การประเมินความต้องการจำเป็นในการพัฒนาจรณทักษะ (Soft Skills)
เพื่อเสริมสร้างจรณทักษะที่จำเป็นสำหรับการทำงานในอุตสาหกรรมการบิน:
กรณีศึกษา นักศึกษาสาขาวิชาการจัดการธุรกิจการบิน
มหาวิทยาลัยราชภัฏเชียงใหม่
NEEDS ASSESSMENT FOR THE DEVELOPMENT OF SOFT SKILLS TO ENHANCE
ESSENTIAL SOFT SKILLS FOR WORK IN THE AVIATION INDUSTRY:
A CASE STUDY OF AVIATION BUSINESS MANAGEMENT STUDENTS
AT CHIANG MAI RAJABHAT UNIVERSITY

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บทคัดย่อ

สมรรถนะทักษะและจรณทักษะมีบทบาทสำคัญต่อประสิทธิภาพการทำงานของแรงงานยุคใหม่ อุตสาหกรรมการบินได้รับผลกระทบจากเทคโนโลยีดิจิทัลและโควิด-19 ทำให้ตำแหน่งงานที่เหลืออยู่ต้องอาศัยจรณทักษะซึ่งเป็นทักษะที่เทคโนโลยีไม่อาจทดแทนได้ การพัฒนาจรณทักษะควรเริ่มตั้งแต่ระดับมหาวิทยาลัย แม้จรณทักษะถือเป็นทักษะที่จำเป็นในการทำงานแต่งานวิจัยด้านจรณทักษะในอุตสาหกรรมการบินและการพัฒนานักศึกษายังมีจำกัด งานวิจัยนี้จึงมีวัตถุประสงค์เพื่อ (1) ระบุจรณทักษะที่จำเป็นสำหรับการทำงานในอุตสาหกรรมการบิน (2) ประเมินความต้องการจำเป็นในการพัฒนาจรณทักษะที่จำเป็นสำหรับการทำงานในอุตสาหกรรมการบินของนักศึกษาสาขาการจัดการธุรกิจการบิน มหาวิทยาลัยราชภัฏเชียงใหม่ และ (3) เสนอการเลือกใช้รูปแบบการจัดการเรียนรู้เชิงรุกเพื่อเสริมสร้างจรณทักษะของนักศึกษาโดยอิงตามลำดับความต้องการจำเป็น การวิจัยนี้ใช้วิธีการวิจัยแบบผสมผสานประกอบด้วย 3 ขั้นตอน ได้แก่ 1) การวิจัยเชิงคุณภาพโดยเริ่มจากการทบทวนวรรณกรรมเพื่อศึกษาจรณทักษะที่จำเป็นในการทำงานและสัมภาษณ์เชิงลึกกับพนักงานสายการบินและสนามบินเพื่อระบุทักษะสำคัญในอุตสาหกรรมการบิน 2) การวิจัยเชิงปริมาณเพื่อประเมินและจัดอันดับความต้องการพัฒนาจรณทักษะของนักศึกษา โดยใช้ดัชนีความต้องการจำเป็นและการทดสอบทีแบบจับคู่ และ 3) การทำวิจัยในชั้นเรียนเพื่อเสนอรูปแบบการจัดการเรียนรู้เชิงรุกเพื่อพัฒนาจรณทักษะของนักศึกษา เครื่องมือที่ใช้ในการวิจัยทั้งหมดประกอบด้วยแบบสัมภาษณ์ แบบสอบถาม แบบทดสอบก่อนและหลังเรียน และแผนการจัดการเรียนรู้แบบการใช้ปัญหาเป็นฐาน 6 ขั้นตอน ข้อมูลเชิงคุณภาพได้รับการวิเคราะห์โดยการวิเคราะห์เนื้อหา ส่วนข้อมูลเชิงปริมาณวิเคราะห์โดยสถิติเชิงพรรณนา ได้แก่ ร้อยละ ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน สถิติเชิงอนุมานประกอบด้วยการทดสอบทีแบบจับคู่ และการวิเคราะห์ความต้องการจำเป็น

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ผลการศึกษาพบว่า จรณทักษะที่จำเป็นที่สุด 5 อันดับแรกในอุตสาหกรรมการบิน ได้แก่ 1) การสื่อสาร 2) ความเป็นผู้นำ 3) ความคิดสร้างสรรค์ 4) การแก้ปัญหาที่ซับซ้อน และ 5) การทำงานเป็นทีม การวิเคราะห์ความต้องการจำเป็นแสดงให้เห็นว่าความต้องการพัฒนาจรณทักษะ 5 อันดับแรกของนักศึกษา ได้แก่ 1) การแก้ปัญหาที่ซับซ้อน 2) การสื่อสาร 3) ความเป็นผู้นำ 4) ความคิดสร้างสรรค์ และ 5) การทำงานเป็นทีม การพัฒนาจรณทักษะโดยใช้การเรียนรู้เชิงรุกแบบการใช้ปัญหาเป็นฐานพบว่าผลสัมฤทธิ์ทางการเรียนหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 ซึ่งแสดงให้เห็นว่าการเรียนรู้เชิงรุกสามารถพัฒนาทักษะการแก้ปัญหาที่ซับซ้อนได้ ผลการวิจัยสามารถใช้เป็นแนวทางในการพัฒนาหลักสูตรและเตรียมความพร้อมนักศึกษาก่อนเข้าสู่ตลาดแรงงานตลอดจนพัฒนาบุคลากรในอุตสาหกรรมการบินได้

คำสำคัญ: ความต้องการจำเป็น, จรณทักษะ, ธุรกิจการบิน, การเรียนรู้โดยใช้ปัญหาเป็นฐาน

