by the WHO as an extension of the WHOQOL framework specifically for older adults (Power et al., 2005). The instrument comprises 24 items organized into six conceptual domains: SAB, AUT, PPF, SOP, DAD, and INT. Each item is rated on a five-point Likert scale, with higher scores reflecting better perceived QoL.

The WHOQOL-OLD has been widely validated across cultures, and the Thai version has demonstrated satisfactory psychometric properties, with Cronbach's alpha values ranging from 0.78 to 0.90 (Kangwanrattanakul, 2025). In the present study, the overall Cronbach's alpha coefficient for the WHOQOL-OLD was 0.87, demonstrating good internal consistency within this sample of older adults in agricultural communities.

Scoring and Interpretation of WHOQOL-OLD

Items 1, 2, 6, 7, 8, 9, and 10 in the WHOQOL-OLD instrument are negatively worded; therefore, reverse scoring was performed before analysis. The total WHOQOL-OLD score ranges from 24 to 120 points, and overall QoL was interpreted according to the criteria proposed by Power et al. (2005), with scores of 24–56 indicating poor QoL, 57–89 indicating moderate QoL, and 90–120 indicating good QoL. Each domain comprises four items, yielding domain scores ranging from 4 to 20 points. Following the WHO guidelines (WHO, 2006), domain-level QoL was classified as poor (4–9), moderate (10–15), or good (16–20).

Variable Coding

All study variables were coded according to established practices in aging, epidemiology, and health research. Sociodemographic, health, and lifestyle variables were categorized or dichotomized based on their empirical distribution. Several variables were collapsed into broader categories to improve model stability, reduce sparse data bias, and enhance interpretability of regression coefficients. Family relationship quality was treated as a continuous variable (1–5); a linearity check confirmed that its relationship with all QoL domains met the linearity assumption. A complete summary of all coding schemes is presented in Tables 1 and 2.

Table 1 Coding Scheme for Sociodemographic Variables

Variable	Coding
Sex	0 = Male, 1 = Female
Age	1 = 60–69 years, 2 = \geq 70 years
Marital status	1 = Single, 2 = Married, 3 = Widowed/Divorced/Separated
Agricultural type	1 = Rice, 2 = Vegetables, 3 = Fruits, 4 = Livestock, 5 = Mixed garden
Education (raw)	0 = No education, 1 = Primary, 2 = Lower secondary, 3 = Upper secondary, 4 = Vocational, 5 = Bachelor's degree or higher
Education (collapsed)	1 = Low (0–1), 2 = Medium (2–4), 3 = High (5)
Income (raw)	1 = <3,000 THB, 2 = 3,001–5,000 THB, 3 = 5,001–10,000 THB, 4 = >10,000 THB
Income (collapsed)	1 = Low (<3,000), 2 = Medium (3,001–5,000), 3 = High (>5,000)
Living arrangement	1 = Alone, 2 = With spouse, 3 = With children, 4 = Extended family, 5 = Others
Family size	1 = <3 persons, 2 = 4–5 persons, 3 = >5 persons
Family Relationship Quality	1 = Very poor, 2 = Poor, 3 = Fair, 4 = Good, 5 = Very good

Note. Coding reflects categorical recoding used for statistical analysis in regression models.

Table 2 Coding Scheme for Health Status and Lifestyle Behaviors

Variable	Coding
Chronic illness	0 = No chronic illness; 1 = At least one chronic illness
Sleep duration	1 = <4 hours; 2 = 4–6 hours; 3 = 7–8 hours; 4 = >8 hours
Smoking status	0 = Never smoked; 1 = Former smoker; 2 = Regular smoker; 3 = Occasional smoker
Alcohol consumption	0 = Never; 1 = Former drinker; 2 = Regular drinker; 3 = Occasional drinker
Physical activity	0 = None; 1 = <3 days/week; 2 = 3–5 days/week; 3 = >5 days/week

Note. Lifestyle behaviors were categorized based on established public health guidelines.

Ethical Considerations

Ethical approval for this study was granted by the Human Research Ethics Committee of Nakhon Si Thammarat Rajabhat University (COA No. 042/2568). Written informed consent was obtained from all participants prior to data collection. All procedures were conducted in accordance with the ethical principles outlined in the Declaration of Helsinki and the WHO's guidelines for research involving older adults (WHO, 2006). Confidentiality and anonymity were strictly maintained throughout the study.

Statistical Analysis

All statistical analyses were conducted using R software version 4.3.0 (R Foundation for Statistical Computing, Vienna, Austria). Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to summarize the sociodemographic, health, and lifestyle characteristics of participants.

Multivariate linear regression models were employed to examine the associations between independent variables and each WHOQOL-OLD domain, following established analytical practices in QoL research (Adhikari et al., 2025).

Model diagnostics were conducted to verify that all assumptions of linear regression were met. Normality and homoscedasticity were evaluated using normal Q–Q plots and residuals-versus-fitted value plots, while linearity was assessed through partial-residual plots; all diagnostics indicated acceptable model fit. Multicollinearity was assessed using Variance Inflation Factors (VIF), with all values below 3, indicating no collinearity concerns. Influential observations were evaluated using Cook’s distance, and no influential cases were detected. Statistical significance was defined as $p < 0.05$.

Results

Participant Characteristics

A total of 381 older adults residing in agricultural communities in Lansaka District participated in the study. Table 3 summarizes their sociodemographic characteristics. The sample was predominantly female (51.40%), and more than half were between 60–69 years of age (57.70%). Most respondents were married (68.20%), and fruit farming was the most common agricultural activity (57.70%), followed by vegetable farming (16.00%) and mixed gardening (13.10%).

In terms of education, over half of the participants had low educational attainment, with 52.50% reporting no formal schooling or completion of only primary education. More than one-third earned less than 3,000 THB per month (34.10%), indicating limited financial resources within this population. The majority of older adults lived with a spouse or children (70.90%) and reported good to very good family relationships (70.80%).

Table 3 Sociodemographic Characteristics of Participants (n = 381)

Characteristic	Category	n	%
1. Sex	Male	185	48.60
	Female	196	51.40
2. Age	60–69	220	57.70
	≥70	161	42.30
3. Marital status	Single	50	13.10
	Married	260	68.20
	Widowed/Divorced/Separated	71	18.70
4. Agricultural type	Rice	20	5.30
	Vegetables	61	16.00
	Fruits	220	57.70
	Livestock	30	7.90
	Mixed garden	50	13.10
5. Education	No education	90	23.60
	Primary	110	28.90
	Lower secondary	50	13.10
	Upper secondary	60	15.70
	Vocational	40	10.50
	Bachelor's degree or higher	31	8.10
6. Income	<3,000 THB	130	34.10
	3,001–5,000 THB	100	26.20
	5,001–10,000 THB	90	23.60
	>10,000 THB	61	16.00
7. Living arrangement	Alone	40	10.50
	With spouse	150	39.40
	With children	120	31.50
	Extended family	60	15.70
	Others	11	2.90
8. Family size	<3 persons	126	33.07
	4–5 persons	168	44.09
	>5 persons	87	22.83
9. Family Relationship Quality	Very good	130	34.10
	Good	140	36.70
	Fair	60	15.70
	Poor	35	9.20
	Very poor	16	4.20

Health Status and Lifestyle Behaviors

Table 4 presents the health status and lifestyle behaviors of the participants. Most older adults (79.00%) reported having at least one chronic illness. Over half of the respondents slept an average of 7–8 hours per night (52.50%). In terms of smoking behavior, 55.12% had never smoked, while 52.76% reported never consuming alcohol. Physical activity levels were generally low, with 63.51% engaging in physical activity fewer than three days per week or not at all. These patterns suggest a high burden of chronic disease and relatively sedentary lifestyles among older adults in agricultural settings.

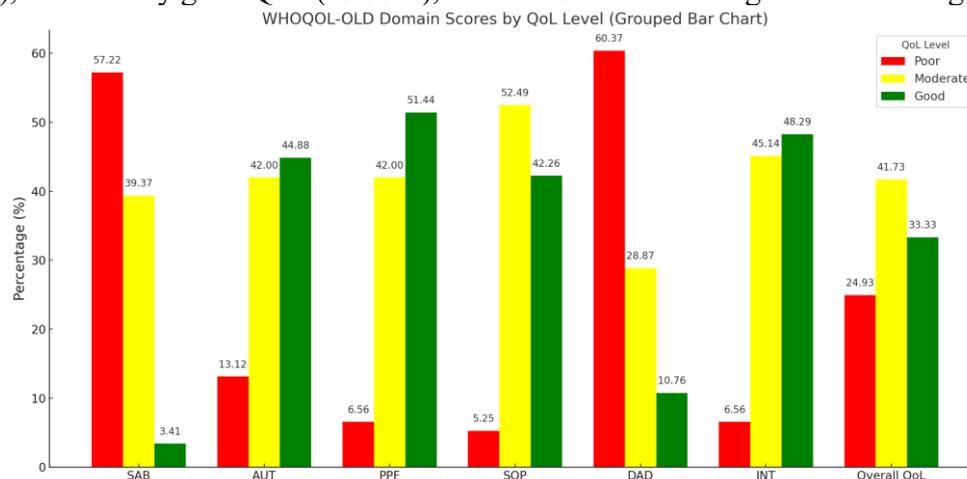
Table 4 Health Status and Lifestyle Behaviors of Participants (n = 381)

Variable	Category	n	%
1. Chronic illness	No chronic illness	80	21.00
	At least one chronic illness	301	79.00
2. Sleep duration	<4 hours	25	6.60
	4–6 hours	90	23.60
	7–8 hours	200	52.50
	>8 hours	66	17.30
3. Smoking status	Never smoked	210	55.12
	Former smoker	65	17.06
	Regular smoker	75	19.69
	Occasional smoker	31	8.14
4. Alcohol consumption	Never	201	52.76
	Former drinker	61	16.01
	Regular drinker	87	22.83
	Occasional drinker	32	8.40
5. Physical activity	None	107	28.08
	<3 days/week	135	35.43
	3–5 days/week	68	17.85
	>5 days/week	71	18.64

QoL Across WHOQOL-OLD Domains

Figure 1 presents the distribution of QoL across the six WHOQOL-OLD domains. The proportion of older adults reporting poor QoL was highest in the domains of SAB (57.22%) and DAD (60.37%), indicating substantial challenges related to sensory decline and concerns about mortality. Conversely, higher levels of good QoL were observed in PPF (51.44%), INT (48.29%), and AUT (44.88%), suggesting stronger performance in life engagement, interpersonal closeness, and independence.

Overall QoL classification showed that the majority of participants had moderate QoL (41.73%), followed by good QoL (33.33%), while 24.93% were categorized as having poor QoL.

**Figure 1** Distribution of WHOQOL-OLD domain scores by QoL level (n = 381)

(Source: Researcher, 2025)

Percentages represent the proportion of participants classified as Poor, Moderate, or Good within each domain. Color key: Poor = red; Moderate = yellow; Good = green. Abbreviations: SAB = Sensory Abilities; AUT = Autonomy; PPF = Past–Present–Future Activities; SOP = Social Participation; DAD = Death and Dying; INT = Intimacy.

Regression Analysis

Multivariate linear regression analyses were performed to examine the independent predictors of QoL across the six WHOQOL-OLD domains. Table 5 presents the unstandardized regression coefficients (B) and corresponding 95% confidence intervals for all variables included in the models. Several sociodemographic, health, and lifestyle characteristics demonstrated significant associations with one or more QoL domains.

SAB

Higher income (B = 0.63, 95% CI: 0.12–1.14*) and sleep duration of 7–8 hours (B = 0.72, 95% CI: 0.14–1.30*) were associated with better SAB. Chronic illness was negatively associated (B = –1.22, 95% CI: –1.74 to –0.70**).

AUT

Significant predictors included medium education (B = 0.62, 95% CI: 0.20–1.04*), high education (B = 1.14, 95% CI: 0.52–1.76**), medium income (B = 0.55, 95% CI: 0.12–0.98*), high income (B = 0.98, 95% CI: 0.37–1.59**), physical activity 3–5 days/week (B = 0.78, 95% CI: 0.20–1.36*) and >5 days/week (B = 1.02, 95% CI: 0.44–1.60**), and better family relationship quality (B = 0.44, 95% CI: 0.18–0.70*).

PPF

Medium (B = 0.48, 95% CI: 0.10–0.86*) and high education (B = 0.91, 95% CI: 0.40–1.42**), medium income (B = 0.50, 95% CI: 0.11–0.89*), high income (B = 0.83, 95% CI: 0.33–1.33**), physical activity 3–5 days/week (B = 0.72, 95% CI: 0.20–1.24*) and >5 days/week (B = 0.95, 95% CI: 0.40–1.50**), regular alcohol consumption (B = 0.55, 95% CI: 0.04–1.06*), and better family relationship quality (B = 0.82, 95% CI: 0.48–1.16**), were all positively associated with PPF.

SOP

Significant predictors of higher SOP included medium education (B = 0.50, 95% CI: 0.14–0.86*), high education (B = 0.85, 95% CI: 0.36–1.34**), physical activity >5 days/week (B = 0.59, 95% CI: 0.12–1.06*), regular alcohol use (B = 0.62, 95% CI: 0.10–1.14*), occasional alcohol use (B = 0.48, 95% CI: 0.02–0.94*), and better family relationship quality (B = 0.66, 95% CI: 0.30–1.02**). Chronic illness predicted lower SOP (B = –0.82, 95% CI: –1.28 to –0.36**).

DAD

Chronic illness was the only significant predictor and was associated with lower DAD scores (B = –1.40, 95% CI: –2.20 to –0.60**).

INT

Higher intimacy scores were associated with medium education (B = 0.44, 95% CI: 0.08–0.80*), high education (B = 0.80, 95% CI: 0.31–1.29**), medium income (B = 0.49, 95% CI: 0.10–0.88*), high income (B = 1.02, 95% CI: 0.48–1.56**), physical activity 3–5 days/week (B = 0.66, 95% CI: 0.18–1.14*), physical activity >5 days/week (B = 0.92, 95% CI: 0.40–1.44**), sleep 7–8 hours (B = 0.66, 95% CI: 0.16–1.16*), and family relationship quality (B = 0.88, 95% CI: 0.52–1.24***).

Table 5 Multivariate Linear Regression Predicting WHOQOL-OLD Domain Scores Among Older Adults in Agricultural Communities (n = 381)

Predictor	SAB B (95% CI)	AUT B (95% CI)	PPF B (95% CI)	SOP B (95% CI)	DAD B (95% CI)	INT B (95% CI)
Female (ref: Male)	-0.18 (-0.62, 0.26)	0.22 (-0.18, 0.62)	0.31 (-0.05, 0.67)	0.14 (-0.20, 0.48)	0.08 (-0.42, 0.58)	0.27 (-0.10, 0.64)
Age ≥70 (ref: 60–69)	-0.40 (-0.88, 0.08)	-0.28 (-0.70, 0.14)	-0.35 (-0.74, 0.04)	-0.12 (-0.50, 0.26)	0.42 (-0.15, 1.00)	-0.21 (-0.61, 0.19)
Education (ref: Low)						
– Medium	0.18 (-0.25, 0.61)	0.62 (0.20, 1.04)*	0.48 (0.10, 0.86)*	0.50 (0.14, 0.86)*	0.12 (-0.42, 0.66)	0.44 (0.08, 0.80)*
– High	0.30 (-0.33, 0.93)	1.14 (0.52, 1.76)**	0.91 (0.40, 1.42)**	0.85 (0.36, 1.34)**	0.25 (-0.55, 1.05)	0.80 (0.31, 1.29)**
Income (ref: Low <3,000 THB)						
– Medium	0.22 (-0.20, 0.64)	0.55 (0.12, 0.98)*	0.50 (0.11, 0.89)*	0.18 (-0.20, 0.56)	0.14 (-0.42, 0.70)	0.49 (0.10, 0.88)*
– High	0.63 (0.12, 1.14)*	0.98 (0.37, 1.59)**	0.83 (0.33, 1.33)**	0.25 (-0.22, 0.72)	0.41 (-0.32, 1.14)	1.02 (0.48, 1.56)**
Chronic illness — Yes (ref: No)	-1.22 (-1.74, -0.70)**	-0.22 (-0.70, 0.26)	-0.18 (-0.60, 0.24)	-0.82 (-1.28, -0.36)**	-1.40 (-2.20, -0.60)**	-0.34 (-0.80, 0.12)
Physical activity (ref: None)						
– <3 days/week	0.08 (-0.40, 0.56)	0.32 (-0.10, 0.74)	0.28 (-0.12, 0.68)	0.14 (-0.24, 0.52)	0.10 (-0.52, 0.72)	0.30 (-0.08, 0.68)
– 3–5 days/week	0.22 (-0.38, 0.82)	0.78 (0.20, 1.36)*	0.72 (0.20, 1.24)*	0.26 (-0.20, 0.72)	0.18 (-0.60, 0.96)	0.66 (0.18, 1.14)*
– >5 days/week	0.35 (-0.28, 0.98)	1.02 (0.44, 1.60)**	0.95 (0.40, 1.50)**	0.59 (0.12, 1.06)*	0.22 (-0.65, 1.09)	0.92 (0.40, 1.44)**
Sleep duration (ref: <4 h)						
– 4–6 h	0.28 (-0.34, 0.90)	0.15 (-0.40, 0.70)	0.12 (-0.34, 0.58)	0.20 (-0.28, 0.68)	0.22 (-0.62, 1.06)	0.18 (-0.32, 0.68)
– 7–8 h	0.72 (0.14, 1.30)*	0.28 (-0.26, 0.82)	0.22 (-0.26, 0.70)	0.18 (-0.26, 0.62)	0.34 (-0.52, 1.20)	0.66 (0.16, 1.16)*
– >8 h	0.34 (-0.32, 1.00)	0.10 (-0.48, 0.68)	0.15 (-0.36, 0.66)	0.08 (-0.42, 0.58)	0.12 (-0.78, 1.02)	0.30 (-0.20, 0.80)
Alcohol consumption (ref: Never)						
– Former	0.12 (-0.40, 0.64)	0.20 (-0.20, 0.60)	0.18 (-0.20, 0.56)	0.24 (-0.16, 0.64)	0.10 (-0.60, 0.80)	0.22 (-0.16, 0.60)
– Regular	0.25 (-0.30, 0.80)	0.14 (-0.30, 0.58)	0.55 (0.04, 1.06)*	0.62 (0.10, 1.14)*	0.05 (-0.82, 0.92)	0.40 (-0.08, 0.88)
– Occasional	0.18 (-0.40, 0.76)	0.10 (-0.34, 0.54)	0.22 (-0.22, 0.66)	0.48 (0.02, 0.94)*	0.18 (-0.64, 1.00)	0.34 (-0.10, 0.78)
Family relationship (1–5)	0.18 (-0.06, 0.42)	0.44 (0.18, 0.70)*	0.82 (0.48, 1.16)**	0.66 (0.30, 1.02)**	0.18 (-0.28, 0.64)	0.88 (0.52, 1.24)**

Note.

- * $p < .05$, ** $p < .01$, *** $p < .001$
- SAB = Sensory Abilities; AUT = Autonomy; PPF = Past–Present–Future Activities; SOP = Social Participation; DAD = Death and Dying; INT = Intimacy.
- Values presented are unstandardized coefficients (B) with 95% confidence intervals (CI).

Model Diagnostics

Regression diagnostic procedures indicated that key assumptions were adequately met across all six WHOQOL-OLD domain models. Normal Q–Q plots showed that standardized residuals aligned closely with the theoretical quantile line in each model, demonstrating that the normality assumption was satisfied (Figure 2). Residuals-versus-fitted values plots further revealed no evidence of heteroscedasticity; residuals were randomly distributed around zero without discernible patterns, confirming constant variance and appropriate model specification (Figure 3).

Multicollinearity was not a concern, as all VIF values were below 3, well within accepted thresholds. Specifically, VIF values ranged from 1.18–2.74 for SAB, 1.21–2.63 for AUT, 1.15–2.81 for PPF, 1.12–2.87 for SOP, 1.16–2.69 for DAD, and 1.19–2.58 for INT, indicating that predictors were sufficiently independent and that coefficient estimates were stable. Collectively, these diagnostic results confirm that the regression models met essential assumptions and were appropriate for interpreting the associations examined.

