SUGGESTED THEMATIC RESEARCH TOPICS FOR AVIATION BUSINESS

Nisara Paethrangsi, Sudsawat Jitsupa, Wanlapa Jandaboue and Kamnuan Wisutthipinetr*
Faculty of Liberal Arts, Rajamangala University of Technology Thanyaburi

*E-mail: kamnuan_w@rmutt.ac.th

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ABSTRACT

Thailand's aviation industry is undergoing rapid transformation, shaped by sustainability imperatives, technological disruption, and evolving consumer expectations. This paper aims 1. To categorize key thematic research areas that address emerging challenges and opportunities within Thailand. 2. To propose actionable research topics aligned with global aviation trends. 3. To explore mechanisms for academia-industry collaboration in advancing workforce development, innovation capacity, and knowledge transfer for Thailand's aviation sector. We proposed five key thematic research areas for driving innovation, operational efficiency, and sustainable growth in the aviation industry, which are (1) sustainability in Thailand's aviation business industry, (2) energy-efficient airport operations., (3) regulatory compliance and carbon offset programs, (4) the challenges and opportunities of sustainable aviation practices, and (5) enhancing passenger experience in Thailand's aviation sector. Each theme includes suggested research topics relevant to Thailand's context and aligned with international aviation trends. The themes, derived from a qualitative document-based analysis, reflect both global trends and Thailand's local context. The findings highlight the need for interdisciplinary research and academia-industry collaboration to advance workforce development, technology adoption, and policy innovation, thereby fostering a resilient and sustainable aviation ecosystem.

Keywords: Thematic Research, Sustainable Aviation Academia–Industry Collaboration, Thailand Aviation Industry

INTRODUCTION

Thailand's aviation business industry plays a significant role in the nation's economic development and connectivity, positioning itself as a key hub in Southeast Asia (Paethrangsi, Jaktong & Brahmaputra, 2025). Thailand benefits from strategic geographic positioning for both passenger and freight transportation, with regional airports such as Chiang Mai, Hadyai, and Phuket International Airport supplementing core hubs such as Bangkok's Suvarnabhumi International Airport and Don Mueang International Airport. (Airports of Thailand, 2023).

The industry has witnessed substantial growth in the past decades, driven by increased tourism, expanding trade relations, and a rise in low-cost carriers (LCCs). Carriers like Thai Airways, Bangkok Airways, and budget airlines such as AirAsia Thailand have diversified service offerings to meet growing domestic and international demands.

Despite its potential, the industry faces challenges, including recovery from the COVID 19 pandemic, fluctuating fuel prices, and the pressure to adopt more sustainable aviation practices. The pandemic drastically affected passenger numbers with Suvarnabhumi Airport handling just 5.7 million passengers in 2021, down from over 65 million in 2019 (AOT, 2024) while global airline traffic dropped by 58% in 2021 compared to 2019 (International Air Transport Association, 2022). However, the industry's resilience was evident in its recovery efforts, supported by government initiatives such as the Tourism Authority of Thailand's campaigns to revive international travel (Nation Thailand, 2025)."

Another critical area is sustainability. Thailand has been actively exploring measures to mitigate aviation's environmental impacts, including discussions on implementing sustainable aviation fuels (SAFs) and enhancing operational efficiency through advanced technologies (Civil Aviation Authority of Thailand, 2022). Furthermore, Thailand's support for regional air transport integration under frameworks like the ASEAN Open Skies Policy underscores its ambitions to strengthen competitiveness on a global scale (Kongsamutr, 2023) Research in aviation plays a critical role in addressing complex challenges and leveraging emerging opportunities in Thailand's aviation industry. As a regional hub for tourism and trade, the sector faces issues such as infrastructure limitations, sustainability concerns, and shifting passenger expectations. Evidence-based research offers strategic insights to support sustainable growth and competitiveness.

Research focusing on airport expansion, air traffic management, and the application of smart airport technologies can guide investments in infrastructure upgrades. Studies on optimizing resource allocation and minimizing congestion are essential for enhancing operational efficiency and maintaining Thailand's position as a preferred transit hub in Southeast Asia (International Air Transport Association, 2022). Research can also reveal ways to improve the traveler experience and adjust to changing customer demands. Passenger expectations were altered by the COVID-19 pandemic, which highlighted the significance of seamless digital experiences and health and safety procedures (Tourism Authority of Thailand, 2023). The airline sector can provide individualized and effective services, increasing customer happiness and loyalty, by analyzing passenger behavior and incorporating technical advancements like biometric systems and contactless procedures.