ABSTRACT

Hard skills and soft skills play a crucial role in workforce efficiency in the modern aviation industry, which has been significantly impacted by digital technology and the COVID-19 pandemic. As a result, the remaining job positions increasingly require soft skills, which technology cannot replace. The development of soft skills should begin at the university level. Although soft skills are considered essential for work, research on soft skills in the aviation industry and student development remains limited. This study aimed to: 1) identify the soft skills necessary for working in the aviation industry; 2) conduct a needs assessment to prioritize the ranking of soft skills required for working in the aviation industry among students in the Aviation Business Management Program at Chiang Mai Rajabhat University; and 3) propose active learning methods to enhance students' soft skills based on prioritized needs. A mixed-method research design was employed, consisting of three phases: 1) qualitative research involving with a literature review to identify the necessary soft skills for work, followed by in-depth interviews with airline and airport service personnel to determine the essential soft skills required in the aviation industry; 2) quantitative research using the Modified Priority Needs Index and paired t-test to assess and rank students' soft skill needs; and 3) classroom research proposing active learning management methods to enhance students' soft skills. Research instruments included interviews, questionnaires, pre-tests and post-test, and the 6-step process of problem-based learning management. The quantitative data were analyzed using descriptive statistics including percentage, mean, and standard deviation. Inferential statistics included pair t-tests, and the Modified Priority Needs Index.

The findings revealed the top five essential soft skills in the aviation industry: 1) communication, 2) leadership, 3) creativity, 4) complex problem-solving, and 5) teamwork. The Priority Needs Index (PNI) analysis showed students' top five soft skills development needs as 1) complex problem-solving, 2) communication, 3) leadership, 4) creativity, and 5) teamwork. Implementation of the problem-based learning model showed a significant difference between pre-test and post-test scores at the .05 significance level, indicating its effectiveness in developing students' complex problem-solving skills. The research results can be applied as a guideline for curriculum development, student preparation for the workforce, and development in the aviation industry personnel.

KEYWORDS: Need Assessment, Soft Skills, Aviation Business, Problem-Based Learning

Introduction

In 2023, Generation Z (Gen Z), which refers to people born between 1997 and 2012, represented a growing proportion of students in higher education institutions (Bangkok Biz News, 2023). In 2020, it marked the beginning of Gen Z's entry into the workforce as new entrants or "First Jobbers" (Kasikorn Research Center, 2021). Working in organizations requires two key skill sets: hard skills and soft skills. Hard skills refer to the technical abilities employees use to accomplish tasks in accordance with organizational goals. Hard skills involve concrete knowledge and capabilities directly related to job performance, such as computer proficiency or operating specific tools. Hard skills can be acquired through classroom learning or self-study and are typically taught by the company through pre-job training programs. However, it has been revealed that many first-jobbers lack soft skills, which are emotional and social competencies. Developing soft skills typically requires experience, active learning, and practical training, all of which contribute to employees' efficiency and career success (Watthanabut, 2020). Moreover, soft skills have a significant influence on creating a positive work environment within an organization. Employees who are satisfied at work tend to perform better and produce higher-quality results (Sinthuvanich, 2020). Soft skills play a crucial role in enhancing employee confidence in their roles, leading to job satisfaction (Shillie & Nchang, 2023). Moreover, Jackson's (2013) research found that many employees and recent graduates entering the workforce possess the necessary professional (hard) skills to meet market demands but often lack essential soft skills. Key soft skills refer to interpersonal skills, communication, problem-solving, and teamwork, which are crucial for efficient work performance and career success (Mor, 2024; Spivak, 2024).

The aviation industry has faced rapid changes in its work environment due to the double disruption of digital transformation and the COVID-19 pandemic. The major disruption in air travel accelerated the use of technology and automation, such as contactless services, robotics, and artificial intelligence (AI). Despite the post-COVID return to normal, airports are expected to reduce staff, keeping only specialized roles, that robots can't replace (Security Systems Magazine, 2020). Therefore, aviation workers are increasingly compelled to develop new skills and improve their soft skills to fulfill changing job requirements. Organizations employ competencies as a structure to organize and plan staff development, matching worker skills with organizational goals and increasing overall efficiency. Competency represents the integrated set of behaviors, skills, knowledge, and personal attributes that organizations expect from their employees for successful job performance. It can be stated that competencies combine the behaviors that organizations expect from their employees, with skills playing a particularly key role in achieving these competencies (McClelland, 1973). According to the Office of the Civil Service Commission (OCSC), competency refers to a set of behaviors that come from knowledge, skills, and personal characteristics, which help a person stand out (Patiwong, 2009). As a result, the education sector must implement teaching approaches that provide graduates with the necessary skills for future employment, guaranteeing their competence in a disruptive work environment. The Aviation Business Management Program at Chiang Mai Rajabhat University recognized the challenges influenced by the double disruption in the aviation industry and the need to develop graduates with essential soft skills. This approach will contribute to the development of a workforce capable of adapting to changes efficiently and sustainably, supporting Thailand's goal to become a regional aviation hub. Therefore, the researcher aimed to conduct a study on the key soft skills necessary for working in the aviation industry and to assess the need for enhancing these essential soft

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skills for the future careers of students. The assessment of needs is a crucial activity for planning and developing students' abilities, enhancing faculty capabilities, and contributing to the university's efforts to develop students with desirable characteristics. These students will serve as an important workforce for the country's development. The development of soft skills, based on the specific needs of students and guided by the principles of needs assessment, involves addressing the gap between the desired state (what should be) and the actual situation (what is). This gap indicated needs, reflecting the exact areas that required improvement. This study provided crucial information for improving education in the aviation industry. It helped educational institutions more successfully adjust their teaching strategies and curriculum by using need assessment to identify and prioritize the soft skills necessary for future employment in the aviation industry. Soft skills development in aviation education is crucial for professional growth, effective teamwork, and efficient, safe operations in the aviation industry (Romanko, 2023).