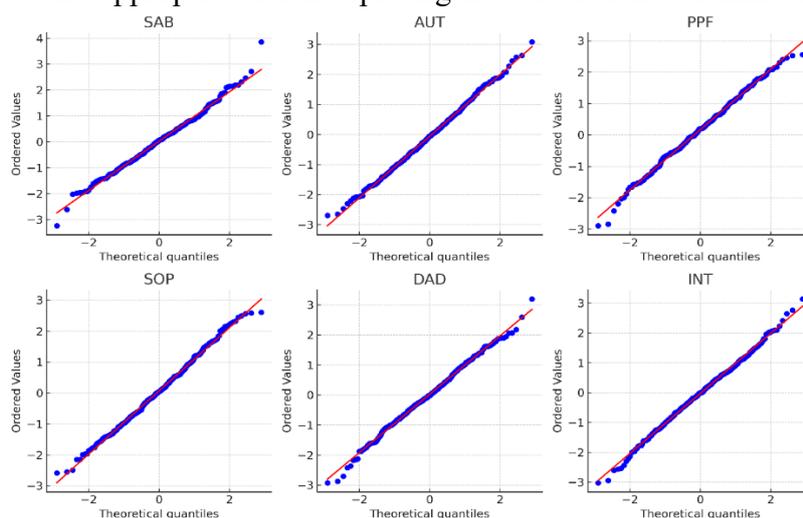


Figure 2 Normal Q–Q Plots for All Six WHOQOL-OLD Domains
(Source: Researcher, 2025)

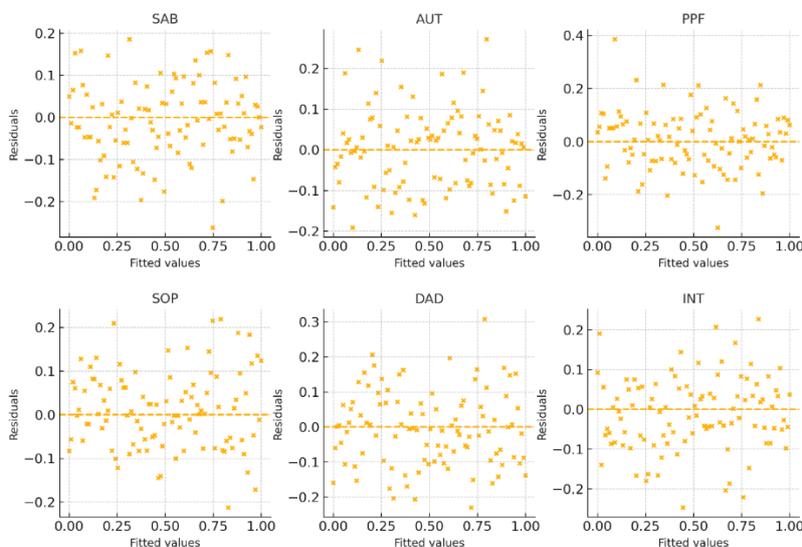


Figure 3 Residuals vs. fitted values plots for the six WHOQOL-OLD domains
(Source: Researcher, 2025)

Discussions

This study investigated the QoL among older adults living in agricultural communities in southern Thailand using the WHOQOL-OLD framework. The results confirm the study objectives by identifying key socioeconomic, health, lifestyle, and psychosocial determinants associated with multiple QoL domains. Overall, the findings reflect the unique challenges and strengths of aging within rural agricultural environments and are broadly consistent with existing literature in Thailand and comparable low- and middle-income country settings.

Overall QoL and Domain-Level Patterns

Most participants reported moderate overall QoL, consistent with findings from rural Southeast Asia (Abdul Mutalip et al., 2020; Tay et al., 2024; Komalasari et al., 2025). Poor QoL was most pronounced in SAB and DAD, paralleling evidence that sensory decline and mortality concerns intensify with age and are exacerbated by prolonged exposure to physical hazards such as sunlight, noise, and agrochemicals (Molot et al., 2022). Similar patterns were reported in studies among older agricultural workers in China and Vietnam (Su et al., 2021; Tran et al., 2023), reinforcing that environmental exposures accelerate sensory deterioration. The high prevalence of poor QoL in the DAD domain may reflect structural and contextual vulnerabilities specific to rural agricultural communities. In many rural areas, access to community-based palliative and end-of-life care services remains limited, which may contribute to uncertainty regarding future medical support, symptom management, and caregiving arrangements. Beyond healthcare infrastructure, mortality-related concerns in subsistence agricultural households may also be shaped by economic realities. Older adults often continue contributing to farm labor and household productivity; therefore, concerns about death may be intertwined with anxiety regarding the loss of functional capacity and its implications for family livelihood and economic stability. This broader socioeconomic context may intensify death-related worries and help explain the elevated proportion of poor QoL observed in this domain. Taken together, these domain-level patterns illustrate the coexistence of structural vulnerability and psychosocial resilience within agricultural aging. While biologically driven decline and mortality awareness appear pronounced, social role continuity and relational embeddedness remain protective resources. This dual pattern reinforces the importance of analyzing QoL as a multidimensional construct rather than a unidimensional indicator of well-being.

Conversely, higher scores in PPF, INT, and AUT suggest that older adults maintain meaningful roles, social connections, and autonomy. These findings are consistent with literature describing strong family cohesion and intergenerational support in rural Thai communities (Yodmai et al., 2021; Nutley, 2025). These results support the hypothesis that despite physical challenges, psychosocial strengths remain a protective factor for rural elders.

Socioeconomic Determinants of QoL

Both education and income were robust predictors across multiple domains. Higher education was associated with better AUT, PPF, SOP, and INT, aligning with previous research showing that education enhances cognitive resilience, problem-solving abilities, and health literacy in late life (Dai et al., 2024; Bashir et al., 2025). Similar results have been observed in Malaysia and Indonesia, where education facilitated greater independence and life satisfaction (Abdul Mutalip et al., 2020; Handajani et al., 2022).

Income showed similarly broad positive effects, particularly on SAB, AUT, PPF, and INT, indicating that financial security enhances access to healthcare services and social opportunities. These findings align with Thai studies demonstrating that low income is a strong

determinant of poor QoL in older adults (Aung et al., 2022; Senkrua, 2025). However, income was not associated with SOP or DAD. This is consistent with Ghose et al. (2021), who found that existential concerns and community participation in rural Thailand are shaped more by cultural norms, spirituality, and community rituals than by economic resources. This contrasts with Western findings, where higher income often reduces death anxiety (Punaglom & Dumrongpakapakorn, 2025), suggesting cultural variation in the role of economic factors.

The domain-specific influence of income suggests that financial resources primarily enhance access to material and healthcare-related supports, thereby strengthening functional independence and future-oriented engagement. However, the absence of association with Social Participation and Death and Dying suggests that community embeddedness and existential perceptions are shaped more strongly by cultural and relational norms than by economic capital.

Health Conditions and Functional Limitations

Chronic illness emerged as a strong negative predictor for SAB, SOP, and DAD. This aligns with extensive evidence that chronic diseases, particularly hypertension, diabetes, and musculoskeletal disorders, reduce mobility, diminish sensory functioning, and heighten mortality awareness (Rolin, 2024). Similar findings were reported in Mexico (Angel et al., 2024) and Brazil (Gomes et al., 2020), reinforcing the global impact of chronic conditions on QoL. The domain-specific impact of chronic illness suggests that health burden directly constrains functional capacity and sensory functioning, which in turn limits social engagement and heightens awareness of mortality. However, its non-significant association with autonomy may reflect adaptive coping mechanisms and familial role adjustments commonly observed in rural Thai contexts.

Interestingly, chronic illness was *not* associated with AUT, differing from studies in Japan and Korea where illness strongly reduced autonomy (Tsubouchi et al., 2021; Jeon, 2020). This pattern may reflect context-specific adaptive mechanisms, whereby Thai agricultural elders maintain perceived autonomy through lifelong engagement in routine labor activities and strong familial support systems that buffer the functional consequences of illness.

Lifestyle Factors and QoL Outcomes

Physical activity showed consistent positive effects across AUT, PPF, SOP, and INT. This confirms previous evidence that active older adults exhibit stronger physical functioning, social participation, and emotional well-being (Saadeh et al., 2020). Comparable studies in Thailand and Indonesia found that agricultural elders who remain physically active maintain higher autonomy and life satisfaction (Phulkerd et al., 2021; Sapbruangthong et al., 2025).

Sleep duration of 7–8 hours was positively associated with SAB and INT, supporting findings that adequate sleep promotes sensory processing, cognitive functioning, and emotional stability (Keil et al., 2023). However, sleep was not associated with AUT, PPF, SOP, or DAD—contradicting Western studies linking poor sleep with lower autonomy or heightened death anxiety (Hajek & König, 2022). This inconsistency may reflect cultural differences: Thai rural elders commonly follow early-sleep/early-wake patterns and may normalize sleep variability.

Alcohol consumption, particularly among regular and occasional drinkers, was associated with higher PPF and SOP. Similar results have been reported in Laos, Vietnam, and rural Thai contexts, where alcohol is embedded in communal gatherings and cultural events (Baird, 2025; Kumar et al., 2023; Jantapo & Kusoom, 2021). This contrasts with Western literature where alcohol use is typically associated with poorer QoL and isolation (Beridze et al., 2020), highlighting differences in cultural norms and drinking contexts.

The positive association between physical activity and multiple domains indicates that sustained engagement in movement-based routines may simultaneously support physical independence, social interaction, and emotional vitality. In agricultural settings, where physical activity is embedded in daily life, this relationship may be particularly pronounced.

Psychosocial Determinants

Family relationship quality was one of the strongest predictors across AUT, PPF, SOP, and INT. This finding is consistent with studies from Thailand, Vietnam, and Taiwan demonstrating that intergenerational support, emotional closeness, and co-residence play central roles in well-being among older adults in collectivist cultures (Jantapo & Kusoom, 2021; Kumar et al., 2023; Lin et al., 2021). The absence of effects on SAB and DAD suggests that while psychosocial support enhances social and emotional domains, it does not substantially buffer biological aging or existential concerns. The differential effects observed across domains suggest that family support primarily strengthens social and emotional dimensions of QoL by enhancing interpersonal connectedness, role continuity, and perceived autonomy. However, it may have limited capacity to mitigate biologically driven sensory decline or existential concerns related to mortality. This pattern underscores the multidimensional nature of QoL, where psychosocial resources buffer social disengagement but do not fully offset physiological aging processes.

Interpretation in the Context of Rural Agricultural Aging

The overall pattern of findings reflects the unique realities of aging within rural agricultural environments, where older adults often continue physically demanding work despite chronic health burdens, financial constraints, and limited access to healthcare services. These vulnerabilities coexist with protective factors such as family cohesion, cultural connectedness, and sustained community participation, which reinforce independence, social engagement, and emotional well-being. The balance between risks and supports indicates that QoL among agricultural older adults is shaped not only by health-related and socioeconomic challenges but also by modifiable determinants including education, physical activity, sleep, and family relationships.

By applying the WHOQOL-OLD framework to an underrepresented population, this study identifies domain-specific determinants that inform targeted intervention strategies. The findings indicate that sociodemographic, health, lifestyle, and psychosocial factors operate through distinct yet interconnected mechanisms, influencing different QoL domains in patterned ways. Specifically, socioeconomic and lifestyle resources primarily enhance autonomy and social engagement, health conditions constrain sensory and mortality-related dimensions, and psychosocial support reinforces relational and participatory aspects of well-being. This domain-structured pattern underscores the multidimensional and context-dependent nature of QoL in rural agricultural settings and highlights the importance of culturally grounded, domain-sensitive community-based policies.

Conclusion and suggestions

The findings of this study address the research objectives by first identifying domain-specific patterns of QoL among older adults in agricultural communities. Poor QoL was most evident in the SAB and DAD domains, whereas higher levels of QoL were observed in PPF, INT, and AUT. These domain-level differences highlight the coexistence of functional vulnerability and psychosocial resilience in rural agricultural aging.

Second, the study identified key determinants associated with each WHOQOL-OLD domain. Sociodemographic factors (education and income) were positively associated with

autonomy, social engagement, and life continuity; health conditions, particularly chronic illness, were negatively associated with sensory functioning and mortality-related concerns; lifestyle behaviors such as regular physical activity and adequate sleep were linked to improved functional and relational domains; and psychosocial support, especially family relationship quality, strengthened participatory and emotional dimensions of QoL.

Collectively, these findings demonstrate that QoL in agricultural older adults is shaped through domain-specific pathways in which structural, health-related, behavioral, and relational factors operate in differentiated yet interconnected ways. The results provide evidence-based directions for targeted, domain-sensitive interventions to improve well-being in rural agricultural settings.

Suggestions

1. Given the high prevalence of poor QoL in the SAB domain, routine community-based screening for vision and hearing impairments should be prioritized in agricultural communities. Early detection, provision of corrective devices such as eyeglasses and hearing aids, and integration of sensory health services into primary rural healthcare systems, together with chronic disease management, may reduce functional limitations and enhance independence.

2. The elevated level of poor QoL observed in the DAD domain indicates the need for culturally sensitive health education, counseling services, and community-based palliative care awareness programs. Facilitating discussions on end-of-life planning and improving access to supportive care may reduce anxiety and strengthen psychological well-being.

3. As moderate to good QoL levels were observed in the AUT, PPF, and SOP domains, interventions should build upon these existing psychosocial strengths. Village-based activity clubs, group exercise programs, and community participation initiatives can help sustain independence and meaningful social roles among older adults.

4. Regular physical activity and adequate sleep, which were positively associated with multiple QoL domains, should be promoted through structured rural exercise programs and community health education on sleep hygiene to enhance functional capacity and relational well-being.

5. Educational opportunities, financial literacy training, and income-stability interventions for low-income older adults may improve autonomy and life continuity. Strengthening intergenerational support through family education programs and community networking initiatives can reinforce relational and participatory dimensions of QoL.

6. Coordinated action among health services, social welfare agencies, local administrative organizations, and agricultural sectors is essential to design aging-friendly policies tailored to rural farming communities.

Overall, applying these findings in practice requires a domain-sensitive approach in which interventions are aligned with specific QoL dimensions and their corresponding determinants rather than adopting a uniform strategy for all aspects of well-being.

New knowledge and the effects on society and communities

This study contributes new knowledge by advancing a domain-structured understanding of quality of life in agricultural aging contexts. Rather than treating QoL as a single global outcome, the findings demonstrate that well-being among older adults in rural farming communities is organized through differentiated yet interconnected pathways. By integrating sociodemographic, health, lifestyle, and psychosocial determinants within the WHOQOL-OLD framework, the study offers a context-sensitive analytical model that clarifies

how structural and relational conditions jointly shape aging experiences in agricultural societies.

Importantly, the research extends aging scholarship by positioning agricultural older adults not merely as a vulnerable population but as a group characterized by both structural risk and psychosocial resilience. This reframing shifts the discourse from deficit-based narratives toward a balanced perspective that recognizes modifiable pathways for intervention.

At the societal level, the study provides an evidence-informed foundation for domain-sensitive policy design, encouraging local communities and policymakers to align interventions with specific dimensions of well-being rather than adopting uniform aging strategies. In doing so, the research strengthens the theoretical and practical integration of rural development, health promotion, and aging policy within agricultural settings.

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Language Policy Implementation Strategies of English Education in Higher Education Institutions in Jiangsu Province of China

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Abstract

This research examines the implementation of national language policies on English education in higher education institutions (HEIs) in Jiangsu Province, China. The objectives of this study are threefold: 1) to analyze the desired conditions of English education as articulated in national policy documents, 2) to investigate the actual practices of English education in HEIs through a case study of institutions in Jiangsu Province, and 3) to identify discrepancies between policy mandates and institutional practices and to propose appropriate implementation strategies. This study adopts a qualitative research design integrating critical discourse analysis, content analysis, and N-gram analysis. The analysis is based on two national policy documents and English education-related information collected from the official websites of 20 sampled HEIs in Jiangsu Province. This integrated methodological approach enables a systematic comparison between national policy expectations and institutional practices.

The findings indicate that national policies articulate comprehensive goals for English education, emphasizing talent cultivation, cross-cultural competence, and quality assurance. However, variations exist in the ways these policies are implemented at the institutional level. Discrepancies are identified in curriculum development, resource allocation, teacher development, evaluation mechanisms, and student outcomes, reflecting challenges in translating national policy mandates into diverse local contexts.

The study concludes that flexible and context-sensitive implementation strategies are necessary to narrow the gap between national language policy expectations and HEI-based practices. The study proposes recommendations to enhance policy implementation through adaptive monitoring mechanisms, strengthened curriculum and resource support, balanced teacher development, improved evaluation systems, and the promotion of cross-cultural competence. The findings contribute to a clearer understanding of language policy implementation in higher education and provide practical implications for policymakers and institutional administrators.

Keywords: Language policy, Implementation strategy, English education, Higher education institution (HEI), Jiangsu province

Introduction

Language policy stipulates the ways in which language is regulated, maintained, and promoted in different settings (Spolsky, 2004a). It primarily refers to an officially mandated set of ideas, rules, laws, regulations, and practices intended to achieve planned language use and form within a society, group, or system, and more broadly within a nation-state (Spolsky, 2012). In the context of education, language policy plays a central role in shaping language teaching and learning, curriculum design, assessment mechanisms, and talent cultivation objectives. In China, language ecology has been deeply influenced by globalization, regional development, and multiculturalism. The country has a long history of emphasizing the education of languages other than the mother tongue, particularly English, which is increasingly regarded as essential for intercultural communication and international competitiveness (Baker, 2011; Okoro, 2019).

Language policy responds dynamically to social development and is subject to continuous revision. The global status of English has exerted a profound influence on English education in higher education institutions (HEIs). Since the beginning of the twenty-first century, China's rapid economic growth, scientific and technological advancement, and expanding international engagement have generated sustained demands for improved English proficiency among university graduates. In Chinese HEIs, English education operates through two major tracks, namely English education for English majors and English education for non-English majors, the latter commonly referred to as College English. In 2020, the Ministry of Education promulgated two major policy documents governing these two tracks: the National Teaching Guide for Foreign Language and Literature Undergraduates: English Majors and the National Guidelines for College English Teaching: Non-English Majors. These documents superseded earlier policy frameworks, including the National Higher Education Syllabuses for English Majors (2000) and the College English Curriculum Requirements (2004, 2007), and now serve as the principal national guidelines for assuring and evaluating the quality of English education in HEIs over the next ten to twenty years.

The National Guide for English Majors 2020 and the National Guidelines for Non-English Majors 2020 constitute the core national language policies on English education in China's higher education system. In a broader sense, these policy documents form part of an ongoing educational reform shaped by multiple factors, including shifts in China's social, political, and economic environment, the deepening of globalization, and the need to cultivate graduates capable of participating in an increasingly competitive global workforce. The policies articulate comprehensive expectations concerning educational objectives, curriculum structures, teaching principles, assessment mechanisms, and quality assurance systems. However, previous studies have demonstrated that the effects of language policy on actual language practices are neither automatic nor uniform, and that policy implementation is often mediated by non-linguistic factors and local conditions (Spolsky, 2004b; Spolsky, 2019).

Within this national policy framework, the implementation of English education policies inevitably takes place within specific institutional and regional contexts. Variations in institutional resources, administrative capacity, stakeholder interpretation, and local development priorities may influence how national policies are enacted at the HEI level. Jiangsu Province provides a particularly suitable context for examining these implementation dynamics. As one of China's most economically developed provinces, Jiangsu hosts a large and diverse higher education system, including public, private, and Sino-foreign cooperative HEIs distributed across all prefecture-level cities in the province. Jiangsu has been at the forefront of educational reform and internationalization initiatives, while at the same time exhibiting internal diversity in institutional capacity and resource allocation. These

characteristics make Jiangsu Province an appropriate and meaningful case for exploring the relationship between national language policy mandates and HEI-based English education practices.

Although language education policy implementation has attracted increasing scholarly attention globally, existing studies have revealed that the relationship between national policy formulation and institutional practice is often characterized by tension, negotiation, and adaptation rather than direct compliance (Spolsky, 2004b; Spolsky, 2019). However, empirical research that systematically examines English education policy implementation within a specific provincial context in China remains limited. In particular, there is a lack of studies that combine policy discourse analysis with an examination of HEI-based practices in order to identify concrete discrepancies between desired policy conditions and actual implementation outcomes.

In response to this research gap, the present study investigates the implementation strategies of national language policies on English education in higher education institutions in Jiangsu Province. By examining both the official discourse embedded in national policy documents and the actual practices of English education across selected HEIs, the study aims to clarify how national policy expectations are interpreted and enacted at the institutional level, to identify key discrepancies between policy mandates and practice, and to propose context-sensitive strategies for improving the effectiveness of language policy implementation in higher education.

Research Objectives

1. To analyze the desired conditions of English education as articulated in national policy documents
2. To investigate the actual practices of English education in HEIs through a case study of institutions in Jiangsu Province.
3. To identify discrepancies between policy mandates and institutional practices and to propose appropriate implementation strategies

Literature Review

Over the past sixty years or so, language policy has thrived steadily into a remarkable field with interdisciplinary features. Language policy involves the decisions about what languages to use, how they are educated, and how they are used in different contexts (Spolsky, 2019). Language education policy plays a crucial role in shaping language teaching and learning and can have a significant impact on individuals, communities, and society as a whole (May, 2002). However, the effect of language policy on language practices is neither guaranteed nor consistent (Spolsky, 2004b). Language policy implementation is commonly blocked or vitiated by non-linguistic events or forces (Spolsky, 2019). Policy implementation requires adopting specific measures through a combination of methods and various means in order to translate decisions into actionable processes (Sager & Gofen, 2022). It can take many forms and can be accomplished through different alternative strategies, i.e., the initiatives, schemes, programs, or projects offering incentives, providing the means through which policy objectives can be attained and desired outcomes be achieved (Savio & Nikolopoulos, 2009; Savio & Nikolopoulos, 2010).

