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Supply Chain and Sustainability Research (SCSR) is an independently run non-profit journal dedicated to serve the worldwide scientific community through periodical of high-quality and high-impact scholarly, multi, and inter-disciplinary research that broadly resides in the arenas of supply chain and sustainability research. SCSR is committed to provide a platform that disseminates academic work, findings, and knowledge promptly, openly, and freely to all, and thus promote practical and public conversation and communication. By this, SCSR strives to be one of the important supply chain and sustainability journals in the world.

The Purpose: To support and encourage the writing of academic works. Disseminate academic works of faculty, academics and students both internally and externally as well as being a medium for education, research and dissemination of academic knowledge.

The goal is to serve as a hub for scholarly support, knowledge transfer, and dissemination. along with quality research The SCSR strives to publish insightful, innovative, and pertinent research that describes or may have an impact on management and/or innovation within the SCSR framework. Benefits to society, the community, and the country as a whole are frequently published in electronic journals by the SCSR. is diverse and interdisciplinary in character. The magazine accepts essays on all topics related to management as well as those relevant to innovation, regardless of discipline or subject area.

SCSR uses a “double-blind peer review system,” meaning that the authors do not know who the reviewers are, and the reviewers do not know who the authors are. All submitted manuscripts are to be reviewed by three expert reviewers per paper. Reviewers are chosen because of their expertise in the topic area and/or methodology used in the paper. Each article is judged based solely on its contribution, merits, and alignment with the journal’s mission. Should any revision be required, our instructions to authors are designed to move authors towards a successfully published article.

Periodicity: Four a year publication: 1) First Issue: January – December 2) Second Issue: April – June 3) Third Issue: July – September and 4) Four Issue: October – December.

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Greetings from Editor-in-Chief: Supply Chain and Sustainability Review (SCSR)

The application of sustainability issues to supply chain management, logistics, transportation, and various optimization methods has been increasingly popular in recent years. One of the numerous issues that supply chain management encounters on an ongoing basis is operating in a sustainable manner. The goal of the SCSR is to investigate the use of sustainability in supply chain management, operation management, logistics, transportation, healthcare management, and fuzzy sets theory. The first issue of SCSR is to serve this purpose as how sustainable development must go hand in hand with logistics and supply chain management.

We invite academics from a variety of management-related disciplines to submit original, high-quality research papers that primarily address sustainability-management-related challenges and contribute to the SCSR's mission. The articles in the SCSR will emphasize both theoretical and empirical research. Literature reviews, conceptual theory development, qualitative survey research, such as case studies, and quantitative empirical methodologies may all be included in academic papers. SCSR rules must be adhered to by all submitted papers.

In view of current disruptions in global supply chains (e.g., chip crisis), the implications of supply chains for the climate and biodiversity discourse, new supply chain laws to increase social responsibility, and technological innovations (e.g., blockchain), supply chain management has become an imperative for global business.

In this issue, 6 research papers are presented.

1) A Study of Relationship Between Teachers' Emotional Intelligence and Work Stress: A Case Study in Shandong Industrial Technician College

2) Integrating Carbon Credits into Supply Chain Decision Simulations: Environmental Analysis and Business Strategy Discourse

3) The contribution of the banking and insurance industry to climate change: a case study of carbon-neutral commodities

4) Discussion on Consumers' Purchase Intention in Cross-cultural Context: A Conceptual Study of E-commerce Supply Chain as an Example

5) Carbon Cut and Swap: Is Trading Emissions the Green Magic Bullet?

6) Strategies, practices and observations of green tourism supply chain Taking the promotion of GDMO in Tamlan area as an example

In addition, we would like to inform you about our next issues (Volume 3 No.2,…) in 2024. Recent announcement of the call for papers is accessible on the SCSR website. This issue marks the debut of the

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SCSR and its birth. It is my pleasure to address you on this occasion. I would like to express a warm welcome to the SCSR readership on behalf of the SCSR Editorial Team. I would like to thank our authors, editors, and anonymous reviewers, who have all voluntarily contributed to the journal's success. Without your participation, this initial issue would not exist.

We look forward to receiving your contributions.

Jirasek Trimetsoothorn
Editor-in-Chief

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A Study of Relationship Between Teachers' Emotional Intelligence and Work Stress: A Case Study in Shandong Industrial Technician College

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Abstract

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This study investigates the relationships between emotional intelligence and work stress among teachers at Shandong Industrial Technician College. In order to examine such relationship, a survey method with 194 teachers selected by simple random sampling method is used in this study. Findings indicate that the teachers exhibit a high level of emotional intelligence, especially the Self-Awareness, and a medium level of work stress, primarily from Intrinsic Work Factors. A weak significant negative correlation between teachers' emotional intelligence and work stress levels was identified, with the emotional intelligence component of Self-Regulation showing the strongest inverse relationship with work stress. These results suggest that higher emotional intelligence could contribute to lower levels of work stress among teachers, underscoring the importance of emotional skills in educational environments.

Keywords: Emotional Intelligence, Work Stress, Vocational School in China

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Introduction

Since Selye (1956) first introduced stress as a physiological and psychological concept, work stress, as a kind of stress, has not only received attention from the public from a health perspective, but also companies, schools and other organizations have realized its importance to management. How to minimize the negative effects of work stress becomes an area of interest and study for researchers, Fteiha and Awwad (2020) highlight in their study that the presence of emotional intelligence can help employees to manage their work stress.

As the 21st century progresses, knowledge increasingly drives economic development, highlighting the significance of higher education and its faculty. Higher education institutions, particularly vocational colleges and universities are pivotal in meeting societal and industry talent demands. This necessitates a swift response from these institutions to adapt to societal and industry changes. Currently, China hosts the world's largest vocational education system, with Shandong Industrial Technician College as a case in point. Established in 1978 in Weifang, Shandong, it is a government-approved, full-time technical college under the Shandong Provincial Department of Human Resources and Social Security. Faculty members face pressures not only from their workplace but also from interactions with colleagues, students, and parents, reflecting broader social challenges (Ozoemena et al., 2021).

This study explores the relationship between Emotional Intelligence (EI) and work stress, establishes a research framework to investigate their relationship. According to the research framework, researcher designs a survey questionnaire. 194 teachers of Shandong Industrial Technician College participate the survey questionnaires, quantitative and statistical analysis are used in this study to well answer the main objective of this study:

Objectives

The purposes of this study are:

1. To examine the level of emotional intelligence among teachers at Shandong Industrial Technician College.

2. To assess the level of work stress experienced by teachers at Shandong Industrial Technician College.

3. To investigate the relationship between teachers' emotional intelligence and their work stress levels.

The investigation into the relationship between teachers' Emotional Intelligence (EI) and work stress addresses a critical gap in both theoretical and practical knowledge. It aims at enhancing educators' job satisfaction, educational quality, and institutional practices at Shandong Industrial Technician College and potentially across the broader educational landscape. This study posits that understanding the dynamics between EI and work stress among teachers can forge pathways to ameliorating stress and bolstering overall teacher well-being. The significance of this study lies in its potential to inform and improve the management of work stress among vocational educators, thereby enhancing their quality of life and teaching effectiveness.

Literature Review and conceptual Framework

Work Stress

The early study of work stress could be traced back to the late 19th and early 20th centuries, when the influence of fatigue on human performance is observed (Taylor, 1911; Gilbreth, 1914). Selye (1956), often regarded as the father of stress, introduced stress as a biological and psychological term, paving the way for theories such as Karasek's (1979) Job Demand-Control (JDC) model and its later expansion, the Job Demand-Control-Support (JDCS) model (Karasek & Theorell, 1990). Hobfoll's (1989) Conservation of Resources (COR) theory and Lazarus and Folkman's transactional model offer alternative perspectives on stress, emphasizing resource loss and the appraisal of situational demands versus personal resources, respectively. Although work stress is widely recognized as leading to burnout, chronic health problems, and decreased employee performance (Maslach et al., 2001), Selye (1974) introduced the concept of "eustress", stating that moderate stress can be adopted as a motivational tool to increase job satisfaction and productivity. These above theories and findings underline the complexity of work stress and its significant implications for occupational health.

Work stress is caused by stress contributing factors, this factor called "stressors." (Salye, 1936). The concept of stressor is well elaborated by Cooper and Marshall (1976) identified six key areas: intrinsic work factors, role in dual careers, career development, organizational structure, interpersonal relations, and external organizational factors, Beehr and Newman (1978) narrowed down stressors to role expectations, job demands, and the internal and external organizational environments, furthermore Financial aspects (Raver & Nishii, 2010), and motivational factors (Karimi & Alipour, 2011), have also been implicated in work stress. Recent guidelines by OSHA (2024) highlight modern stressors, including

job security, access to work tools, fear of retaliation, customer confrontations, and challenges in adapting to new work environments or balancing work-life dynamics.

Emotion and Emotional Intelligence

Historical and contemporary research has extensively explored the multifaceted nature of emotions, from the philosophical inquiries of Socrates, Plato, Aristotle, Descartes, and Locke to modern psychological investigations. Emotions are recognized as complex experiences with intentional, physiological, and action-inducing dimensions, metaphorically likened to natural forces by Omori (2008).

The concept of Emotional Intelligence (EI), evolving from early studies on social intelligence by Thorndike (1920), encompasses non-cognitive skills crucial for understanding, managing, and utilizing emotions effectively. Salovey and Mayer (1990) defined EI as comprising skills in perceiving, appraising, expressing, and regulating emotions to foster emotional and intellectual growth. Goleman (1998) expanded on this, advocating for EI as a learnable set of competencies vital for exceptional performance and leadership, introducing a mixed model of EI that includes five core competencies: Self-Awareness, Self-Regulation, Motivation, Empathyn and Social Skills. Petrides (2009) proposed a trait model of EI, focusing on emotional self-perceptions within personality hierarchies. The significance of EI has been recognized in various HRM practices, leadership effectiveness, workplace relationships, mental health, life satisfaction, and professional success, underscoring its importance in personal development and adaptive capabilities in a dynamic work environment (Zeidner et al., 2004; Goleman, Boyatzis, & McKee, 2002; Carmeli & Gittell., 2009; Salovey et al., 1999; Bar-On, 2006).

Conceptual Framework

Figure 1 Research framework

Research Method

Types of Research

The approach taken for this study is a quantitative research design utilizing survey research methods to ascertain the relationship between teachers' emotional intelligence and their work stress. This empirical investigation is rooted in the theoretical frameworks of emotional intelligence as delineated by Goleman (1998) and work stress factors as conceptualized by Cooper and Marshall (1976). These theoretical perspectives guide the operationalization of the variables and are critical to our understanding of the observed relationships.

Population, Samples and Random Sampling Method

In this study, the population is 377 teachers work at Shandong Industrial Technician College (Shandong Industrial Technician College, 2024). The sample is 194 teachers from Shandong Industrial Technician College, with the margin of error 5% (Yamane, 1973). The simple random sampling method was utilized in this research

Research instruments

In this research, questionnaires are used as research instruments of data collection. These questionnaires are segmented into 3 parts, 3 items related to the respondents' characteristics, 26 items related to emotional intelligence (Goleman, 1998) and 30 items related to work stress (Cooper and Marshall, 1976).

Assessment of research instrument and data collection

After the questionnaires are reviewed and determined, a pre-testing with a sample of 30 teachers from other vocational colleges at Weifang is piloted, and its reliability is analyzed using Cronbach's Alpha statistic that its overall reliability is 0.92 (Cronbach & Furby, 1970).

The researcher collected data by distributing questionnaires to 194 teachers at Shandong Industrial Technician College, followed by verifying the responses' completeness and analyzing the data using software package.

Statistical methods

The study analyzes respondents' characteristics through frequency and percentage, emotional intelligence and work stress levels using mean and standard deviation, and explores the relationship between emotional intelligence, factors of EI and work stress via Pearson's correlation analysis.

Finding and Results

Results about Respondents in this study

The researcher analyzes the data of teachers who participated the questionnaire, including gender, age and years of work experience. Frequency and percentage analysis of the data are performed. The results are shown in Table below

Table 1 : Respondents' Characteristics

	Frequencies	%
Gender		
Male	84	43.3%
Female	110	56.7%
Total	194	100.0%
Age	Frequencies	%
20-30	60	30.9%
31-40	89	45.9%
41-50	22	11.3%
51 and above	23	11.9%
Total	194	100.0%
Years of work experience	Frequencies	%
Less than 1 year	10	5.2%
1 - 3 years	38	19.6%
3 - 5 years	29	14.9%
More than 5 years	117	60.3%
Total	194	100.0%

From Table 1, it is found that the data of the 194 respondents who participated in the questionnaire are as follows: In the survey respondents, more female respondents than males, constituting 56.7% (110 individuals) and 43.3% (84 individuals), respectively. For the age field, most of respondents falls within the 31-40, making up 45.9% (89 individuals), followed by the 20-30 age group at 30.9% (60 individuals), the 41-50 range at 11.3% (22 individuals), and those aged 51 and above at 11.9% (23 individuals). When examining years of work experience, 60.3% (117 individuals) have over

than five years of experience. This is succeeded by those with 1-3 years of experience at 19.6% (38 individuals), those with 3-5 years at 14.9% (29 individuals), and individuals with less than one year of experience comprising 5.2% (10 individuals).

Table 2 Mean and standard deviation of Emotional Intelligence, overall and all factors.

Emotional Intelligence	n = 194		Level of EI
	$\bar{x}$	sd.	
Self-Awareness	4.39	0.56	Very high
Self-Regulation	4.24	0.69	Very high
Motivation	4.34	0.60	Very high
Empathy	4.38	0.56	Very high
Social Skills	4.36	0.60	Very high
Total Average	4.33	0.54	Very high

The Table 2 shows that emotional intelligence level of teachers from Shandong Industrial Technician College is at the Very high level ($\bar{x}$= 4.33). The factor which has the highest mean value is Self-Awareness ($\bar{x}$ = 4.39) that suggests teachers at Shandong Industrial Technician College possess a very high level of awareness regarding their emotions, strengths, weaknesses, and the effects of their actions on others. The lowest mean value, Self-Regulation ($\bar{x}$= 4.24), although still indicating a very high level, suggests a slightly lower proficiency in managing emotions, impulses, and resources. In the context of teaching, enhancing self-regulation skills could further improve classroom management, decision-making, and adaptability to changing situations or stressors.

Table 3 Mean and standard deviation of Work Stress, overall and all factors.

Work Stress	n = 194		Level
	$\bar{x}$	sd.	
Intrinsic Work Factors	3.22	1.09	Medium
Dual Roles	3.10	0.94	Medium
Career Development	2.95	1.09	Medium
Relationships at Work	2.72	1.10	Medium
Organizational Structure	2.79	1.17	Medium
Extra-organizational Stressors	2.99	1.07	Medium
Total Average	2.96	0.95	Medium

In Table 3, the assessment of work stress among teachers at Shandong Industrial Technician College indicates a medium level of stress ($\bar{x}$= 2.96). The highest mean value, attributed to the factor of Intrinsic Work Factors ($\bar{x}$ = 3.22), indicates that internal aspects related to the nature of the work itself significantly contribute to teachers' stress levels. Conversely, the lowest mean value, identified in the factor of Relationships at Work ($\bar{x}$ = 2.72), suggests that interpersonal relationships within the workplace have a comparatively lower impact on teacher's stress levels.

Table 4 Correlation between Emotional Intelligence and Work Stress

		Emotional Intelligence	Work Stress
Emotional Intelligence	Pearson Correlation	1	-0.235**
	Sig. (2-tailed)		<.001
	N	194	194
Work Stress	Pearson Correlation		1
	Sig. (2-tailed)		
	N		194

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

The Table 4 shows that the work stress level has a weak negative relationship (r=-0.235) with emotional intelligence level of teachers from Shandong Industrial Technician College, at the statistically significant level of 0.01.

Table 5 Correlation between Factors of Emotional Intelligence and Work Stress Please, add Sig(2-tailed) in the table.

		Self-Awareness	Self-Regulation	Motivation	Empathy	Social Skills	Work Stress
Self-Awareness	Pearson Correlation	1	0.667**	0.695**	0.648**	0.617**	-0.110
	Sig. (2-tailed)		<.001	<.001	<.001	<.001	0.128
	N		194	194	194	194	194
Self-Regulation	Pearson Correlation		1	0.857**	0.783**	0.809**	-0.269**
	Sig. (2-tailed)			<.001	<.001	<.001	<.001
	N			194	194	194	194
Motivation	Pearson Correlation			1	0.846**	0.814**	-0.236**
	Sig. (2-tailed)				<.001	<.001	<.001
	N				194	194	194
Empathy	Pearson Correlation				1	0.879**	-0.221**
	Sig. (2-tailed)					<.001	0.002
	N					194	194
Social Skills	Pearson Correlation					1	-0.209**
	Sig. (2-tailed)						0.004
	N						194
Work Stress	Pearson Correlation						1
	Sig. (2-tailed)						
	N						194

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

The Table 5 shows that all the five factors of emotional intelligence have weak negative effect on work stress, Self-Regulation, Motivation, Empathy and Social Skills have wake negative relationships at the statistically significant level of 0.01. The factor “Self-Regulation” contributes the highest effect on work stress (r = -0.269, at the statistically significant level of 0.01).

Conclusions Discussions and Recommendations

A Study of the Relationships between Teachers Emotional Intelligence and Work Stress: A Case Study in Shandong Industrial Technician College" is a survey research, collecting data using questionnaires from a sample of 194 teachers from Shandong Industrial Technician College. Descriptive statistics are used in this study to analyze the frequency, percentage, mean, and standard deviation. The correlation of emotional intelligence and work stress is tested by the Pearson correlation coefficient.

Conclusions

The results of this study indicates that teachers from Shandong Industrial Technician College have a very high level of emotional intelligence, with an overall mean of 4.33. The component with the highest mean is Self-Awareness, followed by Empathy, Social Skills, Motivation, and Self-Regulation in descending order of mean values.

The results also presents that the teachers at Shandong Industrial Technician College has the medium level of work stress, with an overall mean of 2.96. The highest contributing factor to stress is Intrinsic Work Factors, succeeded by Dual Roles, Extra-organizational Stressors, Career Development and Organizational Structure. The factors with the lowest mean values contributing to stress is Relationships at Work.

With this study, the researchers find that the work stress level has a weak negative relationship

(r=-0.235) with emotional intelligence level of teachers from Shandong Industrial Technician College, at the statistically significant level of 0.01. The results of data analysis show that all the five factors of emotional intelligence have weak negative effect on work stress, among which the factor "Self-Regulation" has the highest effect on work stress (r = -0.269, at the statistically significant level of 0.01).

Discussions

Emotional Intelligence

From the study the emotional intelligence of teachers at Shandong Industrial Technician College is at a very high level ($\bar{x}$= 4.33). A high level of emotional intelligence is especially necessary for teachers, because it could help the teachers to deal with classroom management, coping with individual student differences, and building positive student-teacher relationships. The research of Brackett et. al. (2011) shows that emotional intelligence, especially in the field of education, has a direct impact on the

quality of teaching and the learning experience of students. The five factors of emotional intelligence - self-awareness, self-regulation, social skills, empathy, and motivation - are critical to promoting a positive educational environment (Rahman et. al., 2024).

Among the five factors of emotional intelligence, the most contributing factor is Self-Awareness ($\bar{x}$ = 4.39). which means that teachers at Shandong Industrial Technician College are strong in recognizing their own emotions and understanding how they affect their thoughts and behavior. High self-awareness is associated with better mental health and life satisfaction, as well as leadership capabilities (Goleman, 1995; Mayer & Salovey, 1997; Li, et. al., 2021). Meanwhile, the weakest factor is self-regulation ($\bar{x}$ = 4.24). that is a relative weakness within the teachers. Self-Regulation refers to managing disruptive emotions and impulses, and the ability to stay in control. Lower scores in self-regulation can be associated with stress, burnout, and less effective coping strategies (Gross, 1998; Thompson, 1994; Bakker & de Vries, 2020).

Work Stress

The teacher work stress level at Shandong Industrial Technician College falls within the medium level ($\bar{x}$= 2.96), reflecting that while stress is present, it may not be at a highly detrimental level. Among the factors affecting work stress levels, the most advantageous factor is Relationships at Work ($\bar{x}$= 2.72), which indicates that teachers generally experience positive interactions and connections with their peers at Shandong Industrial Technician College. These healthy work relationships can provide emotional support, facilitate exchange of helpful resources, and promote a sense of belonging and team cohesion. Studies have found that social support at work can act as a protective factor against the development of work-related stress and burnout (Shahwan et. al., 2024). Conversely, the most significant area for improvement is found within the Intrinsic Work Factors ($\bar{x}$= 3.22), suggesting that the essential nature of the work that teachers at the college are engaged in is a notable source of stress. Intrinsic work factors often include aspects such as workload, complexity of tasks, responsibility, and performance pressures, which can significantly affect teachers' stress levels. A substantial body of research has confirmed the link between intrinsic job factors and occupational stress, highlighting the importance of workload management, job role clarity, and task variation in reducing teacher stress (Montgomery & Rupp, 2005; Agyapong et. al., 2022).