Lastly, research plays a pivotal role in supporting policy development and regulatory compliance. Thailand's engagement with international aviation agreements, such as the ASEAN Open Skies Policy, requires thorough analysis to maximize benefits while mitigating potential risks. Research can assist in crafting policies that foster collaboration between public and private sectors, enabling the industry

to navigate competitive pressures and geopolitical shifts (International Civil Aviation Organization, 2022). Research is an essential instrument for tackling the issues that the aviation business industry in Thailand faces and capitalizing on the opportunities that it presents. It is possible for the industry to assure resilience, innovation, and sustainable growth in a global landscape that is rapidly changing by conducting targeted studies on infrastructure, sustainability, customer experience, and legislation.

RESEARCH OBJECTIVES

1. To categorize key thematic research areas that address emerging challenges and opportunities within Thailand.
2. To propose actionable research topics aligned with global aviation trends.
3. To explore mechanisms for academia-industry collaboration in advancing workforce development, innovation capacity, and knowledge transfer for Thailand's aviation sector.

LITERATURE REVIEW

Transformations and Disruptions in Thailand's Aviation Business Industry. *Current Trends and Disruptions in Thailand's Aviation Business Industry:* Thailand's aviation business industry is undergoing significant transformations driven by global trends and localized disruptions. These changes, fueled by technological advancements, environmental imperatives, and shifting consumer behavior, present both challenges and opportunities for industry stakeholders.

Post-Pandemic Recovery and Changing Travel Preferences: The COVID-19 pandemic significantly disrupted Thailand's aviation sector, resulting in a dramatic reduction in passenger volumes and revenue. Although recovery is underway, the industry must adapt to changing travel patterns, including the rise in domestic tourism, increased demand for leisure travel, and cautious business travel recovery (TAT, 2023). Health and safety measures, such as contactless technologies and enhanced sanitation protocols, have become key considerations for passengers, reshaping the operational priorities of airlines and airports.

Growth of Low-Cost Carriers (LCCs): The expansion of low-cost carriers continues to shape the competitive landscape of Thailand's aviation market. Airlines such as Thai AirAsia and Nok Air have leveraged affordable pricing and extensive domestic networks to attract middle-class travelers and first-time flyers. This trend has increased connectivity between secondary cities and major hubs, boosting regional tourism and economic activity (International Civil Aviation Organization, 2023). However, LCCs face pressures to balance cost efficiency with sustainable practices, a growing concern for environmentally conscious consumers.

Emphasis on Sustainability: Sustainability has emerged as a critical focus for the aviation industry worldwide, and Thailand is no exception. Airlines and airports are adopting green practices, such as investing in sustainable aviation fuels (SAFs) and optimizing flight operations to reduce emissions. Suvarnabhumi

Airport, for instance, has implemented solar energy systems to improve energy efficiency (AOT, 2023). These initiatives align with Thailand's broader environmental goals and increasing global pressure to achieve net-zero emissions by 2050.

Digital Transformation: Technological advancements are revolutionizing Thailand's aviation industry, with airports and airlines embracing digital solutions to enhance efficiency and passenger experience. Innovations such as biometric identification, automated check-ins, and AI-powered predictive maintenance are being implemented to streamline operations and reduce costs. Additionally, the rise of e-commerce has spurred growth in air cargo services, prompting investments in logistics infrastructure and digital supply chain management (CAAT, 2023). Thailand's importance as a regional hub is strengthened by its involvement in the ASEAN Open Skies Policy, which encourages greater connectivity and market liberalization. This integration has increased competition among regional carriers while also giving Thai airlines opportunity to extend their networks. At the same time, geopolitical concerns and shifting fuel prices continue to be external disruptors, necessitating strategic changes in route design and operational efficiency.

Aviation industry workforce challenges: Another disruption in the aviation industry involves labor shortages, exacerbated by pandemic-induced layoffs and skill gaps in emerging technologies. The need for retraining and upskilling aviation personnel is increasingly critical to meet operational demands and adapt to technological changes (Halawi, 2022; Lougheed, 2022).