The implementation of language education policy constituted distinctively a global topic of research interest in recent years. Geographically, the literature covered all the inhabited continents in the world. As for Asia, studies were done on language education policy implementation issues of China (Deng, 2021; Li, 2022; Lu, 2022; Graham & Yeh, 2023; Liyanage & Walker, 2023; Woo, 2023; Sun & Buripakdi, 2024), Indonesia (Eddy & Mukminin, 2012; Haryanto, 2013), Iran (Rasti, 2023), Kazakhstan (Sarmurzin, et al., 2024),

Kyrgyzstan (Kazakbaeva, 2023), North Korea (Oh & Kim, 2024), Philippines (Gempeso & Mendez, 2021), Singapore (Kaur & Lim-Ratnam, 2023), etc. Concerning Africa, attentions were drawn to Botswana (Mokibelo, 2016), Kenya (Jones & Barkhuizen, 2011; Awuor, 2019), Nigeria (Owojecho, 2020; Ugwu, 2020), among other countries. About Europe, studies included but were not limited to Belgium (Vanbuel & Van den Branden, 2020; 2023; Vanbuel, 2022), Netherlands (Waslander, Hooge & Theisens, 2023), Russia (Sinagatullin, 2013), and Turkey (Lytra & Gelir, 2023). Implementation matters of countries like Colombia (Guerrero & Camargo-Abello, 2023) and the United States (Ricklefs, 2022) were addressed in America. And Australia (Scarino, 2014; Rubino & Hajek, 2024) was not left alone.

It is revealed that the issues of research on language education policy implementation are literally extensive and abundant in recent years. To sketch a general picture, the issues could be thematically clustered into three general aspects:

1. Teachers and other stakeholders in policy implementation. Stakeholders in language education policy make a most researched aspect of the issues of global research. Researchers paid great attention to topics of stakeholders including administrators, teachers, and students (Ricklefs, 2022; Lytra & Gelir, 2023). Interests were shown on the stakeholders' perceptions of policy (Li, 2022; Vanbuel, 2022), the challenges for stakeholders (Sarmurzin, et al., 2024), teachers' (assigned and claimed) identities (Liyanage & Walker, 2023), teachers' agency (Deng, 2021; Liyanage & Walker, 2023; Guerrero & Camargo-Abello, 2023; Vanbuel & Van den Branden, 2023), teachers' awareness of language policy (Mbaka, Peter & Karuri, 2013) and strategies of policy implementation (Guerrero & Camargo-Abello, 2023), and teachers' tensions (Jones & Barkhuizen, 2011) and resistances in implementing policies (Kazakbaeva, 2023), etc.

2. Policy implementation in levels of the education system. The education system constitutes the specific setting of research, and the literature consecutively covered all levels of the education system from kindergartens or preschools (Lu, 2022, Guerrero & Camargo-Abello, 2023; Lytra & Gelir, 2023), to primary schools (Mbaka, Peter & Karuri, 2013; Mokibelo, 2016; Vanbuel & Van den Branden, 2020, 2023; Gempeso & Mendez, 2021; Kaur & Lim-Ratnam, 2023), to secondary schools (Sinagatullin, 2013; Oh & Kim, 2024; Liyanage & Walker, 2023; Waslander, Hooge & Theisens, 2023), and to higher education institutions (Deng, 2021). The academia has consistently explored the implementation problems of language education policy in the whole education system to look into the linkages between national language policy and school practices (Waslander, Hooge & Theisens, 2023), the functions of schools to capture the essentials of language policy (Sinagatullin, 2013), the local capacities of schools for implementing policy (Vanbuel & Van den Branden, 2020), and the school-based concrete implementation (Li, 2022), so as to examine the impact of school context on language education policy implementation.

3. Implementation and the whole policy process. Fundamentally, the whole policy process includes three basic stages of policy formulation (design, development), implementation (enactment), and evaluation (assessment), and they make a spiral continuum with successive policy updates. The literature dealt with language education policy implementation problems in light of the whole policy process. Scholars explored the potential and perceived policy implementation challenges (Mokibelo, 2016; Awuor, 2019; Owojecho, 2020; Lu, 2022) and the corresponding arrangements (Graham & Yeh, 2023), making evaluation or assessment of policy itself and its implementation (Gempeso & Mendez, 2021), inter alia, the implementation defects (Owojecho, 2020), so as to envisage the diversity and equity of society (Sinagatullin, 2013), to avoid the recurring problems (Ugwu, 2020), and to enhance practicality of updating policy design (Awuor, 2019).

Most of the emerging disciplines with promising prospects show an interdisciplinary nature. The interdisciplinarity of language policy is well embodied in the methodologies

employed for its research. The researchers used a number of qualitative and quantitative methods, including but not limited to critical discourse analysis (Rasti, 2023; Woo, 2023), content analysis (Kaur & Lim-Ratnam, 2023; Sun & Buripakdi, 2024), thematic analysis (Deng, 2021), empirical analysis (Owojecho, 2020), comparative analysis (Oh & Kim, 2024), questionnaire survey with close- and open-ended questions assisted by statistical tools like SPSS (Mbaka, Peter & Karuri, 2013), nonparticipant observation (Deng, 2021; Gempeso & Mendez, 2021; Kaur & Lim-Ratnam, 2023; Kazakbaeva, 2023), focus group semi-structured interview or discussion (Haryanto, 2013; Awuor, 2019; Vanbuel & Van den Branden, 2020, 2023; Deng, 2021; Vanbuel, 2022; Graham & Yeh, 2023; Kaur & Lim-Ratnam, 2023; Kazakbaeva, 2023; Liyanage & Walker, 2023), and case study (Deng, 2021; Kaur & Lim-Ratnam, 2023; Vanbuel & Van den Branden, 2023). Some studies sought perspectives from interdisciplinary approaches or perspectives, e.g., sociolinguistic approach (Ricklefs, 2022), ethnographic approach (Jones & Barkhuizen, 2011; Guerrero & Camargo-Abello, 2023; Lytra & Gelir, 2023), post-structural approach (Rasti, 2023), stakeholder theory perspective (Lu, 2022; Vanbuel, 2022), organization theory perspective (Waslander, Hooge & Theisens, 2023), educational effectiveness perspective (Vanbuel & Van den Branden, 2023), temporal perspective (Liyanage & Walker, 2023), macro-sociological analysis (Rasti, 2023), and diachronic analysis (Sun & Buripakdi, 2024).

The propositions are the well-derived statements in academic publications avowed by the scholars from their research, and notwithstanding they may be either credited or assailed, they could be enlightening and inspiring for future studies and the effective practice. The major propositions of the literature on language education policy implementation during the recent years could be generalized as below:

1. “Teachers play a crucial role in language education policy implementation, among other stakeholders.” The interaction between stakeholders determines the effectiveness of a policy mechanism, so it calls for the full participation of all stakeholders for fruitful policy implementation. Nevertheless, different stakeholders do not necessarily play proportionate parts in the process. Teachers and other stakeholders may negotiate, contest, reframe, recast, adjust, or adapt official policies according to school time, space, material, and activity (Vanbuel, 2022; Guerrero & Camargo-Abello, 2023; Lytra & Gelir, 2023).

2. “Language education policy implementation at every educational level should be based on the unique school context.” For language education policies, the contextual setting of schools practically influences the policy implementation (Vanbuel & Van den Branden, 2020; Kaur & Lim-Ratnam, 2023). On that account, “local actors have to design concrete policies tailored to their needs” (Vanbuel & Van den Branden, 2020), otherwise, the intended change may not bring about the desired outcomes if all elements at certain educational level are decoupled (Kazakbaeva, 2023).

3. “The whole language education policy process should be consistent at all stages to achieve the desired outcomes.” A systemic view should be taken toward the whole language education policy process, since the whole is not just an adding of all the parts, but all the individual parts are interrelated and their interrelation and consistency determine the effectiveness of achieving the goals of the whole policy system. Policy failure may be attributed to either “(inadequate) assumptions made at the stage of policy development” (Mbaka, Peter & Karuri, 2013), or “lack of adequate implementation” (Owojecho, 2020).

Conception framework

This study conceptualizes language policy implementation as a dynamic process linking national language policy mandates with institutional practices of English education in higher education institutions. National language policies define the desired conditions of English education, which are enacted through HEI-based practices in the context of Jiangsu Province. By comparing policy expectations with actual practices, the study identifies discrepancies and proposes context-sensitive implementation strategies to enhance the effectiveness of English education policy implementation in higher education.

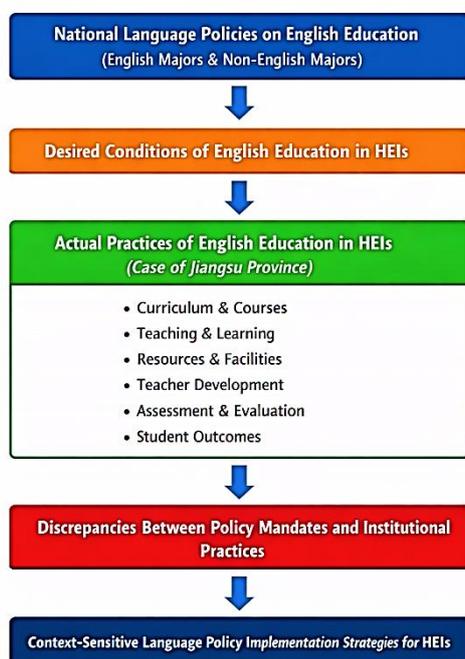


Figure 1 Conceptual framework of the study (Source: Researcher, 2025)

Methodology

1. Research Design

This study adopts a qualitative research design to examine the implementation of national language policies on English education in higher education institutions (HEIs). The design is appropriate for policy implementation research, as it enables an in-depth examination of both official policy discourse and institutional practices within their real-world context. A case study approach is employed, focusing on HEIs in Jiangsu Province, China, to explore how national language policy mandates are interpreted and enacted at the institutional level.

2. Data Sources and Sample

Two main sources of data are used in this study. The first data source consists of two recently updated national language policy documents governing English education in Chinese HEIs, namely the National Teaching Guide for Foreign Language and Literature Undergraduates: English Majors and the National Guidelines for College English Teaching: Non-English Majors. These documents represent the authoritative national framework for English education policy implementation.

The second data source comprises English education–related information collected from the official websites of HEIs in Jiangsu Province. As of 2024, Jiangsu Province hosts 78 regular HEIs offering four-year undergraduate programs approved by the Chinese Ministry of Education. These institutions include public, private, and Sino-foreign cooperative HEIs distributed across all prefecture-level cities in the province.

A purposive sampling strategy is employed to select 20 HEIs for analysis. The sampling criteria include: 1) proportional representation of HEIs across prefecture-level cities, 2) inclusion of different institutional types (public, private, and cooperative HEIs), and 3) accessibility and completeness of English education–related information on official institutional websites. The final sample consists of 13 public HEIs, 6 private HEIs, and 1 Sino-foreign cooperative HEI.

3. Research Instruments and Analytical Techniques

This study integrates three qualitative analytical techniques: critical discourse analysis, content analysis, and N-gram analysis.

Critical discourse analysis is applied to the national language policy documents to uncover the official stance toward English education, including policy objectives, ideological underpinnings, mandatory requirements, and the desired conditions constructed by national authorities.

Content analysis is conducted on English education–related information retrieved from HEI official websites. This technique enables systematic examination of institutional practices related to curriculum design, teaching and learning activities, resource allocation, teacher development, assessment mechanisms, and student outcomes. Website content is selected as it reflects publicly endorsed institutional practices and policy compliance narratives presented by HEIs.

N-gram analysis is employed as a supplementary analytical tool to identify high-frequency lexical patterns in both policy documents and HEI website corpora. Using AntConc version 4.3.1, textual data from the policy documents and institutional websites are converted into plain text corpora and processed to extract frequent two-word and three-word sequences. Function words and short prepositions are removed prior to analysis to enhance analytical clarity.

4. Data Collection Procedures

The national language policy documents are collected from official government sources and translated into English by the researcher for analytical purposes. English education–related information is collected manually from the official websites of the sampled HEIs, focusing on sections related to academic programs, curriculum design, teaching resources, faculty development, assessment practices, research activities, international cooperation, and student outcomes.

All collected textual data are organized, coded, and prepared for analysis following systematic procedures to ensure consistency across data sources.

5. Data Analysis Procedures

Data analysis proceeds in three stages. First, critical discourse analysis is conducted to identify the desired conditions and official expectations embedded in national language policy documents. Second, content analysis is applied to institutional website data to identify patterns and characteristics of HEI-based English education practices. Third, N-gram analysis is performed to compare high-frequency lexical patterns across policy and institutional corpora, thereby highlighting convergences and divergences between policy mandates and institutional practices.

Findings from the three analytical techniques are triangulated to enhance analytical rigor and to support the identification of discrepancies between national policy expectations and institutional implementation.

Results

This section presents the research findings in accordance with the three research objectives of the study. The results are derived from critical discourse analysis of national language policy documents, content analysis of English education–related information from HEI websites in Jiangsu Province, and N-gram analysis of the policy and institutional corpora.

According to research objective 1: desired conditions of English education in national language policies:

Table 1 Desired Conditions of English Education in National Language Policies

Policy Dimension	Desired Conditions Stipulated in National Language Policies
Policy rationale	English education is positioned as essential for national development, international communication, and the global dissemination of Chinese culture.
Educational goals	Development of comprehensive English competence, cross-cultural communication ability, critical thinking, and lifelong learning skills.
Curriculum structure	Differentiated but aligned tracks for English majors and non-English majors, with flexibility for HEI-based curriculum adaptation.
Teaching principles	Emphasis on innovation, interdisciplinarity, integration of technology, and student-centered learning approaches.
Resource construction	Development of diversified teaching resources, digital platforms, and supportive learning environments.
Assessment and evaluation	Establishment of scientific, multi-stakeholder evaluation systems and continuous quality improvement mechanisms.
Teacher development	Continuous professional development, research engagement, and integration of teaching and research responsibilities.

The critical discourse analysis of the two national language policy documents reveals a comprehensive and standardized vision of English education in higher education institutions. The policy documents construct the desired conditions of English education across several key dimensions.

First, English education is justified as an essential component of national development. The policies emphasize that English proficiency supports economic development, technological advancement, international communication, and the global dissemination of Chinese culture. English education is positioned as serving both individual development and national interests.

Second, the policy documents articulate clear ideological underpinnings. They stress the dual principles of national standardization and institutional flexibility. While all HEIs are required to comply with national standards, institutions are also encouraged to adapt curriculum design and teaching approaches to their specific contexts. Interdisciplinarity, innovation, and integration of language learning with broader educational goals are strongly promoted.

Third, explicit goals and requirements for English education are specified. These include the cultivation of comprehensive language competence, cross-cultural communication ability, critical thinking, and lifelong learning skills. Although differentiated requirements are set for English majors and non-English majors, the highest proficiency targets for non-English majors are aligned with those for English majors.

Fourth, the policies provide detailed guidance on teaching principles and resource construction. HEIs are expected to develop diversified curricula, integrate technology into teaching and learning, and construct supportive educational resources and learning environments.

Finally, the policies emphasize assessment, evaluation, and quality assurance. HEIs are required to establish scientific and systematic evaluation mechanisms involving multiple stakeholders and to implement continuous quality improvement processes. Teacher professional development is also highlighted as a key condition for effective English education.

According to research objective 2: actual practices of English education in HEIs in Jiangsu province:

The content analysis of English education–related information from the official websites of 20 sampled HEIs in Jiangsu Province reveals patterns in institutional practices that reflect both alignment with and variation from national policy expectations.

In terms of curriculum and program construction, most sampled HEIs demonstrate systematic development of English-related disciplines, majors, and courses. English majors and College English programs are commonly established, and several institutions highlight first-class majors and courses at national or provincial levels.

Regarding teaching resources and facilities, HEIs report substantial investment in physical and digital infrastructure, including language laboratories, multimedia classrooms, online learning platforms, and off-campus practice bases. However, the extent and quality of these resources vary across institutions.

With respect to teacher development and research engagement, HEIs emphasize faculty qualifications, professional titles, and participation in research projects. Many institutions highlight awards, funded projects, and academic outputs. At the same time, the degree of research engagement and institutional support differs among HEIs.

Assessment practices and quality assurance are frequently reported through indicators such as examination pass rates, accreditation outcomes, and institutional recognitions. English proficiency tests, including national and international examinations, are strongly emphasized in institutional narratives.

In addition, HEIs commonly stress international cooperation, student employability, postgraduate admission, and interdisciplinary talent cultivation models, such as the “English+” approach. These practices demonstrate institutional efforts to align English education with regional development and labor market needs in Jiangsu Province.

Table 2 Actual Practices of English Education in HEIs in Jiangsu Province

Practice Dimension	HEI-Based Practices Identified in Jiangsu Province
Curriculum and programs	Systematic development of English majors and College English programs; recognition of first-class majors and courses at national or provincial levels.
Teaching resources	Investment in language laboratories, multimedia classrooms, online platforms, and off-campus practice bases, with variation across institutions.
Faculty development	Emphasis on faculty qualifications, professional titles, awards, and participation in research projects.
Assessment practices	Strong focus on examination performance, pass rates of national and international English proficiency tests, and institutional accreditation outcomes.
International cooperation	Promotion of overseas exchange programs, joint programs, and cooperation with foreign institutions.
Student outcomes	Emphasis on employability, postgraduate admission, academic competition achievements, and interdisciplinary talent cultivation models.

According to research objective 3: discrepancies between policy Mandates and Institutional practices

By comparing the desired conditions articulated in national language policies with HEI-based practices in Jiangsu Province, several key discrepancies are identified.

First, while national policies promote balanced development across curriculum quality, teaching innovation, and student competencies, institutional practices tend to prioritize measurable indicators such as examination pass rates, awards, and accreditations. This results in uneven emphasis on cross-cultural competence and lifelong learning abilities.

Second, although the policies advocate flexible and context-sensitive implementation, disparities in institutional resources lead to unequal capacity for curriculum innovation and technological integration among HEIs. Not all institutions are able to fully implement the resource-intensive practices envisioned in policy documents.

Third, national policies emphasize continuous evaluation and quality improvement, whereas institutional practices often focus on summative evaluation outcomes. The implementation of formative evaluation and feedback mechanisms varies considerably across HEIs.

Fourth, while teacher professional development is highlighted as a core policy requirement, institutional practices reveal tensions between teaching responsibilities and research expectations, particularly in HEIs with limited staffing or support structures.

These discrepancies indicate that national policy mandates are not uniformly translated into institutional practices, and that contextual factors within Jiangsu Province play a significant role in shaping policy implementation outcomes.

Table 3 Comparison Between Policy Mandates and Institutional Practices

Policy Dimension	Policy Mandates (Desired Conditions)	HEI Practices in Jiangsu Province
Educational focus	Balanced development of language skills, cross-cultural competence, and lifelong learning	Emphasis on measurable outcomes such as test scores, awards, and accreditation
Curriculum innovation	Flexible, technology-integrated, and interdisciplinary curricula	Uneven levels of curriculum innovation and technological integration
Resource allocation	Adequate and diversified resources across all HEIs	Resource disparities among institutions
Teacher development	Balanced engagement in teaching and research	Tensions between teaching workload and research expectations
Evaluation mechanisms	Continuous and formative evaluation systems	Predominantly summative evaluation practices
Student competencies	Development of global competence and adaptability	Varied student outcomes across institutions

Table 4 Summary of Identified Discrepancies

Category of Discrepancy	Description
Policy standardization vs institutional diversity	Uniform national standards encounter diverse institutional capacities and local conditions.
Evaluation orientation	Policy emphasis on continuous improvement contrasts with institutional focus on summative indicators.
Resource dependency	Resource-intensive policy expectations are difficult to implement uniformly across HEIs.
Teacher workload	Policy expectations for research engagement coexist with heavy teaching responsibilities.
Student development	Cross-cultural and lifelong learning competencies receive less emphasis than test performance.

Discussions

Based on the research findings, the researcher analyzed and discussed the results in accordance with the research objectives as follows:

Research Objective 1: Desired Conditions of English Education in National Language Policies

The findings related to the first research objective reveal that national language policies on English education in China articulate a comprehensive and standardized vision of English education in higher education institutions. Consistent with Spolsky's theory of language policy, the policies emphasize not only linguistic outcomes but also ideological orientations, management mechanisms, and educational goals (Spolsky, 2004a; 2012; 2019). English education is positioned as serving national development, global engagement, and cultural dissemination, reflecting the strategic role of English within China's broader sociopolitical agenda.

The policies also demonstrate an attempt to balance national standardization with institutional flexibility. This dual orientation aligns with prior research suggesting that effective language policy design must allow space for contextual adaptation while maintaining coherent national objectives (Vanbuel & Van den Branden, 2020). Furthermore, the emphasis on cross-cultural competence, lifelong learning, and interdisciplinary integration reflects global trends in language education policy identified in earlier studies (Baker, 2011; Okoro, 2019). These findings confirm that China's national language policies are conceptually aligned with contemporary international discourse on English education in higher education.

Research Objective 2: Actual Practices of English Education in HEIs in Jiangsu Province

In relation to the second research objective, the findings indicate that HEIs in Jiangsu Province demonstrate substantial efforts to align institutional practices with national language policy expectations. Curriculum construction, investment in teaching resources, faculty development, and international cooperation are prominently featured in institutional narratives. This reflects what previous studies have identified as institutional strategies to signal compliance with national policies and to enhance organizational legitimacy (Waslander, Hooge & Theisens, 2023).