Relationship between Emotional Intelligence and Work Stress

In this study, the results of analysis shows that the work stress level has a weak negative relationship with the emotional intelligence level of teachers from Shandong Industrial Technician

College (r= -0.235), at the statistically significant level of 0.01. More detailed, the self-regulation, motivation, empathy and social skills have weak negative relationship with work stress at the statistically significant level of 0.01; self-awareness has a weak negative relationship with work stress but not at the statistically significant.

A negative correlation means that as teachers' emotional intelligence levels increase, their reported levels of work stress decrease, albeit the correlation is weak. This relationship can be attributed to several facets of emotional intelligence that may play a role in stress management:

1) Self-awareness: Teachers with higher levels of EI may have a better understanding of their own emotions, allowing them to recognize the signs of stress early on and take proactive steps to manage it (Salovey & Mayer, 1990; Li, et. al., 2021;). As for self-awareness not showing statistical significance in its relationship with work stress, it could be that while self-awareness is important, it may not directly alleviate stress unless coupled with the ability to act on that awareness, which is facilitated by the other components of EI (Mayer & Salovey, 1997).

2) Self-regulation: Higher EI also encompasses the ability to regulate one's emotions, which could help teachers manage emotional responses to stressors in the workplace (Brackett & Katulak, 2006; Bakker & de Vries, 2020).

3) Motivation: Motivated teachers may perceive challenges as opportunities for growth rather than stressors. This intrinsic motivation can bolster resilience and may lead to increased job satisfaction and reduced perceived work stress (Selye, 1974; Fteiha & Awwad, 2020).

4) Empathy: Teachers with a high level of empathy may better understand and manage the emotions of others, such as students or colleagues, potentially resulting in a less stressful work environment (Goleman, 1995).

5) Social skills: With better EI, teachers likely possess superior social skills that might enable them to seek support from colleagues or superiors, leading to reduced perceptions of stress (Lopes et al., 2004; Shahwan et. al., 2024).

In this study, a weak correlation is found between emotional intelligence and work stress could be due to several reasons:

1. Multiplicity of Stressors: Work stress is multifaceted and often caused by many different factors. In teaching, these can include job demands, lack of resources, student behavior, time pressures, and work-life balance issues. The complex nature of these stressors may diminish the potential impact of EI. (Kyriacou, 2001; Bakker & de Vries, 2020).

2.Ceiling Effect: There might be a limit to how impactful EI can be on stress reduction. Once basic emotional competencies are met, further improvements in EI might not translate into significant stress mitigation (Brackett et.al., 2011).

3. Organizational Culture and work ethic: The organizational environment can also influence the relationship between EI and stress. If a workplace has rigid structures, ineffective communication, or poor leadership, the benefits of EI on stress might be constrained (Goleman et al., 2002). A strong work ethic might influence how individuals perceive and respond to potential stressors. For example, individuals with a strong work ethic might be more engaged and find a sense of purpose in their work, which could mitigate feelings of stress (Mazzola et. al., 2011).

Recommendations for Future Research

Because the research is limited to the teachers of Shandong Industrial Technician College, the research results have its limitations. The prospect is put forward to provide reference for scholars in related research in the future.

1) Extensive Data Collection: Future research could benefit from a broader dataset, including the

data of the teachers from other vocational institutes, to enable more generalized results and to capture the factors may influence the relationship between emotional intelligence and work stress that were not fully addressed herein.

2) Longitudinal Studies: Collecting data over time would allow us to track changes in the relationship between work stress and emotional intelligence and test for causality.

3) Comparative Analysis: Conducting studies across different populations would be pivotal in determining the universality of the findings of relationship between emotional intelligence and work stress, and in identifying context-specific variables.

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Integrating Carbon Credits into Supply Chain Decision Simulations: Environmental Analysis and Business Strategy Discourse

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Abstract

As global concerns about carbon emissions continue to escalate, effective carbon emission management has become a crucial aspect of business operations. This study aims to develop a simulation system centered on enterprises, incorporating carbon emission trading dynamics into comprehensive decision-making frameworks. Through environmental analysis, decision-making processes, and target management, this paper systematically models the business environment for enterprises under carbon emission constraints. Additionally, it explores the influence of carbon credit mechanisms on business strategies. The simulation system endeavors to serve as an experimental platform for researchers and business managers, enabling them to conduct simulation tests and refine strategies. Ultimately, it seeks to help enterprises navigate the challenges of carbon emission management and achieve mutually beneficial outcomes for both the environment and the economy.

Keywords: Enterprise, Simulation Systems, Carbon Credits, Business Strategy, Environmental Benefits

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Introduction

Background

As global environmental concerns escalate and corporate social responsibility gains increasing prominence, the imperative for effective carbon emission management continues to grow. Businesses, integral to the economic system, wield significant influence in addressing this issue. However, given their finite resources, enterprises often face formidable challenges in managing carbon emissions. To aid companies in navigating these challenges more effectively, the design of a simulation system is imperative.

The simulation system aims to replicate real-world business scenarios, furnishing a virtual platform for business managers and researchers to conduct simulation tests, assess diverse strategies, and proactively address carbon emission management challenges. Through this system, enterprises can accrue invaluable experiences and insights at minimal cost and risk, enhancing their carbon emission management capabilities and standards.

In the realm of carbon emission management, the consideration of carbon credits assumes paramount importance. Carbon emission trading, a pivotal mechanism in carbon emission management, exerts a profound influence on enterprise strategies and costs. Integrating carbon credits enables enterprises to grasp and tackle carbon emission management challenges more effectively, allocate resources judiciously, optimize business strategies, and attain a symbiotic relationship between economic prosperity and environmental stewardship. Hence, in designing the simulation system, thorough consideration of carbon weighting factors is indispensable to enhance its fidelity to real-world conditions, bolstering its practicality and reliability.

Through the enterprise simulation system devised by our institute, we aspire to furnish an efficacious tool and platform for enterprise carbon emission management, fostering their sustainable development, and contributing to global carbon emission reduction and environmental preservation endeavors.

Research Objectives

The objective of this study is to devise a simulation teaching system tailored for enterprises, integrating considerations of carbon emission management, and scrutinizing the ramifications of carbon credit factors on business strategies and environmental outcomes. Precisely, this study will achieve its objectives by:

1) Designing a simulation system: Establishing a simulation framework that emulates the enterprise's business milieu, encompassing industrial dynamics, market competitiveness, carbon

emission oversight, and other pertinent facets, to furnish an authentic and dependable experimental platform.

2) Incorporating carbon emission management: Embedding relevant carbon emission management parameters into the simulation system, such as carbon emission expenses, carbon trading platforms, emission thresholds, etc., to enhance the fidelity of the simulated business environment vis-à-vis actual enterprise challenges.

3) Analyzing the impact of carbon credit factors: Through simulation experiments and rigorous data analysis, delving into the influence of carbon credit factors on business strategies and environmental dividends, thereby fostering a deeper comprehension of the nexus between carbon emission management and enterprise dynamics.

4) Proposing strategic recommendations: Leveraging research findings to offer strategic insights for managing corporate carbon footprints, encompassing strategy optimization and environmental enhancement initiatives, thereby catalyzing sustainable enterprise development and environmental preservation endeavors.

Research Questions

This study endeavors to address the following research inquiries:

1) How can companies navigate the complexities of carbon management? Considering resource constraints and disparate management proficiencies, what impediments and hurdles might enterprises encounter in carbon emission oversight? What strategies can be devised to effectuate efficacious carbon emission management?

2) What are the repercussions of carbon emissions trading on corporate strategic initiatives? How do carbon credit factors influence business decisions, cost structures, and competitive positioning? What are the implications of carbon emission control on enterprises' economic viability and environmental stewardship?

How can a simulation system be crafted to replicate an enterprise's carbon management scenario? Given the imperatives of carbon emission control and trading, how can a realistic and dependable simulation system be engineered to empower business managers and researchers in comprehending and addressing the challenges of carbon emission management effectively?

3) Through an exploration of these research inquiries, this study aims to furnish theoretical insights and practical recommendations for enterprises' carbon emission management endeavors, thereby fostering sustainable enterprise growth and environmental conservation initiatives.

Literature Review

Game-Based Teaching

Game-based teaching, as an innovative pedagogical approach, has garnered increasing attention within the education sector. Compared to traditional classroom methods, game-based teaching captivates learners through its interactive, engaging, and multimedia-rich environment, thereby enhancing learning efficacy and motivation (Flood, 1952; Wu et al., 2012). Research indicates that game-based teaching fosters active learning, problem-solving skills, creativity, and heightened learner interest and engagement (Nadolny & Halabi, 2016; Li et al., 2023). The realm of educational technology, game-based teaching has emerged as a focal area of research, attracting scholarly interest and investment. By immersing students in simulated virtual environments, game-based teaching facilitates experiential learning and practical application of acquired knowledge (Mayer et al., 2013; Schrader & Bastiaens, 2012). Consequently, the development of game-based teaching software holds significant promise, offering novel approaches to education and instruction.

Importantly, game-based teaching transcends academic settings and finds applicability in corporate training and professional skill development. Recognizing its potential, many companies have developed educational game software systems to enhance employee proficiency, efficiency, and job satisfaction (Larson, 2019; Milosz & Milosz, 2014). In summary, game-based teaching, as an innovative instructional method, not only holds intrinsic value in academia but also demonstrates promising prospects across diverse practical domains such as enterprise training. Therefore, the development of game-based teaching software systems stands to positively impact education and enterprise training endeavors.

The Impact of Carbon Emissions on Business Operations

Greenhouse gas emissions, particularly carbon dioxide (CO_2), significantly contribute to climate change, posing profound environmental and societal challenges (Masson-Delmotte et al., 2022). Carbon emissions exert a substantial impact on business operations. Firstly, many jurisdictions have instituted carbon emission control policies, including permit systems and trading markets, imposing penalties and operational constraints on non-compliant enterprises, thereby jeopardizing their stability and competitiveness (Li et al., 2019). Secondly, heightened consumer awareness regarding corporate social responsibility and environmental sustainability translates into resistance towards high-carbon products and companies, potentially tarnishing brand image and market competitiveness (Ziabina & Dzwigol-Barosz, 2022). Additionally, escalating carbon emission costs inflate production and operational expenses, thereby impacting enterprise profitability and financial health (Wang & Zhang, 2022).

Despite the escalating impact of carbon emissions on business operations, many stakeholders remain uncertain about addressing this challenge effectively. Hence, the design of this software system

aims to equip business operators with a comprehensive understanding of carbon emission issues, proficiency in emission management, and the ability to make informed decisions to navigate carbon emission challenges, thereby fostering sustainable development and environmental protection.

How to Calculate Product Carbon Emissions

Understanding Carbon Footprint

A carbon footprint encompasses the greenhouse gas emissions, both direct and indirect, associated with an activity or product throughout its lifecycle, spanning from raw material extraction to final disposal or recycling (Wiedmann & Minx, 2008). While greenhouse gas inventories typically focus on emissions related to energy combustion, product carbon footprints delineate emissions attributable to individual products, accounting for the entire lifecycle, including extraction, manufacturing, assembly, transportation, usage, and disposal or recycling (He et al., 2019).

What distinguishes a carbon footprint from conventional greenhouse gas emissions is its consumer-centric perspective, deviating from the notion that emissions stem solely from industrial sources. While emissions attributed to enterprises and industries typically pertain to manufacturing, product carbon footprints encompass emissions arising from raw material extraction, manufacturing, assembly, transportation, usage, and disposal or recycling (Rizan et al., 2021). Today, product carbon footprints serve as essential tools for governments and companies in achieving greenhouse gas reduction objectives and fostering communication with the public (Penz & Polsa, 2018). Understanding the interplay between greenhouse gas inventories and product carbon footprints is pivotal in calculating carbon emissions, empowering business managers and consumers to comprehend the environmental impact of products and foster sustainable production and consumption behaviors.

Carbon Footprint Calculation Formula

1) Carbon footprints are typically computed using a straightforward formula, multiplying activity data by emission factors and global warming potentials (GWP). Below are examples illustrating carbon emissions in the manufacturing process of a product:

2) Electricity Usage Carbon Emissions: Activity data (e.g., 2 kWh electricity consumed) multiplied by the electricity emission factor and GWP. For instance, if electricity consumption data is 2 with an emission factor of 0.601 kg CO2e/kWh, then electricity consumption emissions = 2 (activity data) × 0.601 (emission factor) = 1.202 kg CO2e.

3) Iron Production Carbon Emissions: Activity data (e.g., 2 kg iron consumed) multiplied by the iron production emission factor and GWP. For example, if the activity data for iron production is 2 with

an emission factor of 2.447 kg CO2e/kg, then iron production emissions = 2 (activity data) × 2.447 (emission factor) = 4.894 kg CO2e.

4) PET Plastics Carbon Emissions: Activity data (e.g., 1.2 kg PET plastics consumed) multiplied by the PET plastic manufacturing emission factor and GWP. For example, if PET plastic activity data is 1.2 with an emission factor of 4.595 kg CO2e/kg, then PET plastic emissions = 1.2 (activity data) × 4.595 (emission factor) = 5.514 kg CO2e.

Summing these emissions yields the total product carbon emissions, which in this case would be 11.61 kg CO2e. These examples illustrate carbon emissions from iron production and PET plastics, highlighting emissions generated during product manufacturing. These emissions primarily arise from raw material extraction, energy consumption during manufacturing, and associated industrial processes. Understanding and computing these emissions aids businesses and consumers in comprehending the overall environmental impact of products, facilitating adoption of more sustainable production and consumption behaviors.

System Design Methodology

The system design is aimed at all enterprises that may have ESG requirements. Due to significant regulatory changes in ESG in recent years, we base the design on the latest regulatory demands (Li et al.,2021). These include the collection of carbon taxes, requirements for zero carbon emissions, and the use of recycled materials, all of which are key considerations in the system design (Jia & Lin, 2020).

Global Environmental Analysis

Global environmental analysis constitutes a pivotal component of system design. In 2015, over 190 countries ratified the Paris Agreement, committing to curbing global warming to below 2 degrees Celsius, with aspirations towards a 1.5-degree Celsius target. The emergence of this objective has spurred a wave of declarations for "net zero emissions" from nations and enterprises alike, thrusting the concept of a low-carbon economy onto the global stage and heralding the onset of the carbon rights era. As an emerging concept, "carbon credits" can be construed as the entitlement to emit carbon, typically quantified as the emission of 1 metric ton of carbon dioxide (CO_2). Companies procure carbon credits to adhere to governmental carbon control regulations or to align with carbon neutrality mandates in international supply chains and initiatives. Within business operations, the utilization of carbon credits profoundly influences decision-making and strategic initiatives:

1. Capital Investment: Companies can attain low-carbon production by enhancing processes to significantly mitigate carbon emissions while boosting production.

2. Maintenance Expenditure: Ensuring equipment upkeep to curtail energy waste and emissions effectively.

3. R&D Budget: Allocating resources towards R&D projects aimed at fostering decarbonized business models and enhancing product quality to align with Sustainable Development Goals.

4. Carbon Credit Procurement: As an imperative operational strategy, acquiring carbon credits enables companies to offset carbon emissions, achieve net zero emission objectives, and concurrently comply with pertinent regulatory frameworks.

Thus, in an era of heightened global environmental consciousness, enterprises must amalgamate insights from global environmental analysis to formulate judicious business strategies conducive to sustainable development and eco-friendly production practices.

Company Market Analysis

Company market analysis stands as a pivotal facet of system design, enabling enterprises to grasp the ramifications of internal and external market dynamics on their operations. Firstly, it entails gathering pertinent information related to business operations, encompassing market intelligence, competitor profiles, industry trends, and regulatory landscapes. Information acquisition can be facilitated through market research, data analytics, and industry reports, furnishing enterprises with a comprehensive information repository.

Secondly, conducting a SWOT analysis proves instrumental in comprehensively evaluating a business's strengths, weaknesses, opportunities, and threats. This assessment empowers companies to discern internal competencies and vulnerabilities, as well as external prospects and challenges, thus facilitating the development of effective marketing strategies and business plans. Moreover, competitor analysis assumes paramount importance, enabling enterprises to discern the strengths, weaknesses, market positioning, and product strategies of rivals. This insight aids in formulating targeted competitive strategies to enhance market competitiveness. Finally, trend analysis is indispensable for strategic planning, enabling companies to discern industry development trajectories, shifts in market demand, and technological innovations. By extrapolating future development directions, enterprises can devise adaptive business strategies encompassing market positioning, product strategies, marketing initiatives, and human resource management strategies.

In essence, company market analysis serves as a linchpin process, empowering enterprises to comprehend their internal and external market milieu comprehensively, thereby facilitating the formulation of effective business strategies, bolstering competitiveness, and fostering sustainable development.

Management of Company Objectives

Implementing management by corporate objectives is a vital strategy to ensure the smooth operation of a business. The SMART goal-setting approach offers a simple yet effective framework to guarantee that goals are Specific, Measurable, Achievable, Realistic, and Time-bound. Firstly, clarity necessitates that goals are specific, clear, and purpose-driven rather than vague. Specific goals enhance employee understanding of what needs to be achieved, thereby boosting productivity and motivation. Secondly, measurability dictates that goals should be quantifiable in some objective manner, such as deadlines, numerical targets, or percentage changes. Measurable goals facilitate objective assessment of goal attainment, enabling companies to adjust and refine operational strategies as needed. Moreover, achievability mandates that goals must be realistic and within the company's capability. Ensuring that goals are achievable helps prevent setting targets that are overly ambitious or too conservative, thereby enhancing goal attainment and success rates.

Additionally, feasibility dictates that goals should be realistic, with a clear resource management plan in place to ensure efficient resource utilization and conservation. Realistic goals enable businesses to allocate resources effectively, thereby enhancing efficiency and outcomes. Lastly, establishing a time limit necessitates that goals have a clear end date or project timeline. Time-bound goals enable companies to prioritize and schedule efforts effectively, thereby enhancing efficiency and expediting goal achievement.

In addition to the SMART goal-setting method, gap analysis proves invaluable for identifying discrepancies between the current state and the desired state. Through gap analysis, enterprises can gain clarity on "where we are now" versus "where we want to go," thereby formulating effective improvement plans and strategies to achieve business objectives and system enhancements.

Annual Target Formulation

In formulating annual goals, the annual plan is progressively allocated across four quarters, encompassing targets such as net profit, return on common equity, and carbon credits. Firstly, concerning net profit, the company aims to sustain profitability each quarter, with the annual pre-tax net profit surpassing 500,000 yuan. This objective ensures operational stability and profitability, facilitating long-term development goals. Secondly, the target for return on common equity is set at no less than 1% quarterly, with an annual target exceeding 6%. This objective ensures that company shareholders receive a reasonable return on investment, thereby bolstering shareholder satisfaction and confidence and enhancing the company's capital market performance. Finally, regarding carbon credit targets, the company plans to purchase no less than 100,000 yuan worth of carbon credits each quarter, and over 500,000 yuan annually. This goal underscores the company's commitment to carbon emission

management, actively participating in emission reduction initiatives to fulfill corporate social responsibility obligations and promote environmental sustainability.

Overall, the company's annual targets are designed to ensure a balanced and stable outcome across financial performance, shareholder returns, and environmental stewardship, fostering sustainable development and long-term prosperity.

Decision-making by the Company's Operators

In the simulation game, decision-makers play a pivotal role in strategizing to achieve the company's operational objectives. They begin by analyzing decision scenarios, understanding the context such as market demand, competitor actions, and resource allocation. Based on these factors, decision-makers set specific objectives like increasing market share or reducing costs. To enhance decision accuracy, they must conduct probability analysis, which includes data modeling using historical data and predictive models to simulate outcomes, and employing risk assessment tools to evaluate the risks associated with each decision. Additionally, decision-makers must be prepared to dynamically adjust strategies in real time, reassessing probabilities as scenarios evolve. By following these steps, decision-makers can grasp detailed probability information and formulate more scientific and forward-looking strategies.