Thailand's aviation business industry is navigating a dynamic environment characterized by recovery efforts, technological innovation, sustainability imperatives, and regional competition. Addressing these trends and disruptions will require a proactive approach, blending strategic investments, policy reforms, and industry collaboration to ensure resilience and sustainable growth.

Aligning with Global Challenges and Industry Demands in Thailand's Aviation Business Industry Research.

Thailand's aviation business industry operates in a dynamic environment where global challenges and evolving industry demands continuously reshape operational priorities and strategies. Conducting research that aligns with these factors is essential for ensuring the sector's resilience, competitiveness, and sustainability.

Addressing Environmental Sustainability: Environmental concerns are among the most pressing global challenges for the aviation industry. With international frameworks such as the International Civil Aviation Organization's (ICAO) Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), airlines are increasingly required to adopt sustainable practices. Research on the development and implementation of sustainable aviation fuels (SAFs), carbon offset mechanisms, and energy-efficient airport infrastructure is critical for Thailand's aviation industry to meet global regulatory requirements and contribute to net-zero emissions goals (International Civil Aviation Organization, 2023).

Adapting to Technological Disruption: The rapid pace of technological advancement in aviation necessitates research to explore the integration of digital tools and automation. Thailand's aviation sector must address industry demands for innovations such as artificial intelligence (AI), predictive analytics, and Internet of Things (IoT) applications in maintenance, passenger services, and cargo operations. Research can provide actionable insights into how these technologies can enhance operational efficiency, reduce costs, and improve customer experience (Patibandla, 2024; Kabashkin & Perekrestov, 2024; Tansiria et al., 2023).

Improving Crisis Preparedness and Resilience: Preparation for immediate challenges such as aviation vulnerabilities, fuel crises, and national emergencies require research on fostering organizational resilience and adaptive strategies. This involves analyzing financial risk management, identifying supply chain weaknesses, and assessing the role of government regulations in recovery efforts. These studies could aid Thailand in developing crisis-resistant frameworks suitable for its geographic and economic circumstances.

Managing Changing Passenger Requirements: Transforming passenger behaviors and expectations are redefining the worldwide aviation environment. Investigating consumer preferences, encompassing the demand for tailored services, health and safety protocols, and seamless digital experiences, are essential for Thai airlines and airports to maintain competitiveness. Research on these subjects can assist firms in aligning with trends like contactless transport and improvements in loyalty programs, therefore improving consumer satisfaction and retention (Chanpariyavatevong, Wipulanusat, Champahom,, Jomnonkwao, Chonsalasin & Ratanavaraha, 2021; Kanchanawongpaisan, Zhou & Voon 2024; Kungwola, 2023).

Competing in the Global and Regional Market: As Thailand positions itself as a hub for aviation in Southeast Asia, research is needed to address competitive pressures and leverage opportunities under international agreements like the ASEAN Open Skies Policy. Exploring the implications of market liberalization, air traffic growth, and partnerships with global carriers can inform strategies for expanding Thailand's regional and international reach.

Research that aligns with global challenges and industry demands is vital for driving Thailand's aviation business industry toward long-term sustainability and competitiveness. By focusing on sustainability, technological innovation, crisis preparedness, consumer trends, and market competition, Thailand's aviation research can contribute to strategic decision-making and ensure the sector's continued growth in a rapidly evolving global environment.

CONCEPTUAL FRAMEWORK

The conceptual framework links global aviation issues to Thailand's sustainability, innovation, and workforce development priorities. It shows how sustainable aviation fuels, energy-efficient airport

operations, regulatory compliance, and digital transformation affect aviation competitiveness. The framework emphasizes policy, technology, and human resource interactions based on an integrative understanding of international and local contexts. It helps identify research themes that link global imperatives like environmental responsibility and digital advancement with Thailand's efforts to improve academia–industry collaboration and aviation sustainability.