However, the analysis also reveals considerable variation among HEIs in terms of resource availability, technological integration, and research engagement. Such variation

supports earlier findings that policy implementation is strongly mediated by institutional capacity and local context (Deng, 2021; Vanbuel, 2022). The reliance on website-based representations further suggests that HEIs tend to emphasize visible and measurable achievements, such as awards, accreditation, and examination outcomes, which function as symbolic indicators of policy compliance. This phenomenon resonates with Owojecho's (2020) observation that implementation practices often prioritize demonstrable outputs over deeper pedagogical transformation.

Research Objective 3: Discrepancies Between Policy Mandates and Institutional Practices

The third research objective focuses on identifying discrepancies between national language policy mandates and HEI-based practices. The findings reveal that while national policies promote balanced development across curriculum quality, teaching innovation, evaluation mechanisms, and student competencies, institutional practices tend to concentrate on summative indicators and performance metrics. This discrepancy echoes Mokibelo's (2016) argument that policy goals are frequently constrained by implementation challenges related to resources, infrastructure, and organizational routines.

In addition, tensions between teaching responsibilities and research expectations among English teachers reflect structural constraints that have been widely discussed in the literature (Liyanage & Walker, 2023; Deng, 2021). Although policies advocate the integration of teaching and research, institutional realities often limit teachers' capacity to fulfill both roles simultaneously. Moreover, disparities in resource allocation across HEIs further exacerbate uneven policy implementation, supporting the view that uniform national standards may produce unequal outcomes when applied to diverse institutional contexts (Vanbuel & Van den Branden, 2020; Kazakbaeva, 2023).

Taken together, these discrepancies highlight the complexity of language policy implementation as a negotiated and adaptive process rather than a linear translation of policy into practice. The findings reinforce Spolsky's (2019) assertion that language policy outcomes emerge from the interaction of policy texts, institutional actors, and contextual conditions.

Conclusion and suggestions

Since outcomes may not always meet the expectations set by policies, creative solutions can bring vitality to problem solving endeavors. Language policy implementation strategies should stem from addressing the discrepancies between the actual practices of HEI-based English education and the mandated requirements of the national language policies, just as "a rigorous review of the policy and its actual implementation" is always a call from the academia (Gempeso & Mendez, 2021). To bridge the gap, the following implementation strategies could be adopted:

1) Monitoring HEI performance: To introduce an adaptive monitoring and support system that regularly reviews each HEI's adherence to policy standards while considering their unique conditions. HEIs that show particular strengths in implementing national policies could serve as models to offer insights and support to other institutions, encouraging cross-institutional collaboration and fostering alignment with national policy while honoring HEIs' local context.

2) Advancing curriculum and resource development: To establish national or regional online platforms that consolidate high-quality digital resources, lesson plans, and curriculum modules for English education, and accommodate HEIs at varying stages of resource and technological development. While all institutions would follow a core curriculum, privileged institutions could be incentivized to incorporate higher-tier curriculum elements.

3) Enhancing research engagement and teacher development: To develop guidelines for balanced teacher workloads, with flexibility based on institutional capacities to prevent burnout and ensure both teaching and research effectiveness. Research mentorship initiatives could be established to connect less experienced HEI teachers with senior researchers, fostering professional development without overburdening teachers, reinforcing the importance of both teaching and research.

4) Improving teaching quality and evaluation mechanisms: To introduce a policy emphasis on formative assessment practices to complement summative evaluations. Formative assessments would allow institutions to gather regular feedback from students and teachers, facilitating timely improvements in teaching methods and curriculum adjustments. A set of nationally or provincially standardized evaluation tools that HEIs can either adopt or adapt could be established, from surveys to peer-review frameworks.

5) Elevating student outcomes and cross-cultural competence: To integrate modular cultural competence courses into the English curriculum to ensure that students develop the competencies outlined in the national policies. National or provincial support for initiatives such as partnerships with overseas HEIs to promote language exchange and cross-cultural immersion would increase opportunities for students to gain real-world experiences, and national or regional equity initiatives would help HEIs with fewer resources access high-quality teaching materials and cross-cultural training resources.

In conclusion, this study provides a comprehensive understanding of how national language policies on English education are implemented within higher education institutions through a provincial-level case study of Jiangsu Province. With regard to the first research objective, the findings confirm that national policy documents articulate a coherent and ambitious vision of English education, emphasizing comprehensive language competence, cross-cultural communication, and alignment with national development goals. Concerning the second objective, the analysis of institutional practices reveals that higher education institutions in Jiangsu Province actively respond to policy expectations by developing curricula, investing in resources, and promoting faculty development, while simultaneously adapting these practices to their specific institutional conditions. Regarding the third objective, the study identifies systematic discrepancies between policy mandates and institutional practices, particularly in areas related to evaluation mechanisms, resource distribution, and the balance between teaching and research responsibilities. These findings underscore that language policy implementation is not a linear process of policy compliance, but rather a dynamic and context-dependent process shaped by institutional capacity, organizational priorities, and regional conditions. From an academic perspective, this study contributes to the literature on language policy implementation by integrating policy discourse analysis with institutional practice analysis at the provincial level, thereby extending existing theoretical discussions that often focus on national policy design or individual institutional cases. From a practical standpoint, the findings suggest that effective implementation of national language policies requires flexible and context-sensitive strategies that acknowledge institutional diversity and regional disparities. It is important to note that the findings of this study should be interpreted within the context of Jiangsu Province and do not imply uniform conditions across all regions in China. Nevertheless, the analytical framework and methodological approach adopted in this study may offer valuable insights for future research and policy evaluation in other regional and national contexts.

Recommendations

1. For problem in this research

With the “National Guide for English Majors 2020” and the “National Guidelines for Non-English Majors 2020” superseding the predecessor policy documents and being enacted as new guidelines for English education in China’s HEIs for the ten to twenty years to come, an exploration of HEIs in Jiangsu Province has revealed that discrepancies exist between the HEI-based actual practices and the national policy mandates. Language policy implementation strategies stemmed from addressing the discrepancies as proposed by this study could be adopted to facilitate endeavors so as to ensure alignment between actual outcomes and policy expectations.

2. For directions of further research

Further research could be done in the following directions: extending the inquiry to other provinces or regions in China to offer a more comparative and comprehensive understanding of how national language policies are implemented across diverse settings; analyzing how localized language policy implementation strategies affect language education outcomes to identify best practices for balancing national goals with local needs; creating a set of metrics that could be used to evaluate the success of language policy implementation strategies across diversified HEI contexts; studying teachers and students perspectives on policy impacts to uncover on-the-ground insights that inform more effective language policy implementation strategies.

New knowledge and the effects on society and communities

The findings indicate that national policies articulate comprehensive goals for English education, emphasizing talent cultivation, cross-cultural competence, and quality assurance. However, variations exist in the ways these policies are implemented at the institutional level. Discrepancies are identified in reflecting challenges in translating national policy mandates into diverse local contexts. The flexible and context-sensitive implementation strategies are necessary to narrow the gap between national language policy expectations and HEI-based practices. The study proposes recommendations to enhance policy implementation through adaptive monitoring mechanisms, strengthened curriculum and resource support, balanced teacher development, improved evaluation systems, and the promotion of cross-cultural competence. The findings contribute to a clearer understanding of language policy implementation in higher education and provide practical implications for policymakers and institutional administrators.

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Blooming Seasons: The Art of Creating Traditional-Based Contemporary Dance

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Abstract

As one of the representative traditional dances of Hunan Province, China, Mayang Huadeng faces the challenge of integrating into contemporary society while preserving its cultural heritage. Taking innovation as the starting point, this research explores the creation of contemporary dance based on traditional Mayang Huadeng through practical investigation and artistic creation. The study examines traditional creative methods of Mayang Huadeng and develops contemporary dance works grounded in these traditions, ultimately establishing an approach for creating contemporary dance art rooted in traditional forms. Data collection involved literature review and fieldwork utilizing interviews and observations as primary research instruments. The researchers conducted creative practice research employing focus groups to gather expert feedback on the choreographic process. Through comprehensive analysis, this study presents a methodology for creating contemporary dance art that honors tradition while embracing innovation. The resulting dance work, 'Blooming Seasons,' demonstrates how traditional elements can be transformed through creative adaptation of movement vocabulary, innovative development of traditional forms, and balanced integration of collective heritage with individual artistic expression. This research contributes to the discourse on intangible cultural heritage preservation by proposing practical strategies for revitalizing traditional dance forms to meet contemporary aesthetic expectations while maintaining cultural authenticity.

Keywords: Mayang huadeng, Traditional-based contemporary dance, Blooming seasons, Creative transformation, Intangible cultural heritage

Introduction

Huadeng represents one of the quintessential Han Chinese folk dance forms in southern China. Specifically, Mayang Huadeng flourishes in Mayang Miao Autonomous County, Hunan Province, embodying a unique synthesis of Han and Miao cultural traditions. Traditionally performed by male-female pairs with women portraying 'Deng Guniang' (Lantern Girl) and men enacting 'Lai Huazi' (Flower Boy) these performances encompass themes of ritual celebration, romantic expression, and communal entertainment. During the Chinese New Year period, Huadeng troupes traverse communities performing festive greetings, as captured in the traditional saying: 'A set of gongs and drums, a row of Huadeng. They pick up their fans and go out. Thousands of firecrackers come to greet them, and they sing from the first night to the fifth night.' This jingle illustrates the profound affection communities historically held for Huadeng performances (Miao et al., 2023).

However, rapid social development, modernization, and urbanization have dramatically transformed the cultural and ecological environment supporting Mayang Huadeng. The art form faces increasing endangerment and developmental challenges, including declining numbers of performing artists, insufficient successors, limited repertoire preservation, lagging theoretical research, and stagnant innovation in performance content and form. As contemporary entertainment options proliferate, traditional performing arts struggle to maintain audience engagement. Multiple factors contribute to this predicament: the accelerated pace of modern life, the influence of foreign dance forms such as street dance and K-pop, the perceived incompatibility between traditional aesthetics and contemporary preferences, youth migration for employment opportunities, career diversification, and the resulting succession crisis. Consequently, Mayang Huadeng increasingly diverges from contemporary lived experience. While dedicated inheritors and veteran artists continue their preservation efforts, traditional dance styles alone cannot satisfy the aesthetic expectations of contemporary youth. Failure to address innovation in the current era will only widen the inheritance gap in future generations.

The inheritance and development of Mayang Huadeng have entered a new era, requiring deep consideration of inheritance protection and innovative development.' As a traditional Chinese folk dance that has endured millennia of cultural evolution while remaining embedded in community practice, Mayang Huadeng clearly demonstrates significant influence and value. However, when traditional dance serves solely purposes of social entertainment, physical exercise, and ritual worship, it inadequately addresses modern aesthetic needs and lifestyle requirements. Contemporary stewardship must balance two imperatives: preserving historical continuity and facilitating future evolution. In an era emphasizing cultural confidence, practitioners must articulate both traditional cultural connotations and practical contemporary value. Innovation grounded in tradition, responsive to temporal changes and iterative development, prevents cultural obsolescence and disappearance. From this perspective, innovation emerges organically from traditional bottlenecks, with inheritance itself constituting a process of continuous creation (Yana et al., 2024). Integrating traditional performing arts into contemporary life requires enabling traditional dance to meet evolving aesthetic expectations. Beyond encouraging local inheritors to maintain traditional forms, artists must engage in what Hobsbawm & Ranger (1983) term 'inventing traditions' creating contemporary dance works grounded in traditional foundations that resonate with present-day aesthetics. By leaving traces in current historical stages, practitioners achieve the dual objectives of tradition preservation and innovation.

Luna and Shuib (2025) emphasize that 'it is particularly crucial to explore and establish research methods applicable to Mayang Huadeng, which must both deeply explore its unique artistic charm and cultural connotations while providing strong academic support and practical guidance for its inheritance and development.' Through comprehensive study of Mayang Huadeng, researchers have identified substantial prototypes amenable to re-creation with new connotations and aesthetics. Works such as 'October Flowers,' 'December Tea Picking,' and 'Flowers Bloom in All Seasons' demonstrate elegant refinement; 'The Widow's Tune' features prominent narrative elements; 'Welcoming the Bride' and 'The Female Militia of Xiangshan Mountain' offer varied thematic content. While seemingly disconnected from contemporary social life, these works retain emotional cores and distinctive movement vocabularies with complete formal structures. Through artistic processing and innovation, they possess potential for what He (2020) describes as achieving 'new singing of old opera.'

Practice facilitates theory formation, which in turn guides subsequent practice. This study begins with the cultural roots of Mayang Huadeng, progressing systematically through data collection, creative practice, and performance feedback to analyze innovative approaches to traditional dance. Compared to conventional art production, this process demands greater complexity, yet only through such rigor can truly effective pathways emerge. This methodology differs fundamentally from 'fast-food style' artistic creation, addressing the gap in practical methodology within creative theory.



Figure 1 The traditional dance "Mayang Huadeng"
(Source: Mayang government website)

Research Objective

To study the contemporary development pathways of the traditional dance Mayang Huadeng.

Methodology

For the first research objective, the researcher conducted literature review and fieldwork for data collection. Research instruments included interviews and observations with key informants such as choreographers, inheritors, and performers.

For the second research objective, the researcher conducted creative practice study, utilizing focus groups to collect expert feedback before public performance.

For the third research objective, the researcher conducted comprehensive analysis based on empirical results to establish principles for creating traditional-based contemporary dance.

Literature Review

Research on the Historical Evolution of Mayang Huadeng

In the articles "Mayang Huadeng Opera (Provincial Cultural Education Department , 2013): A Miao Village's 'Duet' Enriches Colorful Life" published by the Provincial Cultural Education Department, and "The 'Southern Duet' Mayang Miao Huadeng" by Li Qiang and Yang Guopeng, the authors reconstruct the trajectory of Mayang's basin gourd culture through local chronicles, Huadeng lyrics, local historical materials, and oral histories. They highlight its rich content and widespread regional presence, emphasizing its deep historical and cultural value, unique artistic aesthetic, and practical societal utility. Despite the legends suggesting that Huadeng opera existed since the Tang Dynasty, there is no factual evidence to support this, with folklore being the sole source of its origins. On the Historical Evolution and Human Ecological Protection of Mayang Huadeng," analyzes the historical changes of Mayang Huadeng from perspectives of geographical conditions, and the evolution of economic and cultural aspects. It argues that Mayang's unique geographical location made it a strategic military post for feudal rulers for a long time. The stationed soldiers, primarily of Han ethnicity, interacted extensively with the local Miao people. Over time, due to Han migration and intermarriages with the Miao, a fusion of Miao and Han cultures emerged, leading to the long-standing tradition of Mayang Huadeng (Zhao et al., 2024). The Inheritance and Transformation of Mayang Miao Huadeng Opera," discusses how Mayang Huadeng is the progenitor of Xiangxi Huadeng. Historical accounts note that as early as the Southern Song Dynasty, Lu You had described how locals in Xiangxi went to town to watch Huadeng during the New Year and other festivals. By the Ming and Qing Dynasties, with an influx of outsiders, local people began to perform Han operas, Nuotang plays, and Yang operas on holidays. Eventually, the modern form of Mayang Huadeng opera emerged during the Qing Dynasty, under the reign of Emperor Guangxu (Jian & Nicolas, 2021).

Research on the Protection of Intangible Cultural Heritage

The Inheritance and Development of Mayang Huadeng Opera," the author outlines the historical context of the Huadeng opera and offers recommendations for its inheritance and development. Firstly, it is suggested that the provincial government allocates special funds from the national intangible cultural heritage protection funds to support the Mayang Huadeng theatre troupe annually. Secondly, the government should expedite the creation of a long-term mechanism to support national intangible cultural heritage local opera types, specify more detailed local financial support, and develop related preferential policies. Thirdly, the government should promote Huadeng opera within the community, especially encouraging performances in schools (Lin, 2025). Study on the Disconnection in the Inheritance and Development of Mayang Miao Autonomous County's Huadeng Opera" (1994) examines the various issues encountered during the inheritance process of the intangible heritage Huadeng opera. By investigating the current state of Huadeng opera development and inheritance in Mayang County, the study identifies reasons for its decline and factors affecting its development and inheritance, aiming to establish mechanisms for its protection and continuation (Zhang et al., 2022).

Folkloristic Study of Mayang Huadeng

From a folkloristic perspective, the article "Beautiful Folk Song and Dance—Playing with Huadeng mainly introduces the performance forms of Mayang Huadeng. The content often promotes Confucian rituals, and celebrates love and life, serving as a folk activity for extending New Year greetings and blessings (Liu & Chuangprakhon, 2024). This highlights the role of Mayang Huadeng in festival celebrations and its function in transmitting cultural

values and social messages. The Cultural Blend of Miao and Han in Mayang Huadeng" takes the New Year's Huadeng in Mayang as a starting point, discussing the customs related to Huadeng, the organizational forms of Huadeng groups, the making of lanterns, classifications of Huadeng, and Huadeng music. It also addresses the current state of Miao-Han cultural integration, reflecting the customs, human relationships, and unique characteristics of the ethnicity and region (Wang, 2015).

Study of the Artistic Forms and Characteristics of Mayang Huadeng

On the Artistic Forms and Characteristics of the Mayang Miao 'Huadeng Opera' in Western Hunan focuses on the artistic forms and styles of the "Huadeng Opera" itself. It categorizes the repertoire of the Mayang Miao Huadeng Opera, analyzes the modal scales used in the music, and partly discusses the content and form of performances, including props and costumes. Meanwhile, Li Jing's "The Artistic Characteristics of Dance Music in Mayang Huadeng" centers on dance movement analysis, describing how dance uniquely manifests in the music of "Huadeng Opera" with singing, dancing, and acting, creating a vibrant and diverse performance (Hongxian & Yodwised, 2023). In summary, although relatively few articles discuss the artistic forms and features of Mayang Huadeng, those that do often describe the performance contexts as part of broader discussions on the origins and historical evolution of Huadeng opera. Moreover, as Mayang Huadeng has evolved, it has increasingly incorporated local cultural performances, thus transforming into more of a scenic depiction. This has led to a more ambiguous analysis of traditional artistic characteristics, blending them with broader cultural expressions and making the traditional forms less distinct. This evolution reflects the adaptive and evolving nature of folk arts as they interact with changing cultural dynamics and societal needs. The aforementioned literature primarily summarizes historical and cultural contexts, rarely documenting the performances of inheritors and artists, nor does it explore the historical development of Mayang Huadeng. Researchers are needed to conduct more comprehensive analyses, such as analyzing photographic and audiovisual materials, or interviewing folk artists, to further gather data.

Results

1. The dilemma in the inheritance of Mayang Huadeng

In past research on the historical evolution and changes of Mayang Huadeng, studies were primarily based on local chronicles, local histories, and oral histories. These studies placed the art form within a temporal context to analyze the circumstances of Mayang Huadeng in each era. Although there has been considerable effort to trace the overall evolution of the Mayang Miao Huadeng opera, there has been little in-depth exploration of the reasons behind these transformations. Without a profound analysis of the reasons and results of the cultural changes of Mayang Huadeng, it is difficult to make accurate and valuable judgments on the protection and inheritance of the art form, thus recommendations for the development paths of its inheritance lack specificity.

From the perspective of folklore studies, although it is possible to see the full picture of the Huadeng opera, there is insufficient focus on its development and protection. In the analyses from the perspectives of musicology and dance studies, which begin to touch on the vitality of Mayang Huadeng through ontological analysis, there is a scarcity of existing materials, and more emphasis is often placed on descriptions of the form, features, and scenes of the Huadeng. There are almost no proposals on how to start with the ontology of Mayang Huadeng, combining social and cultural factors, and there is a lack of effective protection and inheritance development research.



Figure 2 Researchers collect historical information from inheritors (Source: Researcher, 2025)

2. Obstacles in the Development of Mayang Huadeng

As an intangible cultural heritage, Mayang Huadeng continuously confronts "modernization," which also presents obstacles in the methods of inheritance and economic investment. Firstly, there is a conflict with the times. As the economy and technology rapidly advance, Mayang Huadeng faces challenges in competing with "modernization." Many young people are now pursuing "short, frequent, fast" entertainment activities, significantly reducing the number of participants and spectators of Huadeng. How to make the art form interesting to the new generation and to encourage active participation in its dissemination and inheritance is a visible problem, yet difficult to address effectively.

Secondly, the modes of inheritance are limited. In the traditional social structure, the master-apprentice relationship was akin to a parental relationship, influenced by the feudal notion of passing skills only to males, which meant many female learners could not formally enter the lineage of inheritors. This directly affected the scope and number of inheritors. In recent years, policies have encouraged both men and women to learn from inheritors and become the next generation of inheritors, but this has not had a significant effect in practice, as most young people go out to study or work and rarely stay in the county to learn the art, leading to a lack of successors for Mayang Huadeng.

Thirdly, there is insufficient economic investment. In a market economy, whether it is the government or investors, focus is typically placed first on projects with high returns, wide benefits, and quick results. The development of intangible cultural heritage remains at a basic standard, leading to very limited incomes for inheritors, performers, choreographers, and even theatre troupes involved in Mayang Huadeng. They cannot sustain themselves on wages or government subsidies alone and must devote more energy to solving income issues, which directly affects the development of Mayang Huadeng.