In the simulation game, decision-makers play a pivotal role in strategizing to achieve the company's operational objectives. One critical element of their strategy is product pricing, which ranges from $3 to $9 per unit. Pricing decisions must consider three key factors: market demand, cost structure, and competitors' pricing strategies. Decision-makers analyze market demand to determine how pricing affects consumer willingness to buy, with lower prices generally driving higher demand but potentially lowering profit margins. At the same time, they must account for the cost structure to ensure the price covers production costs and remains profitable. Competitors' pricing strategies also influence the decision, as matching or undercutting competitors may increase market share, while premium pricing could help differentiate the product but risks reducing demand. To determine probabilities for each pricing scenario, decision-makers can use probability analysis, drawing from historical sales data, cost calculations, and competitive market positioning. By utilizing a decision tree or diagram, they can visually compare the outcomes of various pricing strategies. The table below provides a simplified breakdown of pricing, market demand, profitability, and market position probabilities:

Table 1 Probability Breakdown for Pricing Decisions Based on Market Demand, Cost Structure, and Competitors' Strategies

Price per Unit	Market Demand Probability	Profit Probability (Cost Structure)	Market Position Probability (Competitors)
$3	80% (High Demand)	10% (Low Profit)	60% (Gain Market Share)
$5	60% (Moderate Demand)	50% (Moderate Profit)	70% (Competitive Position)
$7	40% (Low Demand)	80% (High Profit)	50% (Premium Position)
$9	20% (Niche Demand)	90% (Maximum Profit)	30% (Risk of Losing Share)

By constantly adjusting their strategies and reassessing probabilities based on real-time data, decision-makers can make informed pricing decisions that optimize their company's performance.

Secondly, decision-makers need to plan the production volume, accounting for factors such as raw material availability and capacity constraints to ensure that the final stock volume meets predetermined targets.

Additionally, decision-makers must allocate a marketing budget, determined as a percentage of total projected sales, to ensure the efficacy of marketing campaigns. The quantity of materials purchased must be calculated based on market prices, cost considerations, and factors such as production volume and material conversion rates. Furthermore, decision-makers need to factor in equipment investment and maintenance expenses. Investment levels impact product quality and productivity, while maintenance expenditures are crucial for equipment reliability and operational continuity.

Allocating budgets for research and development (R&D) is essential to enhance product quality and brand image, while simultaneously reducing carbon emissions and increasing production efficiency, thus fostering environmental and economic benefits. Lastly, the purchase of carbon credits presents an important strategic option for offsetting carbon emissions while influencing production and product image.

Overall, decision-makers must integrate various factors to develop a comprehensive strategy aligned with the company's operational objectives, thereby ensuring long-term development and success within the simulation game.

Results and Discussion

Here are the research findings for the four objectives of this study:

1. Designing the Simulation System: The research successfully established a comprehensive simulation framework that accurately replicates the business environment of enterprises. This framework includes key factors such as industry dynamics, market competition, and carbon emission regulation. The system provides a reliable experimental platform, allowing companies to test

and evaluate their business strategies in a controlled setting, thereby providing empirical evidence for decision-making.

2. Incorporating Carbon Emission Management: The research successfully integrated carbon emission management parameters into the simulation system, including carbon emission costs, carbon trading platforms, and emission thresholds. This integration enhanced the realism of the simulated business environment and allowed for a more accurate reflection of the actual carbon emission challenges faced by enterprises. The results showed that incorporating these parameters significantly affects the evaluation of company performance under different carbon emission policies.

3. Analyzing the Impact of Carbon Credit Factors: Through simulation experiments and rigorous data analysis, the research delved into the influence of carbon credit factors on business strategies and environmental benefits. The findings revealed that carbon credit factors significantly impact corporate strategy choices and their environmental contributions. The simulation data highlighted the specific effects of carbon credit market changes on company financials and environmental performance, deepening the understanding of the link between carbon emission management and enterprise dynamics.

4. Proposing Strategic Recommendations: Based on the research findings, a series of strategic recommendations for managing corporate carbon footprints were proposed. These recommendations include strategy optimization and environmental improvement plans aimed at promoting sustainable development and environmental preservation. Specific suggestions include adjusting carbon emission strategies to reduce carbon footprints, utilizing carbon trading platforms for carbon credit management, and implementing environmentally friendly technologies and process improvements to support long-term business growth in the face of increasingly stringent environmental regulations.

Design Conditions and Definitions of Terms

In the carbon market, carbon trading is commonly referred to as carbon credits or emissions trading. These carbon credits permit companies to emit greenhouse gases within certain limits, with the trading price of these allowances contingent upon market supply and demand. Initially, carbon credits traded between US$3.9 and US$12 per metric ton of CO2e. Within this system, emissions and the carbon emission ratio constitute the core parameters of carbon trading. The initial emission ratio denotes the proportion of emissions in the production process devoid of any carbon-saving interventions, while the standard emission ratio represents the acceptable emission proportion within policy constraints.

Should a company exceed permissible emissions, it faces fines of $3 and $5 per unit, respectively. When deliberating on the decision to procure carbon credits, companies can augment their emissions by investing in carbon credits, thus mitigating the emission proportion. Production costs and

standard emission caps serve as pivotal factors influencing business decision-making, with penalty points serving as indicators that companies must monitor closely to avert fines for exceeding allowable emissions.

Table 2 Parameters Related to Carbon Trading Decisions

field	description
Carbon Credit	It is commonly known internationally as carbon rights.
The transaction price of the first batch of carbon credits	The CO_2 equivalent range from US$3.9 to US$12 per tonne.
Initial Emission Ratio	The value is 0.025, which means the proportion of emissions produced without any carbon-saving inputs.
Standard emission ratio	The value is 0.02, which is the acceptable emission ratio under the policy.
Emission Limits (Penalties)	- If the discharge exceeds the allowable discharge, a fine of 3 yuan/USD per unit will be imposed. - If the emission exceeds the allowable emission by 10%, a fine of RMB 5 per unit will be imposed.
Decision-making (purchase of carbon credits)	After input, the emittable amount increases, and the proportion of emissions per unit decreases.
Emission Ratio (Allowable Emissions)	The average emission is 0.021 × (1 + (carbon credit input / production cost)).
Allowable emissions	Production cost × Proportion of emissions.
production costs	Production volume×3 (fixed).
Standard emission caps	With the production volume (production cost), the standard emission ratio × 0.02.
Penalty points	Actual emissions exceed allowable emissions.
Actual emissions	With the production volume (production cost), × initial ratio of 0.025.
fine	The part of the emission exceeding the standard is 3 yuan per unit. If the emission exceeds the standard, it will be 5 yuan per unit.

Participant's Objective Management

In the simulation game, participants typically include decision-makers, senior managers, or other key personnel responsible for developing and executing company strategies. These participants can come from various types of companies, such as:

1. Manufacturing Companies: For example, automotive manufacturers or consumer goods producers, which need to consider production efficiency, cost control, and market demand.

2. Service Companies: Such as financial institutions or consulting firms, which focus on customer service quality, market competition, and business development strategies.

3. Technology Companies: Including software developers or technology innovators, emphasizing technological innovation, market positioning, and product management.

4. Retail Companies: For instance, large retail chains or e-commerce platforms, which need to manage inventory, pricing strategies, and customer demand.

Participants must effectively manage these objectives to achieve the company's operational goals and ensure success within the simulation. The specific management methods and strategies are detailed in Table 2.

Table 3 Participant's Goal Management

Objective	Description
Pricing Strategy	Determine product pricing based on market demand, cost structure, and competitor pricing strategies.
Production Volume	Plan the volume of stock to be produced considering factors like raw material supply and capacity constraints.
Marketing Budget	Allocate a budget for marketing activities based on a percentage of projected sales.
Material Procurement	Determine the quantity of materials to purchase considering market prices and production requirements.
Equipment Investment	Decide on investments in equipment to impact product quality and productivity.
Maintenance Expenditure	Allocate funds for equipment maintenance to ensure operational continuity.
R&D Budget	Allocate resources for research and development to enhance product quality and innovation.
Carbon Credit Procurement	Decide on the purchase of carbon credits to offset emissions and comply with regulations.

Table 3 outlines the key objectives participants must manage in the simulation, which directly relate to our research by illustrating how these decisions impact business performance. Each objective, such as pricing strategy and R&D budget, influences various aspects of operational success and sustainability. Our research examines how these factors affect outcomes within the simulation, helping to understand the relationship between strategic decisions and overall enterprise dynamics.

Table 4 Actual goal management (Unit: USD)

Item	Quarter 0	Quarter 1 target	Quarter 1 achieved
sales revenue	2,808,826	2,573,000	
sales cost	1,580,019	1,450,000	
gross profit	1,228,807	1,123,000	
Operating expenses	150,000	250,000	
Management costs	647,311	600,000	
Net profit before tax	411,496	273,000	
return on common equity	3.86	2	
Buy carbon rights	0	100,000	

Table 4 shows the performance of goal management in the simulation. It compares the actual results for Quarter 1 with the targets. Sales revenue fell short of the target, while sales costs were lower than expected. Gross profit, net profit before tax, and return on common equity also did not meet targets, indicating challenges in achieving financial goals. Operating expenses exceeded the target, and carbon rights were purchased as planned.

Consideration of Changes in Carbon Prices

In the formulation of business strategies, fluctuations in international carbon prices constitute a critical consideration. With the establishment of the Taiwan Carbon Exchange, carbon credit prices are anticipated to range between US$5 and US$15 per metric ton (approximately NT$150 to NT$450), exerting direct influence on company operating costs and strategic planning. Enterprises must factor in the impact of fluctuating carbon prices on production costs, market competitiveness, and the efficacy of carbon emission management practices in shaping corporate image and fostering sustainable development.

The introduction of the carbon credit trading platform affords enterprises enhanced opportunities to engage in carbon credit transactions, thereby mitigating carbon emission costs and augmenting production efficiency. By purchasing carbon credits, companies can offset their carbon emissions, earning recognition and incentivization from government and society alike. Concurrently, fluctuations in carbon prices will impact operational profits and competitive positioning, prompting enterprises to closely monitor price shifts and adapt strategies in a timely manner to navigate market dynamics.

The participation of governmental agencies such as the Ministry of Environment, the Ministry of Economy, and the National Development Commission in carbon exchange operations ensures transactional integrity and market stability. Domestic carbon credit trading obviates the need for overseas transactions, thus curbing costs and risks. Moreover, carbon credit prices serve as a pivotal benchmark

for enterprises in formulating business strategies and investment decisions, facilitating the attainment of sustainable development objectives and fostering the transition towards a green economy.

Conclusions and Recommendations

For business operators, the implementation of this system offers several key benefits:

1. Clear Cost Concept: Effective carbon emission management enables companies to reduce energy consumption and resource waste, thereby lowering operating costs. Additionally, by purchasing carbon credits and implementing other emission-reduction strategies, enterprises can further curtail operational expenses. (Mishan & Quah, 2020)

2. Brand Image Enhancement: Proactive engagement in carbon emission management and sustainable development endeavors can elevate the social image and brand value of enterprises. This serves as a significant competitive advantage, particularly among environmentally-conscious consumers. (Bernarto et al., 2020)

3. Regulatory Compliance: As governments and regulators increasingly focus on carbon emission management, companies must adhere to relevant regulations and policy requirements. This system aids enterprises in understanding and complying with such regulatory mandates, thereby mitigating risks and losses associated with non-compliance.

4. In terms of enhancing the teaching effectiveness, this system presents the following improvements: Knowledge Mastery: Through system-based instruction, students gain a comprehensive understanding of carbon emission management principles and practices, bolstering their proficiency in applying such knowledge.

5. Hands-on Experience: The system provides a simulated environment wherein participants engage in practical exercises pertaining to real-world carbon emission management scenarios. This hands-on approach fosters deeper understanding and application of relevant concepts.

6. Learning Interaction: The system facilitates communication and interaction among students through (Seo et al., 2021).

Discussion forums, Q&A sessions, etc., thereby enhancing learning outcomes and satisfaction. In summary, the adoption of this system not only yields business benefits but also enhances the effectiveness of carbon emission management education, empowering students to develop a deeper understanding and application proficiency in this critical field.

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The contribution of the banking and insurance industry to climate change: a case study of carbon-neutral commodities

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Abstract

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This article reviews the important international efforts to address climate change and protect biodiversity, with a particular focus on the key role played by the banking and insurance industry in this global challenge. From the Kyoto Protocol to the Paris Agreement, and including related initiatives such as ESG (Environmental, Social, and Governance) and TCFD (Task Force on Climate-related Financial Disclosures), the international community is consistently striving to advance carbon emissions management and climate risk mitigation. In this context, the banking and insurance industry is transforming from traditional financial support to a promoter of sustainable finance, committed to providing financial services in line with the Sustainable Development Goals of United Nations.

This paper further analyzes the specific actions of the insurance industry in responding to climate change. In addition to its investment efforts, the insurance industry is actually involved in carbon management and decarbonization through innovative products and services, such as solar insurance and carbon neutral commodities. In particular, this paper introduces in detail the design and implementation of a new type of insurance product, an indemnity insurance to cover the cost of accidental greenhouse gas emissions emphasizing its importance in compensating for losses caused by accidently increased carbon emissions and preventing the risk of carbon leakage.

Finally, this paper proposes the potential contribution of the insurance industry in promoting green procurement, emphasizing its role in promoting the greening of supply chains in the future. Overall, this paper calls for more insurance institutions to join the ranks of climate change response and points out the positive role and potential contribution that the insurance industry can play in this process.

Keywords: Climate Change, Finance and Insurance, Sustainable Finance, Carbon Emissions Management, Green Procurement

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Introduction

Background

With the increasing severity of global climate change, the international community has gradually paid more attention to carbon emissions management and climate risk management. Extreme weather and ecological changes brought about by climate changes on human societies and natural ecosystems have had a profound impact. In this context, the banking and insurance industry, as one of the important economic pillars, has been forced to re-examine its role and responsibility in addressing climate changes. In the past, the banking and insurance industry focused primarily on risk transfer and capital flows, but now its role has expanded to promote sustainability and carbon emissions management.

Research Motivation

This study explores the specific actions and actual contributions of the banking and insurance industry in addressing climate change. Although a series of international climate agreements and carbon emissions management mechanisms have been put in place (Schneider & La Hoz Theuer, 2019), the actual participation and contribution of the insurance industry in this area are still relatively vague. Therefore, it is necessary to conduct an in-depth study on the role of the insurance industry in the response to climate change, to explore its specific actions, challenges, and future development directions.

Purpose of the study

This study analyzes the role and contribution of the banking and insurance industry in climate change response and discusses its practical actions in carbon emissions management, sustainable finance, and green procurement. Specific objectives include:

1) Explore how the insurance industry can actively participate in climate change response

2) Analyze the specific measures and effects of the insurance industry in carbon emissions management and sustainable finance;

3) Discuss the role of the insurance industry in promoting green procurement.

Contribution to this study

This paper deeply explores the role and contribution of the banking and insurance industry in climate change response, which has important theoretical and practical value for promoting the insurance industry to actively participate in climate change response and promote the transformation of the banking and insurance industry from traditional finance to sustainable finance. At the same time, this study can also provide reference and suggestions for relevant policy formulation and practice, and promote the banking and insurance industry to better fulfill its social responsibilities and jointly respond to the challenges of global climate change.

Literature Review

Greenhouse Effect Management Regulations

International agreements

In the process of responding to the challenge of climate change, countries have actively formulated and implemented a series of greenhouse effect management regulations. These regulations aim to regulate and manage greenhouse gas emissions and promote carbon emissions reduction and climate risk management. Typical regulations include:

(1) Kyoto Protocol: It aimed to reduce greenhouse gas emissions, especially from industrialized countries in 1997 (COP 3). The agreement establishes specific emission reduction targets and implementation mechanisms (Kim et al., 2020).

(2) Paris Agreement: The annual adoption aims to limit the global average temperature rise to not more than Celsius 2 degrees above pre-industrial levels and strive to achieve Celsius 1.5 degrees above pre-industrial levels in 2015 (COP 21). The agreement requires countries to submit specific emissions reduction targets and action plans (Liu et al., 2020)

Regional laws and regulations

Countries have also enacted a series of domestic laws and regulations to address the challenges of climate change, such as:

European Union Carbon Trading Market

It has been implemented since 2005 and is the world's first carbon trading mechanism, which formally gives carbon emissions rights to the trading price, the so-called carbon price. Such a market, the mechanism has been effective in encouraging companies to reduce their emissions while creating an emerging financial market (Zhang & Wei, 2010).

International initiatives and action plans

The international community is increasingly concerned about climate change and has developed several initiatives and action plans to address greenhouse gas emissions. These initiatives include:

Table 1 International Initiatives on Climate Change

Abbreviation	Full Title	Year	Reference
CDM	Clean Development Mechanism	1980	(Burian, 2006) The Clean Development Mechanism, Sustainable Development and its Assessment, HWWA-Report 264, ISSN 0179-2253.
CPM	Customer Data Platform		

Table 1 Cont.

Abbreviation	Full Title	Year	Reference
EPs	Equator Principles	2003	Conley and Williams (2011). Global banks as global sustainability regulators?: The equator principles. *Law & Policy, 33*(4), 542-575.
II	Impact Investing	2007	Crédit Agricole CIB (2019). Launch of the first Sustainability-Linked Bond for Enel.
SASB	Sustainability Accounting Standards Board	2011	Schooley and English (2015). SASB: A pathway to sustainability reporting in the United States. *The CPA Journal, 85*(4), 22.
PSI	Principles for Sustainable Insurance	2012	Scordis et al. (2014). Principles for sustainable insurance: Risk management and value. *Risk Management and Insurance Review, 17*(2), 265-276.
IIR	International Integrated Reporting Framework	2013	International Integrated Reporting Council – IFRS Foundation.
RE100	Renewal Energy 100	2014	The Climate Group and Carbon Disclosure Project (CDP).
SBTi	Science Based Target initiative	2015	SBTs (2022). Science Based Targets initiative.
PRI	Principles for Responsible Investment	2005	Gond and Piani (2013). Enabling institutional investors' collective action: The role of the principles for responsible investment initiative. *Business & Society, 52*(1), 64-104
PCAF	Partnership for Carbon Accounting Financials	2015	Ascui and Lovell (2012). Carbon accounting and the construction of competence. *Journal of Cleaner Production, 36*, 48-59.
PRB	Principles for Responsible Banking	2019	Griffiths and Griffiths (2021). To be or not to be: Principles for responsible banking. *Corporate Governance in the Knowledge Economy: Lessons from Case Studies in the Finance Sector,* 181-210.

Table 1 Cont.

Abbreviation	Full Title	Year	Reference
GRI	Global Reporting Initiative	2016	Wright (2009). Setting standards for responsible banking: examining the role of the International Finance Corporation in the emergence of the Equator Principles. *In International Organizations in Global Environmental Governance* (pp. 65-84). Routledge.
TCFD	Task Force on Climate-related Financial Disclosures	2017	Force (2017). Climate-related Financial Disclosures.
PBAF	Partnership for Biodiversity Accounting Financials	2022	Addison et al. (2019). Using conservation science to advance corporate biodiversity accountability. *Conservation Biology, 33*(2), 307-318.
TNFD	Task Force on Nature-related Financial Disclosures	2023	Board (2017). Recommendations of the task force on climate-related financial disclosures.
TIFD	Task Force on Inequality-related Financial Disclosures	2024	Cort and Nascimento (2022). Disclosure of Corporate Risk from Socio-Economic Inequality. *Available at SSRN 4018590*.

These initiatives and action plans have played an important role in driving global climate action, prompting companies and financial institutions to be more proactive in addressing the challenges of climate change.

The impact of greenhouse effect regulations on the financial sector

With the increasing impact of climate change on the financial industry, governments and regulators have begun to formulate corresponding climate change adaptation regulations to protect the stability and sustainable development of the financial system. These regulations typically include the following:

1) Risk assessment and disclosure requirements, which require financial institutions to assess and disclose climate-related risks, such as the likely impact of climate events on asset values and liabilities;

2) Climate risk management requirements require financial institutions to formulate and implement corresponding climate risk management policies and procedures to cope with the uncertainty and volatility brought about by climate change.

3) The establishment of a climate change supervision and supervision mechanism strengthens the supervision and supervision of financial institutions on climate change, and ensures that they fulfill their corresponding social responsibilities and climate risk management functions.

The implementation of these regulations will have a profound impact on the business strategy and risk management of the banking and insurance industry, prompting it to pay more attention to climate risk management and sustainable development, so as to better cope with the global climate change challenge. First of all, international agreements such as the Kyoto Protocol and the Paris Agreement. (Kim et al., 2020; Liu et al., 2020) will have an impact on the financial industry. Second, it will explore how governments and regulators can develop laws and regulations to regulate the climate risk management and sustainability practices of financial institutions. Finally, the impact of greenhouse effect regulations on the strategies and business models of the financial industry will be discussed, as well as the corresponding measures taken by financial institutions to address the challenges of climate change.