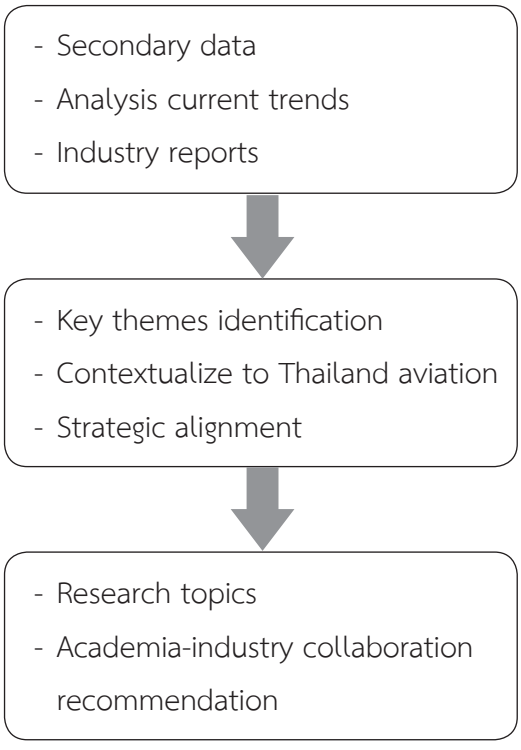


Figure1 Conceptual framework

The conceptual framework was developed based on an integrative review of aviation business literature and sustainability frameworks (IATA, 2022; CAAT, 2023; ICAO, 2023). It synthesizes the relationship between global aviation challenges such as environmental sustainability, digital transformation, and policy compliance, and Thailand's strategic priorities in workforce development and industry academia collaboration. The five thematic areas were not predetermined but emerged inductively from a systematic review of documents, ensuring that the framework reflects both international trends and local relevance.

METHODOLOGY

This study employed a qualitative, document-based thematic analysis to identify and structure research themes relevant to Thailand's aviation business. A total of 28 documents were reviewed, comprising 14 peer-reviewed journal articles, 6 industry and policy reports, and 8 academic books

or papers published between 2015 and 2024. The materials were selected based on three inclusion criteria: (1) relevance to Thailand's or Southeast Asia's aviation and sustainability contexts, (2) discussion of innovation, technology, or regulatory practices, and (3) credibility and accessibility through recognized databases such as Scopus, ICAO, IATA, CAAT, and AOT.

The analysis followed a six-phase process: (1) data familiarization through detailed reading, (2) coding of key concepts, (3) identification of recurring patterns, (4) refinement and validation of themes, (5) definition and naming of final themes, and (6) synthesis into a thematic framework tailored to Thailand's aviation context. The process resulted in five key thematic areas**.**

RESULTS CONCLUSION AND DISCUSSION

Results

In total, the study proposed five research themes that collectively represent strategic research directions for Thailand's aviation business**.** They consist of 1) Sustainability in Thailand's Aviation Business Industry. 2) Energy-Efficient Airport Operations. 3) Regulatory Compliance and Carbon Offset Programs. 4) Challenges and Opportunities of Sustainable Aviation Practices in Thailand. And 5) Enhancing Passenger Experience in Thailand's Aviation Sector.

Theme 1: Sustainability in Thailand's Aviation Business Industry.

Sustainability has become a central focus in Thailand's aviation business industry, reflecting global efforts to mitigate the environmental impact of air travel while ensuring long-term growth. The industry faces mounting pressure to align with international environmental standards and reduce greenhouse gas emissions, necessitating innovative strategies and investments in sustainable practices.

Adoption of Sustainable Aviation Fuels (SAFs): One of the primary approaches to sustainability in Thailand's aviation sector is the adoption of Sustainable Aviation Fuels (SAFs). SAFs, derived from renewable sources, offer a significant reduction in carbon emissions compared to conventional jet fuels. Thai Airways has explored collaborations with international partners to integrate SAFs into their operations, signaling the nation's commitment to eco-friendly aviation practices (Civil Aviation Authority of Thailand, 2023). However, challenges such as high production costs and limited supply chains need to be addressed through research and policy support. suggested research topics on the adoption of sustainable aviation fuels (SAFs) include several important areas. For example,

Exploring the technological feasibility and development of SAFs: This involves examining recent advancements in feedstock technologies that support the efficient and scalable production of sustainable fuels. Another key area is a comparative analysis of SAF production methods, such as biofuels, synthetic fuels, and waste-derived fuels, to identify the most viable and environmentally friendly options. Additionally, researchers should investigate the integration of SAFs into existing airport fuel supply chains, focusing on both the challenges and opportunities that may arise during implementation.