Figure 3 Researchers interviewing inheritors at the Mayang Huadeng Theatre Troupe (Source: Researcher, 2025)

3. Contemporary Development Pathways for Mayang Huadeng

Balancing Theory and Practice: Mayang Huadeng carries a wealth of content and broad significance. To more completely represent the Huadeng opera in written form, it is first necessary to describe its artistic forms in detail and change the mode of transmission from "oral" to "written." Simultaneously, there should be a focus on the results of practical applications to achieve innovative development of Mayang Huadeng, making it dynamic in its transmission and increasing the artistic quality of the dance works to align with contemporary aesthetics, thus attracting more young people.

Improving the Economic Income of Inheritors: Addressing the salary issues of inheritors is crucial. Adequate life assurance would allow them to devote more time and energy to inheritance activities. Expanding the number and scope of inheritors by shifting from individual development of apprentices to official selection processes and fostering a value-oriented approach that takes pride in becoming an inheritor can also help.

Increasing Government Support: In addition to achieving annual goals, government departments can use a project-based approach to create cultural industries, attract commercial investments, and bring income to individuals involved in Mayang Huadeng while boosting tourism and economic development. Using new media and multiple channels for widespread dissemination, such as online and television media platforms, can enhance the social impact of Mayang Huadeng, especially during festivals and organized events to generate public discussion and traffic.

Strengthen school-local collaboration and educational outreach. By collaborating with local primary and secondary schools, universities, and professional art schools, incorporate Mayang Huadeng into the curriculum, offering specialized courses and practical instruction in Huadeng, thereby fostering a deeper understanding and love of traditional culture among young people. Encouraging students to participate in the creation, rehearsal, and performance of Mayang Huadeng will not only improve their performance skills but also deepen their identification with local culture. Furthermore, "Intangible Cultural Heritage Inheritance Bases" or "Mayang Huadeng Workshops" could be established, bringing in professional instructors for systematic instruction and cultivating a group of promising young successors.

Promote cross-sector integration and industrial expansion. Integrate Mayang Huadeng with tourism, cultural and creative industries, film and television, and fashion to develop cultural and creative products with local characteristics, such as lantern-themed handicrafts, clothing and accessories, animated shorts, and stage plays, expanding its expression and market potential. Beyond theatrical performances, night tourism, intangible cultural heritage markets, and immersive experiences could be integrated to create diversified consumption scenarios and enhance cultural added value. This not only enhances the sustainable development capabilities of Mayang Huadeng, but also makes them closer to people's lives and market demands.

Discussions

Through the study of the historical evolution and current state of the traditional dance Mayang Huadeng, this research proposes contemporary development pathways: balancing theory and practice, improving the economic income of inheritors, and increasing government support. Initial literature research revealed a multi-dimensional organization and analysis of Mayang Huadeng's history, changes, and artistic characteristics from various perspectives, including its status as an intangible cultural heritage and studies from folklore, musicology, and dance perspectives. Based on this, the study focused on analyzing the cultural concepts and aesthetic standards that have changed over the decades, identifying the challenges faced in inheritance. This is consistent with research of Wilcox (2018) Study of dynamic inheritance: representative works and the authoring of tradition in Chinese dance. And consistent with

research of Zong et al. (2025) study of the impact mechanism of Chinese higher folk dance education on the traditional national cultural inheritance and innovation among young universities students: a deep exploration. The research also revealed the positive promotion of folk dance education on universities students' national pride and cultural confidence, as well as their role in promoting cultural inheritance and innovation.

Field research involved in-depth investigations and first-hand data collection from local cultural institutions and interviews with inheritors, performers, and directors, providing a detailed understanding of why young people are no longer willing to learn the craft voluntarily and analyzing the realistic obstacles to the development of Mayang Huadeng: conflicts with modern times, limited inheritance methods, and insufficient economic investment. These are details that are not easily examined through books, documents, or online reports, adding significant research value.

Finally, the study proposes contemporary development pathways for Mayang Huadeng. It suggests strategies from economic, cultural, and governmental support perspectives, hoping to transform theory into practice, promote protection through inheritance, and aid development with support, ultimately forming a beneficial cycle at the societal level. The study also aims to initiate discussions, identify innovative and focal points, and promote the artistic creation of Mayang Huadeng, producing artworks that highlight core values and achieve the goal of dynamic inheritance and development. Furthermore, there have been studies on the inheritance, development, and promotion of the artistic creation of traditional dance. Such as, Huang, (2024) to explore the artistic, cultural and education characteristics and inheritance of dance in of music and dance of silk road in the han and tang dynasties. Mackerras (1992) study of integration and the dramas of China's minorities. Huang (2025) study of transforming dance education in China: enhancing sustainable development and cultural preservation. Mao & Potiwetchakul (2025) study the movement characteristic and cultural connotation of gujiazi in anhui huagudeng dance. Symbolizing joy and enthusiasm for life. Additionally, it fosters community cohesion, represents historical continuity, and embodies auspiciousness and well-wishing, reflecting the rich local heritage and cultural values of Anhui.

Conclusion and suggestions

Conclusion

This research establishes a comprehensive methodology for creating contemporary dance grounded in traditional forms, addressing the critical challenge of intangible cultural heritage preservation through active innovation. The study demonstrates that Mayang Huadeng, despite facing contemporary challenges, possesses substantial potential for creative transformation when approached through systematic analysis of traditional creative methods, rigorous artistic practice, and thoughtful integration of contemporary aesthetics.

The three-stage creative process pre-production organization, production refinement, and post-production evaluation provides a replicable framework applicable beyond Mayang Huadeng to other endangered traditional performing arts. The resulting dance work 'Blooming Seasons' exemplifies how traditional materials can undergo creative transformation, traditional forms can receive innovative development, and individual artistic expression can honor collective cultural heritage while meeting contemporary expectations.

Suggestion

This study contributes to both theoretical understanding and practical application of cultural heritage preservation. Theoretically, it bridges the gap between traditional preservation discourse and contemporary creative practice, demonstrating that 'inventing traditions' need not compromise cultural authenticity when grounded in rigorous research and respectful

innovation. Practically, it offers choreographers, cultural institutions, and policymakers a tested methodology for revitalizing traditional dance forms.

Future research should examine audience reception across different demographic groups, explore digital preservation and dissemination technologies, investigate economic sustainability models for traditional dance troupes, and analyze application of these creative principles to other regional and ethnic dance traditions. As China continues emphasizing cultural confidence and creative transformation of traditional culture, methodologies such as those developed in this study will prove increasingly valuable for ensuring that invaluable cultural heritage remains vibrant, relevant, and accessible to contemporary and future generations.

New knowledge and the effects on society and communities

The paper explores the historical inheritance and cultural innovation derived from the Haihunhou archaeological site in China. It connects ancient heritage with modern cultural and creative product design, emphasizing how traditional knowledge can be reimagined in the present-day context.

The paper presents "new knowledge" not only as abstract academic output but as a transformative force that reshapes how communities relate to their past, present, and future. By creatively engaging with archaeological findings, it provides a vision of culture as both a legacy and a resource, generating social cohesion, economic opportunity, and aesthetic enrichment.

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The Effects of Design Thinking Activities on Learning Achievement and Innovative Thinking Skills Among Undergraduate English Major Students in Thailand

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Abstract

The purposes of this research were to compare undergraduate students' learning achievements and innovative thinking skills before and after learning through design thinking activities in English for communication in service industry course, and to study undergraduate students' self-perception on their innovative thinking skill after learning through design thinking activities. A one-group pretest–posttest design was employed. The sample group of this research was 59 undergraduate students majoring in English who enrolled in English for communication in service industry course in academic year 2024. Total population sampling was employed, representing 95.1% of the population. The research instruments included design thinking activity plans in English for communication in service industry course, a learning achievement test, an innovative thinking skills test and a self-perception of innovative thinking skills questionnaire. All instruments were validated by experts for content validity (IOC = 0.67–1.00). The internal consistency reliability of the instruments was examined using the Kuder–Richardson Formula 20 (KR-20) for the learning achievement test and the innovative thinking skills test, and Cronbach's alpha for the self-perceived innovative thinking skills questionnaire. The reliability coefficients were 0.74, 0.79, and 0.91, respectively. Data were analyzed using mean, standard deviation, t-test (dependent samples), and Cohen's d. The results indicated that post-test scores for learning achievement were significantly higher than pre-test scores at the .05 level, with a very large effect size ($d = 2.57$). Similarly, innovative thinking skills significantly improved, with a very large effect size ($d = 2.14$). Students' perceptions of their innovative thinking skills were rated at a high level after the intervention.

Keywords: Design thinking, Innovative thinking, Learning activity, English for communication, Learning achievement

Introduction

In today's rapidly changing society, innovative thinking skills are important skills for undergraduate students' lifelong development. Educational management in Thailand emphasizes the importance of cultivating undergraduate students who possess 21st-century skills as well as academic knowledge. Among 21st-century skills, innovative thinking skills are recognized as essential skills for success in an increasingly complex, dynamic, and innovation-driven global economy (Avcı & Durak, 2023; Gregory et al., 2013). Innovative thinking skills not only enable undergraduate students to generate new ideas and solve real-world problems but also integrates creativity, critical analysis, and collaborative problem-solving skills which are considered essential for qualified graduates to compete in a labor market. Innovative thinking skills refer to the capacity to generate new ideas that address specific needs and can be adapted to diverse contexts and working environments. Individuals with innovative thinking abilities are capable to resolve complex problems and adjusting their knowledge and perceptions by leveraging existing resources (Hart, 1996). It is a process of solving problems in novel and original way, which is not restricted by existing conventional thinking. According to Swallow (2012), innovative thinking skills comprise core competencies of questioning, observing, experimenting, networking, and associating. These skills enable undergraduate students to frame problems creatively, recognize patterns across disciplines, and develop original solutions. Therefore, Innovative thinking skills are essential skills that integrates creativity, analytical reasoning, and problem-solving. Undergraduate students with such abilities can generate, refine, analyze, and evaluate ideas to enhance existing concepts. From a social standpoint, they are also able to collaborate effectively with others, communicate and articulate new ideas clearly, consider diverse perspectives, understand real-world conditions, and produce applicable outcomes. As a critical competency, innovative thinking promotes creativity and problem-solving across various domains, including education, society, and the economy, contributing significantly to personal development and societal advancement. However, traditional educational management often emphasizes knowledge mastery while neglecting the assessment of undergraduate students' thinking abilities (Gao, 2023), which contributes to the under development of innovative thinking skills among Thai undergraduate students. According to Klinart (2019), many Thai undergraduate students have difficulty applying what they learn in class to real-world problems and lack the habits of questioning, experimenting, and networking that are key to innovation. As a result, it is urgent to adopt teaching methods that encourage undergraduate students to build these abilities so they can compete successfully in today's fast-changing job market.

Design Thinking is a human-centered approach that has been proven effective in promoting both deep learning and the development of creative thinking skills (Brown, 2009). Its procedure consists of five stages; empathize, define, ideate, prototype and test. This process of design thinking approach can be integrated in educational learning activities. This approach has been utilized as an effective learning tools to promote undergraduate students' understanding in multidisciplinary, fosters meaning learning with real-world experiences extensively (Carroll, et al., 2010). The design thinking process focuses on empathizing with users, clearly defining problems, generating creative ideas, prototyping, and testing solutions to refine them based on real-world needs. It also provides learners with opportunities to address real-world challenges and bridges the gap between theoretical knowledge and practical application.

Although Design Thinking has been widely recognized as an effective approach for fostering creativity and problem-solving skills, existing research has primarily focused on general education and business-related disciplines. Empirical studies examining the integration

of Design Thinking activities in English language learning contexts, particularly in English for Communication courses related to the service industry, remain limited. This gap is significant because English major undergraduate students must develop not only language proficiency but also innovative thinking skills to effectively communicate and respond to complex, real-world professional situations. Moreover, there is a lack of empirical evidence investigating the simultaneous impact of Design Thinking activities on both learning achievement and innovative thinking skills among English major students in higher education, especially within the Thai educational context. Addressing this gap, the present study integrates Design Thinking activities into an English for Communication in the Service Industry course and empirically examines their effects on students' learning achievement and innovative thinking skills. By doing so, this study contributes to the existing body of knowledge by extending the application of Design Thinking to English language education in a discipline-specific context and providing empirical evidence to support its effectiveness in promoting both cognitive and innovative skill development among undergraduate English major students.

Thus, this research aimed to compare undergraduate students' learning achievement and innovative thinking skills before and after learning through design thinking activities in the English for communication of service industry course and to study undergraduate students' self-evaluation on their innovative thinking skill after participating in design thinking activities. The findings of this study are expected to contribute to the development of an effective instructional approach that meets the needs of learners and prepare undergraduate students' readiness to be qualified graduates, aligned with demands of competitive labor market, enabling undergraduate students to develop themselves in education and career in the future.

Objectives

1. To compare undergraduate students' learning achievement before and after learning through design thinking activities.
2. To compare undergraduate students' innovative thinking skills before and after learning through design thinking activities.
3. To investigate undergraduate students' self-perceived innovative thinking skills after engaging in design thinking activities.

Research Hypotheses

H₀₁: There is no statistically significant difference in undergraduate students' learning achievement before and after learning through design thinking activities.

H₁₁: Undergraduate students' learning achievement after learning through design thinking activities is significantly higher than before learning through design thinking activities.

H₀₂: There is no statistically significant difference in undergraduate students' innovative thinking skills before and after learning through design thinking activities.

H₁₂: Undergraduate students' innovative thinking skills after learning through design thinking activities are significantly higher than before learning through design thinking activities.

Conceptual Framework

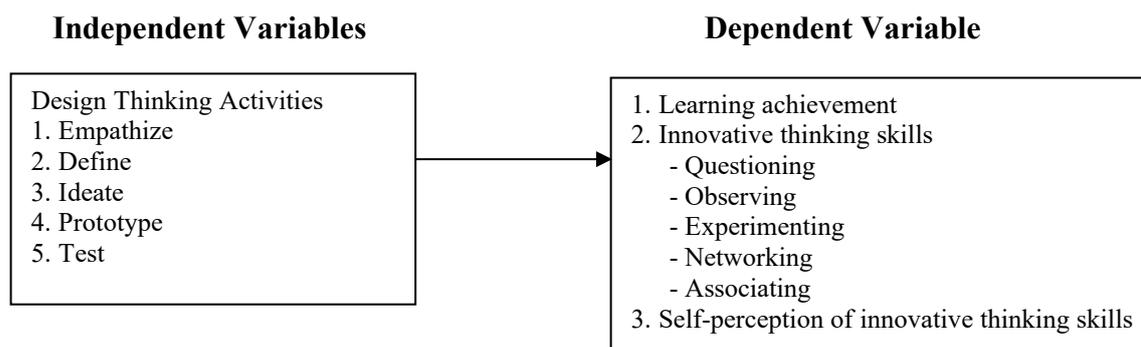


Figure 1 Conceptual Framework (Source: Researcher, 2025)

Methodology

Population and Samples

The population for this research consisted of 62 fourth-year English major undergraduate students at Chiang Mai Rajabhat University. The sample group, obtained through total population sampling, included 59 undergraduate students majoring in English (95.1% of the population) enrolled in the English for Communication in the Service Industry course during the 2024 academic year. Prior to data collection, the research procedures were reviewed and approved by the Institutional Review Board (IRB) of Chiang Mai Rajabhat University (Certificate No. IRBCMRU 2024/258.14.06). All participants were informed of the study's objectives, and written consent was obtained to ensure voluntary participation and the confidentiality of their responses.

Research Instruments

The research instruments in this study consisted of the following:

1. The design thinking activity plans were designed to cover the context of English for communication in the service industry, with an implementation period of 30 hours. The topics included 1) Understanding customer needs in the service business 2) Solving problems for passengers at the airport 3) Managing car rental services 4) Elevating customer experience at the hotel and 5) Designing travel packages. These activity plans served as the instructional intervention to enhance students' learning achievement and innovative thinking skills, and to provide experiences that enabled students to reflect on their innovative thinking skills.

2. The learning achievement test consisted of 20 multiple-choice items. It was developed to measure undergraduate students' learning achievement in the English for Communication in the Service Industry course. The test was utilized as both a pretest and a posttest to compare students' learning achievement before and after participating in the design thinking activities.

3. The innovative thinking skills test consisted of 20 multiple-choice items. It was constructed to assess undergraduate students' innovative thinking skills in applying English for communication in service industry contexts. The test was administered before and after the implementation of the design thinking activities to compare students' innovative thinking skills.

4. The self-perceived innovative thinking skills questionnaire was developed as a five-point Likert scale instrument to investigate undergraduate students' self-perceived innovative thinking skills after participating in the design thinking activities. The questionnaire covered

five key areas of innovation thinking skills: questioning, observing, experimenting, networking, and associating.

Research Instruments Development and Validation

1. The design thinking activity plans in the English for Communication in the Service Industry course were evaluated by three experts in curriculum development, language teaching and learning, and English language teaching. The Index of Item-Objective Congruence (IOC) was used to assess the alignment between the activity components and the learning objectives. The IOC values of the design thinking activity plans ranged from 0.67 to 1.00, indicating acceptable to excellent content validity. After expert validation, the activity plans were piloted with 12 undergraduate students representing different English proficiency levels based on the Common European Framework of Reference for Languages (CEFR), including levels A2, B1, and B2, as determined by the university's English proficiency placement records. The pilot test was conducted to evaluate the clarity, feasibility, and suitability of the activities for students with varying proficiency levels. Based on the pilot results, the activity plans were revised and refined before implementation with the sample group.

2. The learning achievement test was developed to measure undergraduate students' learning achievement in the English for Communication in the Service Industry course before and after participation in the Design Thinking activities. The instrument was constructed in alignment with the course learning objectives and the research objectives. To establish content validity, the test was evaluated by three experts in English language teaching, curriculum design, and educational assessment. The evaluation focused on content relevance, clarity of language, and alignment between the test items and the intended learning outcomes. The Index of Item-Objective Congruence (IOC) values ranged from 0.67 to 1.00, indicating acceptable content validity. Subsequently, the instrument was pilot tested with 30 undergraduate students representing different English proficiency levels (A2, B1, and B2) according to the Common European Framework of Reference for Languages (CEFR). These students were comparable to the target population but were not included in the main study sample. The internal consistency reliability was calculated using the Kuder–Richardson Formula 20 (KR-20), yielding a coefficient of 0.74, which indicates acceptable reliability for research purposes (Nunnally & Bernstein, 1994). Based on the pilot results, the test was revised prior to its administration as a pretest and posttest in the main study.

3. The innovative thinking skills test was developed to assess undergraduate students' innovative thinking skills in applying English for communication in service industry contexts. The test was evaluated by three experts in English language teaching, curriculum design, and educational assessment to ensure content validity, appropriateness of language, and alignment with the research objective. The Index of Item-Objective Congruence (IOC) values ranged from 0.67 to 1.00, indicating acceptable content validity. The test was piloted with 30 undergraduate students representing CEFR proficiency levels A2, B1, and B2. Internal consistency reliability was determined using the Kuder–Richardson Formula 20 (KR-20), resulting in a coefficient of 0.79, which demonstrates acceptable reliability (Nunnally & Bernstein, 1994). Following the pilot analysis, necessary revisions were made to improve item clarity and overall test quality prior to implementation with the sample group.

4. A self-perceived innovative thinking skills questionnaire was validated by three experts. The content validity, appropriateness of language use, and the congruence between learning objectives and test items were evaluated. The Index of Item-Objective Congruence (IOC) was calculated to ensure alignment between the items and the objectives. The self-perception of Innovative thinking skills questionnaire was then piloted with 30 undergraduate students representing different English proficiency levels based on the Common European Framework of Reference for Languages (CEFR), including A2, B1, and B2 levels to assess

clarity and preliminary internal consistency. Cronbach's alpha coefficient was 0.91. Then the self-perceived innovative thinking skills questionnaire was revised before implementing with the sample group.

Data Collection

The data in this study were collected through the following steps. First, the researcher explained the objectives and content of the English for Communication in the Service Industry course, along with the procedures of the design thinking activities, to the participants. Next, the undergraduate students' prior knowledge in English for communication in the service industry and their innovative thinking skills were assessed using a learning achievement test developed for the course and an innovative thinking skills test before participating in the activities. The undergraduate students then took part in 30 hours of design thinking activities within the course, following the five stages of the design thinking approach: empathize, define, ideate, prototype, and test. After completing the activities, the undergraduate students' learning achievement and innovative thinking skills were reassessed using the same tests. Additionally, the undergraduate students evaluated their own innovative thinking skills through a self-assessment questionnaire after engaging in the design thinking activities. Finally, the collected data were analyzed using statistical methods.

Data Analysis

1. To compare undergraduate students' learning achievement before and after learning through design thinking activities, the scores obtained from the learning achievement test, administered as a pretest and posttest, were analyzed using descriptive and inferential statistics. The mean, standard deviation, and percentage were calculated to describe students' learning achievement. A dependent samples t-test was used to examine whether there was a statistically significant difference between the pretest and posttest scores. In addition, Cohen's d was calculated to determine the effect size and to measure the magnitude of the difference between pretest and posttest scores. The effect size was interpreted according to Cohen (1988) as follows: 0.20 = small effect, 0.50 = medium effect, and 0.80 or higher = large effect.