Research Objectives

1. To identify the soft skills necessary for working in the aviation industry.

2. To conduct a needs assessment to prioritize the ranking of soft skills required for working in the aviation industry among students in the Aviation Business Management Program at Chiang Mai Rajabhat University.

3. To propose active learning methods to enhance students' soft skills based on prioritized needs.

Conceptual Framework

This study's conceptual framework consisted of three steps. First, essential soft skills for general work and in the aviation, industry were identified through a review of theories, Thailand Professional Qualification Institute (TPQI) standards, and related research, along with qualitative in-depth interviews with aviation personnel to identify key soft skills for the aviation field. Second, the identified variables from the first step were used in a quantitative study by the Priority Needs Index (PNI) methodology to assess and prioritize the soft skills required for Aviation Business Management students. Finally, classroom research based on active learning principles was carried out to create guidelines for improving these priority soft skills. The relevant literature, concepts, and theories on competencies, soft skills, and active learning were reviewed, leading to the development of a conceptual framework to assess the needs assessment to develop soft skills to enhance the essential soft skills for future work in the aviation industry, as below;
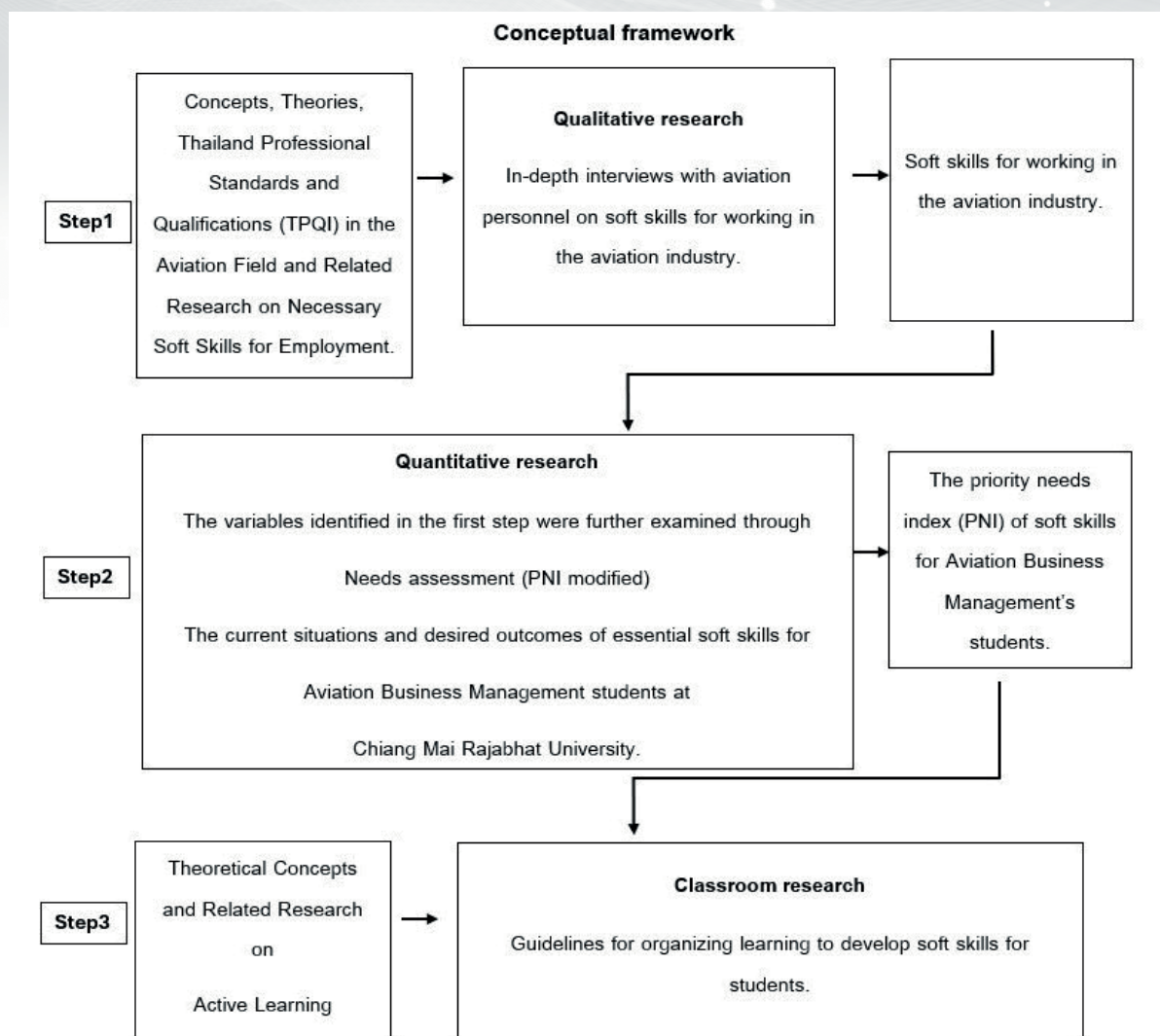
Figure 1 Conceptual Framework

Research Methodology

This section outlined the systematic methodology used in this research, consisting of 3 steps.

Step 1: Identifying essential soft skills for service roles in the aviation industry and conducting qualitative research to achieve Objective 1.

This research began with secondary data, including studying the necessary soft skills for work and service roles, specifically for ground attendants and flight attendants, as outlined by the TPQI. TPQI established qualification criteria based on performance, with each level reflecting the required knowledge, skills, and responsibilities relevant to the aviation sector, examining the essential soft skills required for work. The researcher focused on soft skills in service roles as a critical area of this research because these skills were detailed in the Thai Qualification Framework for Higher Education (TQF2) for the Aviation Business Management Program, which aimed to produce graduates equipped with essential knowledge, abilities, and service skills. The researcher also reviewed the literature and analyzed concepts and theories to synthesize the essential soft skills required in the workplace.