The environmental impact and benefits of sustainable aviation fuels (SAFs) present a valuable area for research: A key focus should be the lifecycle carbon emissions analysis of SAFs in comparison to conventional jet fuels, providing insight into their true environmental footprint. Additionally, studies should evaluate the impact of SAF adoption on achieving global aviation's net-zero emissions targets, assessing how these fuels contribute to broader climate goals. Beyond carbon reduction, SAFs may offer co-benefits such as reducing non-CO2 emissions and improving air quality around airports, which

Economic and Market Dynamics: Research should investigate the cost-effectiveness of SAFs, identifying the key barriers to scaling up production and distribution across the aviation industry. Another important area of focus is the role of government subsidies and incentives, which can significantly influence the pace and scale of SAF implementation. Additionally, a thorough market analysis of SAF supply chains is essential, including an examination of global production capacity and regional demand trends to identify opportunities and challenges in different markets.

Policy and Regulatory Frameworks: Research in this area should include a comparative analysis of international policies that promote the use of SAFs, highlighting the best practices and effective strategies across different regions. Special attention should also be given to the impact of ICAO's CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation), which serves as a key global mechanism for encouraging SAF uptake. Additionally, it is important to examine regulatory barriers to SAF implementation in Southeast Asia, with a particular focus on Thailand as a case study, to understand regional challenges and inform policy recommendations.

Industry Collaboration and Stakeholder Engagement: Research should explore the role of public-private partnerships, which can drive innovation, investment, and large-scale implementation of SAF initiatives. Effective strategies for engaging key industry players-including airlines, airports, and fuel suppliers are also vital to ensure coordinated efforts throughout the aviation sector. Additionally, understanding consumer perception and their willingness to support SAF initiatives, particularly through carbon offset programs, can help shape communication strategies and foster broader public support for sustainable air travel.

Regional and Country-Specific Studies: In Thailand, research should assess the feasibility of producing SAF using local feedstocks, such as palm oil and agricultural waste, to evaluate both economic viability and environmental impact. On a broader scale, studies should explore the potential of Southeast Asia to emerge as a global hub for SAF production, given the region's abundant natural resources and growing aviation market. Additionally, a comparative analysis of SAF adoption rates between developed and emerging economies can offer valuable insights into policy effectiveness, infrastructure readiness, and investment patterns across different contexts.

Technological Innovation in SAF Utilization: A key emphasis is the compatibility of SAFs with next-generation aviation technology, guaranteeing that these fuels can effortlessly integrate

with future innovations in aircraft design and performance. Furthermore, research should focus on enhancing engine performance using SAF mixes, identifying the technical obstacles and prospective solutions necessary for sustaining efficiency and reliability. A key issue is the effect of SAF adoption on airline operational expenses and ticket pricing, as recognizing these financial effects impacts industry decision-making and customer acceptance.

Long-Term Impacts and Future Directions: The industry aims for long-term environmental objectives; therefore, research must investigate the contribution of Sustainable Aviation Fuels (SAFs) to a sustainable aviation ecosystem by 2050, particularly their capacity to substantially decrease greenhouse gas emissions. Innovations in synthetic SAFs, especially those generated via carbon capture and renewable energy, signify a significant advancement in fuel development that may improve sustainability and decrease dependence on conventional fossil fuels.

These topics cover technical, economic, environmental, and policy aspects of SAF adoption, offering a comprehensive foundation for impactful research in this critical area.

Theme 2: **Energy-Efficient Airport Operations.** Airports in Thailand are increasingly incorporating energy-efficient technologies to reduce their carbon footprint. For instance, Suvarnabhumi Airport has implemented solar energy systems and LED lighting to improve energy efficiency while minimizing operational costs (AOT, 2023). Such initiatives align with global trends promoting green airport designs and serve as benchmarks for other regional airports in Thailand. Suggested Research Topics on "Energy-Efficient Airport Operations" are

Technological Innovations for Energy Efficiency: Research should also examine how IoT and AI might optimize airport energy consumption for real-time monitoring and resource management. Large-scale airport terminals can also minimize operational costs and environmental effect by using energy-efficient lighting and HVAC systems, making them more robust and sustainable to rising passenger loads and climate change.