2. To compare undergraduate students' innovative thinking skills before and after learning through design thinking activities, the scores from the innovative thinking skills test, administered as a pretest and posttest, were analyzed using mean, standard deviation, and percentage. A dependent samples t-test was conducted to determine whether there was a statistically significant difference between students' pretest and posttest scores. Additionally, students' innovative thinking skills were classified into four-skill levels based on percentage scores, according to the criteria proposed by Harris (1969), as follows:

- 80–100% = Excellent
- 60–79% = Good
- 50–59% = Average
- 0–49% = Poor

Cohen's d was also calculated to examine the magnitude of the effect of design thinking activities on students' innovative thinking skills.

3. To investigate undergraduate students' self-perceived innovative thinking skills after participating in the design thinking activities, the data obtained from the self-assessment questionnaire were analyzed using mean and standard deviation. The interpretation of students' self-perceived innovative thinking skills was based on the following five-point Likert scale criteria:

- 4.51–5.00 = Highest level
- 3.51–4.50 = High level
- 2.51–3.50 = Moderate level
- 1.51–2.50 = Low level
- 1.00–1.50 = Lowest level

Results

1. The results in Table 1 show that the undergraduate students' mean score on the learning achievement test before participating in the Design Thinking-based activities was 11.05 (SD = 1.45) out of a total score of 20. After the intervention, the mean score increased to 16.20 (SD = 2.27). A dependent-samples t-test indicated that the post-test scores were significantly higher than the pre-test scores, $t(58) = 19.72$, $p < .001$. In addition, the effect size calculated using Cohen's d was 2.57, which is considered a very large effect according to Jacob Cohen (1988). This finding suggests that participation in the Design Thinking-based activities was associated with a substantial improvement in undergraduate students' learning achievement in the English for Communication in the Service Industry course.

Table 1 Comparative analysis of students' learning achievement scores before and after learning through Design Thinking activities

Learning achievement test	N	Total scores	\bar{X}	S.D.	t	P	Cohen's d
Pre-test	59	20	11.05	1.45	19.72*	0.001	
Post-test	59	20	16.20	2.27			2.57

* $p < 0.05$

2. The undergraduate students' pre-test scores of innovative thinking skills in the English for Communication in the Service Industry course had a mean of 9.41 and a standard deviation of 1.75. While the post-test scores had a mean of 13.85 and a standard deviation of 1.96. This indicates that the undergraduate students' innovative thinking abilities after participating in design thinking activities was significantly higher than before, at the .05 level of statistical significance. The effect size for this improvement was very large (Cohen's d = 2.14), suggesting that the Design Thinking activities were highly effective in developing undergraduate students' innovative thinking skills, as presented in table 2.

Table 2 Comparative analysis of undergraduate students' innovative thinking skills scores before and after learning through design thinking activities

Innovative thinking test	N	Total scores	\bar{X}	S.D.	t	P	Cohen's d
Pre-test	59	20	9.41	1.75	16.41*	0.001	
Post-test	59	20	13.85	1.96			2.14

* $p < 0.05$

3. According to the data in table 3, it compares undergraduate students' sub-elements of innovative thinking skills before and after learning through design thinking activities. Before learning through design thinking activities, undergraduate students' observing skills was at an average level. Meanwhile, the questioning, experimenting, networking and associating were at a poor level. After the intervention, every element of undergraduate students' innovative thinking skills improved to a good level. For questioning skill, the mean score improved from 1.98 (SD = 0.66, 49.50%) to 2.56 (SD = 0.62, 64.00%), resulting in a difference of +0.58. Similarly, observing skill mean scores increased from 2.17 (SD = 0.62, 54.25%) to 2.58 (SD = 0.65, 64.50%), with a difference of +0.41. The skill of experimenting rose from 1.92 (SD = 0.53, 48.00%) to 2.53 (SD = 0.60, 63.25%), with a difference of +0.61. Notably, the highest gained scores were observed in associating and networking skills. Therefore, these outcomes support the effectiveness of the design thinking activities in fostering innovative thinking skills among undergraduate students.

Table 3 A comparative analysis of undergraduate students' innovative thinking skills presented in sub-skills before and after learning through design thinking activities

Innovative thinking skills	Scores 20	Pre-test				Post-test				Difference Level (Post – Pre)
		\bar{X}	S.D.	%	level	\bar{X}	S.D.	%	Level	
Questioning	4	1.98	0.66	49.50	Poor	2.56	0.62	64.00	Good	+0.58
Observing	4	2.17	0.62	54.25	Average	2.58	0.65	64.50	Good	+0.41
Experimenting	4	1.92	0.53	48.00	Poor	2.53	0.60	63.25	Good	+0.61
Networking	4	1.81	0.51	45.25	Poor	3.02	0.78	75.50	Good	+1.21
Associating	4	1.53	0.54	38.25	Poor	3.17	0.70	79.25	Good	+1.64

4. The undergraduate students' overall self-perceived innovative thinking skills after participating in design thinking activities was at a high level, with a mean score of 3.88 and a standard deviation of 0.72. When ranking the innovative thinking skills by their mean scores, the highest was networking skills, rated at a high level with a mean score of 4.27 and a standard deviation of 0.11. This was followed by associating skills (mean = 3.94, SD = 0.89), questioning skills (mean = 3.82, SD = 0.49), experimenting skills (mean = 3.72, SD = 0.06), and finally, observing skills (mean = 3.68, SD = 0.30), respectively. When considering individual items, the three highest mean scores were: (1) the ability to listen to others' opinions (mean = 4.59), (2) the ability to develop new concepts or knowledge by making connections (mean = 4.54), and (3) the ability to interact effectively with stakeholders (mean = 4.53), as shown in table 4.

Table 4 Analysis of the mean and standard deviation of undergraduate students' self-perceived innovative thinking skills after learning through design thinking activities

No.	Innovative thinking self-assessment topics	\bar{X}	S.D.	Opinion level	Ranking
Questioning skill					
1	I can ask questions that align directly with the objectives of the teaching and learning activities.	3.80	0.64	High	3
2	I can ask questions that relate to problem-solving approaches.	3.78	0.70	High	4
3	I can ask questions that stimulate participatory thinking.	3.81	0.75	High	2
4	I can ask questions that lead to problem-solving or the creation of new ideas in a clear and focused manner.	3.90	0.71	High	1
Overall score of questioning skill		3.82	0.49	High	
Observing skill					
5	The data from my observation is accurate and complete.	3.59	0.68	High	4
6	I can define details of customer problems in the target group within the service industry.	3.63	0.74	High	3
7	I can take notes and summarize data from observation clearly and completely.	3.80	0.74	High	1
8	I can use details obtained from observations in the design and development of innovations	3.69	0.77	High	2
Overall score of observing skill		3.68	0.30	High	

Table 4 Analysis of the mean and standard deviation of undergraduate students' self-perceived innovative thinking skills after learning through design thinking activities (Continued)

No.	Innovative thinking self-assessment topics	\bar{X}	S.D.	Opinion level	Ranking
Experimenting skill					
9	I can formulate hypotheses.	3.85	0.74	High	1
10	I can create innovative prototypes.	3.56	0.70	High	4
11	I can conduct experiments to solve problems or create new things accurately and systematically.	3.73	0.83	High	3
12	I can evaluate the results of experiments.	3.75	0.80	High	2
Overall score of experimenting skill		3.72	0.06	High	
Networking skill					
13	I share knowledge and experiences with others regarding problem-solving.	4.07	0.74	High	3
14	I interact with relevant stakeholders in the service industry.	4.53	0.54	Highest	2
15	I create new products or service process with clear and concise communication.	3.88	0.77	High	4
16	I am willing to listen to others' opinions.	4.59	0.62	Highest	1
Overall score of networking skill		4.27	0.11	High	
Associating skill					
17	I can connect concepts, principles, and processes to solve problems or create new things.	3.92	0.79	High	2
18	I can integrate knowledge from different disciplines.	3.61	0.77	High	4
19	I can connect ideas from innovative prototypes.	3.68	0.75	High	3
20	I can generate new ideas or knowledge in an integrated way.	4.54	0.60	Highest	1
Overall score of Associating skill		3.94	0.89	High	
Overall		3.88	0.72	High	

Discussions

According to the research findings, the results can be discussed as follows:

1. The undergraduate students' learning achievement was significantly improved after learning through design thinking activities in the English for Communication in the Service Industry course. This improvement may be due to the design thinking activities follow a learner-centered approach which encourages undergraduate students to actively participate in classroom. It emphasizes questioning and information gathering to construct knowledge independently. In the empathize stage, undergraduate students were required to observe and research information according to the given situations provided in each activity. They gathered relevant information about target customers in the real service industry, such as interviewing tourists or airline passengers, to understand the genuine needs related to products and services. Furthermore, the design thinking activities allowed undergraduate students to think analytically and systematically, using reliable sources of information to identify problems. They exchanged knowledge with peers in small groups to create prototypes of products and services. Knowledge and ideas were then summarized collaboratively with classmates. Meanwhile, the teacher

facilitated undergraduate students by giving advice and feedback on their learning performances. This learning process of design thinking activities enables undergraduate students to improve their learning outcomes effectively according to their own potential. The design thinking activities are relevant to problem-based learning approach which emphasizes collaborative learning, finding solutions in real-world context and constructing new knowledge through self-directed learning. Moreover, the design thinking activities enabled undergraduate students to engage in learning within real-life contexts that closely related to their own experiences in the service industry. Through participation in design thinking activities, undergraduate students constructed their own knowledge and skills by observing, collaborating in group activities, thoughtfully analyzing service industry-related data, and applying the acquired knowledge to classroom tasks. This engagement with real-world experiences, reflection on undergraduate students' own experiences and conceptual development contributed to a deeper understanding, enhanced undergraduate students' critical thinking skills, and improved the ability to transfer knowledge to new situations. The process in the design thinking activities aligns with Kolb's (2014) experiential learning theory, which suggested that learners engage in concrete experiences, reflect on experiences, abstract conceptual knowledge, and actively experiment with the newly acquired knowledge in different contexts. This research result is consistent with the findings of Jones & Peck (2023), who found that design thinking can be effectively applied in higher education instruction, enhancing undergraduate students' academic achievement and their ability to solve problems creatively and effectively. This research result also aligns with the finding of Yu et al. (2024), who examined design thinking's effects on student learning and found that design thinking can significantly enhance various learning outcomes such as creativity, engagement, motivation, problem-solving skills, self-efficacy, and academic achievement which are essential for successful learning.

Nevertheless, the participants in this study were English-major students with proficiency levels ranging from A2 to B2 according to the CEFR framework. As language-specialized students, they may possess relatively strong motivation toward English learning and professional communication compared to students from other academic disciplines. This motivational orientation may have interacted positively with the design thinking activities, thereby enhancing engagement and contributing to the significant improvement observed in posttest scores. Consequently, the positive outcomes reported in this study may partially reflect the participants' disciplinary background and may not be fully generalizable to non-English-major populations. Furthermore, the successful implementation of design thinking requires learners to engage in brainstorming, collaborative inquiry, problem analysis, and oral presentation—processes that presuppose adequate linguistic competence. Learners at lower proficiency levels, particularly students at the A1 CEFR level, may experience cognitive overload when required to manage simultaneous language production and higher-order thinking tasks. Therefore, effectiveness of design thinking in English for Specific Purposes contexts may be influenced by students' language proficiency, suggesting the need for proficiency-sensitive scaffolding when applying this approach in lower-level settings.

2. The undergraduate students' innovative thinking skills scores after learning through design thinking activities in the English for Communication in the Service Industry course were significantly higher than the pre-test scores. When considering each of the five subskills of the undergraduate students' innovative thinking; questioning, observing, experimenting, networking, and associating, it showed positive gains from pre-test to post-test, indicating the effectiveness of the design thinking activities. Among the five skills assessed, associating and networking gained the most points. Firstly, the undergraduate students' questioning skill improved from an average to a good level. This aligns with Dyer et al. (2011) assertion that questioning is foundational to disruptive innovation, as it challenges existing assumptions and

sparks new ideas. Encouraging undergraduate students to formulate their own questions likely contributed to questioning skill development. The observing skill also increased from an average to a good level. Observation is critical in identifying unmet needs and opportunities (Brown, 2009). The undergraduate students' attention to detail may have been enhanced by hands-on activities and field-based tasks used in design thinking activities, as suggested by Liedtka (2015), who emphasized observation as a core practice in design thinking. The undergraduate students' experimenting skill showed a notable rise from poor to good level. Experimentation fosters creative confidence, allowing learners to test and refine ideas through trial and error (Kelley & Kelley, 2013). This result is consistent with findings by Seelig (2012), who highlighted that practical experiments help unlock innovative potential in educational contexts. A significant increase was observed in the networking skill, which improved from poor to good level. This could be attributed to the activities in the Ideate stage that encourage undergraduate students to brainstorm and exchange ideas in small groups actively. These sessions encouraged knowledge sharing and integration of diverse perspectives in a positive learning environment. It promotes undergraduate students' idea networking skill which contributes to the development of problem-solving abilities and enhances creativity by encouraging openness to diverse perspectives. According to Sawhney et al. (2006), networking expands exposure to diverse perspectives, which is essential for innovation. Moreover, the collaborative group projects in design thinking activities provide more opportunities for interaction and knowledge exchange. In terms of idea associating skill, the greatest improvement showed in undergraduate students' associating skill, which rose from poor to good level. This may be because the design thinking process allowed undergraduate students to connect information and ideas from various sources and different contexts to generate new ideas. According to Dyer et al. (2011), associational thinking is the ability to connect seemingly unrelated concepts, and was identified as the most powerful skill among innovators. Associational thinking enables undergraduate students to see relationships between different data points, which can lead to the development of effective innovations. This remarkable gain suggests that the integrated tasks and cross-disciplinary in design thinking activities encouraged undergraduate students to form new idea connections, leading to the ability of innovative thinking. This research result confirms the findings of Gao & Jeong (2024) who study the impacts of design thinking on the creativity of college students majoring in art and design and found that design thinking stimulates innovative thinking, encourages students to think outside the box and develop new ideas. It improves undergraduate students' practical operation ability when they are required to create projects. These findings also align with the study of Ravankar et al. (2018), who identified associational thinking as a fundamental component of innovation, as it allows individuals to integrate knowledge from various disciplines. Similarly, Christensen et al. (2013) emphasized that exposure to ideas from various fields enhances cognitive flexibility and fosters creative problem-solving skills.

3. The undergraduate students' self-perceived innovative thinking skills overall were at a high level. Among the dimensions, undergraduate students rated their networking skill at the highest mean score. The undergraduate students were willing to listen to others' opinions and interacted with relevant stakeholders in the service industry at the highest level. This aligns with Chesbrough's (2003) argument that open innovation is driven by strong collaborations and alliances outside the organization. This research result suggests that undergraduate students value collaboration and open dialogue, which are crucial in the service industry where customer-centered innovations often emerge from stakeholder interactions (Tidd & Bessant, 2018). Furthermore, the associating skill was ranked second, with the highest score on the item of being able to generate new ideas and knowledge in an integrated way. This research finding supports the idea that innovative thinkers are skilled at linking unrelated concepts to generate new solutions (Dyer et al., 2011). The strong performance in associating skill indicates that

undergraduate students are capable of synthesizing knowledge across disciplines, a competence increasingly necessary in the era of cross-sectoral innovation (Crossan & Apaydin, 2010). Additionally, undergraduate students rated their questioning skill at a high level. This may be attributed to the characteristics of the design thinking process, which begins with the empathy stage, requiring undergraduate students to engage in extensive questioning to understand users' needs and problems. As effective questioning enables undergraduate students to gather essential information and develop innovative solutions (Brown, 2009; Cross, 2023). This finding is consistent with the study of Alaimi et al. (2020), who found that learners who engage in systematic questioning during the define stage of design thinking activities tend to demonstrate greater creativity and critical thinking abilities. Meanwhile, undergraduate students' experimenting skill was rated at a high level. The undergraduate students found themselves to be able to formulate hypotheses, innovate prototypes, test their developed products or service process to solve problems according to the given situations in service industry to meet the target customers' needs systematically. The repeated experimentation in design thinking activities encourages undergraduate students to learn from failures and improve their concepts. This process fosters flexibility, adaptability, and an attitude that embraces failure as part of learning—an essential aspect of innovation development (Holmes et al., 2015). The undergraduate students who engage in an experimental design process are better equipped to develop their problem-solving and innovation capabilities (Brown, 2020). The undergraduate students evaluated their observing skill at a high level. They could observe data accurately and thoroughly, also identify problems and needs of target customers in service industry context in details. They could apply the details obtained to design and develop innovative products or service models that meet the needs of target customers. As during the empathize stage of design thinking activities, undergraduate students were required to observe and analyze customer behaviors to gain insight information in order to understand real needs of the target customers. This process of design thinking develops undergraduate students' observing skill, encourage them to understand problems in various perspectives which is an essential foundation for innovative ideas development. According to Martin (2009), elaborate observation fosters critical awareness and creative thinking. Observing real-life situations enables undergraduate students to uncover problems that might not be identified through only theoretical study.

Conclusion and suggestions

This study investigated the effects of design thinking activities on undergraduate students' learning achievement and innovative thinking skills in the English for Communication in the Service Industry course. The findings revealed that undergraduate students' learning achievement significantly improved after participating in the design thinking activities. This indicates that design thinking activities can effectively enhance students' understanding and application of English in service industry contexts. In addition, undergraduate students' innovative thinking skills significantly improved after the implementation of design thinking activities. The findings suggest that design thinking provides meaningful learning experiences that promote students' ability to analyze problems, generate ideas, and develop appropriate solutions in real-world communication situations. Furthermore, undergraduate students reported a high level of self-perceived innovative thinking skills after participating in the design thinking activities. This reflects that the learning activities supported students' confidence in their ability to apply innovative thinking processes, including questioning, observing, experimenting, networking, and associating. Overall, the findings confirm that integrating design thinking into English language instruction can

effectively promote both learning achievement and innovative thinking skills among undergraduate students in the service industry context.

Based on the findings, design thinking can be effectively integrated into English language teaching to enhance both learning achievement and innovative thinking skills. Instructors are encouraged to provide opportunities for students to express their ideas, participate in collaborative problem-solving, and engage in real-world service scenarios, as these are essential components of the design thinking process. Additionally, the use of visual thinking tools, such as mind maps, journey maps, and concept diagrams, is recommended to help students organize their ideas, simplify complex information, and recognize relationships between concepts. Furthermore, grouping students with different proficiency levels is suggested, as mixed-ability grouping can promote peer learning, collaboration, and mutual support during the design thinking process.

Future research is recommended to integrate design thinking with other instructional approaches, such as problem-based learning or case-based learning, to examine their combined effects on students' learning achievement and higher-order thinking skills. Further studies should also investigate the impact of design thinking activities on other essential skills, including creativity, problem-solving, communication, and teamwork skills. In addition, future research should employ more rigorous research designs, such as quasi-experimental or experimental designs with control groups, to strengthen causal conclusions. Expanding the sample size and including participants from multiple institutions is also recommended to enhance the generalizability of the findings across different educational contexts.

Limitations of the Study

This study employed a one-group pretest–posttest design without a control group, which limits the ability to attribute the observed improvements solely to the design thinking activities. External factors, such as prior knowledge and learning experiences, may have influenced the results. Therefore, future research should adopt more robust research designs to improve internal validity.

Additionally, the study relied primarily on test scores and self-assessment questionnaires to measure students' learning achievement and innovative thinking skills. Future studies are encouraged to incorporate performance-based assessments, such as project evaluations, presentations, or authentic tasks, to provide more comprehensive evidence of students' abilities. Finally, the sample consisted of undergraduate students from a single university, which may limit the generalizability of the findings. Future research should include larger and more diverse samples from multiple institutions to enhance external validity.

New knowledge and the effects on society and communities

This research contributes new knowledge to the field of English language education by empirically investigating the structured integration of Design Thinking within an English for Specific Purposes English for specific purposes course focused on the service industry. Although prior studies have examined design thinking in general education contexts, limited research has explored its systematic application in English major programs aimed at simultaneously developing communicative competence and innovative thinking skills in authentic service-industry settings. By addressing this gap, the study advances existing knowledge through the development and validation of a Design Thinking-based instructional model tailored specifically to an English for Communication in the Service Industry course.

The findings provide empirical evidence that structured design thinking activities are associated with substantial improvements in students' learning achievement and innovative

thinking skills. Beyond demonstrating instructional effectiveness, the study extends theoretical understanding by showing how the five stages of the design thinking process can be pedagogically aligned with English for specific purposes learning objectives and core innovation skill dimensions. In doing so, it positions design thinking as an integrative framework through which language education and innovation pedagogy can converge. Rather than treating communicative competence and creativity as parallel goals, the instructional model demonstrates how empathy-driven inquiry, stakeholder engagement, collaborative problem definition, ideation, and prototype presentation can function simultaneously as language-learning processes and innovation practices. Within this framework, English serves not merely as a medium of classroom interaction but as a cognitive and professional tool for analyzing user needs, negotiating meaning, generating solutions, and presenting service innovations. This reconceptualization shifts English for specific purposes instruction from discrete language-skill training toward innovation-oriented communicative practice situated in authentic professional contexts.