Then, the researcher used the variables obtained from the secondary data, such as literature reviews, to design in-depth interview questions. This involved interviewing key informants working in the aviation industry, specifically in service roles such as

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ground attendants, flight attendants, and airport staff, to identify the needs of soft skills in service roles within the aviation industry and to gather in-depth information from industry professionals. This step provided valuable information about key soft skills and aviation industry standards, establishing a baseline for the next steps.

Key Informants

The researcher employed purposive sampling to select seven key informants: three people from ground services, two people from in-flight services, and two people from the service's role in the airport business, with details and criteria in Table 1.

Table 1 Criteria for selecting key informants

Criteria	Key Informants
1. Work experience of 10 years or more	1. Ground service staff from a low-cost airline
2. Had work experience during the COVID-19 pandemic	2. Ground service staff from a full-service airline
	3. Ground service staff from an outsourcing company
	4. Cabin crew from a low-cost airline
	5. Cabin crew from a full-service airline
	6. Staff from Airports of Thailand Public Co., Ltd.
	7. Staff from Airports of Thailand Public Co., Ltd.

Research Instrument

The interview questions passed the quality assessment for content validity by 3 experts from 1) airline business (experienced cabin crew currently working as ground staff from a low-cost airline), 2) airport business (relations officer from airport), and 3) lecturer from Human Resource Management Program. The Index of Item-Objective Congruence (IOC) results showed that all questions were scored between 0.70 and 1.00, exceeding the 0.50 criterion for suitability (Rovinelli & Hambleton, 1977). Therefore, the interview questions were considered highly relevant and valid for gathering the necessary information through in-depth interviews.

Data Collection

The researcher conducted qualitative research by collecting data through in-depth interviews with seven key informants. Semi-structured, open-ended questions were used to explore the essential soft skills required for service roles in the aviation industry. Data was collected in September 2023. The face-to-face interviews began with general questions about the key informants' career backgrounds, followed by more focused open-ended questions about career soft skills. In this stage, a total of five open-ended questions were selected for conducting the interviews. The process was also complemented by non-participant observation.

Data Analysis

Data analysis was performed using content analysis, which involved collecting, coding, thematic analysis, frequency analysis, and summarizing the findings to identify information insights.

Step 2: Conducting quantitative research to prioritize essential soft skills for student development in the Aviation Business Management Program at Chiang Mai Rajabhat University to achieve Objective 2.

In this step, the researcher used the variables gained from the qualitative research to design a questionnaire to assess the soft skills required by students. The objective was to analyze the needs, examine the gap between the actual situation (what is),

and determine the desired soft skills (what should be) necessary for the future workforce of students in the Aviation Business Management Program at Chiang Mai Rajabhat University through the Modified Priority Needs Index (PNI$_{modified}$) that set in Objective 2. Additionally, this step indicated the rank of need for the required soft skills development using a quantitative method.

Population and Sample

The population used in this research consisted of 155 current students from the Aviation Business Management Program at the International College of Chiang Mai Rajabhat University (Academic Year 2023). The sample size was determined using Yamane's formula, with a margin of error of 0.05 and a confidence level of 95% (Yamane, 1973). This study used quota sampling to represent students from different year groups, with specific quotas reflecting the overall demographics of Aviation Business Management students. Based on the population (N = 155), the calculated sample size (n) is 112, which is detailed in Table 2.

Table 2 Population and samples

Years	Number	Proportion	Sample Size (n)
4th–year students	33	21%	24
3rd–year students	58	37%	41
2nd–year students	29	19%	21
1st–year students	35	23%	26
Total	**155**	**100%**	**112**

Research Instrument

The research instrument used in the quantitative research phase also passed a quality assessment. It was validated for content validity by the same group of three experts mentioned in the qualitative research section (Step 1). The 27 closed–ended questions were designed to prioritize essential soft skills for student development, focusing on the soft skills required in aviation careers identified in Step 1. The Item–Objective Congruence (IOC) values ranged from 0.60 to 1.00, exceeding the 0.5 criterion (Rovinelli & Hambleton, 1977). This indicated that the questionnaire items were highly relevant and valid in gathering the necessary information. In this stage, a total of 27 closed–ended questions were used to conduct the questionnaires. Moreover, the reliability of the questionnaire was tested and refined with a pre–survey sample of 30 individuals who were not part of the main sample. The reliability of the tools was confirmed with Cronbach's alpha coefficient of 0.985. A Cronbach's alpha coefficient greater than 0.7 suggests acceptable reliability (Cronbach, 1970). The questionnaire was utilized as a research tool for quantitative research with a 5–point Likert Scale and analyzed based on standard criteria for determining rating scales. The PNI questionnaire was utilized as a dual checklist to assess both the actual (present) situation and the desired outcomes. This method was employed to identify gaps between the current state and the desired state to rank the needs for improvement. This research utilized quota sampling for respondent information, with respondents' information presented in Table 3.

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Table 3 The respondents' information

Respondent Information	Number (n=112)	Percentage (100)
1. Gender		
Male	12	10.71
Female	97	86.61
LGBTQ+	3	2.68
2. Year		
4th–year students	24	21.43
3rd–year students	41	36.61
2nd–year students	21	18.75
1st–year students	26	23.21

Data Collection

The online questionnaire was created using Google Forms and distributed to students based on a quota sampling method in February 2024.

Data Analysis

The researcher aimed to rank the needs and find solutions to the necessary requirements for developing students' soft skills using the $PNI_{modified}$ and paired t–test.