Research Concept

Innovative application of financial products and climate change adaptation

Greenhouse gas emissions and innovative applications of financial commodities

Studying the impact of greenhouse gas emissions on business and society? It proposes how to use the innovative application of financial products to help enterprises promote climate change adaptation. Discuss the cost structure of the increase in carbon emissions, including the cost of carbon emissions verification and verification of accidents and the cost of carbon credit by CDM specifications. At the same time, how to design financial commodities to cover these costs and the application prospects of financial commodities in carbon neutrality and climate risk management are discussed.

Risk and feasibility analysis of financial products

In-depth analysis of the risks and viability of new financial instruments. Assess the various risks that this financial product may face, including market risk, operational risk and legal risk. At the same time, the feasibility of this financial product is discussed, including market demand, product design return on investment, etc., to ensure its effective operation and promotion in the market.

Potential impact of financial instruments and policy recommendations

Analyze the potential impact of new financial products on financial markets and global climate change governance, and put forward corresponding policy recommendations and prospects. Discuss the

impact of this financial product on the business model and risk management of financial institutions, as well as the positive impact on climate change adaptation and the achievement of carbon neutrality goals. At the same time, we will propose corresponding measures that should be taken by governments, regulators and financial institutions to promote the development and application of this financial product.

Promotion and application of financial products on climate change

Roles and Responsibilities of Financial Institutions

1) Roles & Responsibilities Financial institutions play an important role in the promotion and application of climate change financial products and have corresponding responsibilities. Firstly, the importance and necessity of climate change adaptation and the realization of carbon neutrality goals are analyzed. Secondly, the social responsibility and moral obligations of financial institutions in promoting the development of climate change financial products are discussed. Finally, this paper explores how financial institutions can promote the promotion and application of climate change financial products through internal management and external cooperation.

2) Importance and Necessity Financial institutions play a key role in climate change adaptation and achieving carbon neutrality goals. First, they can mitigate the economic and social impacts of climate change by providing financial and investment support to promote the development and implementation of climate-friendly projects. Second, financial institutions can help companies and individuals deal with the risks brought about by climate change and protect their assets and investments through risk assessment and management. Finally, financial institutions can also promote the development and application of the carbon market through financial innovation and product design, and promote the reduction of carbon emissions and the realization of climate goals.

3) Social Responsibility and Moral Obligation As an important social and economic participant, financial institutions should bear corresponding social responsibilities and moral obligations. First of all, they should be aware of the serious impact of climate change on people and the planet, and actively participate in climate action to fulfill their responsibilities for sustainable development and environmental protection. Second, financial institutions should follow ethical guidelines and principles to ensure that their business activities are in line with social values and ethical standards and do not have a negative impact on the environment and society. Finally, financial institutions should also actively participate in climate change disclosure and transparency, providing investors and stakeholders with accurate and reliable information to facilitate the assessment and management of climate risks.

4) Promotion and Application Financial institutions can promote the promotion and application of climate change financial products through internal management and external cooperation. First, they can develop policies and guidelines that encourage the active participation of internal departments and employees in climate action and promote the development and application of climate-related products

and services. Second, financial institutions can also work together with stakeholders such as governments, enterprises, and non-governmental organizations to jointly promote the development and application of climate change financial products and achieve climate goals. Finally, financial institutions should strengthen cooperation with international organizations and standard-setting bodies to promote the construction and improvement of the global climate financial system and promote global cooperation and coordination of climate action.

Government Policies and Market Environment

In this process, in addition to the contribution of the insurance industry in terms of "investment", it is difficult to summarize the "specific actions" in which it has actually participated. For example, products such as comprehensive solar insurance (household and commercial), comprehensive engineering insurance for new and renewable energy, performance guarantee insurance for corporate bonds issued due to industrial transformation, and environmental pollution insurance, as well as the use of online insurance and electronic insurance policies can all be considered relevant measures. However, the effect of these measures on the actual help of decarbonization may be limited, and these measures are not widespread and mature in different jurisdictions and economic maturity levels. Perhaps the in-depth research and application of carbon credit will be a more promising direction.

Analyze the impact and role of government policies on the promotion and application of climate change financial commodities. First, it will discuss the relevant measures and policies adopted by the government in financial regulation, climate change governance and green finance policies. Second, it will discuss how governments can promote the market development and application of climate change financial products through laws and regulations, fiscal policies and financial incentives. Finally, the cooperation mechanisms and models between the government and financial institutions, enterprises and social organizations will be analyzed to promote the promotion and application of climate change financial products.

Social Participation and Public Education

The importance and role of social participation and public education in the promotion and application of financial products on climate change are noteworthy. First, it is necessary to analyze the attention and participation of social organizations, non-governmental organizations and the public in climate change financial products. Second, we will discuss how to increase public awareness and acceptance of climate change financial products through public education and social advocacy. Finally, the roles and responsibilities of social organizations and the public in the development and application of climate change financial products will be discussed, and how to promote the promotion and application of climate change financial products through multi-party participation and cooperation.

Results and Discussion

The development and application of the above climate change financial products will be conducted. The basic content and characteristics of the carbon offset cost insurance for accidental greenhouse gas emissions (tentatively known as carbon neutrality insurance) developed by the company are evaluated and analyzed based on actual data and cases. Finally, the relevant policy measures and future development trends are discussed, to provide reference and suggestions for the further promotion and application of financial products for climate change.

The basic characteristics of carbon-neutral insurance

The European Union Emissions Trading System (EU ETS) has been implemented since 2005 and is the world's first carbon trading mechanism system, the carbon emissions rights are officially given to their trading prices, referred to as carbon rights trading. Therefore, carbon emissions, which is counted a "negative asset" as liability, can be offset by carbon credit. Taiwan, the Republic of China, has longed been concerned about the purposes of the United Nations and has been discussing climate change in line with international codes and norms to actively participate. The previous regulations called Greenhouse Gas Reduction and Management Act was upgraded to Climate Change Response Act in 2023 as the national level law which set the action targets of 24% voluntary carbon reduction by 2030 and net-zero carbon emissions by 2050. The introduction of various relevant sub-laws and the promotion of private enterprises, such as the implementation of carbon verification/validation, carbon trading, carbon fee/tax, etc., have led the carbon-neutral insurance products to be developed. (Wang, et al., 2021).

The basic content and characteristics of carbon-neutral insurance include underwriting guidelines, coverages, rating tables, terms & conditions, etc. This product was analyzed the operation and protection effects of carbon neutrality through specific cases and data to evaluate its application value in climate change adaptation and carbon neutrality.

Among the circumstance, the banking and insurance industry has expanded the scope of green banking to sustainable finance. It means that the banking and insurance industry not only provides financial and insurance tools for industrial transformation and/or investment, but also expands its scope to the auxiliary operation and management for all human beings, all species, and all environments. In the process of such transformation, the banking and insurance industry shall consider each and every investment, financial management, and protection in a more comprehensive and balanced way to meet the requirements of the indicators of the 17 Sustainable Development Goals (SDGs) of the United Nations.

Evaluation of application effectiveness and market potential

Based on actual data and cases, the application effectiveness and market potential of carbon-neutral insurance are evaluated and analyzed. This article will review the practical effects of carbon neutrality insurance in terms of carbon emission reduction, risk transfer, corporate liability, etc., and discuss its prospects and development trends in the financial market.

"Carbon Credit" is methodologically valued, in addition to establishing its economic trading value; In terms of insurance, the "insurable value" and "insurable interest" are also formed. Therefore, in 2022, we began to study the worldwide market looking for the similar products to introduce them into the Taiwanese insurance market. However, due to the limited information on carbon issues and the absence of specific products, we invested ourselves to write “Carbon Offsets Indemnity Insurance” (Carbon Neutrality Insurance, tentative) to cover the accidental losses of greenhouse gas emissions during operations. The policy wordings have been revised for the second time which is reviewing by the international chief underwriter for their approve and confirmation. The risk premium is based on the statistics of historical Fire and Natural disasters for the past 50 years in Taiwan and the average carbon emissions per person rated by Chung-Hua Institution for Economic Research (Country-level Social Cost of Carbon for Taiwan, Chung-Hua Institution for Economic Research, ISBN 978-986-5795-51-1) including the loss trends.

This insurance product is to cover the accidental increase in carbon emissions for the indemnity of the relevant expenses according to offset unexpected carbon emissions. Those fees are defined to pay for verification/validation and carbon rights conformed CDM/CDP specifications, such as Gold Standard. This indemnity also helps the Insured to keep their carbon neutrality to survive in the supply chain and prevent the compensation involving with the carbon leakage – Greenwashing (Seda, 2023).

Although this insurance policy is a "non-removable carbon neutrality" product, it must be verified and valid to complete the registration on the official website (https://ghgregistry.moenv.gov.tw/epa_ghg/) supervised by the Ministry of Environment. To encourage the Insured for reducing their carbon emissions actively, the carbon reduction label approved and given by the Authorized (Product Carbon Footprint Information Network (cfp-calculate.tw)) is considered to be an additional intensive for premium discounts during our underwriting.

At the same time, in response to Taiwan's "112 Year Plan to Promote the Implementation of Green Procurement by Private Enterprises and Organizations", it is proposed to assist the insurance companies to apply for green credits by issuing this policy to comply with the domestic and international trends which is also complied with Government Act pressed by Public Construction Commission, Executive Yuan and the potential green procurement among the supply chain.

The governmental policy measures and the prospects

Discussing on the relevant policies and the prospects proposed above, this paper analyzes the role and function the Government acts in the promotion and application of financial products for climate change. We also look forward to the future development and potential challenges of the financial market, and put forward corresponding suggestions and market strategies to promote the prosperous and sustainable development of the financial products addressed climate change.

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Discussion on Consumers' Purchase Intention in Cross-cultural Context: A Conceptual Study of E-commerce Supply Chain as an Example

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Abstract

In the rapidly developing global E-commerce landscape, regional cultural differences significantly impact consumer behavior and preferences. This study focuses on how cultural diversity in regions such as China, Western countries, and Southeast Asia affects E-commerce marketing strategies and brand building. It investigates how cultural differences shape consumer demand psychology, purchasing habits, and consumption preferences, and offers strategies to address these differences effectively.

Firstly, the study analyzes cultural differences within China and globally, revealing their effects on consumer trust, purchase decisions, and brand loyalty. It highlights how these differences influence preferences for product types, payment methods, and shopping times. Secondly, it emphasizes the need for personalized products and services and suggests integrating cultural elements to enhance brand image.

The study also stresses the importance of refined marketing strategies. It recommends using data analysis to understand the specific needs of consumers from different cultural backgrounds and employing localization strategies to tailor marketing messages and promotions. Additionally, it advises E-commerce companies to develop brands with regional characteristics and promote cross-cultural exchanges to improve consumer satisfaction.

In summary, this study provides E-commerce enterprises with comprehensive strategies for understanding and managing cultural differences. It offers valuable insights for future E-commerce marketing and brand building, helping platforms meet diverse consumer needs and gain a competitive edge in the global market.

Keywords: Regional Culture, E-commerce Consumers, Purchase Intention, Influencing Factors

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Introduction

Background

The impact of regional cultural differences on E-commerce consumers' purchase intention. At present, with the rapid development of the Internet, E-commerce has become increasingly popular. In this new situation, meeting the needs of E-commerce consumers and enhancing their purchase willingness has become a matter of great concern to E-commerce operators. Among the many factors that affect the purchase intention of E-commerce consumers, regional cultural differences play an important role.

Culture is the imprint of human activities, and the sum of material and spiritual wealth created by people in the process of social and historical development. Differences in the natural environment have created distinct regional cultures. It can be mainly divided into the following categories: Chinese and Western regional cultures, Southeast Asian regional cultures, and domestic regional cultures.

Research Objectives

The research objective is as the following:

1) Understanding the Impact of Cultural Differences: E-commerce network marketing involves complex psychological processes, and effective strategy formulation must consider economic development levels and consumer demand.

2) Cultural Constraints on Demand: Consumers' willingness to demand is significantly influenced by cultural factors. Marketers need to accurately interpret the cultural context of the consumer's location.

3) Conflict with Local Culture: If a product conflicts with local cultural development, it can limit its market potential. Therefore, integrating local cultural elements is crucial.

4) Consumer Classification and Marketing: Marketers should classify consumers based on their needs and psychology, selecting appropriate product types and marketing methods. This approach ensures more precise e-commerce network marketing and reduces the risk of strategy failure.

Main Research Questions

This study aims to explore the following questions:

1) How do cultural differences between China and the rest of the world influence e-commerce? This question investigates how varying cultural norms, values, and practices between China and other regions affect consumer behavior and e-commerce practices.

2) How do cultural differences impact the purchasing habits of e-commerce consumers? This question examines how cultural factors shape consumers' buying behaviors, including their preferences for product types, payment methods, and shopping patterns.

3) How do cultural differences affect e-commerce consumers' consumption preferences? This question explores how cultural backgrounds influence consumers' preferences for products and services, including their attitudes toward brand image and product personalization.

4) How do regional cultural differences impact e-commerce marketing strategies? This question analyzes how understanding and integrating regional cultural differences can refine marketing strategies, enhance brand positioning, and improve overall marketing effectiveness in different cultural contexts.

Importance of research

The importance of this study lies in the In-depth analysis and understanding of the profound impact of regional cultural differences on E-commerce consumer behavior. With the rapid development of global E-commerce, the ability of E-commerce platforms to effectively identify and respond to the needs, purchasing habits, and consumption preferences of consumers in different cultural backgrounds has become one of the key factors for their success. Research demonstrates a strong correlation between consumer acceptance of E-commerce and domestic culture (Rabayah et al., 2022).

Especially in regions with significant cultural diversity, such as China, Eastern Europe, Western countries and Southeast Asia, cultural differences have put forward higher challenges and requirements for E-commerce marketing strategies and brand building. For example, from the cultural dimension, the impact of performance expectation and social impact on cross-border E-commerce shopping has a positive predictive effect on the purchase intention of Chinese and Russian consumers (Mensah et al., 2020).

By analyzing the cultural differences between China and the rest of the world, this study reveals how these differences shape consumers' trust, purchase decisions, and brand loyalty to E-commerce platforms, which in turn have an impact on the marketing strategy and brand image of E-commerce platforms. In addition, this study delves into the specific impact of cultural differences on consumers' purchasing habits and preferences, highlighting the importance of personalized products and services in cross-cultural markets and how to create a more engaging brand image by integrating different cultural elements.

Most importantly, this study highlights the important role of refined marketing in addressing regional cultural differences, including the use of data analytics to better understand the specific needs of consumers from different cultural backgrounds, and the use of localization strategies to adjust

marketing messages and promotion methods. This not only provides an effective strategic framework for E-commerce companies to better adapt and take advantage of cultural differences but also provides valuable references and guidance for E-commerce marketing and brand building in the context of globalization in the future. By implementing these strategies, E-commerce platforms can more effectively meet the needs of consumers from different cultural backgrounds, and in turn, gain a greater competitive advantage in the global market.

Literature Review

E-commerce consumers' purchase intentions

E-commerce consumers' purchase intention is a psychological assessment of whether to buy a product after analysis by collecting various information based on consumers' own consumption experience, preferences, and various external environmental factors. E-commerce consumers' purchase intentions change due to a variety of factors (Zeithaml et al., 1996). Therefore, it is necessary to conduct In-depth research on the relevant theories and empirical studies of domestic and foreign scholars to further grasp the formation, change, and direct or indirect influencing factors of E-commerce consumers' purchase intention.

Regional cultural differences

In ancient times, productivity was low, and a relatively fixed and closed regional culture was created. In the long-term social practice, along with the improvement of productivity and the emergence of countries, people have created regional characteristic cultures in geographically different and politically closed environments such as rivers and mountains. Regional cultural differences are due to the different historical and cultural backgrounds caused by this geographical environment and natural conditions, resulting in obvious differences in cultural characteristics with different geographical locations.

Research Methods

The main methods of dissertation research are:

Literature review method: The main factors related to regional cultural differences affecting E-commerce consumers' purchase intention are identified from relevant literature research. Comparative research method: It mainly compares the cultural differences between China and the West, as well as the cultural differences between the north and the south of China, and the impact on the purchase intention of E-commerce consumers.

Results & Discussion

Cultural differences between China and the rest of the world

Chinese and Western regional cultures and differences

In the context of globalization, there are significant cultural differences between China and the West, and these differences are reflected in many aspects, including eating habits, ways of thinking, life attitudes, consumption preferences, privacy concepts, fertility concepts, and perceptions of competition. Specifically, the Chinese diet is diverse and refined, using chopsticks, while the Western diet is more practical, using knives and forks. In terms of thinking, Chinese prefer abstract thinking, while Westerners are good at figurative thinking. In terms of life attitude, Chinese culture emphasizes spiritual harmony, while Western culture attaches importance to practicality and rationality. In terms of consumption, the West focuses on individuality, quality and enjoyment of the moment, while the traditional Chinese concept focuses more on family and future. Regarding privacy, Western society respects individual privacy and discourages inquiry. U.S. consumers are generally reluctant to switch from their preferred E-commerce to more sustainable options, with a few exceptions. By revealing differences in program behavior associated with cultural orientation, the findings support firms to consider regional differences in consumer behavior and preferences when designing their E-commerce fulfillment strategies and improving their environmental performance (Alessandro et al., 2023). Overall, the Chinese side is more inclined to pursue long-term interests, while the US side is more focused on short-term interests (Lin & Xie, 2023).

In Chinese society, there is a greater interest in the private lives of others, and sometimes even used as a tool for interpersonal communication. In terms of the concept of fertility, the West tends to reduce fertility due to the quality of life, while China has changed from the traditional tendency to have more children and more blessings to family planning, and in recent years, it has also shown a trend of Westernization. In terms of the concept of competition, Chinese culture emphasizes harmony and moderation, while Western culture attaches great importance to competition and victory. These differences not only affect people's daily lives and social interactions in the two cultures but also have a profound impact on cross-cultural communication and international business activities.

Cultural differences between China and Southeast Asia

Southeast Asia includes more than a dozen countries such as Singapore, Malaysia, and Thailand. The phenomenon of Chinese loanwords from the Chinese languages of Southeast Asia has witnessed the integration of Chinese and Southeast Asian cultures. The migration of Chinese to Southeast Asia shows the cultural commonality of customs and ethnic kinship. China's family-centric values have had a huge impact on Southeast Asia. Buddhism has played an active role in cultural

exchanges between China and Southeast Asia and has promoted cultural and economic cooperation and development.

However, there are also cultural differences between China and Southeast Asia. Singapore's political and cultural concepts are more influenced by Europe and the United States, and the legalization is more thorough, but the Chinese have a stronger family concept. Malaysia has a large number of Chinese, a strong influence on Confucian culture, and its economy is more influenced by Japan, and its political stance is biased towards the West. Thailand has a strong sense of hierarchy, a strong reverence for authority, and a strong religious culture.

The cultures of Southeast Asian countries are distinctly different from those of China in many ways. Chinese culture is influenced by traditional ideologies, advocating the supremacy of collective interests over individual interests, and valuing emotional factors and group relationships in communication and communication. Chinese culture advocates the importance of collective interests over individual interests, and attaches great importance to emotional exchange and communication.