The study further suggests that the effectiveness of design thinking in English for specific purposes settings may be context-dependent, influenced by learners' disciplinary background and linguistic proficiency. This introduces a nuanced theoretical perspective, indicating that the impact of innovation-based pedagogies in language education may be shaped by learner readiness and professional alignment. Thus, design thinking does not simply enhance language learning outcomes but redefines the functional relationship between communication and innovation within discipline-specific education.

For society and communities, the research highlights the potential of integrating design thinking into English for specific purposes instruction to cultivate graduates who are not only linguistically competent but also capable of generating context-sensitive service innovations. In service-oriented economies, effective communication and user-centered problem-solving are essential for enhancing customer satisfaction, service quality, and competitive capacity. By equipping undergraduate students with empathy-driven inquiry skills and collaborative innovation practices, the instructional model prepares future professionals to identify community needs, design responsive service solutions, and contribute to sustainable improvements in local and national service sectors. At a broader level, fostering innovative thinking within language education supports workforce development and sustainable growth in knowledge-based service industries.

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The Construction of Community Identity of the Silk Weaving Group in the Context of the State and Contemporary Society: A Case Study of Ban Phon, Kham Muang District, Kalasin Province

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Abstract

This research aims to study the process of constructing community identity among the silk weaving group in Ban Phon, Kham Muang District, Kalasin Province, within the context of the state and contemporary society. It also seeks to analyze the social, cultural, and governmental factors influencing the preservation and transformation of such identity. This study employed a qualitative research methodology, using in-depth interviews, focus group discussions, and participant observation. The key informants totaled 25 persons, consisting of 5 community leaders, 8 local silk weavers, 4 entrepreneurs, 4 government officers, 2 academic experts, and 2 cultural tourists.

The findings revealed that the identity of the Ban Phon silk weaving community has been constructed and reshaped through various social processes and state policies, particularly those promoting the One Tambon One Product (OTOP) project, creative economy initiatives, and digital media for cultural communication. The image of "Phrae Wa Silk of Ban Phon" has become a cultural symbol reflecting both local pride and modern Thai identity. However, the changes brought by the digital era have led to the reinterpretation of identity in multiple dimensions—cultural, economic, and social. Therefore, identity construction is not merely a process of preservation but also a dynamic adaptation of the community to contemporary social transformations.

Keywords: Community identity, Silk weaving group, State, Contemporary society, Ban Phon

Introduction

In the era of globalization and the movement of local cultures, Thai society has faced challenges in multiple dimensions—economic, cultural, and social—particularly for communities with local wisdom such as silk weaving groups, which need to adapt and create new meanings for their identities to survive and thrive within the context of the state and contemporary society (Hall, 1996). The construction of community identity is not merely about preserving tradition but is a process involving communication, negotiation, and transformation within the context of state policies, economy, and society (Naiyanit et al., 2024).

For the silk weaving community of Ban Phon, Kham Muang District, Kalasin Province, which has a rich history of silk production and distinctive weaving wisdom, this location is not just a geographical area renowned for silk weaving but also serves as a theoretically significant case study for examining the dynamics of identity. This is due to the community's long history of inheriting the wisdom of Phrae Wa silk among the Phu Thai people, and a crucial turning point through royal benevolence and patronage from the monarchy, which elevated Phrae Wa silk from local heritage to a national cultural symbol. Consistent with the conceptual framework of (Eoseewong, 1995), which posits that local culture gains significance when it is redefined within the context of Thai society, the identity of the Ban Phon silk weaving community is deeply intertwined with the spatial and historical narrative of the Phu Thai ethnic group (Vallibhotama, 2003). Beyond exquisite craftsmanship, proactive marketing management and the strategic utilization of digital media are pivotal factors driving the international success of Ban Phon's Phrae Wa silk products (Akranupapong, 2008). This serves as a communicative strategy to construct a contemporary image for traditional cultural capital (Sthapitanonda, 2002). Furthermore, Ban Phon demonstrates a remarkable adaptation through obtaining national-level certifications such as the Peacock Gold Label and OTOP. The OTOP policy has functioned as a vital mechanism in strengthening the economic structure of the weaving groups (Vachirakhachorn, 2004). Alongside entering the digital society where the community actively utilizes online platforms to communicate and tell stories about their identity. These factors make Ban Phon a space of complex negotiation between 'traditional values' and 'contemporary societal demands'. For these reasons, researchers are interested in studying the process of identity construction (Benjawan, 2024). The newly developed patterns in the contemporary era, such as animal motifs or modern color palettes, can be elucidated through (Wittayapak, 2002) theory of 'Invented Tradition'. This demonstrates that the community has not abandoned its cultural roots; instead, it is employing the 'politics of identity' to negotiate with the demands of the global market. Such a process is consistent with the conceptual framework of local wisdom adaptation for sustainable existence within modern Thai society, as articulated by Yos (Santasombat, 2001). Such study is significant both for cultural preservation and community development in line with contemporary contexts.

Additionally, research indicates that silk weaving groups utilize "cultural capital" to construct group identity through various processes such as designing fabric patterns, narrating community stories, and participating in state projects, which helps products gain acceptance both within and outside the community (Thnomdham, 2025). Meanwhile, other studies have found that traditional silk patterns represent Thai culture and community identity and have been developed to possess market value in the present era (Wannakit, 2023). Within the context of the state and contemporary society, there are structural changes in the economy, social media, and concepts of "top-down" and "grassroots" culture, which influence how silk weaving communities define and express their identity. This research's primary objectives are to study the "process of identity construction" of the Ban Phon silk weaving community under the

context of the state and contemporary society, and to analyze the social, cultural, and state policy factors influencing the construction and transformation of identity.

As contemporary social development continuously evolves, the government must support silk, which embodies this valuable community way of life, and must consider economic survival in the globalization era. Due to changing consumer behaviors and the expansion of the ready-made garment market, traditional time-consuming weaving faces challenges in competition. Communities need to create new meanings for their identities to transform 'household items' into 'fashion items and souvenirs' that align with modern market tastes, and to address challenges in wisdom transmission, as younger generations have higher educational opportunities and may view traditional occupations as providing unstable income. Adaptation by incorporating modern knowledge in design and digital marketing becomes a crucial mechanism to attract younger generations back to appreciate and continue their ancestral cultural heritage. The state's role is thus essential in driving and promoting approaches for developing silk weaving wisdom, specifically the silk weaving group within the state and contemporary society context at Ban Phon, Kham Muang District, Kalasin Province, to ensure maximum efficiency and effectiveness for the community's silk weaving group sustainability.

Objectives

1. To analyze the social, cultural, and state policy factors influencing the preservation and transformation of community identity.
2. To study the process of identity construction among the Ban Phon silk weaving group, Kham Muang District, Kalasin Province, within the context of the state and contemporary society.

Literature Review

A review of related research reveals that the concept of "community identity" is viewed as a product of social processes involving interaction between community members and various factors. Identity is not static but is continuously constructed, adjusted, and reinterpreted within social and cultural contexts. Thongkaew (2019) studied weaving communities in Northern Thailand, finding that the process of identity construction arises from negotiation between tradition and modernity, with markets and state policies as key factors. This negotiation is evident through the fusion of traditional patterns with modern color schemes, maintaining ancient weaving techniques while adapting product forms to meet urban market demands, reflecting the community's agency rather than passive reception of impacts. Jaiman (2020) researched the roles of women in Northeastern Thai silk weaving groups, indicating that weaving is not merely an economic activity but a 'social space' where women have decision-making power and demonstrate leadership roles. Women's possession of weaving knowledge grants them significant status within households and communities, making them the main force in preserving and perpetuating cultural identity. Duangduean Phansri et al. (2018) studied social networks and silk identity, finding that platforms such as Facebook and Instagram have become new 'fields' for presenting and constructing community identity. Posting images of the weaving process, behind-the-scenes stories, and direct interaction with customers enable communities to directly control the narrative about their products, reducing dependence on intermediaries or government agencies for meaning communication. Sangrungruengroj (2020) studied marketing communication strategy developing. The marketing communication guideline should portray the product value as being produced by community, gone through production process that inherited from the ancestors' wisdom, and useful for belief and faith related purposes, including the beauty of the products in order for the customers to perceive them as priceworthy. Recommends that social media communication skills and knowledge to realize the use of social media for marketing communication should be emphasized.

Furthermore, Kunsri (2017) analyzed the discourse of "authenticity" in the silk market, finding that the meaning of "authentic" or "traditional" is constructed by multiple parties, including consumers seeking products with stories, communities selectively choosing certain cultural elements to retell, and capitalists creating brands by leveraging the discourse of community to add value to products, sometimes leading to cultural simplification for easier marketing communication. And Wattanaphan (2022) conducted a follow-up study on the impact of the BCG Model policy on weaving communities. This research indicates that the green economy policy has become a new factor affecting identity, with communities increasingly emphasizing natural dyeing and environmentally friendly fibers, not only to meet policy requirements but also as a new 'selling point' for differentiation and value addition, leading to the revival of traditional knowledge about local plants in a new dimension. Naiyanit et al. (2024) highlighted that identity construction among weaving groups arises from utilizing "cultural capital" such as fabric patterns, narratives, and rituals, reflecting community pride. Work emphasizes that local silk is developed to possess economic value alongside cultural value, particularly when the state promotes it through OTOP projects. Bourdieu's (1986) work on cultural capital and Cohen's (1985) work on the symbolic construction of community have been employed to explain that identity construction is not merely heritage transmission but a negotiation of power and meaning in social contexts.

Conceptual Framework

The conceptual framework of this research is based on the concept of the "community identity construction process" under the influence of the state and contemporary society, comprising three main dimensions:

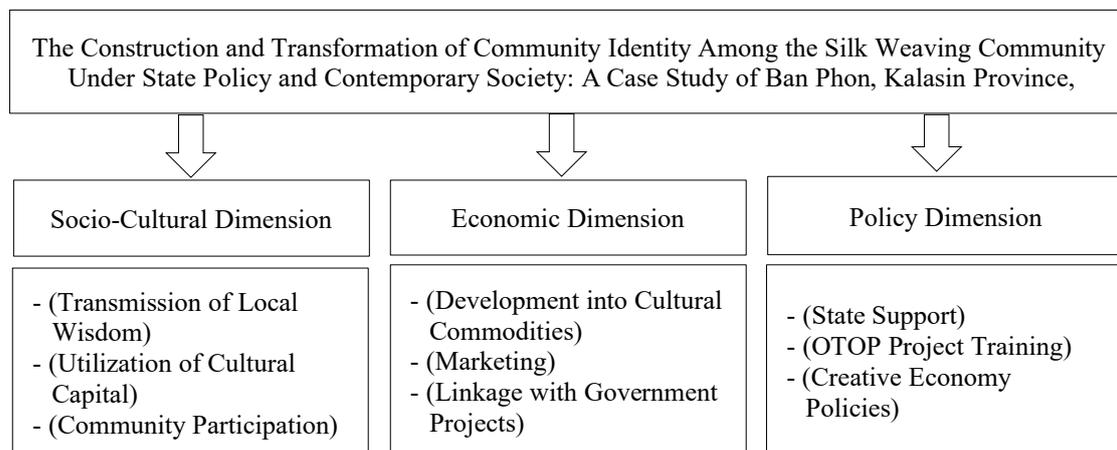


Figure 1 Research conceptual framework (Source: Researcher, 2025)

Methodology

This research is qualitative in nature.

Research Design

A qualitative research design was chosen to understand the complex social phenomenon of "identity construction," which involves deep meanings, perspectives, experiences, and contexts of people in the community, not quantifiable by numbers. The research likely follows phenomenological principles, seeking to understand villagers' direct experiences with identity construction, and constructivist principles, viewing identity as built through social meaning-making and interaction. Key informants included community leaders, weavers, OTOP entrepreneurs, government officers, academics, and cultural tourists, totaling 25 individuals.

Research Instruments and Sampling

Purposive sampling was used to select approximately 25 informants who best aligned with the research themes. Informants were divided into six groups: Community Leaders (e.g., village head, weaving group president): 3-4 people, providing overviews of community history, development policies, and visions for community identity.

Silk Weavers 8-10 people, providing in-depth information on weaving wisdom, pattern design, pattern meanings, changes in weaving styles, and views on traditional vs. modern identity.

OTOP Entrepreneurs 3-4 people, providing information on marketing, product adaptation to customer demands, leveraging cultural capital for value addition, and impacts of state policies.

Government Officers 2-3 people, providing information on top-down promotion policies, budgets, and projects affecting the weaving group's development.

Academics/Experts in culture or community development: 2-3 people, providing theoretical perspectives, broader socio-cultural context analysis, and suggestions for sustainable development.

Cultural Tourists 3-4 people, providing external perspectives on their perception of the community's identity, product value, and appeal, reflecting broader market acceptance.

Data Collection

Methods included in-depth interviews, small focus group discussions, and participant observation in community activities. Instruments were open-ended and flexible, including interview guides, observation forms for field notes, and researcher field diaries.

Data Analysis

Inductive content analysis was employed, moving from specific data to general knowledge. Steps included

Data Preparation: Transcribing interviews and compiling field notes and observations.

Reading for Understanding: Repeatedly reading all data to grasp the overall picture and become familiar with the content.

Coding: Assigning labels or keywords to significant data segments (e.g., "pattern adaptation to market," "intergenerational conflict," "impact of OTOP").

Categorization: Grouping codes into larger themes related to research objectives (e.g., Category 1: Social factors affecting identity; Category 2: State policy factors; Category 3: Identity construction processes).

Interpretation and Conclusion: Explaining the meanings of the categories, connecting them to the theoretical framework and reviewed literature to answer research questions and present new knowledge.

Results

The study on the construction and transformation of community identity among the silk weaving community under state policy and contemporary society: A case study of Ban Phon, Kalasin Province revealed the following:

1. Social, Cultural, and State Policy Factors Influencing the Preservation and Transformation of Community Identity

The process of community identity is continuously adjusted under the influence of three main factors:

1.1 Social Factors Changing values and lifestyles of the younger generation: Community youth with higher education and urban employment opportunities tend to view weaving as time-consuming with unstable income, creating direct transmission challenges. However, some younger generation members, aware of cultural heritage value, attempt to apply modern knowledge in design, online marketing, and business management to develop products and distribution channels, enabling Phrae Wa silk to transcend the framework of "community-use items" to become "fashion items and souvenirs."

Expansion of cultural tourism: Increased tourist visits (both Thai and international) to the community has created "external identity perception." Tourists value beauty, handcrafted qualities, and behind-the-product stories. The community thus learns to "tell stories" and selectively choose patterns and products meeting new market demands while maintaining core cultural values.

1.2 Cultural Factors Traditional cultural capital: Originally, silk in Ban Phon was not specifically called "Phrae Wa silk" but was household-use silk for important ceremonies. Traditional patterns were simple stripes or khit patterns with less complexity than today, often using natural dyes producing earth tones, reflecting simple lifestyles connected to nature.

Awareness and pride in identity: Exposure to external cultures has generated awareness of their own "valuable assets." Accumulated weaving wisdom and skills are viewed as valuable "capital" and are creatively developed further.

1.3 State Policy Factors OTOP (One Tambon One Product) Policy: This project was one of the most crucial accelerating factors transforming Ban Phon silk from "local woven fabric" to "OTOP products" with standards and wide recognition. The state promoted multiple dimensions including standard development by establishing quality criteria for silk threads, pattern density, and weaving intricacy. This aligns with an interview with the president of the Ban Phon silk weaving group who stated "Previously we wove fabric only for household use or merit-making ceremonies. But when the government promoted through OTOP standards and the Peacock Gold Label, villagers became more quality-conscious, needing greater intricacy to meet international standards. Today, Phrae Wa silk is no longer just a shawl for Phu Thai people; it is our pride and the main income supporting the entire community."

2. The Process of Identity Construction Among the Ban Phon Silk Weaving Group in the Context of the State and Contemporary Society

This involves promoting design that supports the community in developing new patterns while preserving traditional identity, making them more contemporary and responsive to market demands as follows:

2.1 Creating Marketing Channels: Organizing OTOP exhibitions and sales nationwide provided crucial platforms making "Ban Phon Phrae Wa Silk" widely known. Cultural tourism promotion policies by the government and local agencies promoted Ban Phon as a "cultural tourism destination," generating additional income from weaving activities and

compelling the community to clearly define and present their identity publicly. The identity construction process of "Ban Phon Phrae Wa Silk" emerges from "negotiation" between tradition and modernity, and between the community and external factors, which can be explained in stages.

2.2 Construction of Silk Weaving Group Community Identity in the Context of the State and Contemporary Society, Ban Phon, Kham Muang District, Kalasin Province

This involves hand-woven silk with long development and immense cultural significance for the Phu Thai people in Kalasin Province. A crucial turning point brought Phrae Wa silk to recognition and widespread inheritance in the pre-royal patronage era. The development of Phrae Wa silk represents a transition from local wisdom to cultural heritage and commercial products gaining international acceptance, with royal institution support playing an extremely important role in elevating and preserving Phrae Wa silk for Thailand until the present. Details include:

Raw Materials and Production Process

Uses natural local silk threads, divided into warp threads and weft threads. Dye colors mostly derived from local plants such as lac, indigo, turmeric, and ebony, reflecting Phu Thai wisdom.

Raw materials The primary raw material for Phrae Wa silk weaving is silk thread, classified into warp threads (stretched lengthwise on the loom) and weft threads (inserted across to intersect warp threads, creating patterns and fabric). Dye colors mostly remain natural, representing inherited Phu Thai wisdom using local plants for distinctive identity colors such as red from lac, blue from indigo, yellow from turmeric and prahod, black from ebony and mud.

Market and Consumers

Phrae Wa silk is distributed through both offline (OTOP) and online (e-Commerce) channels to reach younger customers.

Social media is used for branding and identity creation.

Customer demand Phu Thai hand-woven Phrae Wa products are sold through OTO shops and online market channels.

Marketing promotion e-Commerce sales design, providing detailed information to motivate purchases, determining digital marketing communication strategies on platforms.

Customer groups purchase from production sources, women's groups, silk weaving cooperatives, shops at trade fairs and other areas. Ban Phon Phrae Wa has numerous shops selling Phrae Wa silk. Hand-woven Phrae Wa silk is known among silk collectors, and besides having many skilled Phrae Wa weavers, the area produces the highest quality natural silk threads in Northeastern Thailand.

Product Processing and Development

Development and processing into sabai (shoulder cloths), fabric bolts, clothing, accessories, souvenirs, and home decorations to increase product value.

Products and processing: Phrae Wa silk is a distinctive handicraft of the Phu Thai people in Kalasin Province, renowned for its intricacy, beauty, and complex patterns. Phrae Wa silk products can be processed as follows Sabai or shawls: Woven width not less than 27-75 cm, length not less than 2 meters, or dimensions according to market demand, with patterns throughout and fringes on both ends.

Fabric bolts or pieces: Woven width not less than 62-90 cm, length not less than 5 meters, or dimensions according to market demand, with patterns throughout or patterns on

one part and plain color on another, used for garment sewing or processing into other products according to desired usage characteristics.

Hair wraps, neckties, hair clips, keychains.

Ready-made shirts and garments: High-value-added silk processing popular especially among working-age and middle-aged groups.

Accessories and souvenirs: Including earrings, necklaces, bracelets. Additionally, Phrae Wa silk is processed into bags, scarves, and home decorations such as pillows, table covers, and curtains.

Phrae Wa silk processing reflects the invaluable wisdom and culture of the Phu Thai people, inherited and developed from generation to generation.

State Policy and Support

The state plays a crucial role in promoting silk identity through OTOP projects, training, trade fair organization, and standard certification such as the Peacock Gold Label.

Market and products comparison Saket silk Scarves, shawls, fabric bolts, ready-made garments.

Khan Kaen Khun silk: GI certified and provincial identity fabric, consistently in demand, especially naturally dyed fabric bolts. Products: fabric bolts, garments, accessories, utilities, religious items.

Soi Dok Mak silk: OTOP 5-star standard, demanded by government and private sectors for important events, sold both online and at trade fairs. Products: fabric bolts and garments.

Phrae Wa silk market: Peacock Gold Label standard, Thai Community Product Standard (TCPS) certified, known as provincial identity pattern, distribution channels through trade fairs and various markets.



Figure 2 So i Dok Mak silk (Source: Researcher, 2025)

Market and Consumers

Phrae Wa silk is distributed through both offline (OTOP) and online (e-Commerce) channels to reach younger customers. Social media is used for branding and identity creation. Regarding customer demand, Phu Thai hand-woven Phrae Wa products are sold through OTOP shops and online market channels. Marketing promotion involves designing e-Commerce sales, providing detailed information to motivate purchases, and determining digital marketing communication strategies on various platforms. Customer groups make purchases from production sources, women's groups, silk weaving cooperatives, and shops at trade fairs and other venues. Ban Phon Phrae Wa has numerous shops selling Phrae Wa silk. Hand-woven Phrae Wa silk is well-known among silk collectors. Besides having many skilled Phrae Wa weavers, the area is also recognized as producing the highest quality natural silk threads in Northeastern Thailand.