The paired t–test was used because the data involved paired measurements from the same sample group under different conditions, such as actual skills levels versus desired skills levels. This test helped compare the differences between these two periods. After data collection, the researcher performed statistical analysis using SPSS Amos version 26. The analysis involved both descriptive and inferential statistics. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to present general respondent information. The $PNI_{modified}$ was also calculated to rank the soft skills development needs. The inferential statistics used was the paired t–test, which was applied to make inferences from the sample, comparing the actual and desired skill levels to determine gaps in soft skills development.

This study allowed the researcher to identify the priority needs for enhancing students' soft skills in preparation for future work in the aviation industry.

Step 3: Conducting classroom research to propose learning guidelines for developing essential soft skills in the aviation business to achieve Objective 3.

The researcher employed the active learning approach by considering the key soft skills identified through the $PNI_{modified}$ in Step 2. The highest–ranked skills, based on the identified needs for soft skills development, were selected to design the active learning activities.

Population and Sample

The researcher selected 38 students enrolled in the Fundamental Business Management in Aviation Business (AVI 1213) course in Semester 2/2024 (March 2024) over a two–week period. The population for the classroom research used purposive sampling. This method was both cost–effective and efficient for achieving the study's objectives. This course and its students were chosen due to the subject content focusing on various business scenarios and its suitability for active learning methods, particularly PBL, which effectively developed complex problem–solving skills. Furthermore, the researcher's role as a course lecturer made it easier to conduct in–depth observation and analysis of the learning outcomes. This classroom research, which was also supported by statistical evidence, was credibly used to propose guidelines for organizing learning styles to enhance students' soft skills.

Research Instrument for Classroom Research and Data Collection

Classroom research was conducted to assess the effectiveness of learning guidelines designed to enhance students' essential soft skills for the aviation industry. The researcher implemented active learning methods to develop the students' soft skills. The 20–question multiple–choice pre–test and post–test were used to

assess complex problem–solving skills. Each correct answer earns 1 point, for a total score of 20 points. The questions were designed to challenge students' complex problem–solving abilities and require them to choose appropriate solutions. Moreover, non–participating observation was also used to assess students' reactions during the lessons. The IOC was used in the study to confirm that the pre–test and post–tests related to the desired learning objectives. The pre–test and post–test passed a quality assessment for content validity, evaluated by three experts: 1) a lecturer in airline business with experience in the aviation business, 2) a senior lecturer from the Civil Aviation Training Center, and 3) a lecturer from the Faculty of Education. The IOC ranged from 0.60 to 1.00, which was greater than 0.5, making the tests reasonably valid for use (Rovinelli & Hambleton, 1977).

The research instrument for classroom research was established as follows.

1. Preparation

During the preparation phase, the researcher reviewed theories and research on soft skills and Problem–Based Learning (PBL). The researcher identified the target soft skills (problem–solving skills) for development and created a 6–hour PBL to enhance problem–solving skills for aviation business students with the details of the learning management plan as below:

2. Implementation

The researcher created two sessions of three hours classes (six hours in total), each focusing on a specific topic within the aviation industry based on the six–step process of PBL.

Class 1 (three hours): Complex problem-solving in airline operations.

Step 1 of the PBL Process: Introduction
The researcher explained the class objectives and provided an overview of complex problem–based learning methods linked to airline operations and conducted a pre–test.

Step 2 of the PBL Process: Identifying Problems

Students were organized into groups. Students selected and listed specific airline operation problem issues (such as delays, and irregular customer service).

Step 3 of the PBL Process: Analyzing Problems

The groups analyzed and discussed the chosen problems, considering their causes, impacts, and stakeholders.

Step 4 of the PBL Process: Evaluating Solutions

Discussed potential solutions and evaluated the selected outcomes through group discussion.

Step 5 of the PBL Process: Presentations

The groups presented their findings and proposed solutions.

Step 6 of the PBL Process: Reflection

The researcher was given feedback, and key points were summarized to students.

Class 2 (three hours): Complex problem-solving in crisis management in aviation.

Students developed strategies to manage crises, like flight cancellations due to pandemics or emergencies, and evaluated their decisions and outcomes following the same six– step process of PBL used in Class 1.

After the 6–hour PBL session, the researcher conducted a post–test to assess students' complex problem–solving skills.

Data Collection

This study employed Classroom Action Research with 38 students in the Fundamental Business Management in Aviation Business (AVI 1213) course conducted in March 2024. The data collection began with dividing students into groups of 5–6 members. The study was conducted over a two–class period of Problem–Based Learning (PBL), focusing on different topics:

Class 1 (three hours): Complex problem–solving in airline operations and administration.

Class 2 (three hours): Complex problem–solving in aviation crisis management.

Data was collected using the six–step Problem–Based Learning (PBL) process, observations, and pre–test and post–test assessments. Throughout the sessions, students were observed, and their progress was assessed using a 20–question multiple–choice test. The test was given as a pre–test (before Class 1) and a post–test (after Class 2) to assess their complex problem–solving skills.

Data Analysis

After the classroom experiment, the researcher assessed the development of students' soft skills by using pre–tests and post–tests to evaluate their understanding of complex problem–solving skills in aviation before and after the PBL sessions.

Data analysis involved comparing pre–test and post–test scores using statistical methods (pair t–test) to compare learning outcomes and assess significant differences between the results. This study allowed the researcher to provide recommendations for improving and developing instructional methods aimed at enhancing students' soft skills.