Table 1 Comparison of cultural differences between China and the West

Dimensions of cultural differences	China	western
Eating habits	There are many types, pay attention to exquisiteness, and use chopsticks	Practical and simple, using a knife and fork
Mindset	Preference for abstract thinking	Good at visual thinking
Attitude to life	Emphasis on spiritual harmony	Pay attention to practicality and rationality
Consumption orientation	Traditionally considered for the family and the future	Focus on individuality, quality, and enjoyment of the moment
Privacy concept	Interested in the private lives of others, sometimes used as an interpersonal tool	Respect personal privacy and discourage inquiry
Fertility concept	The traditional tendency to have more children and more blessings has shown a trend of family planning and Westernization in recent years	Tend to reduce fertility and focus on quality of life
Competitive perspectives	Emphasis on harmony and moderation, not on competition	We attach great importance to competition and take pride in our victories

China's domestic regional culture and its differences

As a large and complex cultural entity, Chinese culture exhibits great regional differences within its vast domain. The simplest way to divide China is to divide China into north and south. The northern region is vast, with magnificent loess and black soil, its scenery is beautiful, and the climate is dry and cold. The temperament of northerners is usually characterized by being heavy, strong, upright, and rigorous. In the southern region, rivers are crisscrossed, the mountains are clear, and the climate is mild. Southerners, on the other hand, are known for their gentleness, delicacy, agility, romance, and perceptiveness. Another division method is to divide Chinese culture into Yanzhao culture, Sanqin culture, Sanjin culture, Wuyue culture, Qilu culture, Kanto culture, Jingchu culture, grassland culture, Lingnan culture, Qinghai-Tibet culture, Bashu culture, Yunyun culture, Western Regions culture, Taiwan culture, etc. The cultural differences of these regions are reflected in many aspects such as language, customs, and traditional habits, which constitute the unique appearance of Chinese culture richly and colorfully. This diversity makes Chinese culture a fascinating and diverse system with a deep historical heritage. From many aspects, the cultural differences between the northern and southern Chinese people have gradually formed in the historical evolution, which is manifested as follows:

The first, there are differences in attitudes towards profession and business between people in the North and South. Historically, northerners have viewed agriculture as a tradition and emphasized its importance, while they have a conservative and contemptuous attitude towards trade. Southerners, on the other hand, are characterized by a prolific and multi-industry economy, as well as being good at agriculture as well as handicrafts and commerce.

Secondly, the difference in lifestyle between the North and the South is manifested in the pursuit of luxury and enjoyment of life by Southerners, while northerners pay more attention to a simple and frugal lifestyle. Southerners love fashionable clothing and delicious food and focus on quality of life. Northerners, on the other hand, are more unpretentious, pay more attention to practicality, and pay more attention to the needs of the masses.

The third, there is a contrast between the people of the North and the South in their concept of life between enterprising and conservative. Southerners tend to be more enterprising, focusing on personal development and innovation. On the contrary, northerners tend to be conservative, value old traditions, and follow inherent rules and norms.

Finally, there are also significant differences in personality traits between the North and the South. Southerners are generally considered weak and talented, adept at debate and expression, and pursuing natural progress and material gain. Northerners, on the other hand, are characterized by being rough and strong, with weaker expressive skills, and pay more attention to social progress, moral self-improvement, and the adjustment of interpersonal relationships.

These cultural differences between the North and the South have had a profound impact on Chinese history and society, forming a rich and colorful regional cultural landscape. The cultural differences between the North and the South can be summarized in the following table, which summarizes the main cultural differences between southern and Northern Chinese in terms of career and business attitudes, lifestyles, life concepts and personality traits.

Table 2 Comparison of cultural differences between northern and southern China

Dimensions of cultural differences	southerner	northerner
Career & Business Attitude	It is prolific and multi-industry, with equal emphasis on agriculture, handicrafts and commerce	Agricultural traditions, trade was despised
lifestyle	He likes fashion, pursues enjoyment, and attaches importance to the quality of life	Simple, frugal, and practical
The concept of life	Enterprising, focusing on personal development and innovation	Keeping the success, attaching importance to the old tradition
Personality traits	Weak but talented, good at debating and expressing	Rugged, strong, and focused on social progress and moral self-improvement

The impact of cultural differences on the purchasing habits of E-commerce consumers

Cultural differences can lead to different degrees of aversion, which can negatively affect perceived values. Consumers who are highly averse to cultural differences tend to reject or reject foreign cultures, which can also affect consumers' purchasing habits. Consumers with a high degree of cultural aversion tend not to absorb new ideas and concepts from foreign cultures and therefore exhibit a high degree of exclusionary cognition. This exclusionary perception encourages consumers to conform to the cultural norms of the region and does not tolerate behaviors that undermine the vitality of the region's culture.

Consumers with a high degree of exclusion tend to think that goods from other regions will pose local competition and threats, and even affect the economic development and lifestyle of the region, so they are prone to negative evaluations of products from other regions. Therefore, it is necessary to conduct in-depth investigation and research on the influencing factors of cross-cultural communication under the condition of cultural differences, and improve the awareness of regional cultural integration and the ability of win-win cooperation, to reduce cultural distortion and misinterpretation in cross-cultural marketing.

Cultural differences affect consumer needs, which in turn affect consumer buying habits. A certain product is popular in this region, but not in others. Therefore, when making E-commerce marketing decisions, we should pay full attention to the impact of regional cultural differences on consumers' purchasing habits.

The impact of cultural differences on the consumption preferences of E-commerce consumers

Artificial intelligence systems integration, customer acumen, innovation culture, competitive pressure, and business partner pressures positively and significantly influence E-commerce choice intentions (Hasan & Moufeed, 2024). When it comes to buying goods, consumers usually make decisions based on their preferences, and they generally don't buy products they don't like. Consumers in different regions have different shopping preferences. Often one product is in high demand in the region, while the other product is very deserted, which plays an important role in the difference of Chinese.

Different colors and symbols of the same product represent different meanings in different cultural contexts. In Eastern culture, red symbolizes happiness, festivity, and peace, but in Western culture, red is not important. Therefore, in the planning of E-commerce marketing, it is necessary to fully consider the impact of cultural differences on consumers' shopping preferences to improve marketing efficiency.

The impact of regional cultural differences on E-commerce marketing strategies

1) Impact on website design

Web design styles include logos, colors, glyphs, and more. The design of an E-commerce website is highly dependent on local linguistic habits. Language is an important variable that should be considered in the process of E-commerce globalization, and it also includes honesty, goodwill, and the ability to gain the trust of E-commerce consumers (Huang, 2022). For example, when designing a website, consider the crowd: simplified characters are used in the Chinese mainland, and traditional characters are common in Hong Kong and Taiwan. Red is a symbol of festivals in China, while in France and England, it is a symbol of masculinity. Determining the specific meaning of the local color is an indispensable cultural element.

2) The impact on sales strategy

E-commerce sales mainly depend on the needs and satisfaction of consumers. Develop an E-commerce sales strategy and design products that match local cultural tastes from different cultural backgrounds to achieve results. Sometimes, culture can also be a non-tariff barrier, so it is important to take this into account in E-commerce market development, product design, and promotion styles, and develop a product sales strategy tailored to local conditions.

3) Impact on Product Pricing

The price of a product depends on its value, and the price that consumers are willing to pay depends not only on the value of the product itself but also on the culturally relevant value of identity that the consumer recognizes. The same product may be accepted at different prices in different regions or countries. Therefore, pay attention to price research and be cautious about pricing-related products.

When formulating the prices of international and domestic products, we must seriously consider the differences in consumer culture concepts arising from economic development in different regions of the world, as well as in different regions of China, such as the East and West, the North and the South.

Impact on E-commerce models

E-commerce has different transaction models such as Business to Business (B2B), Business to Customer (B2C), Customer to Customer (C2C), and Business to Government (B2G). Due to the impact of different cultures on consumers in different countries or regions, their trade patterns may also be different. Due to demographic differences, inventory shortages, high unit costs, and large price differences, some developing countries tend to focus on smaller intermediaries. In this case, we need to focus on the B2B model. Some less developed countries have a negative attitude towards intermediaries, which they perceive as inefficient. In this case, it is best to choose B2C or C2C mode.

Impact on Product Advertising

The marketing and communication forms of E-commerce include electronic magazine advertising, online advertising, printed flyers, radio, film and television advertising, online banners, online windows, bus stops, etc. Whatever the form, the use and spread of E-commerce in different regions is inevitably influenced by cultural differences. Cultural differences lead to different understandings of the same thing, so the advertising design of E-commerce products must conform to local customs and avoid taboos.

Impact on marketing methods

The development of E-commerce in China is typically characterized by a block economy. Chinese mainland presents the characteristics of relatively developed blocks in the southeast coast, rapid development in the north and central regions, and relatively backward in the west, which is related to local cultural influences. The economically developed areas along the eastern coast are more open-minded and have a stronger ability to accept foreign cultures, while the Chinese mainland is relatively economically backward and deeply influenced by traditional culture, and has a relatively low ability to accept new cultures. When choosing marketing tools, it is important to take into account the cultural differences in the regions mentioned above.

The impact of the cultural difference dimension is shown in Table 3 below. This table summarizes the impact of regional cultural differences on multiple aspects of E-commerce marketing strategies, including website design, sales strategies, product pricing, E-commerce models, product advertising, and marketing methods.

Table 3 Multi-dimensional impact analysis of regional cultural differences on E-commerce marketing strategy

Dimensions of cultural differences	impacts Influencing factors	Specific
Website design	Language habits	Design logos, colors, and glyphs according to local language habits, and consider the use of simplified and traditional Chinese characters and cultural symbols of colors.
Sales strategy	Consumer demand and satisfaction	Starting from different cultural backgrounds, design products that are in line with local cultural tastes, and formulate sales strategies tailored to local conditions.
Product Pricing	Cultural identity values	Conduct price research that takes into account the cultural differences of different regions or countries, and carefully set the price of products that vary according to the cultural background and the value of identity.
E-commerce model	Cultural influences	Choose the right E-commerce model based on cultural influences, such as B2B, B2C, C2C and B2G, taking into account the trade habits and intermediary attitudes of different regions.
Product advertising	Customs	Advertising design should be in line with local customs, avoid breaking taboos, and consider cultural differences that lead to different understandings of the same thing.
Marketing tools	Regional economic development and cultural impact	The marketing method is selected according to the characteristics of the block economy of the region, and the cultural openness and ability to accept foreign culture in different regions are considered.

Some countermeasures to improve the purchase willingness of E-commerce consumers in the context of regional cultural differences

In order to promote the rapid development of China's E-commerce economy, it is necessary to attach great importance to the influence of cultural differences. E-commerce marketing activities are

carried out in different ways according to the cultural differences in different regions to prevent cultural differences from negatively impacting the E-commerce industry.

1. Distinguish regional cultural characteristics and precise E-commerce marketing to meet market demand

1) E-commerce companies should conduct comprehensive consumer demand surveys and research and engage in E-commerce network marketing in a targeted manner. Based on the premise of continuous progress in network information technology, E-commerce enterprises should have a more comprehensive grasp of consumer needs to avoid blindly engaging in business activities. This focuses on the close correlation between cultural differences and the development of the E-commerce industry. In the process of E-commerce Internet marketing, it is necessary to conduct a comprehensive and accurate analysis and research on the regional culture of the domestic and foreign markets and formulate a marketing plan suitable for the differences of different cultural regions.

2) Actively explore emerging markets, and continuously expand the market scale of E-commerce enterprise marketing according to cultural differences. E-commerce companies not only need to carefully analyze the regional cultures of different markets, but also need to actively explore emerging markets according to regional cultural differences and continuously expand the market scale. It is necessary to pay close attention to the new market needs of different cultural regions, and tap the consumption potential in depth and meticulously to improve the operational effect of E-commerce.

2. Based on cultural differences, create independent brands and enhance the influence of E-commerce. E-commerce products are similar in online channels, and consumers can choose to purchase goods through multiple channels. This requires E-commerce companies to be good at building their brands, focusing on improving the quality of online services, providing consumers with a wide range of products that highlight their advantages based on cultural differences, and improving the transparency of product prices, so as to enhance the influence of E-commerce enterprises.

When developing products, Chinese E-commerce companies need to focus on development costs, product quality, packaging design, environmental protection and other aspects. Therefore, when E-commerce companies design their brands, they adhere to the concept of green environmental protection and continue to convey the brand value concept to consumer groups, to enhance the value of independent brand research and development and creation.

3. Pay attention to regional cultural integration, respect consumer wishes, and optimize platforms and experiences.

1) Promote the integration of different regional cultural backgrounds and customs. Because of cultural differences, E-commerce needs to integrate the cultural traditions and customs of different regions into the product marketing of E-commerce platforms to optimize and improve the purchase

experience of consumers on online platforms. Actively use various E-commerce network marketing methods to provide consumers with a more convenient network environment to improve the integration of E-commerce marketing.

2) Pay attention to cultural differences and strive to protect intellectual property rights. Cultural and linguistic differences are inevitable in the operation of different E-commerce platforms, and E-commerce operators must take targeted measures to deal with them. In the sales work, the buyer's local service staff is hired to provide consumers with high-quality communication and communication, to solve the actual problems encountered more effectively. When designing the text, image, or video of the product, it is necessary to pay attention to the details such as the unit of measurement of the product, and strictly avoid various legal disputes. The first is not to infringe on the intellectual property rights of other products, and the second is to protect their legitimate rights and interests to the greatest extent.

3) Improve the cost performance of personalized products and optimize online reviews. It is necessary to create a unique consumer culture, improve the relevant functions of the website, and provide a full range of comprehensive services such as cultural promotion, price concession marketing, group discounts, and personalized consumption for different consumers. It is necessary to improve platform traffic, brand recognition, product sales, and E-commerce profitability as a whole. It is necessary to optimize the ratings of Internet users, strives to create a personalized image of the E-commerce market, and enhance consumers' favorability and product cost performance through channels such as consumer forums, after-sales service, and rectification of bad reviews. In short, the development of E-commerce enterprises must give priority to the impact of cultural differences, and on this basis, comprehensively consider product marketing methods, consumer needs, independent brands, etc., to actively avoid the negative effects caused by cultural differences, to improve consumers' purchase intention and experience, and continue to promote the development of E-commerce to keep pace with the times.

The above suggestions can be illustrated in Figure 1

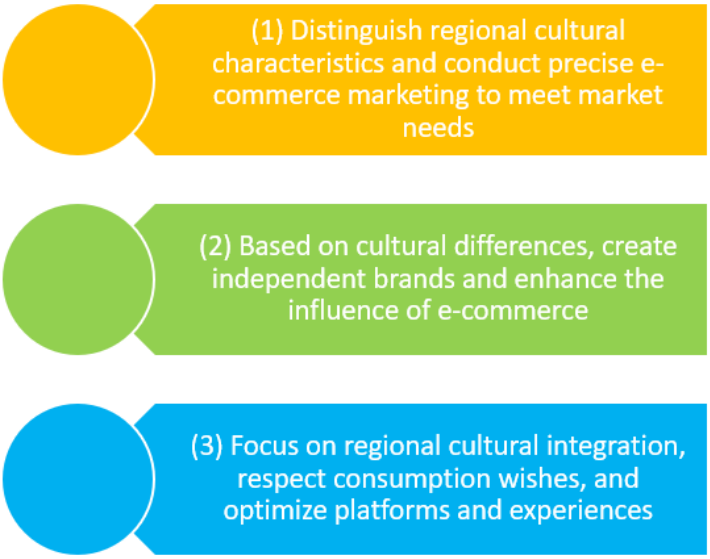

Figure 1 Countermeasures to increase E-commerce consumers' purchase intention in the context of regional cultural differences

Conclusions and Recommendations

Conclusions:

This paper explores the multifaceted impact of cultural differences between the north and the south of China on E-commerce, including website design, sales strategy, product pricing, E-commerce model, product advertising and marketing methods, etc. Through observation and research, the significant influence of different regional cultural backgrounds in the field of E-commerce is revealed, and the importance of cultural differences in developing effective marketing strategies is emphasized.

1. Culturally sensitive website design: According to the language habits and cultural characteristics of different regions, it is recommended to fully consider the use of simplified and traditional Chinese characters and the cultural symbolism of colors in the design of E-commerce websites to improve user experience.

2. Differentiated sales strategy: According to the needs and satisfaction of consumers with different cultural backgrounds, it is recommended to formulate differentiated sales strategies, design products that conform to local cultural tastes, and flexibly adjust sales strategies to adapt to the markets in different regions.

3. Culture-oriented product pricing: When formulating product prices, it is recommended to have an in-depth understanding of the cultural identity values of different regions, conduct price research, and formulate a reasonable product pricing strategy to improve the acceptance of the product in the market.

4. Flexible choice of E-commerce model: According to the cultural influence of different regions, it is recommended to consider local trade habits and intermediary attitudes when choosing an E-commerce model, and choose an E-commerce model that adapts to the local culture.

5. Culturally appropriate product advertising: When advertising products, it is recommended to design advertisements according to local customs and habits to avoid violating taboos and improve the acceptance and effectiveness of advertising.

6. Differentiated marketing methods: According to the block economic characteristics of different regions in Chinese mainland, it is recommended to choose differentiated marketing methods, considering regional economic development and cultural influence, so as to better meet the needs of local consumers. By adopting the above suggestions, E-commerce companies can better respond to the cultural differences in different regions, develop more targeted and effective marketing strategies, and enhance the competitiveness of their brands in the global market.

Recommendations for future researchers:

Through this study, the following quantitative research recommendations are proposed for future researchers, as shown in Figure 2, as described below.

The aim of this study is to explore the impact of cultural differences on consumers' purchase intentions and to define independent variables as cultural differences, including regional culture (e.g., north-south Chinese culture, east-west cultural differences), language differences (e.g., simplified and traditional Chinese characters, different language expressions), and value differences (e.g., the opposition between individualism and collectivism). The dependent variable is the consumer's purchase intention, which is mainly divided into purchase intention and actual purchase behavior. Considering the possible mediating effect between cultural differences and consumers' purchase intention, this study introduces two mediating variables, cultural identity and trust, to explore how consumers' cultural identity with a product or brand and the degree of trust in different cultural factors affect their purchase intention. At the same time, this study also focuses on possible moderating variables, including cultural sensitivity and personal characteristics (e.g., age, education level, etc.), to analyze how these variables moderate the relationship between cultural differences and purchase intention, among which high cultural sensitivity may make consumers more susceptible to cultural differences. Through this framework, the research aims to gain a deeper understanding of the complexity of consumer behavior in cross-cultural contexts and provide targeted strategic recommendations for the E-commerce supply chain. By considering these variables, research can delve into how cultural differences directly or indirectly affect

consumers' purchase intentions. Cultural identity and trust can be used as mediating variables, while cultural sensitivity and personal characteristics can be used as moderating variables to help a more complete understanding of the role of cultural differences in consumer behavior.

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Carbon Cut and Swap: Is Trading Emissions the Green Magic Bullet?

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Abstract

This study assesses the efficacy of carbon emissions trading mechanisms in mitigating the release of carbon emissions. through a combination of literature review and empirical research. Findings indicate that while carbon trading can reduce emissions to some extent, its efficacy varies widely based on factors like quota setting, market participant behavior, and policy implementation. The study also explores the application of carbon trading in different regions, revealing varied effectiveness, with Europe showing better results than some emerging economies. Additionally, the paper addresses challenges such as market fluctuations, risks, and potential abuse by companies or countries, emphasizing the need for policy measures to ensure fair and effective market operation. In conclusion, the research suggests that while the carbon trading mechanism has some effectiveness, improvements are necessary to address existing challenges and enhance its role in reducing carbon emissions.

Keywords: Carbon emissions trading, Efficacy, lamentation, Market fluctuations, Climate mitigation.

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Introduction

Introduction: Background on ETS and a review of relevant literature

The Carbon Emissions Trading Scheme (C ETS) is a widely used market-driven approach to curbing carbon emissions. that has received significant attention and application worldwide. The Emissions Trading Scheme (ETS) enables governments or relevant agencies to regulate and restrict carbon emissions and encourage companies to reduce their carbon footprint, additionally, it promotes the advancement of low-carbon technologies. However, there is still debate about the effectiveness of ETS in mitigating carbon emissions. Certain research indicates that carbon trading schemes contribute positively to the reduction of carbon emissions. while others question their effectiveness and highlight potential limitations and shortcomings.

Background and literature review of ETS: In the last two decades, many countries and regions have introduced ETS as part of their carbon reduction policies. For instance, The European Emissions Trading System (EU ETS) stands as the globe's most extensive market for emissions trading. which aims to manage the emissions. of major carbon emitters within Europe. Furthermore, regions such as New York, California, and Quebec have implemented emissions trading schemes to promote low-carbon economic development and reduce carbon emissions.

Several researchers have conducted studies on the efficiency of Emissions Trading Systems (ETS) in diminishing carbon emissions. For example, research revealed that the adoption of the EU Emissions Trading System (EU ETS) yielded favorable outcomes. on diminishing carbon emissions. from participating companies and prompted them to increase their focus on the application and promotion of decarbonization technologies. However, some studies have questioned the effectiveness of ETS, as shown in a study published in Energy Policy (Borghesi & Zhu, 2020).

The purpose of the scholarly investigation is to examine how well emissions trading schemes (ETS) function. in reducing carbon emissions. As a market-oriented policy tool, ETS has gained attention and implementation worldwide in recent years. By setting carbon emission quotas and permitting companies to engage in buying and selling. carbon emissions, the mechanism aims to reduce greenhouse gas emissions through market incentives. However, there are still debates and controversies regarding the effectiveness of ETS. The study may raise possible arguments questioning the effectiveness of ETS, including improper mechanism design, operational difficulties, an imperfect market, inconsistent assessment methods, and economic and social factors. These arguments may require further analysis and discussion to determine their validity and relevance to specific research contexts.