Renewable Energy Integration:

Solar, wind, and geothermal energy for airport operations must be investigated for cleaner, more sustainable aviation infrastructure. Airports that have reached net-zero energy consumption through renewable energy systems can provide practical lessons and best practices for research. Technical compatibility, financial investment, and regulatory compliance must be addressed to enable a smooth yet efficient integration of renewable energy sources into airport infrastructure.

Sustainable Building Design: Green building certifications like LEED enhance airport terminals but are difficult to carry out. Designing energy-efficient terminals in tropical regions needs specific architectural solutions. Airports must also be adapted to improve energy efficiency and reduce environmental impact.

Carbon Emissions Reduction: Energy-efficient airport operations reduce carbon footprints. A comparison of international airport energy-saving programs shows best practices, while carbon-neutral ground operations techniques assist global environmental goals.

Electrification of Ground Support Equipment (GSE): The example research in this area, i.e., transitioning to electric-powered ground support vehicles: Financial implications and advantages. The function of wireless charging stations in facilitating electric ground support equipment fleets. Evaluating the energy efficiency of hybrid and completely electric ground support equipment solutions.

Energy Management Systems: This research may be done on these topics. Role of centralized energy management systems in reducing airport energy consumption., Case studies of airports implementing advanced energy monitoring and analytics tools. Predictive maintenance technologies for optimizing energy-intensive airport equipment.

Policy and Regulation for Energy Efficiency: The example of topics including

The role of government incentives in promoting energy-efficient airport projects., Policy frameworks for mandating renewable energy adoption in airport operations., Comparative study of international energy efficiency standards for airports

Passenger and Stakeholder Engagement: Proposed Research Topics are as follows. Passenger behavior and energy efficiency in airports, energy-saving methods., Collaborative frameworks for stakeholders in the execution of extensive energy efficiency initiatives., Funding energy-efficient airport enhancements through public-private partnerships.

Regional and Country-Specific Studies: Proposed research topics are Opportunities for energy-efficient operations in Thailand's major airports., Energy efficiency challenges and solutions in developing countries' airports., Best practices for energy-efficient operations in airports located in tropical regions.

The following research topics are recommended for future trends and innovations: The potential of hydrogen and fuel cells in powering airport operations. Exploring carbon capture and utilization technologies for energy systems in airports. The role of autonomous systems in enhancing airport energy efficiency.

These topics provide a comprehensive framework for exploring the technical, operational, and policy dimensions of energy-efficient airport operations, with global and regional relevance.

Theme 3: Regulatory Compliance and Carbon Offset Programs. Thailand is engaged in global initiatives, including the International Civil Aviation Organization's (ICAO) Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which mandates airlines to track and mitigate carbon emissions from international flights via certified carbon credits. Adherence to CORSIA not only bolsters Thailand's status as a responsible aviation center but also cultivates opportunities for collaboration among airlines, regulatory bodies, and environmental organizations to advance sustainable aviation practices.

Proposed research topics in this domain encompass the efficacy of carbon offset initiatives in mitigating global aviation emissions and contrasting voluntary and mandatory offset frameworks in various international settings. Subsequent research may investigate the economic and operational obstacles airlines face in executing offset programs, encompassing financial ramifications, data monitoring systems, and the incorporation of sustainability initiatives into business practices.

To evaluate pricing trends, quality assurance mechanisms, and developing nations' carbon trading, carbon credit markets and regulatory frameworks must be examined. A promising research topic is how digital technologies and blockchain systems enable carbon transaction transparency and traceability. Comparisons of international and regional carbon offsetting strategies, especially in Southeast Asia, may help Thailand improve its aviation policies and achieve long-term sustainability goals.

These studies improve regulatory compliance, policymaking, and Thailand's transition to environmentally friendly and competitive aviation.

Theme

Theme 4: Challenges and Opportunities of Sustainable Aviation Practices in Thailand. Despite progress, significant challenges remain in implementing sustainable aviation practices in Thailand. High initial investments, technological barriers, and the need for a supportive policy environment are key obstacles. However, these challenges present opportunities for collaboration between government agencies, private stakeholders, and research institutions to drive innovation and promote sustainability. Policy and Regulatory Challenges: Potential topics in the subject area are "Gaps and opportunities in Thailand's sustainable aviation regulatory system." "Barriers to implementing sustainable aviation fuels in Thailand: A policy perspective."