Results

This research has summarized the results according to the research objectives as follows:

1. The soft skills required for work in the aviation industry.

This study aimed to identify the key soft skills needed for service roles in the aviation industry. The first step involved reviewing academic sources and standards from the TPQI. The result indicated the top essential soft skills for service roles in the aviation industry as follows: 1) communication skills, 2) observation skills, 3) collaboration skills/teamwork skills, 4) ability to adapt to and work with equipment, information, and technology,

combined with soft skills such as assisting passengers with automated self–check–in kiosks, 5) service skills according to procedures and regulations, 6) leadership skills, 7) creative thinking skills, and 8) skills for solving complex problems.

The second step of the study used qualitative research through in–depth interviews to gather in–depth information about the necessary skills for the future of the aviation business. The essential soft skills in the prior step through the secondary data were developed into interview questions. From the in–depth interviews, five key soft skills essential for service roles in the aviation industry were found as follows: 1) communication skills, 2) leadership, 3) creative thinking skills, 4) complex problem–solving skills, and 5) teamwork.

2. Priority of the needs assessment of soft skills in the Aviation Business Management Program at Chiang Mai Rajabhat University.

The analysis of the respondents revealed that the majority of the survey respondents were female, with 97 individuals, accounting for 86.61%. This was followed by male respondents, totaling 12 individuals, which represented 10.71%, and LGBTQ+ individuals, totaling 3, accounting for 2.68%. In terms of years of study, third–year students represented the highest number of survey respondents, totaling 41 individuals, which accounted for 36.61%. They were followed by first–year students with 26 respondents (23.21%) and fourth–year students with 24 respondents (21.43%). Second–year students had the respondents, totaling 21 individuals, representing 18.75%. The distribution of samples showed a balanced approach to quota sampling, ensuring that various year groups efficiently represented the population.

The statistical results of the comparison between the mean values of the actual situation and the desired situation for the necessary requirements in developing students' soft skills in each area are shown in Table 4.

Table 4 The statistical results of the comparison between the mean values of the actual situation and the desired situation for the necessary requirements in developing students' soft skills in each area.

Soft Skills	Actual			Desired			Mean Difference	t	p-value*
	$(\bar{x})$	(S.D.)	Interpret	$(\bar{x})$	(S.D.)	Interpret			
Communication	3.45	0.40	Moderate	4.76	0.19	Highest	1.31	45.89	<0.001
Leadership	3.61	0.39	High	4.85	0.15	Highest	1.24	39.24	<0.001
Creativity	3.69	0.43	High	4.85	0.20	Highest	1.16	34.70	<0.001
Complex Problem Solving	2.95	0.76	Moderate	4.58	0.35	Highest	1.63	32.17	<0.001
Teamwork	3.71	0.50	High	4.83	0.23	Highest	1.12	28.95	<0.001

*Statistically significant at the .05 level.

From Table 4, the comparison of mean scores between the desired situation and the actual situation, using paired t-test statistics, showed that in all aspects of soft skills, there was a significant difference in mean scores between the expected and actual situations at the 0.05 significance level. The data analysis also showed that the mean scores of the actual situation were lower than those of the desired situation in all five key soft skills.

The results of the needs assessment for developing essential soft skills for future work among students ranked in order from highest to lowest priority were: 1) complex problem solving, 2) communication, 3) leadership, 4) creativity, and 5) teamwork, as shown in Table 5.

Table 5 The rank of needs assessment

Soft Skills	I	D	$PNI_{modified} = \dfrac{I - D}{D}$	Rank
Communication	4.76	3.45	0.380	2
Leadership	4.85	3.61	0.343	3
Creativity	4.85	3.69	0.314	4
Complex Problem Solving	4.58	2.95	0.553	1
Teamwork	4.83	3.71	0.302	5

3. Guidelines for organizing active learning to enhance students' soft skills based on the prioritization of essential soft skills needs.

This study aimed to propose guidelines for organizing learning styles that promoted student potential in developing the soft skills necessary for the aviation business through classroom research. The study of instructional methods for developing students' soft skills was conducted using the active learning approach as a guideline. The $PNI_{modified}$ results indicated that complex problem-solving skills were ranked as the highest priority for development among Aviation Business Management students.

The findings indicated that in the implementation of the active learning approach using PBL in Fundamental Business Management in Aviation Business (AVI 1213), 38 students were enrolled, but one student did not complete the pre-test and was thus excluded from the analysis. Consequently, the analysis was based on data from 37 students. After collecting scores, the researcher

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checked the normality test of data distribution. The difference between pre- and post-test scores followed normal distribution at a significant level of 0.05, as the p-values were greater than 0.05. Therefore, a paired t-test was used to compare the pre-test and post-test scores for the Fundamental Business Management in Aviation Business (AVI 1213) course. The comparison of pre-test and post-test scores for the course using the paired t-test revealed that the average post-test score (mean = 15.19, standard deviation = 2.05) was higher than the average pre-test score (mean = 14.00,

standard deviation = 2.51). The difference between the average post-test and pre-test scores was 1.19. The scores before and after the course differed significantly at the 0.05 level of significance. Thus, this study found that students' post-test scores were significantly higher than pre-test scores with a p-value equal to 0.002 at a significant level of 0.05, indicating that PBL effectively improved problem-solving skills. The comparison of pre-test and post-test scores for the Fundamental Business Management in Aviation Business (AVI 1213) course is shown in Table 6.

Table 6 The comparison of pre-test and post-test scores for the Fundamental Business Management in Aviation Business course.

Score	Mean	Standard Deviation	Mean Difference	t	p-value*
Pre-test	14.00	2.51	1.19	3.35	0.002
Post-test	15.19	2.05			

*Statistically significant at the .05 level.

Conclusion

1. The first objective of this study was to identify the essential soft skills needed for work in the aviation industry. The result identified the top five essential soft skills for aviation service roles as: 1) communication, 2) leadership, 3) creative thinking, 4) complex problem-solving, and 5) teamwork.