Table 1 The current status and problems of the global expansion of carbon emission trading

Topic	The development of emissions trading
Background	The ETS is a market-oriented carbon reduction policy tool that is widely used around the world
Problem	- Debate surrounds the efficacy of Emissions Trading Systems (ETS) in mitigating carbon emissions. - Some studies have questioned the effectiveness of ETS, highlighting potential limitations and drawbacks
Region	- The European Emissions Trading System (EU ETS) holds the distinction of being the largest global marketplace for emissions trading. that controls emissions from Europe's major carbon emitters - New York, California, Quebec, and other regions implement emissions trading schemes to foster the growth of a low-carbon economy.
Study	- A study noted that the EU Emissions Trading System (EU ETS) exerts a beneficial influence on participating companies and promotes the adoption of decarbonization technologies - Other studies, such as the one in Energy Policy, have questioned the efficacy of ETS (Borghesi & Zhu, 2020)
Objective	Explore the efficiency of Emissions Trading Systems (ETS) in mitigating carbon emissions.
Problem	- Possible problems such as improper design of mechanisms, operational difficulties, imperfect markets, inconsistent assessment methods, economic and social factors, etc.
Conclusion	Further analysis and discussion is needed to determine the effectiveness and relevance of the ETS to the specific study context

Research Objective

The Emissions Trading Scheme (ETS) has gained increasing attention and adoption as a globally implemented market-oriented strategy for mitigating carbon emissions. By setting carbon emission quotas and enabling companies to trade emissions, the ETS aims to incentivize greenhouse gas reductions through market mechanisms. Despite its growing popularity, there are still differing opinions and debates surrounding the effectiveness of the ETS.

This scholarly research aims to scrutinize the tangible influence of Emissions Trading Systems (ETS) on carbon reduction and assess its overall effectiveness. The research aims to accomplish the subsequent research goals: (1) investigate the implementation and effectiveness of ETS; (2) evaluate the motivational impact of the carbon emission trading mechanism on behavior related to carbon reduction.; (3) investigate the spatial and temporal changes regarding the impact of the carbon emission trading mechanism on carbon reduction; and (4) identify potential limitations and challenges of ETS. The findings of this study will provide valuable insights into the functioning, benefits, and limitations of ETS, and offer empirical evidence for future policymakers and decision-makers (Haites, 2018).

Research Questions

As a market-oriented carbon reduction policy tool, the ETS has gained global attention and implementation in recent years. By setting carbon emission quotas and allowing Enterprises to engage in the purchase and sale of carbon emissions, the mechanism aims to reduce greenhouse gas emissions through market incentives. However, there are still many questions and uncertainties about the actual carbon reduction effect of the Emissions Trading System (ETS).

This research endeavors to address the subsequent inquiries: (1) What is the factual influence of the Emissions Trading System (ETS)? on carbon reduction? (2) Can the ETS effectively incentivize enterprises to reduce carbon emissions? (3) How do spatial and temporal changes affect the carbon emission trading mechanism's carbon reduction effects? (4) What are the limitations and challenges of the ETS? The study posits that the Emissions Trading System (ETS) exerts a specific positive influence on carbon reduction, but its actual effect may be influenced by various factors, such as policy design, market structure, and corporate behavior.

Review of existing literature

Trading of Emissions Mechanism

The market-oriented policy instrument for mitigating carbon emissions is the carbon emission trading mechanism. which allows for the trading of carbon emission allowances. Under this mechanism, companies can buy and sell these allowances and are incentivized to Mitigate their carbon emissions to adhere to regulatory requirements with their allocated allowances. The market mechanism helps to establish carbon prices, which can then be used to balance supply and demand and incentivize carbon emission reduction. Various nations and regions globally have adopted emissions trading schemes, exemplified by the initiation of the EU Emissions Trading System (EU ETS) in 2005. encompassing numerous industrial sectors. in European countries. Other countries and regions, include the United States, Canada, Japan, and New Zealand. have also implemented or are implementing emissions trading schemes or similar market-oriented carbon reduction policies. These schemes serve as examples of the potential for emissions trading to reduce carbon emissions and provide insights into its practical implementation (Hansjürgens, 2005).

Evaluation of carbon reduction effect

Evaluating the carbon reduction effect is a crucial aspect of examining the carbon emission trading mechanism aids in evaluating the attainment of carbon reduction objectives and offers guidance to policymakers. To evaluate the effect of carbon reduction, various indicators can be used, including carbon emission reduction, carbon price formation, market participation, technological innovation, and green industry development. For instance, carbon emission reduction is a direct measure of the carbon

reduction effect, and its effectiveness can be assessed by comparing changes in carbon emissions and assessing the period preceding and succeeding the implementation of the carbon trading scheme. Furthermore, the formation of carbon prices serves as a crucial indicator for assessment, as higher carbon prices can incentivize enterprises to reduce carbon emissions. Market participation is another measure that can gauge the efficacy of the carbon trading market by examining the participant count, trading volume, and activity. Technological innovation and green industry development reflect the influence of the carbon trading mechanism. on industrial structure and serve as significant metrics in assessing the effects of carbon reduction (Zakeri et al,, 2015).

The results of research on analyzing the influence of emissions trading schemes on the reduction of carbon emissions. show that the effectiveness varies by region and policy design. For instance, Research on the European Emissions Trading System (EU ETS) indicates substantial outcomes in terms of carbon price formation and reduction in some countries and sectors, but limited results in others. Additionally, the carbon trading mechanism has been found to promote technological innovation and green industry development and help transition to a low-carbon economy.

Other relevant research

In the literature review section, this study delves deeper into the academic research on carbon trading mechanisms, including stakeholder analysis and policy evaluation, in line with the research question of the paper titled "Examining the Efficacy of Carbon Emissions Trading Mechanisms in Carbon Reduction: An Academic Analysis". Prior research has extensively investigated the implementation, operation, and effectiveness of carbon trading schemes, providing valuable insights.

This study specifically explores stakeholder analysis of ETS, focusing on the stakeholders involved in the implementation of ETS and their roles, interests, and impact on policy outcomes. The study highlights that carbon trading mechanisms involve multiple stakeholders, including governments, enterprises, and social groups, and their differing interests and influences can significantly impact the efficiency of the carbon trading mechanism. A comprehensive comprehension of stakeholder analysis related to carbon trading mechanisms serves as a valuable point of reference for the literature review conducted in this study (Gao et al., 2020;
Martin & Rice, 2009).

Research methods

Study design

This study employs an empirical research approach that involves a systematic review and analysis of existing literature to integrate and evaluate the relevant research results related to carbon trading mechanisms on carbon reduction. The research methodology includes a literature search,

literature selection, results analysis, deduction, and conclusion. To ensure the rationality and breadth of the research scope, the literature search utilizes the literature databases of multiple international journals, and the literature is screened by keywords and screening criteria. A systematic literature review of the effects of ETS is conducted in this study, which comprehensively assesses the impacts of various Emissions Trading Systems (ETS) on carbon reduction. The study's research methodology and scope offer a framework, facilitating an in-depth examination of how carbon trading mechanisms influence carbon reduction.

Research results

Implementation of the carbon trading mechanism across diverse nations and regions. Carbon trading mechanisms have been applied with varying degrees of success in different countries and regions. As an illustration, the European Union's Emissions Trading System (EU ETS), initiated in 2005, has proven successful in diminishing carbon emissions and has become a blueprint for emulation in other geographical areas. Japan and South Korea have also launched carbon trading mechanisms, but the effectiveness of these mechanisms has been limited in some cases. China has made significant strides in carbon trading, launching seven carbon emissions trading markets since 2013 and becoming one of the foremost global markets for carbon trading. However, emerging economies like India and Brazil have yet to implement carbon trading mechanisms, and Africa has relatively few carbon trading markets.

The success of carbon trading mechanisms depends on various factors, such as how carbon emission quotas are set, the behaviour of market participants, and the implementation of policies. To improve the effectiveness of carbon trading, policymakers need to consider the unique circumstances of their respective countries and regions when designing policies and regulations and strengthen the supervision and management of carbon trading markets. By doing so, they can work towards achieving their carbon reduction goals (Lo, 2012; Marin et al., 2018; Baranzini et al., 2017; Roman, 2011).

Table 2 Factors of success and relevant suggestions for the progression of carbon emission trading across global nations.

Region/Country	Implementation of carbon trading mechanism	effect	remark
European Union	EU ETS	The results are good	Become a model for other regions
Japan	Commencement of the carbon trading system.	Limited effectiveness	In some cases, it doesn't work well
Korea	Commencement of the carbon trading system.	Limited effectiveness	In some cases, it doesn't work well

Region/Country	Implementation of carbon trading mechanism	effect	remark
China	Seven ETS	Significant progress	Emerging as one of the globe's primary markets for carbon trading.
India	No mechanism for carbon trading has been put into effect.	Not Implemented	A carbon trading scheme has not yet been introduced
Brazil	No carbon trading mechanism has been implemented	Not Implemented	A carbon trading scheme has not yet been introduced
Africa	There are relatively few carbon trading markets	Not implemented	The carbon trading market is relatively underdeveloped
Success factors	Carbon emission quota setting, market participant behaviour, policy implementation	-	Success depends on a number of factors
Suggestion	Consider the unique situation of countries and regions, and strengthen supervision and management	-	Enhance the efficiency of carbon trading.

Analysis of the impact of carbon reduction

In this study, we have conducted a comprehensive review of multiple articles and have concluded that Emissions Trading Schemes (ETS) are an effective tool for reducing carbon emissions. Our conclusion is based on empirical research that demonstrates the positive impact of ETS on carbon reduction. These findings are consistent with a reputable journal study, which also concluded that the implementation of Emissions Trading Systems (ETS) can successfully lower carbon emissions from companies and contribute to achieving carbon reduction objectives. For example, in China's ETS pilot, the carbon emissions of participating enterprises decreased significantly after implementing ETS, confirming the positive impact of ETS on carbon reduction (Liu & Sun, 2021). The cited article provides further empirical support for the effectiveness of ETS in carbon reduction, reinforcing the findings of this study. This demonstrates that ETS is a positive carbon reduction policy tool that can effectively reduce emissions of carbon.

Analysis of influencing factors

Within the context of this investigation, we not only conducted a review of empirical research on the effectiveness of Emissions Trading Schemes (ETS) but also analyzed the influencing factors that may affect the carbon reduction effect of ETS. Specifically, we explored market design and government policies as potential factors. Empirical studies have shown that the design of carbon trading markets can exert a substantial influence on the outcomes of carbon reduction. As an example, the quantity of participants in the market and the method of allocating carbon allowances are factors that can affect the carbon reduction effect of ETS. Government policies, such as carbon pricing and regulation, can also have an important impact on the effectiveness of carbon trading schemes (Bryant, 2016). Our analysis provides a comprehensive understanding of the factors that can influence the carbon reduction effect of ETS and can guide policy-making and market design for ETS implementation.

The referenced article offers a comprehensive examination of the elements impacting the effectiveness of carbon reduction through carbon trading mechanisms, underscoring the pivotal contributions of market structure and governmental policies in realizing carbon reduction. The article offers valuable perspectives on the intricate dynamics of the carbon reduction impacts associated with Emissions Trading Systems (ETS). and offers relevant factors to consider when designing and implementing a carbon trading policy. This study helps to deepen our understanding of the effectiveness of ETS and guides for policymakers to optimize carbon reduction outcomes.

Discussions

The results of this study are further discussed and compared with existing literature, showing a positive impact of Emissions Trading Schemes (ETS) on carbon reduction. Facilitating companies to engage in carbon emissions trading, the mechanism encourages enterprises to curtail their emissions and lower costs, fostering behavior conducive to carbon reduction. This finding is consistent with previous studies, such as a study cited in an international journal, which suggests that carbon trading mechanisms can encourage firms to carry out carbon reduction behaviors and ultimately reduce carbon emissions. Yet, the impact of carbon trading mechanisms on carbon emissions reduction is shaped by the design of the market and government policies. with different designs and policies having varying impacts on carbon reduction outcomes. Empirical studies substantiate the beneficial influence of carbon trading schemes on reducing carbon emissions, with market design and government policies acting as moderating factors.

In conclusion, this research contributes additional support to affirm the favorable influence of carbon trading mechanisms on carbon reduction, aligning with established literature. The analysis highlights the importance of carefully designing carbon trading mechanisms, considering market design and government policies, to optimize their efficacy in mitigating carbon emissions. This underscores the

importance of implementing a well-designed carbon trading policy as an effective tool for reducing carbon emissions.

Table 3 Thorough examination of the variables impacting the carbon reduction outcomes of the Emissions Trading System (ETS) in various dimensions

Topic	**The primary The primary elements influencing the efficiency of carbon reduction**
Contextual information regarding the execution of the Emissions Trading System (ETS).	Affirm the efficacy of the Emissions Trading System (ETS) as a tool for reducing carbon emissions.
The methodology employed for analyzing the effectiveness of the carbon emission trading mechanism.	Literature review and empirical research
Scholars' research on the effectiveness of the ETS	Recognizing the favorable influence of the Emissions Trading System (ETS) on the reduction of carbon emissions,
Research sources supporting this conclusion	Research in a well-known journal: carbon trading mechanism effectively reduces corporate carbon emissions (Liu & Sun, 2021)

Conclusions and Recommendations

Conclusion

This research offers an in-depth examination of how carbon trading mechanisms influence the effects of carbon reduction. addressing research questions and hypotheses. The findings indicate a beneficial influence of the carbon trading mechanism on the reduction of carbon emissions. By allowing companies to trade according to their carbon emissions, the mechanism incentivizes enterprises to reduce carbon emissions and thereby lower costs, promoting carbon reduction behavior. These findings align with prior research, including the article cited from an international journal that similarly emphasizes the importance of carbon trading schemes in achieving carbon reduction targets while highlighting the need to consider factors such as market design, government policies, and corporate participation.

Drawing from the outcomes of this investigation and the backing of pertinent literature, we conclude that Emissions Trading Systems (ETS) can function as a potent instrument for advancing carbon reduction. Nevertheless, the enactment of a carbon trading scheme needs to consider aspects like market structure, government policies, and corporate involvement to maximize its effectiveness.

Policy recommendations

Drawing insights from the findings of the academic study titled "Carbon Emission Trading Schemes," several policy suggestions emerge to bolster the efficacy of carbon trading schemes in

curbing carbon emissions:

Primarily, governmental advocacy is crucial, necessitating transparent, fair, and efficient market design. Regular assessments of carbon prices, coupled with adjustments, become imperative to provide ample economic incentives for companies to curtail their carbon emissions.

Second, governmental commitment should manifest in the establishment of clear carbon reduction objectives, diligently monitored and enforced. Introducing incentives such as carbon reduction quotas can stimulate companies to adopt more substantial carbon reduction measures.

Tertiary, fostering improved collaboration between governments, companies, and stakeholders is vital to encourage broader engagement in carbon reduction endeavors. Offering technical and financial support facilitates the implementation of carbon reduction measures and the development of environmentally friendly products and technologies.

Lastly, the establishment of robust monitoring and reporting mechanisms, ensuring transparent communication with the public, becomes paramount. Inclusion of scientific research institutions in long-term follow-up studies is recommended to assess the true impact of carbon trading schemes on carbon reduction.

In conclusion, carbon trading schemes emerge as potent instruments for reducing carbon emissions, effectively encouraging companies to embrace carbon reduction and facilitate the transition toward a low-carbon society. Implementing the aforementioned policy recommendations can further fortify the impact of carbon trading schemes, propelling them towards achieving envisioned carbon reduction goals.

Research Contributions and Future Research Directions

This study offers a thorough analysis of the carbon reduction outcomes associated with carbon trading mechanisms, investigating influential factors like market design and government policies. The findings affirm the positive impact of Emissions Trading Systems (ETS) on carbon reduction, underscoring the pivotal role of government policies in its success. This research lays an empirical foundation for crafting and implementing policies while enhancing our comprehension of the carbon reduction effects of ETS.

In terms of future inquiries, several promising avenues emerge. Firstly, broadening the research scope to compare carbon trading mechanisms across different countries or regions can unveil variations in influencing factors. Secondly, a more in-depth examination of market designs may illuminate how different structures impact carbon reduction effects. Additionally, delving into the application of carbon trading mechanisms in diverse industries can deepen insights into their sector-specific effects. Furthermore, exploring the dual impact of ETS on both economic development and business performance, considering environmental and economic objectives, can provide a more holistic

understanding of their advantages and limitations. Lastly, continued research into the role of government policies in implementing carbon trading mechanisms can offer insights into their effectiveness and sustainability.

Collectively, this study and its proposed research directions underscore the significance of carbon trading mechanisms in advancing carbon reduction, emphasizing the ongoing need for research and policy endeavors to optimize their effectiveness.

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Strategies, practices and observations of green tourism supply chain Taking the promotion of GDMO in Tamlan area as an example

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Abstract

Tourism phenomena impact nature, humanity, society, and industry, focusing increasingly on people-to-people contact and community-based experiences. Recent trends emphasize participatory and unique tourism, fostering interactions between tourists and residents, and promoting warmth and mutual assistance. From a green tourism perspective, these trends offer opportunities to protect culture, promote social equality, and practice sustainable economies. The Tamlan Ancient Trail, spanning northern Taiwan for centuries, connects Tamsui Hall and Kamalan Hall, reflecting ancestral values of sustainability. This study explores "green tourism" and proposes the GDMO (Green Destination Management and Marketing Organization) framework, using Tamlan Town to support local development through creativity, innovation, and entrepreneurship. By integrating industries and communities, the study aims to enhance the ecological, cultural, and economic sustainability of Tamlan's leisure tourism. With a focus on strategic planning and community participation, this research provides practical insights into improving the depth and sustainability of tourism experiences. The GDMO model demonstrates the potential for achieving green economic value, social impact, environmental conservation, and cultural preservation.

Keywords: green tourism, GDMO, DMO, local sustainable development, tourism management

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Introduction

Sustainable development, green economy and green tourism

Tourism, as a socio-economic phenomenon, has many concepts or practices that have been proposed or tried in the pursuit of sustainable development by mankind, but they often end up being narrow or insufficient. For example, "low-carbon tourism" only focuses on carbon emissions; "responsible tourism" fails to emphasize economy and sustainability; traditional "sustainable tourism" or even "environmental hotels" often only focus on the environmental impact level. Due to these constraints, it fails to provide solutions for sustainable development in smaller towns or consider the economic aspects of the community or industry.

The concept of "green tourism" is different from general eco-tourism or traditional "sustainable tourism" that only pays attention to environmental protection. With the evolution of the times, it has increasingly complete definitions and practices (Tao et al., 2010), facing the potential of climate change (Tao & Yang, 2010) and urban applications (Wu et al., 2011), as well as the construction and promotion of standards (Tao & Ren, 2013; Tao, 2020; Tao et al ., 2021), as well as design integrated with education (Tao, 2012a; Tao, 2015), based on possible business opportunities in leisure agriculture (Tao, 2012b) and encouragement (Tao et al., 2021), and Application in local creation (Tao, 2019B), green tourism began to be officially applied in leisure agriculture in 2019 (Tao, 2019a). Green tourism is based on the concept of the "Green Economy Report" proposed by the United Nations in 2011. It aims at green economic development and local sustainable development, and centers on life in tourist destinations, long-term profits for operators, and responsibilities to the world and future generations. , comprehensive consideration (Lu, 2020; Wu, 2021). "Green Tourism" focuses on the following local sustainable development goals through local implementation of green economy, including:

1. Social aspect - grasp important systemic issues in the process of social development, make good use of tourism phenomena and dynamics, and contribute to equal opportunities for social development and the care of disadvantaged groups;

2. Cultural aspect - Look for various forms of local cultural assets, find elements of local pride and attachment, and make good use of and protect them through tourism momentum to avoid the loss of cultural significance for the survival of human groups;

3. Environmental aspect - Prompt the host and guest to rethink the relationship between people and the environment and how to improve it, and gain benefits from it.

Since tourism has both important social and economic aspects, as well as environmental and cultural assets as its main assets, what can truly help local areas move towards sustainable development through tourism must also pay attention to the good use and protection of the natural environment and the discovery of excellent culture. It survives through economic power and provides

consumers, that is, local guests, with a tourism model that satisfies both physical and mental aspects in the consumer market. The concepts proposed in this study are shown in Figure 1.