Product Processing and Development

There is development and processing into sabai (shoulder cloths), fabric bolts, clothing, accessories, souvenirs, and home decorations to increase product value. Regarding products and processing, Phrae Wa silk is a distinctive handicraft of the Phu Thai people in Kalasin Province, renowned for its intricate beauty and complex patterns. Phrae Wa silk products can be processed as follows Sabai or shawls: Woven with a width of not less than 27-75 cm, length not less than 2 meters, or dimensions according to market demand, featuring patterns throughout and fringes on both ends.

Fabric bolts or pieces: Woven with a width of not less than 62-90 cm, length not less than 5 meters, or dimensions according to market demand, with patterns throughout or patterns on one part and plain color on another. These are used for garment sewing or processing into other products according to desired usage characteristics.

Hair wraps, neckties, hair clips, keychains.

Ready-made shirts and garments: This represents high-value-added silk processing, popular especially among working-age and middle-aged groups.

Accessories and souvenirs: Including earrings, necklaces, and bracelets. Additionally, Phrae Wa silk is processed into bags, scarves, and home decorations such as pillows, table covers, and curtains.

The processing of Phrae Wa silk reflects the invaluable wisdom and culture of the Phu Thai people, inherited and developed from generation to generation.

State Policy and Support

The state plays a crucial role in promoting silk identity through OTOP projects, training, trade fair organization, and standard certification such as the Peacock Gold Label.

Saket silk: Products include scarves, shawls, fabric bolts, and ready-made garments.

Khan Kaen Khun silk: The marketing of this silk benefits from GI certification and its status as the provincial identity fabric, ensuring consistent demand, especially for naturally dyed fabric bolts. Products include fabric bolts, garments, accessories, utilities, and religious items.

Soi Dok Mak silk: This silk holds OTOP 5-star standard certification and is in demand by government and private sectors for use in various important events. It is sold both online and at trade fairs. Products include fabric bolts and made-to-order garments.

Phrae Wa silk market: It has received the Peacock Gold Label standard and Thai Community Product Standard (TCPS) certification. It is known as the provincial identity pattern, with distribution channels through trade fairs and various markets.

Summary of Research Findings

The research findings indicate that the identity of the Ban Phon silk weaving community arises from a process of construction and adaptation across four dimensions under the influence of cultural, economic, state policy, and contemporary social factors, as follows:

Table 1 Summary of Research Findings

Dimension	Details	Supporting Data
Culture & Local Wisdom	Inheritance of Phrae Wa patterns; storytelling and local symbols.	Use of local floral/fauna patterns expressing Phu Tai identity.
Economy & Market	Product adaptation to market demands; processing silk into diverse goods.	Fabric lengths, shawls, clothing, home decor, accessories; OTOP, e-commerce channels.
State Policy & Support	Support via OTOP, product standards, participation in trade fairs.	OTOP 5-star certification, financial/training support for weavers.
Contemporary Society & Technology	Use of digital media for promotion; reinterpretation of identity.	Communication via social media; creating and promoting community narratives.

Ultra & Local Wisdom: Phrae Wa pattern creation reflects Phu Tai stories/symbols (e.g., local flowers, leaves, animals). Knowledge transmission occurs within families/groups, with new weavers learning both techniques and cultural meanings.

Economy & Market: The community adapts products to market needs (e.g., processing into various goods). Using OTOP, trade fairs, and online platforms promotes Phrae Wa and reaches new customer segments.

State Policy & Support: Support from government/local agencies (e.g., OTOP standards, training, exhibitions) elevates the community's identity to regional/national recognition.

Contemporary Society: Digital media allows the community to **create identity narratives** linked to local pride. Identity is reinterpreted symbolically and economically to adapt to contemporary Thai society.

Overall Summary: The identity of Ban Phon silk is not merely about preservation but is a **process of negotiation and re-creation**, blending local wisdom with state policies and socio-economic pressures.

Discussions

The research findings significantly align with and extend theoretical frameworks and related research, allowing for discussion as follows:

1. Identity Construction as a Process of Social and Cultural Negotiation

The study found that the identity construction process of the Ban Phon silk weaving group is filled with negotiation between tradition and modernity. This aligns with Cohen's (1985) concept of the symbolic construction of community, where communities use various symbols to define boundaries and create shared meanings. A clear example is the community's choice to adapt traditional patterns such as the "pair of birds pattern" and "dok phikul flower pattern" with more modern colors and forms to meet market demands while preserving traditional meanings. This adaptation is not a loss of identity but a dynamic "construction of new identity" consistent with changing social contexts.

2. The Role of Cultural Capital in Value Addition

This research clearly confirms the findings of Naiyanit et al. (2024) that the community utilizes "cultural capital" in three main forms:

Objectified capital: Developing patterns and weaving techniques to become more intricate and complex.

Embodied capital: Inheriting wisdom from generation to generation and applying modern knowledge for further development.

Institutionalized capital: Obtaining various standard certifications such as the Peacock Gold Label.

The use of this cultural capital aligns with Bourdieu's (1986) concept that cultural capital can be effectively converted into economic value, especially when supported by state policies.

3. Influence of State Policies on Identity Formation

The study found that OTOP policy profoundly impacted the community's identity construction, consistent with Vachirakhachorn (2004) research indicating that transforming silk into OTOP products led to adjustments in patterns, production methods, The self-definition of the Ban Phon community through Phrae Wa silk, juxtaposed with the external recognition by the state and society through the OTOP project, illustrates the concept of social identity as a reciprocal process of interaction (Jenkins, 2008). and product meanings. However, this research found that the Ban Phon community was not merely a passive recipient of policy impacts but engaged in "negotiation" with state policies by selectively developing elements aligning with traditional identity while attempting to preserve cultural values.

4. Cultural Tourism and the Process of Identity Construction

The expansion of cultural tourism has created "external identity perception," compelling the community to learn to present and "tell stories" about their identity publicly. This finding aligns with Appadurai's (1996) concept of globalization causing local cultures to adapt to global markets. The Ban Phon community has been able to utilize this opportunity to create an identity that is both "authentic" in the villagers' eyes and "interesting" in the tourists' eyes.

5. The Role of Digital Media in Shaping New-Generation Identity

The research found that social media has become a new field for constructing and presenting community identity, extending the research of Duangduean Phansri (2018). The Ban Phon community uses online platforms not only for marketing but also as spaces to "control their own narrative," creating awareness of the value and meaning of Phrae Wa silk directly to consumers without depending on intermediaries for meaning communication.

6. Sustainability of Identity Amidst Change

The success of the Ban Phon community in maintaining their identity under pressure from change supports Hall's (1996) concept that identity is not static but a process requiring continuous adaptation. The community's ability to balance preservation and development by leveraging the strengths of original cultural capital combined with opportunities from state policies and modern technology enables Phrae Wa silk identity to persist meaningfully and vibrantly in contemporary social contexts.

The above discussion indicates that the identity construction process of the Ban Phon community is a complex phenomenon arising from interaction between social structures and the agency of community members. A deep understanding of this process will aid in designing policies and operations that effectively promote sustainable development based on local culture.

Conclusion and suggestions

This research has revealed several interesting issues deserving further study in the future.

Recommendations for Utilizing Research Findings

Role and Bargaining Power of Women in Identity Construction: As textile handicrafts are primarily a women's domain, specific research on how this process affects the roles, status, and decision-making power within households and communities of these women is an important and interesting issue.

Dynamics of Conflict and Cooperation Between Generations: In-depth study of negotiation, adaptation, and finding common ground between older and younger weavers in determining the direction of community identity would provide deeper explanations than merely observing change.

Comparative Study Between Communities: Conduct comparative research between Ban Phon and other renowned silk weaving communities in Northeastern Thailand (e.g., Mukdahan silk, Buriram silk) to analyze factors contributing to each community's success or differences in constructing and maintaining their identity under similar contexts.

Recommendations for Future Research

Quantitative Research on Consumer Behavior: Conduct a broad survey of Phrae Wa silk consumer groups using questionnaires to understand purchasing motivations, levels of cultural value perception, satisfaction, and future purchasing trends. This data would be extremely beneficial for the community's marketing planning.

Longitudinal Study on Sustainable Tourism Impacts: Conduct in-depth, long-term follow-up research on how the expansion of cultural tourism impacts the Ban Phon community both positively and negatively (e.g., excessive commercialism, resource strain, changes in social relationships).

Research on Material and Production Process Innovation: Study the feasibility of applying new innovations such as natural dyeing producing more durable and varied colors, or developing software for digital pattern design, without losing the traditional spirit.

Acknowledgments

This research was successfully completed with the kindness of the Ban Phon community leaders, the silk weaving group, government agencies in Kalasin Province, and experts who provided consultation throughout the research process. The researchers extend their gratitude to all concerned.

New knowledge and the effects on society and communities

1. Analysis of Social, Cultural, and State Policy Factors Influencing the Preservation and Transformation of Community Identity

This objective delves into the driving forces and pressures causing identity to persist or change.

1.1 Cultural and Social Factors (Preservation)

Knowledge transmission: Identity preservation depends on transmitting weaving wisdom across generations within families/groups.

Beliefs/traditions: Weaving continues to be viewed as the "DNA" of Phu Thai women or as a "social symbol medium" used in rituals or important occasions, maintaining connection to traditional identity.

Social capital: Grouping into cooperatives/weaving groups builds bargaining power, enables collective management, and serves as a crucial mechanism for maintaining quality and knowledge.

1.2 Economic Factors and State Policies (Change/Adaptation)

Promotion policies: State and agency projects help make Phrae Wa an economic product (product collection businesses, processing), providing members with clear income. Income generation is a key factor enabling this identity to "survive" and become "interesting" for younger generations.

Modern marketing: Support for marketing channels such as OTOP, fairs, and online channels forces the community to modernize products and packaging (change).

Tourism: Ban Phon becoming a cultural tourism destination (cultural center) results in identity being "displayed" and "presented" publicly, which may lead to emphasizing only market-desired aspects (selective presentation).

Challenge factors (pressures): Weaver age - findings may show most weavers are older, with younger generations less interested in weaving (pressure on transmission).

Ready-made garment market: Community members increasingly purchasing market clothing reduces demand for woven fabric in daily life (social change affecting usage).

2. The Process of Identity Construction Among the Ban Phon Silk Weaving Group in the Context of the State and Contemporary Society

This objective focuses on understanding how the weaving group constructs and maintains their "Ban Phon-ness" amidst change.

2.1 Traditional Identity (Core)

Findings confirm that "Phrae Wa silk" is the core identity, reflecting the "Phu Thai" (Phu Tai) ethnic group of Ban Phon.

Traditional weaving processes represent accumulated wisdom about ways of life rather than commercial production, considered "cultural heritage" inherited from ancestors.

Weaving skills/patterns: Reveal pride in advanced techniques such as jok (brocade with white silk) and preservation of traditional patterns (e.g., cho, khan, choeang).

2.2 State Influence (Integration and Elevation)

The involvement of the Arts and Crafts Promotion projects was a crucial factor transitioning Phrae Wa from local heritage to "national product/provincial symbol."

State support through various agencies (e.g., Department of Cooperative Promotion, OTOP) helps create standards and expand recognition, producing state-recognized identity that enhances economic stability.

2.3 Adaptation in Contemporary Society (Dynamics)

Found adaptation termed "dynamics," where weaving groups develop and modernize fabric patterns to meet external market demands (e.g., incorporating animal patterns or applying to contemporary garments).

Conflict/negotiation: May find debate or balancing between "preserving" traditional patterns and "creating" new patterns for commerce.

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This research was successfully completed thanks to the generosity of the community leaders of Ban Phon, the silk weaving group, government agencies in Kalasin Province, and the experts who provided consultation during the research process. The researchers would like to express their sincere gratitude to everyone involved.

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Name of the journal (new): Community and Social Development Journal

ISSN 3027-7493 (Online)

ISSN 3027-7485 (Print)

From Vol 25 No 1 January - April 2024 onwards.

Name of the journal (formerly): Rajabhat Chiang Mai Research Journal

ISSN 2651-2068 (Online)

ISSN 1513-8410 (Print)

From Vol 1 No 1 1999 - Vol 24 No 3 2023

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2. There is a writing style, American Psychological Association (APA) 7th edition (applied).

Details of writing a bibliography / references**1. Journal** (References journal that up-to-date/most current)**(General Format)**

Surname, /the first letters of the name. / (Year of publication). /Title of article, /Title of journal/Year of journal (issue), Page Number Starting - Page number ending. <http://www.....>

Elmastas, M., Isildak, O., Turkekul, I., & Temur, N. (2007). Determination of antioxidant activity and antioxidant compounds in wild edible mushroom. *Food Composition and analysis*, 20(1), 337-345. <https://www.abc.ac.th/article12345>

2. Book

Surname. (Year of publication). Title of book. (Edition). Place: Publisher

Rangkhakunnuwat, P. (2013). *Time Series Analysis for Economics and Business*. (4thed.). Bangkok: Chulalongkorn University Printing House.

Courtney, T. K. (1965). *Physical Fitness and Dynamic Health*. New York: McGraw-Hill Inc.

3. Thesis (If the that subject has an article in journal use references from the journal)

Author. (Year). *Translated Title of dissertation*. (Doctoral dissertation or Master's thesis, University).

Sunretphol, N. (2004). *A Development of Educational Indicators for Lifelong Learning*. (Ph.D., Srinakharinwirot University).

Magyar, C. E. (2014). *The discourse of tourism and national heritage: A contrastive study from a cultural perspective*. (Doctoral's thesis, University of Madrid).

4. Electronic media (Refer to only up-to-date information/ Up-to-date such as

Population statistic etc.)

Surname. (Year of publication). Title. Retrieved from the title of website

Rankin, E. (2013). Residential school survivor says he was starved CBC NEWS. Retrieved from <https://www.cbc.ca/news/canada/british-columbia/b-c-residential-school-survivor-says-he-was-starved-1.1317712>

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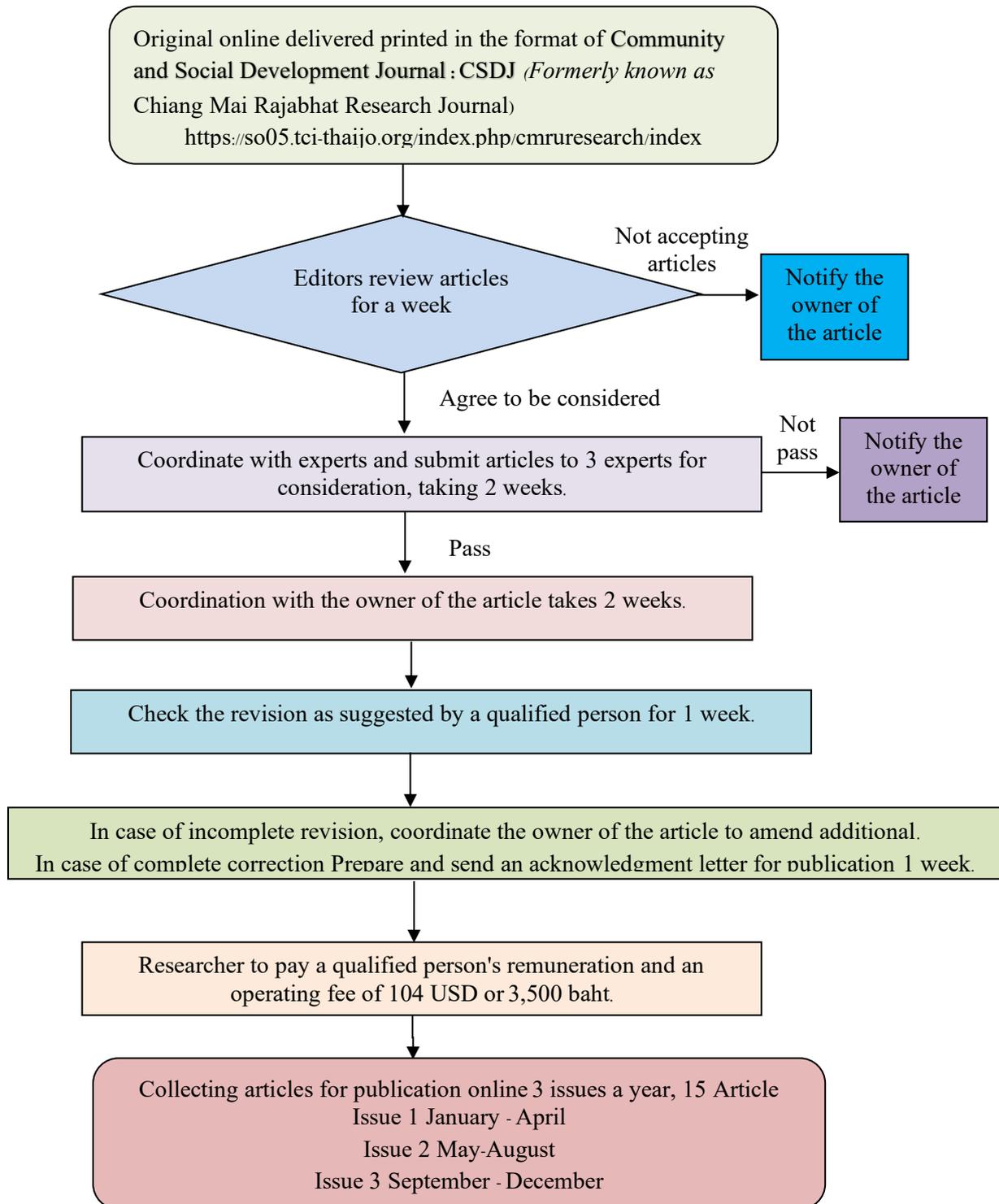
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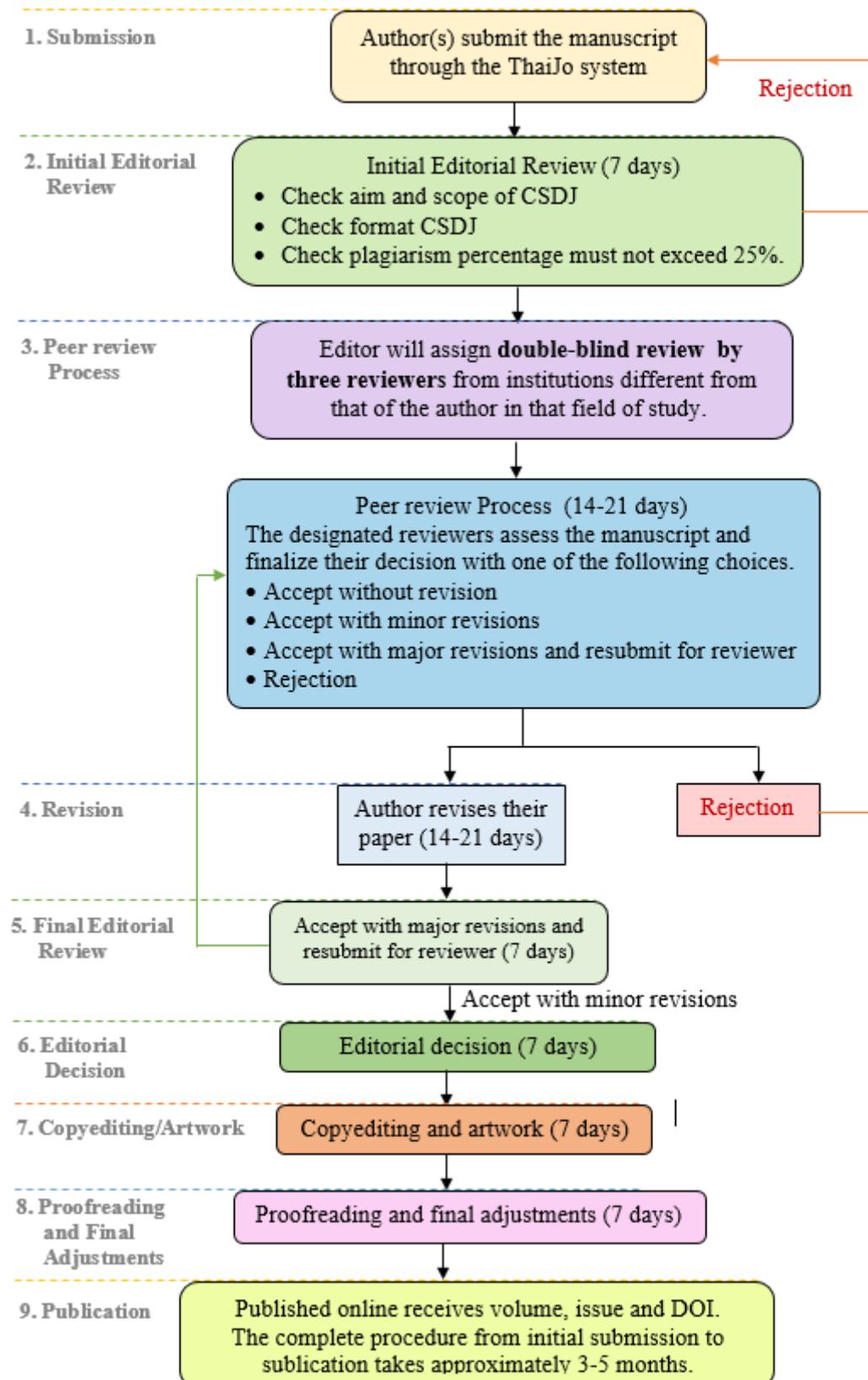
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