2. The second objective of this study was to prioritize the essential needs of soft skills for student development in the Aviation Business Management Program at Chiang Mai Rajabhat University. The soft skills most in need of improvement were identified in the following order of priority: 1) complex problem solving, 2) communication, 3) leadership, 4) creativity, and 5) teamwork.

3. The third objective of this study was to propose guidelines for organizing learning styles that promote student potential in developing the desired soft skills needed for work in the aviation business. It identified complex problem-solving skills as the most critical area

for improvement. The research recommended using Problem-Based Learning (PBL) as the primary teaching method. To conclude, problem-based active learning is an effective teaching method that can enhance soft skills.

Discussion

The study identified five important soft skills needed in aviation service roles as follows.

1. Communication

It is important to communicate clearly with colleagues and passengers, especially during stressful times. The finding is consistent with previous research emphasizing that strong communication skills are vital for operational success in aviation (Chinwongamorn, 2015).

2. Leadership

Good leadership helps teams stay organized and make the right decisions, particularly in the dynamic and often disruptive working environment of aviation.

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This is supported by the World Economic Forum's (2020) report emphasizing the increasing demand for leadership skills in future work (World Economic Forum, 2020).

3. Creative Thinking

This skill allows workers to find new ideas and solutions when unexpected problems occur. Muñoz-Marrón, Gil, and Lanero (2018) indicated that creativity can significantly enhance problem-solving abilities in dynamic environments.

4. Complex Problem-Solving

It is essential to be able to analyze and solve complex problems in aviation. This finding is supported by the World Economic Forum's report, which identified complex problem-solving as one of the top skills needed by 2025 (World Economic Forum, 2020).

5. Teamwork

In the aviation industry, teamwork to collaborate effectively with others is essential for delivering quality service and meeting passenger needs. Wong and Neustaedter (2017) expressed that strong teamwork skills are fundamental for success in the aviation sector, as they facilitate coordination among various departments. Moreover, students expressed the need for the Aviation Business Management Program to develop soft skills in all areas. This reflects the desired situation has high expectations, but the actual state does not yet meet those expectations, resulting in a clear gap. Therefore, all areas of soft skills are considered necessary needs. The prioritization of essential soft-skill development to enhance the necessary skills for future work among students in the Aviation Business Management Program at Chiang Mai Rajabhat University was as follows: 1) complex problem solving, 2) communication, 3) leadership, 4) creativity, and 5) teamwork.

Ranking 1: Complex Problem Solving

The $PNI_{modified}$ score for complex problem solving ranged between 0.466 and 0.641. The research findings on problem-solving skills indicated that this skill was in the highest demand. The sub-skills that required the most development were the ability to adapt to problem-solving and flexibility. The findings were consistent with the World Economic Forum's (2020) report, which stated that complex problem-solving would be one of the most in-demand skills, especially by 2025. It also addressed the changing demands of the labor market, which was undergoing rapid transformation. Thus, developing complex problem-solving skills was seen as crucial for future work. Moreover, in accordance with in-depth interviews with aviation personnel, it was stated that

"...In my everyday work, various problems arise, and we must resolve them. I believe that problem-solving skills are essential for dealing with problems efficiently and appropriately. In addition, good problem-solving not only ensures smooth work processes but also builds passenger confidence and creates good relationships with colleagues..."
(AB4, personal communication, September 9, 2023)

This emphasized the importance of complex problem-solving skills in the aviation field. Additionally, research by Ayres and Malouff (2007) emphasized that systematic problem-solving skills can improve work efficiency, smooth work processes, and enhance positive emotions, job satisfaction, and life satisfaction among aviation employees.

Furthermore, the study found that students had the highest need for complex problem-solving skills development, which agreed with the research by Watthanabut (2020). This study examined the factors influencing the development of soft skills among Thai youth in the 21st century and found that one of the key skills Thai youths should develop is critical thinking and problem-solving skills, which are part of complex problem-solving.

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As a result, educational institutions were encouraged to focus on developing curricula and teaching activities that promoted these skills.

Ranking 2: Communication

The PNI$_{modified}$ score for communication ranged between 0.345 and 0.438. The result showed that students still lacked important communication skills, especially the ability to express complicated information and cooperate within a group. The result was consistent with studies by Phokao (2017) and Atama (2020), which studied the importance of soft skills for current and future work. Phokao (2017) studied the need for developing work and life skills (soft skills) for master's degree students and identified communication as one of the skills sought by employers. Atama (2020) studied soft skills on the successful performance of private company employees. According to the research results, communication skills, particularly technical and team communication, were identified as areas needing improvement. Additionally, effective communication skills are critical for aviation students, as emphasized by the research of Vieira and Santos (2010), which stated the significant role of communication plays in aviation work, particularly in managing high-pressure situations. Furthermore, the research by Ferreira and Gomes (2018) expressed that poor communication among aviation workers contributes to operational failures and poses high risks to aviation safety. Communication skills are crucial in aviation and significantly impact passenger satisfaction (Chinwongamorn, 2015). Therefore, aviation students must possess strong communication skills to work safely and effectively in various situations in the future.

Ranking 3: Leadership

The PNI$_{modified}$ score for leadership ranged between 0.318 and 0.369. The research findings indicated that students still needed to develop leadership skills in various areas, particularly in task delegation, problem management, decision-making in emergencies, and listening to others' opinions. This corresponds to the World Economic Forum's 2020 Future of Jobs Survey, which stated that the most in-demand soft skills by 2025 would include leadership (World Economic Forum, 2020). In aviation, leadership plays a critical role. Yeter and Konyalilar (2022) showed that participation in leadership improves ground staff performance. As a result, building leadership abilities can improve collaboration and understanding, both of which are essential for effective leadership and team success. In a study by Lee and Yun (2018), the research was conducted to provide helpful recommendations by analyzing the causal relationships between leadership quality and followership, as well as the positive impact of good leadership and followership models on job satisfaction and team commitment. This study suggested that in aviation roles, such as flight attendants, leadership skill development should consider the interchangeable roles of leading and following, based on the nature of flight attendants' work. The ability of flight attendants to adapt to both leadership and followership roles significantly influences job satisfaction and team commitment.