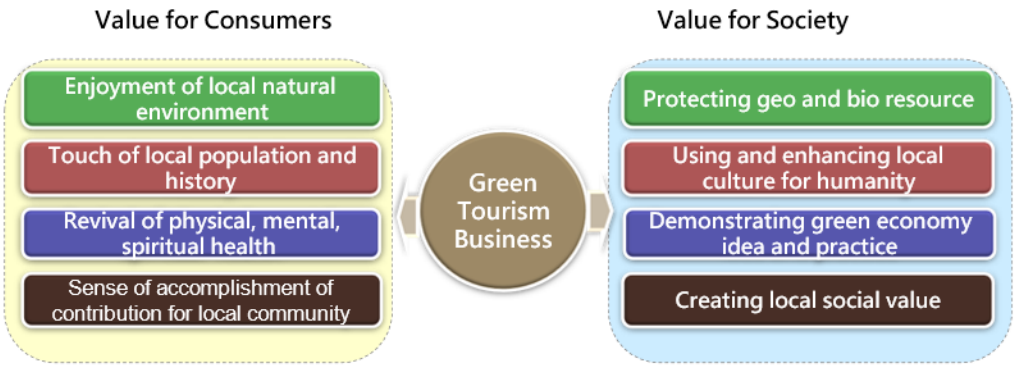

Figure 1 Green tourism takes into account both economic aspects and social responsibility (Source: this study)

Therefore, "green tourism" is closer to the solution than "sustainable tourism", and goes beyond the single-line thinking of general "environmental protection", and can better help local and community (town, village or tribe) levels to generate tourism income and benefit good people. Fulfill the environmental obligations of global citizens and maintain a good quality of life and fine cultural traditions.

Tourism destination management, DMO and GDMO

1. Tourism destination management and tourism destination management organizations

The World Tourism Organization (UNWTO) points out that the development and management of tourist destinations require a holistic policy and governance approach. Governance has two specific dimensions: 1). Directive capacity of government, which depends on coordination and collaboration and stakeholder participation; 2) Directive effectiveness, systematically determine the expertise and resources to support the way the process is performed. This enables local (i.e. relevant stakeholders) to define goals and implement them together by providing tools and means to find solutions and opportunities.

A study of small towns in Japan showed that after the establishment of the DMO organization, the number of foreign tourists visiting the tourist circle increased rapidly, and the number of accommodations soared; the number of revisits and intention to revisit the tourist circle reached the third highest level in the national tourist circle. One, resident satisfaction is also at the top of the national tourism circle. A harmonious cooperative relationship has been formed between the tourism circle and various tourism industries in the region, which has made up for the shortcomings of the original administrative-led tourism management model and promoted Japanese people's understanding of local creation (Wang, 2019). Another study on Kunigami Village in Okinawa Prefecture, a rural area in Japan,

showed that Japan's policies for local tourism development include strengthening local cohesion, establishing organizations, and revising regulations. In the establishment of the organization, the establishment of regional DMOs is the main promotion axis, and the main focus is to reduce the difficulty of youth participation. Therefore, attention should be paid to the trend of combining DMOs and local creation in local travel, so that young people have the opportunity to return to their hometowns for tourism industry. Use your own strength to promote local creation, plan to establish a coaching DMO organization, strengthen the training and investment of relevant talents, etc. (Gao, 2020). In terms of promotion, a study on the promotion model of the Gaoshu Tourism Industry Association brand in China pointed out that through local bottom-up discussions, a public association development organization can be formed to form a co-creation model, and Its action plan is also easier to be accepted by diverse organizations and shows results (Xu, 2022). Recent research also pointed out that the so-called "small travel" is the focus of DMO operation and management, covering "8 attributes (themed experience, diverse tours, convenient connections, dedicated tour guide, cultural depth, local characteristics, resource sharing and professional reception) , 6 results (cross-domain integration, legal management, marketing channels, matchmaking and customer solicitation, formulation of special laws and special chapter amendments), and 5 values (fun memories, travel safety, liability protection, operation supervision and community recognition))" (Chen, 2019). In addition, in the face of the development of the Internet and the advancement of information technology, tourism destinations must have new thinking in competition (Huang, 2019).

Therefore, local members' efforts to develop effective governance models/structures and attach importance to social development characteristics to formulate strategies are the core focus of local tourism development. This includes tourism development direction and strategic planning, the establishment of vertical cooperation (i.e., national-regional-local-community levels, and Public-private Partnerships; PPP).

It follows that the role of the Destination Management/Marketing Organization (DMO) should be to lead and coordinate activities according to a consistent strategy to achieve this common goal. The content of management should include the coordinated management of all elements that constitute a tourist destination. In particular, these sometimes very independent elements (people, organizations, resources, activities, risks, beliefs, etc.) are connected together for review and planning. In this way, it helps to improve efficiency in marketing, visitor services, training, business, etc., and review shortcomings or weaknesses. To achieve this goal, many organizations or interest alliances are needed to work towards common goals and ultimately ensure the competitiveness and sustainability of tourism destinations.

2. Development of Japanese DMO

According to the Tourism Agency of the Ministry of Land, Infrastructure, Transport and Tourism of Japan, the tourist area development corporation cooperates with various stakeholders to play a leading role in the development of tourist areas from the perspective of "tourist area management", absorb the "income capacity" of the area, and cultivate A sense of pride and attachment to the area. The Ministry of Land, Infrastructure, Transport and Tourism of Japan clearly defines that DMO is an organization that formulates and implements tourism area development strategies based on clear concepts and has the coordination function to steadily implement the strategy, and is required to perform the basic roles and functions (tourist area marketing and management) , including 1). Establishing consensus among various stakeholders in tourist area development with the tourist area development legal person as the center; 2). Continuously collecting and analyzing various data, etc., to develop clear concepts based on data Strategy; 3). Extracting tourism resources helps to increase the attractiveness of the region, improve transportation access, including intra-regional traffic, and improve the reception environment, such as multilingual signage; promote regional measures related to destination development; 4). Coordination , establish mechanisms, and promote tourism

Research Concept-Green Destination Management Organization (GDMO)

1. From DMO to Green DMO focusing on green tourism

Traditionally, DMOs focus on marketing activities, but with the world's sustainable development issues and social expectations and other trends, DMOs should be more sensitive to local sustainable development and become a strategic leader in the sustainable development of tourist destinations. This includes strategic planning, coordination and management of short, medium and long-term goals and activities within an appropriate governance structure, with the goal of sustainable development and green economy, and integration of tourism destination operations under a common sustainable goal. different stakeholders.

Therefore, green tourism management and organization that pursues green economy for the purpose of sustainable development from the global, regional to local and community levels are particularly meaningful and valuable. The purpose of DMO (Destination Management and Marketing organization) is to have management and marketing functions. The organization that allows tourist destinations to practice green tourism and move toward sustainable development is GDMO (Green Destination Management and Marketing organization).

2. An advanced model combining Japanese DMO, local sustainable development and green economy

This study improves the Japanese DMO concept, adds elements of local sustainable development and green economy, and forms the GDMO concept. GDMO includes 3 elements: 1) DMO

– Destination Management Marketing Organization; 2) Green Economy; 3) Locality. as shown in Figure 2.

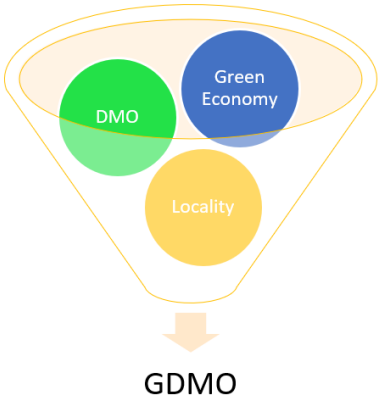

Figure 2 GDMO concept (data source: this study)

In local practice, the "Green Tourism Business Framework" is used as the operational blueprint, as shown in Figure 3.

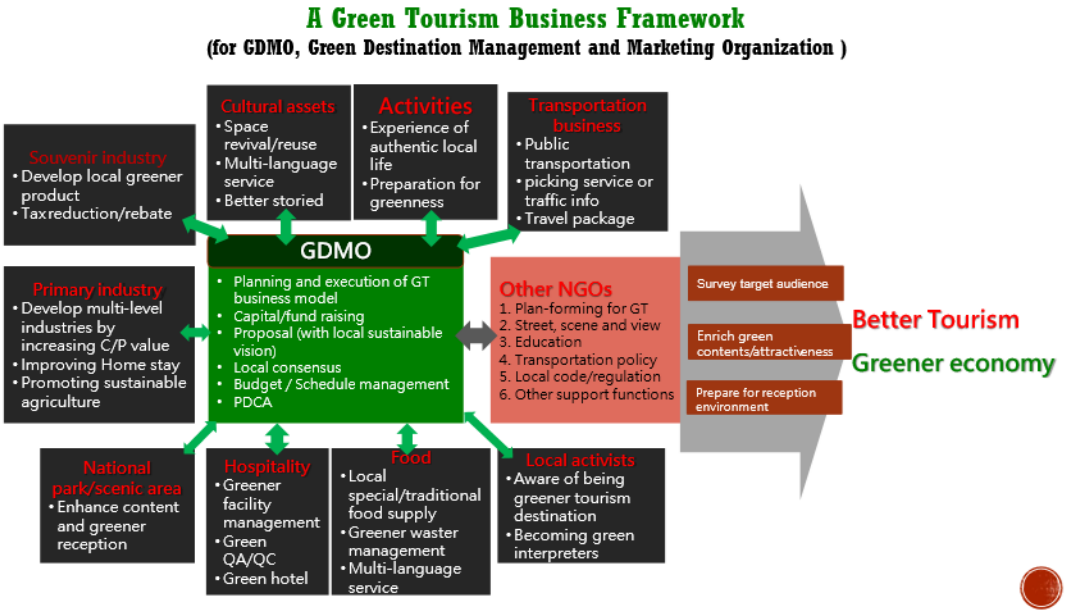

Figure 3 Green Tourism Business Framework (Source: this study)

Implementation and discovery of GDMO attributes

Based on the above discussion and structure, this study uses Southeast University of Science and Technology's USR project "Green Tourism Energization Takeoff on Tamlang Road South" as the

main activity planning and management resource, and combines national organizations and individuals to practice the behavioral attributes of GDMO to explore Its structural characteristics, implementability and key points to note. The execution activities and findings of this study are as follows:

1. Green tour guide training

This study is aimed at tour guides who are professional tour guides, taking the United Nations Sustainable Development Goals (SDGs) as a thinking, and strengthening the students (executive tour guides of the New Taipei City Tourist Guides Association)'s understanding of green tourism under the green economy. Based on the natural ecological and humanistic characteristics of Pingxi Jingtongkeng, we design tours and guided tours, as well as marketing methods for green catering, DIY, souvenirs, etc., so that the explanations become a powerful way to promote green tourism and respect local culture and ecology. tool. The content covers enhancing the understanding of local plants in Pingxi, reviewing the history of Pingxi and Jingtong, understanding the significance of green tourism and sustainable development, and discussing special lunch box dishes. Table 1 shows the key points of green tour explanation from the perspective of GDMO.

Table 1 Key points of green tour interpretation from the perspective of GDMO (data source: this study)

SDGs	Explanation points
1. End poverty in all its forms everywhere	Encourage green consumption. Through the process of contacting tourists, we understand the characteristics of tourists, emphasize local characteristics, and lay out these green consumptions during explanations. Feed-back tourist interests to the local area, with a focus on assisting in research and development, specially creating opportunities to improve the welfare of low-income or disadvantaged groups, to propose innovative products and services to achieve the purpose of increasing green income.
2. End hunger, achieve food security, improve nutrition and promote sustainable agriculture.	In the explanation, the local efforts to cherish food and promote sustainable agriculture are highlighted. Emphasize and market catering service providers that use seasonal, local, friendly agriculture to increase value.
3. Ensure healthy lifestyles and promote well-being for people of all ages.	The commentary highlights local efforts to ensure healthy lifestyles and promote the well-being of people of all ages. Avoid tourist guide activities from affecting local lifestyles, and encourage local residents to treat and receive tourists with a healthy and welcoming attitude.
4. Ensure universal, fair and high-quality education and promote lifelong learning	Let the guided tours and interpretation activities become inclusive and equitable high-quality education, so that every visitor can have the opportunity to learn. Excavate local in-depth ecological and humanistic materials, and transform them into the most valuable opportunities for citizen education and local cultural promotion

SDGs	Explanation points
	through guided tours and explanations, so that guided tours and explanations can become a high-quality education.
5. Achieve gender equality and empower all women and children.	In the explanation, local efforts to gender equality and the empowerment and empowerment of all women and children are highlighted, including history, present and future. Tourists are also encouraged to purchase products from women businesses and products that are beneficial to the development of children.
6. Provide water sanitation and sustainable management for all.	In the explanation, the scenery related to local water resources is used to move tourists and create a feeling of caring for water resources. It also highlights the efforts of local communities in water sanitation and sustainable management to remind tourists to jointly protect water resources.
7. Ensure affordable, reliable and sustainable modern energy for all.	In the explanation, local efforts to use sustainable modern energy are highlighted, and efforts to avoid the use of non-green energy in the planning and design of leisure activities are also highlighted, and activities are designed to allow tourists to participate.
8. Promote inclusive and sustainable economic growth, achieve comprehensive and productive employment, and give everyone a good job	In interpretation, highlight local efforts to promote sustained, inclusive and sustainable economic growth, promote full and productive employment and adequate work for all, and design activities to engage visitors.
9. Build resilient infrastructure, promote inclusive and sustainable industries, and accelerate innovation	In the explanation, we highlight the local efforts to build disaster-proof infrastructure, promote inclusive and sustainable industrialization and promote innovation, as well as the relevant awareness and activities formed by the community, and design activities for tourists to participate.
10. Reduce inequalities within and between countries.	In the commentary, local stories from the past and current facts are used to highlight efforts to reduce inequality, and activities are designed to allow visitors to participate.
11. Make cities and human settlements inclusive, safe, resilient and sustainable.	In the explanation, the local efforts to make cities and human settlements inclusive, safe, resilient and sustainable are highlighted, as well as the related awareness and activities formed by the community, and activities are designed to allow tourists to participate.
12.Ensure sustainable consumption and production patterns.	In the explanation, local efforts to ensure sustainable consumption and production patterns are highlighted, as well as related awareness and activities formed by the community, and activities are designed to allow tourists to participate.
13. Take urgent action to combat climate change and its impacts.	In the explanation, local efforts to take urgent action to deal with climate change and its impacts, as well as the relevant awareness and activities formed by the community, are highlighted, and activities are designed to allow tourists to participate.
14. Protect and sustainably utilize the ocean and marine	In the explanation, we highlight the local efforts to protect and sustainably utilize the ocean and marine resources and promote sustainable development, as well as the

SDGs	Explanation points
resources to promote sustainable development.	relevant awareness and activities formed by the community, and design activities, including mountain cleaning, stream cleaning, beach cleaning, etc., to allow tourists to participate.
15. Protect and sustainably utilize terrestrial ecosystems, sustainably manage forests, prevent desertification, prevent land degradation, and curb the loss of biological diversity.	In the explanation, we highlight local efforts to conserve and sustainably utilize terrestrial ecosystems, sustainably manage forests, prevent desertification, prevent land degradation, and curb the loss of biodiversity, as well as relevant awareness and activities formed by the community, and design activities, allowing visitors to participate.
16. Promote peaceful and inclusive societies for sustainable development; provide access to justice for all; and establish effective, accountable and inclusive institutions at all levels.	In the explanation, highlight the local history and current social efforts to promote peace and tolerance, as well as the related awareness and activities formed by the community, and use the explanation opportunity to promote the development of the local atmosphere and culture of peace and tolerance.
17. Strengthen the means of implementation and reinvigorate the global partnership for sustainable development.	In the explanation, the connection between the local area and the world is highlighted, including history and culture, geology, geography, climate and ecology, and industry, so that tourists can understand the local and global partnership in the process of jointly promoting sustainable development by mankind. .

The results show that students can better understand sustainable development, green economy and green tourism, and can guide tourists to have a deeper enjoyment and respect for tourist destinations.

1. Local development cooperation

"Cooperation" is the essence of DMO. This research plans and conducts the following types of collaboration:

(1) Cooperation in cross-school higher education development plans

Cooperated with National Taiwan Normal University's "110-year National Taiwan Normal University Higher Education Intensive Development Plan - Enhance environmental awareness of residents in catchment areas and assist regional development plans" to assist in the construction and guidance of tourism plans for the "Lok Shui Shi Ding" in-depth tourism series View the narrated volunteer training workshop. The content includes the environmental changes and attachment of the lost village, the history of reservoir construction, water sources for Greater Taipei, and challenges in the development of water source protection areas; natural experiences (historical and cultural tour of Shiding

Old Street, dinner after a walk by Wutu River , slow life, night viewing and other experiences), chatting and planning and local accommodation experience (Sancai Ganoderma Farm), walking along the Danlan Ancient Road by the stream, and hand-making experience of good mountains, good water and good noodles (Xujia Noodles), etc. .

The results show that tourists in urban areas have great affirmation that settlements provide a relaxing environment and rural ecological experience.

(2) Local government policy cooperation

This study cooperates with and deepens the local historical and cultural activities of "Jingtongnv Road". "Jingtong Women's Road" is the most important female cultural heritage in the Tamlan area in northern Taiwan. Taking the "Jingtong Nu Road" promoted by the New Taipei City Government as the theme, it records the struggle between relevant places and the living environment, food traditions and related leisure and tourism development directions. In order to deepen this study, this study continues to invite teacher Yang Guixin, who grew up in this environment, to describe the connotation to industry-government-academy-regional tour guides, district offices, school teachers and students through detailed explanations and route guidance, and provide on-the-spot tours. Green tourism content establishes a more solid foundation. The full record of Jingtong Nu Road is to continue to deepen the GDMO cooperation relationship, and to strengthen the connotation of contribution and make good use of cultural assets for the management and promotion of cultural tourism and leisure agriculture in the study area.

(3) Students integrate into activities and cooperate with local creative organizations

With the theme of " Tamlan Warm Blue", this activity combines the existing "three circles and one square" jade in the Dajing Farm site to reproduce the traditional indigo craftsmanship, create Nuannuan regional characteristic activities, and integrate activities related to the Tamlan Ancient Trail, allowing the integration of regional characteristics to have greater energy, in line with the spirit of this study to help local areas promote sustainable development. The organizer, Dajing Farm, assisted two students from the leisure management department of our school to design concepts for activities that make good use of and protect the environment, and provided them with practical knowledge on green marketing. The results show that this activity can lead tourists to visit the leisure farm on the Tamlan Trail by organizing local innovative activities, cooperate to promote the development of the leisure industry, and practice the meaning and practice of place creation.

(4) Investigation and cooperation with cultural and historical experts

Cooperate to investigate the history of the deep pit and deepen the green tourism materials and cooperation. Visit the unknown ancient tombs in Shenkeng (Qingxi in the late Guangxu years), and find out the local history and story through joint explanations by Academia Sinica and local cultural and historical experts; cooperate with Shenkeng Elementary School and the Taiwan Cultural and Creative

Society to conduct nationwide In conjunction with the Zheng Futian Cultural and Educational Foundation, we will provide suggestions on sustainable tourism and green tourism in promoting community construction in Shenkeng District, and provide suggestions for cultivating social talents, inheriting local culture, and guiding green tourism. Suggestions and implementation of video image promotion, etc.

(5) Cooperation in community cultural and artistic activities

"2022 Jingcai Tongyi Cultural Exhibition" is an important current literary and art event located in Jingtong, a remote area. The exhibition content emphasizes the mining era, when Jingtong women took care of housework and were exposed to rough work such as coal mining, as well as the community's memories of the mining era and their unknown future development. In the Jingtong Coal Mine Life Museum, this researcher participated in assisting in the management of modern related artistic and literary creations, joint painting, linking community activities between the elderly, middle-aged and young children and local groups, and exhibitions of photography and painting works by teachers and students of Southeast University of Science and Technology.