Adoption of Sustainable Aviation Fuels (SAFs): Proposed research topics include "Feasibility on the production of Sustainable Aviation in Thailand." "Comparative analysis of Sustainable Aviation initiatives between Thailand and other Southeast Asian nations."

Airport Sustainability Practices: The example of topics including "Evaluating energy-efficient operations at major Thai airports: Suvarnabhumi and Don Mueang as case studies". "Opportunities for integrating renewable energy systems into Thailand's airport infrastructure". "Circular economy practices in Thai airports: Waste management, recycling, and water conservation."

Theme 5: Enhancing Passenger Experience in Thailand's Aviation Sector. *Consumer Perceptions and Behavior:* Proposed research topics are "Passenger awareness and attitudes toward sustainable aviation initiatives in Thailand."

"Strategies to encourage Thai passengers to participate in airline carbon offset programs."

Workforce Development and Training: Here are the potential topics "Skill gaps in the Thai aviation workforce for implementing sustainable practices." "Role of training programs and education in

building capacity for green aviation initiatives in Thailand'. "Opportunities for public-private collaboration to enhance workforce readiness for sustainable aviation".

These topics provide a foundation for exploring the multifaceted challenges and opportunities associated with sustainable aviation practices in Thailand, with applications for policy, industry, and consumer perspectives.

Passenger Experience: Digital transformation in Thailand's aviation sector focuses on passenger comfort and satisfaction. Suvarnabhumi and Don Mueang airports use biometrics for faster check-in, boarding, and immigration (AOT, 2023). Proposed "Enhancing Passenger Experience in Thailand's Aviation Sector" Research Topics

Digital Transformation and Smooth Travel: Topics are "Role of biometric systems in enhancing the passenger journey at Thai airports." "Impact of mobile applications and AI-powered chatbots on customer satisfaction in Thai airlines."

Passenger Services Personalization: "Examining passenger inclinations for customized services: Case studies from Thai airlines." "Big data analytics to customize travel experiences." "Obstacles and prospects in personalization in Thailand's aviation business."

CONCLUSION

This study identified five key thematic research areas essential for guiding the sustainable transformation of Thailand's aviation. (1) Sustainability in Thailand's Aviation Business, (2) Energy-efficient airport operations, (3) Regulatory compliance and carbon offset programs, (4) Challenges and opportunities of sustainable aviation practices, and (5) Enhancing passenger experience through digital transformation. These themes collectively address environmental, technological, regulatory, and human resource dimensions that define the current and future landscape of Thailand's aviation industry. Results highlight the need for a comprehensive strategy that incorporates workforce development, policy innovation, and technology advancement for aviation to grow sustainably. Sustainable aviation fuels and energy efficiency research can help Thailand meet global climate goals, while regulatory frameworks and carbon offset mechanisms improve compliance and environmental accountability. Digital innovation improves passenger experience and highlights the growing importance of service quality and operational agility post-pandemic. Academics, industry, and government agencies must collaborate to advance these research directions. Thailand can create a strong aviation knowledge ecosystem that integrates theory and practice, fosters innovation, and ensures regional and global aviation network competitiveness through interdisciplinary efforts.

DISCUSSION

The findings underscore the research focus on the integration of Thailand's aviation research with global sustainability and digital transformation strategies. Efficient operations directly address environmental demands, reinforcing Thailand's commitment to net-zero goals and the International (Prapun, 2024; Civil Aviation Organization, 2022). Likewise, digital transformation improves operational agility and service quality, which are increasingly vital in post-pandemic recovery and consumer-focused markets (Tansiria et al., 2023). The emphasis on academia–industry collaboration underscores the necessity of integrating applied research with workforce development and policy innovation to close skill gaps and accelerate technology adoption (Esangbedo et al., 2023; Hendra et al., 2024). This study emphasizes the need for Thailand's aviation sector to evolve from disjointed efforts to a unified strategy that incorporates technology, policy, and human resources. Future research should include comparative analyses within the ASEAN region and develop quantitative models to evaluate the economic and environmental impacts of sustainable practices (Champeecharoensuk, Dhakal, & Chollacoop, 2023). The thematic synthesis provides a structured foundation for guiding interdisciplinary research, policy formulation, and industry collaboration to promote a resilient and sustainable aviation future for Thailand.

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