Ranking 4: Creativity

The PNI$_{modified}$ score for creativity ranged between 0.300 and 0.333. The analysis results regarding the necessity of developing creative thinking skills in students highlight the importance of enhancing the ability to think innovatively and creatively. Although the need to develop this skill ranked fourth in priority, its importance should not be overlooked. Insights from in-depth interviews showed the opinion that

> *"...creativity seems unnecessary in aviation work because everything follows regulations. However, if we look at it from another perspective, having good creative thinking in work can help manage various problems more effectively in unexpected situations...".*

(AB1, personal communication, September 9, 2023)

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In the fast-changing aviation industry, the ability to create new ideas is becoming increasingly important. As technology and innovation continue to develop, the industry faces challenges, such as adapting to changing customer behaviors or handling emergency situations. The need for creative thinking in accordance with future job trends was predicted by the World Economic Forum in the *Future of Jobs Survey 2020*, which highlighted creativity, originality, and initiative as key skills needed by 2025 (World Economic Forum, 2020). In the context of aviation, creativity serves as a key foundation for enabling effective problem-solving during emergency situations, as studied by Muñoz-Marrón, Gil, and Lanero (2018). Similarly, Abuan, Corpuz, Cruz, and Deles (2023) researched the role of ground staff at Manila International Airport and found that creative thinking skills have been utilized to manage disruptive passenger behavior. The researchers found that creativity is a critical competency for ground staff, particularly in handling situations involving unruly passengers. Therefore, creative skills are essential for ground staff. This is further supported by Kanlayanamit (2021), who studied the skills necessary in the post-COVID-19 era and concluded that creative and innovative thinking are considered essential for working after the pandemic.

Ranking 5: Teamwork

The $PNI_{modified}$ score for teamwork ranged between 0.266 and 0.393. The results indicated that students still need to develop teamwork skills in various areas, particularly in being flexible as both leaders and followers, taking responsibility for their tasks, collaborating with others, and adapting to and considering team members' opinions. Atama (2020) stated that teamwork played a key factor in contributing to work success. Additionally, the research supports Robles' (2012) study, which identified teamwork as one of the most important skills for career success, especially in an era where work is becoming more complex and requires

greater collaboration. In the aviation field, teamwork and collaboration are essential for flight attendants to perform their duties effectively (Wong & Neustaedter, 2017). Furthermore, aviation research suggested that comprehensive training to develop teamwork skills can improve the collaboration of teams from different departments within the aviation industry (Littlepage, Hein, Moffett, Craig, & Georgiou, 2016). In a study by Yang and Chou (2020), the researcher analyzed and identified the essential skills of airline ground service employees, highlighting teamwork as a critical factor in delivering quality service and effectively meeting passengers' needs. The study also recommended developing interdisciplinary curricula or courses that combine knowledge from various fields to help students acquire teamwork skills that align with the practical needs of the aviation industry.

Moreover, this research demonstrated the effectiveness of problem-based active learning in developing students' complex problem-solving skills within the aviation business context. Additionally, the findings of this research agreed with Savery and Duffy (1995) concept, which states that problem-based learning helps develop problem-solving abilities, especially in complex situations where there is no single correct answer. The significant improvement in students' complex problem-solving skills is also in accordance with the research of Strobel and van Barneveld (2009), which found that problem-based learning is highly effective in developing problem-solving skills and applying knowledge in actual situations.

Moreover, this research supports the ideas of Duch, Groh, and Allen (2001), who suggested that problem-based learning enhances the essential skills required for working in the 21st century, including complex problem-solving, critical thinking, and teamwork, which refer to all crucial skills to work in the aviation industry. Problem-based active learning is recommended as a

guideline to enhance students' soft skills. It demonstrated a positive impact on both lecturer and learners by increasing students' soft skills competency, especially complex–problem skills. Additionally, the active learning method contributes to engagement, motivation, and participation, making it an effective method for developing essential soft skills in students (Mohamad Ali, Mohamed, AbdulKarim, Ismail, & Aziz, 2022).

Recommendations

Recommendations for utilizing this research

1. Curriculum Development

The research findings should be used to improve and develop the aviation business management curriculum to utilize the essential soft–skill development needs of students. The focus should be on enhancing skills in complex problem–solving, communication, leadership, creativity, and teamwork. PBL activities should be incorporated into the curriculum to strengthen these skills necessary for working in the aviation industry.

2. Student Development Projects and Budget Design

According to the needs assessment, the most important soft skills for Chiang Mai Rajabhat University's Aviation Business Management students should be prioritized when designing extracurricular activities and student projects. The faculty can structure the budget to focus on developing the highest–ranking soft skills. This strategic approach optimizes budget allocation and enhances extracurricular programs, maximizing the return on investment in student development. Emphasizing these key soft skills will better prepare graduates to meet the changing demands of the aviation industry.

3. Lecturer Development

It could be providing lecturers with training in active learning techniques to improve students' soft skills.

4. Staff Training and Development in the Aviation Sector

These research findings can guide industry stakeholders to design effective training programs and professional development activities for policymakers.

Recommendations for Future Research

This study focused on soft skills in the aviation services sector and Aviation Business Management at Chiang Mai Rajabhat University. It may not fully represent soft–skill development across all aviation sectors and students. Further research is recommended to include a broader student population and explore soft–skill development across the entire aviation field.

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