(6) Collaboration between organizational representatives and domain experts

"Jingtong 100". This study introduces the spirit of green tourism and helps create a green tourism environment. With local people as the core, organizational representatives and individual experts will be gathered to discuss the Jingtong tree restoration strategy and strengthen their contribution to the green tourism-related management and future development of the study area. The content is based on the theme of "100 years since the Pingxi Line was opened to traffic, and Jingtong has entered the next 100 years." Organization representatives and individual experts are as follows:

Table 2 "Jingtong 100" team composed of organizational representatives and experts

	unit	Expert/Individual
1	Office of the Chief of Jingtong Village, Pingxi District/Jingtong Returnees	Chief Zheng Xianliang
2	New Taipei City Taiwan Art Creation and Culture Foundation	Chen Shiwei CEO
3	Jingtong Community Development Association/Jingtong New Residents	Director General Cheng Kaisheng
4	Chen Qinzhong Architects Office	Chen Qinzhong Architect
5	Jingtongkeng Culture and Tourism Development Association/Jingtong Returnees	Yang Jincong Executive Supervisor
6	"Rural Regeneration Consultant" of the Council of Agriculture/Xizhi Community University/Media	Principal Zheng Wei Zong
7	New Taipei City Tourist Guides Association/Jingtong Returners	Director General Lin Shanbai
8	Teacher of Department of Leisure Business Management of Southeast University of Science and Technology/Executor of USR Project	Associate Professor Tao Yihuang

It was found that people with different attributes can use different administrative or professional knowledge and resources to help promote activities.

1. Public Sustainable Education

The promotion of local sustainability is based on education. Conduct sustainable education for the public through a series of lectures on the themes of sustainable governance and green tourism. The content covers the philosophy, practice, analysis and suggestions of the public and private sectors on the theme of sustainable tourism, as well as the sharing and inspiration of domestic and foreign travel at the individual level, and the expression, discussion and promotion of core values. The contents of the public education planning lecture series [Tamlan Green Tourism ~ Towards Local Sustainable Development] are as shown in Table 3:

Table 3 [Tamlan Green Tourism ~ Toward Sustainable Local Development] Speech Series

No.	Speaker	Topic/Area
1	Dadongshan Jewelry-Chairman of Lu Huayuan	Sustainable Development Practice of Tourism Industry
2	Leisure Industry Manager-Mr. Lin Shengyuan	Development Trend of Fitness and Leisure Industry and Tamlan Ancient Trail
3	Ms. Huang Mingying-Taipei City Baishi Senhuo Leisure Farm	The current situation and challenges of promoting urban leisure agriculture ~ Let's talk about the concept and operation of Baishi Leisure Farm
4	Young Traveler-Mr. Chen Lang	Youth Tourism ~ From Tamlan to the World
5	Chairman Ke Muzhou	The current situation and challenges of DMO promotion in my country and its relationship with sustainable development
6	Huang Meihua, District Chief of Shenkeng District	Sustainable management of deep pits and green tourism
7	Li Haorong, Mayor of Shiding District	Sustainable management and green tourism of Shiding
8	Cheng Kaisheng, Director General of Jingtong Community	Jingtong community and leisure therapy green industry
9	Mr. Jian Zhenlong, an expert in Shenkeng literature and history	The literature, history and heart-warming stories of Shenkeng
10	CEO of Pingxi Literature and History Expert Lin Shanbai	The local creation and environmental restoration of Jingtong
11	Mr. Lin Wang, an expert in Tamlan literature and history	Tamlan literature and history, industrial transformation and business district development

It turns out that speeches have some effectiveness. However, the effects vary due to various factors such as included design and speech interaction. It is estimated that further research, such as related planning and design such as more touching experiences, is needed to achieve better results.

1. Integrate university teaching and talent cultivation

Universities have teachers, students, and teaching activities, and should be one of the axes that can best practice green tourism education and cultivate talents.

(1) Cooperation with the "Youth Highlights Project"

This study cooperates with the "Youth Tourist Spot Project" implemented by the Shenkeng District Farmers' Association and Shenkeng Elementary School, and targets students from the Leisure Industry Management Department of Southeast University of Science and Technology, using Shenkeng as the learning location. By providing young students of our school with innovative learning experiences at Sham Hang tourist spots, we can understand the humanities and characteristics of Sham Hang development, and inspire our students to deepen their passion and care for this land in a diversified and public welfare way, and to help Establish and strengthen Taipei's Shenkeng youth tourist spots, develop a touching map of youth tours in Shenkeng, and cooperate with surrounding non-profit organizations and schools to carry out activities related to the major tourist spots in a non-profit manner, serving as an entry point for young people to learn in depth at any time . Activities include cultural and historical understanding and green leisure practice.

The results showed that explanations are difficult to attract students' attention for a long time, but hand-made tofu and tea culture experiences deeply attract the interest of young students. It is said that the planning and design of leisure activities can attract the younger generation more.

(2) Integrate service learning into university majors

Cooperate with the "111-1 Jingtongli Community Care Activities Implementation Plan, Pingxi District, New Taipei City" of Southeast University of Science and Technology's "Professional Integrated Service Learning". Through the two-stage activities of 1). Understanding the place and 2). Contributing to the place, we not only learn about the natural environment and human history of the place, but also understand the industry, help the community improve the environment, and market the beauty of the community. The content includes understanding and improving the connotation and quality of the leisure tourism environment, including cleaning up the environment and planting trees, improving the environment of the watershed and community landscape, in order to promote green tourism for the purpose of sustainable development and green economy, and at the same time, it is in line with the Ministry of Education and teaching purposes. Through charity projects in old streets and the restoration of Jington trees, we will plant local areas to create "green tourism sites", drive new tourism momentum, and bring new green tourism business opportunities to Jingtong operators.

The results show that the public welfare green tourism teaching design, because pre-departure education is followed by hands-on practice, can deeply impress students, and it is an activity project worthy of further promotion.

(3) General teaching cooperation and student inspiration

a) Inspiration from young students of Mazu in Nangongshi, Shenkeng Town Zhennan Palace is one of the most important places of interest in the Shenkeng area. Zhennan Palace Stone Mazu is an ancient temple with a history of more than a hundred years. Since the palace was built in the late Qing Dynasty, it has been prosperous and attracted endless tourists. In the early morning, there are hikers resting under the trees in front of the palace; in the evening, believers and fellow practitioners can be seen discussing Dharma and practicing in the square next to the palace. Through the trip to the Nangong Stone Mazu and the ancient road in Shenkeng Town, the leading teacher explained the natural and humanistic history, reminding the students of the hardships of the ancestors in reclamation, the pursuit of the value of spiritual peace, and the importance of doing good to social culture, and reminded students to pay attention Human sophistication and environmental ethics on the farm.

The results show that caring and spiritual green tourism teaching design means pre-trip education is very important. However, there are gaps in social culture, diverse leisure environments, and increasingly diverse social beliefs. Therefore, what can impress students is still local humanity rather than religion. environment provided.

b) Foreign language-oriented teacher and student services

Invite foreign teachers to go to Jingtong to provide international-standard foreign language translation services based on student learning. Including local understanding (mining background of Jingtong Sheshishan Park area), discussions, asking about the significance of cultural representatives or special livestock services (the meaning and sales method of sky lanterns), and tasting (chicken rolls, sweet and spicy, fortune-telling) meat and other snacks).

In addition, this study also attempts to propose Tamlan international integration services (Pingxi. Jingtong) ~ special products/commodities/products, taking Chinese, English, Japanese, Korean, Vietnamese and other languages as examples, with the purpose of receiving tourists coming to Taiwan, eliminating barriers, and daring to try, raising interest in green consumption. The preliminary results are shown in Table 4:

Table 4 Preliminary results of Tamlan International Integration Service Characteristic Products/Commodities/Products in Chinese, English, Japanese, Korean and Vietnamese

No.	中文	英文	日文	韓文	越南文
1	天燈	sky lantern	ランタン	천등	Đèn trời
2	雞捲	meat rolls	鶏巻き	유부 야채말이	Thịt cuộn
3	雞柳	chicken fillet	ささみ	닭고기	Ức gà chiên
4	排骨	pork ribs	パイコー	돼지 갈비	Thịt sườn
5	花枝肉丸	meatballs with squid	イカのつみれ	오징어 완자	Mực viên
6	卜肉	fried pork	豚ロース天ぷら	돼지고기	Thịt chiên giòn
7	蔥油餅	scallion pancakes	焼き葱入り餅	파전	Bánh hành chiên
8	仙草茶	herb Tea	仙草茶	한방차	Trà Tiên Thảo
9	長壽菜	purslane	長寿料理	갓(야채)	Trà trường thọ
10	薑桐	Jingtong	菁桐	징통	Thanh Đồng
11	肉羹	meat soup	肉つみれのあんかけスープ	돼지고기 완자탕	Súp thịt heo
12	甜不辣	tempura (fish paste mixed with sweet potato powder)	さつま揚げ	어묵	Chả cá
13	芋圓	taro ball	タロイモの団子	타로떡	Chè khoai dẻo

東南科技大學 USR 計畫【淡蘭古道南路綠色旅遊培力起飛計畫】

The results showed that although the translation of rural delicacies and other snacks for the purpose of tourism can arouse students' interest, it must convey the ingredients themselves and cultural characteristics, which is quite difficult. Therefore, it is recommended that the Tourism Bureau of the Ministry of Transport make more detailed investments.

c) Jingtong cement potted plants and green healing

Cooperating with the Jingtong Community Development Association, we combine the advantages of green care for the elderly and local resource recycling to create therapeutic activities and new products. The aggregate materials for this activity's cement potted plants come from discarded plastic bottles. Combining cement with artistic creation, it has healing properties and has the potential to further become a new green product in the old streets.

During the process, it was discovered that students were able to concentrate on cutting and recycling plastic bottles, making the production process closer to that of green plants, which have a healing effect. Students can understand and establish a rational and sustainable attitude towards waste. Through teachers explaining the meaning of green tourism, demonstrating the process of making cement basins, and students helping each other in groups, they also enjoyed their own achievements and realized the educational effect of studying hard and achieving success. Such hands-on activities are a good connotation of green tourism and should be vigorously promoted.

d) Green cultural and creative personnel training

This research aims to assist local areas in enhancing their unique cultural creativity and leisure capabilities, driving momentum towards a green economy. Training courses will be offered to support local revitalization and sustainable development, with a focus on enriching green tourism through practical and implementable cultural creativity. A core objective is to use cultural creativity to deepen the content of green tourism, emphasizing hands-on implementation and practicality.

The GDMO initiative is organized by local universities and national associations, such as the Southeast University of Science and Technology USR Program, Taiwan Cultural and Creative Society, and Taiwan Green Tourism Association. Local government bodies, including the New Taipei City Pingxi District Office, and community organizations like the Jingtong Community Development Association and various business district and agricultural cooperatives, will provide administrative support, venues, and promotional resources. These efforts aim to benefit service providers, product operators, and community residents interested in cultivating cultural creativity, understanding the green economy, and enhancing the value of green tourism. Special emphasis is placed on business operators and residents in the Pingxi, Shiding, and Shenkeng areas, as well as the Dongshige Settlement in Ganzhenlin Creek, a tributary of the Keelung River, focusing on "Creating Dongshi's Green Tourism," as detailed in Table 5.

Table 5 Green cultural and creative personnel training Shenkeng Shiding Pingxi River connected to County Road 106

No.	Speaker	Life and innovation-activate your products and services
1	Wu Zhongmei, Dadaocheng Green Cultural and Creative Curator	Application of place creation-the beauty and engraving of words
2	Xu Wenyan, General Manager, Jiuzang Enterprise Co., Ltd.	Exploration of visual symbols~taking Jingtong as an example
3	Zhu Qi, General Manager of Huiyuan Digital Media Company	Green Healing ~ When succulents and cement pots meet
4	Lai Jijun Horticultural Therapist	Local specialty creative food
5	Lin Kezhu, person in charge of Patriotic Farm	Flow animation by amateurs Experience sharing and implementation from self-healing to output realization
6	Liu Zhongyu, person in charge of Ouli Humanistic Space/Agricultural Food	Turning local art into merchandise
7	Teacher: Fang Xiaojing	Creating a local green tourism economy ~ Principles and applications of cultural and creative and leisure activity planning
8	Teacher: Tao Yihuang	Life and innovation-activate your products and services

Table 6: Green Tourism and Ecological Economy Training Courses

No.	lecturer	theme
1	Teacher Tao Yihuang	The creation of local green tourism economy ~ the key to unlocking ecological economy
2	Teacher Lin Kezhu	Application of edible wild vegetables under the forest ~ Fresh wild vegetables have been regarded as an ideal vegetable and good medicine with both medicinal and food properties and are known as "natural food" and "health food".
3	Teacher Yang Congfeng	Wild bee restoration in Taiwan-~Wild bees and ecological management
4	Teacher Yu Youzhong	Tour of the National Medicinal Plant Teaching Park
5	Teacher Chen Junjin	(No. 53-2, Ganzhenlin, Pingxi District, New Taipei City)

The results show that local businesses are highly interested in cultural and creative technologies and experiences and are likely to increase business projects with the active experience economy as the core. Therefore, it is recommended to develop more in this direction.

Market introduction

The market is a place for trading. The organization, connotation, service and product planning of green tourism must be connected with marketing. This research project is an extended commercial marketing attempt following the previous project "Green Cultural and Creative Personnel Training". The planning is based on the " Tamlan Market" model, emphasizing the integration of reality and reality.

Through festivals and other events (this study is planned for the New Year Street in Dihua Street, Dadaocheng), the actual booths and personnel services are featured, and the highlights of the service personnel are featured to attract on-site experience tourists to the township's physical services and services. Consumer sites. The results remain to be seen.

Conclusions and suggestions

1. After trying diversified cooperation with many parties, GDMO’s sustainable value and cooperation model can be accepted by most organizations and individuals.

2. Combined with formal courses, it is necessary to understand the different concepts across generations in order to impress students and achieve the effect of cultivating concepts.

3. Talent is the core of machine transformation. With "green cultural creativity" as the capability feature, regional characteristics as the implementation design guide, and a name for the regional brand (in this case, " Talman"), it will be attractive to regional businesses and participating students. Training courses on green cultural and creative abilities have proven to have gradually formed a feasible prototype, with a high chance of creating green business opportunities and assisting rural revitalization with a green economy.

During the course of this study, it was also found that the implementation of DMO in Taiwan focused too much on industry and not on social development. It failed to consider the actual implementation of social care and economic opportunities in remote areas, thus marginalizing small settlements. This would run counter to the goals of local regeneration policies. The implementation of the "green cultural and creative" training concept has the opportunity to assist villages and towns in remote areas of Taiwan to use green tourism to achieve local sustainable development goals.

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Author Guidelines

For Paper Submission and Manuscript Preparation

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The Journal of Supply Chain and Sustainability Research (SCSR) accepts research papers, academic articles, and review articles written in Standard British or American English, not a mixture. Poorly written English may result in rejection or return of the submission for language editing. The articles must fall within the aim and scope of the journal, that is, science, social science, technology, management, and related issues (see about Journal).

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For research papers, the author is advised to include all elements of the structure below:

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- **Keywords** (3-5)**,** immediately after the abstract**,** keywords are for indexing purposes, and should be different from the title.
- **Introduction** This section provides necessary background of the paper and a brief review the existing knowledge, and importance of the problem.
- **Objectives**
- **Literature Review, Conceptual Framework (**Discussion of the research work of others in the field or topic area and how your work will enhance and contribute to the field. Citation of work by others should follow APA (7th edition) style e.g.

Example: Maslow (1970) asserts that……;……. (Maslow, 1970)

Wang and Pettit (2021).....;..... (Wang & Pettit, 2021)

Hisrich et al. (2020)……..;…… (Hisrich et al., 2020)

Novack et al. (2018)……;…… (Novack et al., 2018)

- **Research Methodology** This section indicates clear research objectives, conceptual framework(s) (if any), research question(s), hypotheses, population and sample, research instruments, and the data collection process. This section provides clear steps used in conducting your research. It means all procedures need to be described in sufficient detail to allow someone to replicate it.
- **Results and Discussion** This section covers the analysis of the data. It should include statistics in tables, charts, graphs, or pictures analyzed against hypotheses or in answering the research question(s) in quantitative research, or descriptive analyses of categories in qualitative research. **Results** is purely descriptive. **Discussion** describes and interprets the findings, placing them in a bigger context, relating them to other work(s) and issues outlined in the Introduction.
- **Research Benefits**
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For academic articles, we recommend the structure below:

1. **Introduction**
2. **Discussion**
   2.1 subheading
   2.2 subheading
3. **Conclusion**

The author is advised to follow a logical, understandable point of argument. Break your main argument into sub-headings and present them in an outline at the end of the Introduction.

- **References List** all the sources you have cited in the body of your research. It states the author/s of the source, the material's year of publication, the name or title of the source material, as well as its electronic retrieval information, including the date it was accessed, if these were gathered from the Internet (Research articles, academic articles, reports, academic conferences, references, no later than the last 5 years and Books, unlimited years of reference)

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- **Spacing** Double space lines throughout the paper including appendices, footnotes. Exceptions: Triple or quadruple spacing can be done around equations. Single or one-and-a-half spacing can be done in tables or figures. Indent the first line of every paragraph a standard Tab key space (½ inch).
- **Font Size and Type**. Browallia New font (20 pts. bold for title; 14 pts. for author(s) and affiliation; 16 pts. bold for headings and 16 pts. bold subheadings; and 14 pts. for text)
- **Titles** should be no more than three typeset lines.
- **Headings** should be in bold type, in 16 point Browallia New font. First-level headings should be aligned to the left with initial caps. One line space should separate headings from the preceding text.
- ***Subheadings*** Italicize the subheadings in the bold type, single-spaced; in 16 point Browallia New font.

SUB-HEADING ONE Bold, Left, UPPERCASE HEADING

Sub-heading Two Bold, Left, Capitalize Each Word

Sub-heading Three Indented, bold, Capitalize Each Word

- Tables, Graphs, Charts, and Figures in 12-point Browallia New font, Bold
- **References** The Journal uses American Psychological Association (APA) style (7th edition).
  - Include only those sources you have cited in your paper.
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  - Organize the list in alphabetical order according to the first letter beginning each entry. Usually, the author's last name is the first piece of information in each entry. Use initials for the author's first/middle names.
- Use the following format for your reference list:

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Heizer, J., Render, B., & Munson, C. (2020). *Operations Management Sustainability and Supply Chain Management* (13rd ed). U.K : Pearson.

Kumar, V., Leone, R. P., Aaker, D. A., & Day, G. S. (2018). *Marketing research* (13th ed). U.S.A.: John Wiley & Sons.

Maslow, A. H. (1970). Motivation and Personality (2nd ed). New York : Harper & Row.

Novack, R. A., Gibson, B. J., Suzuki, Y., & Coyle, J. J. (2018). *Transportation A Global Supply Chain Perspective* (9th ed). Singapore : Cengage.

Royal Thai Government Gazette. (2019). *National Education Act(no.4) , B.E. 2019*. Retrieved December 1, 2019, from http://www.ratchakitcha.soc.go.th/DATA/PDF/2562/A/057/T_0049.PDF

Thinwiangthong, S., & Inprasitha, M. (2018). The Model of Teaching Measurement in the School Level Mathematics Course. *Nakhon Phanom University Journal*. 8(3), 118-127.

Wang, Y., & Pettit, S. (2021). *E*- Logistics (2nd ed). U.S.A.: Kogan page.

- **Tables and Figures**
  - Line drawings should be of high resolution and high contrast. For color or grayscale photographs (halftones), use a minimum of 300 dpi (.JPG).
  - Provide captions to figures
  - Use the table function of Microsoft Word.
  - Figure and tables should be placed as close as possible to where they are mentioned in the text
- **Page Numbering**: Number all pages of the paper, beginning with the title page. The number is in the bottom right corner (1 inch from right and ½ inch from the bottom page edges).

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Publication Charge

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Remark: The fee shall be in effect from October 1, 2026 onward.

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As part of the submission process, authors are required to check off their submission's compliance with all of the following items, and submissions may be returned to authors that do not adhere to these guidelines.

1. The manuscript must not have been published or submitted elsewhere for consideration. (A brief explanation will be necessary to clarify this matter.)
2. The submitted file is in **Microsoft Word** and **PDF** document file with a single column format.
3. Where available, URLs for the references must be provided.
4. Research or academic papers must be 15-20 pages in length inclusive of references, tables, graphs, charts, and figures.
5. The text must be double-spaced; (a 14-point font Browallia New; italics rather than underlining except for URL addresses); and all illustrations, figures, and

tables must be placed within the text at the appropriate points, rather than at the end.

6. The text adheres to the stylistic and bibliographic requirements outlined in the Author Guidelines.
7. Attached to all submitted articles must be a **150-250 words abstract**, **Keywords** (3-5) and a statement containing the author's present academic or nonacademic position and an address where he or she may be contacted by the editors or interested readers. Authors should place their names on the cover page, but the name should not appear on headers or elsewhere in the body of the article. Full contact details for the corresponding author, including email, mailing address and telephone numbers should also be provided. As the Journal of Supply Chain and Sustainability Research (SCSR) is a peer reviewed journal, the author must be follow the instructions about Ensuring a Blind Review.
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