International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 8 Issue 30 (June 2025) PP. 229-245
DOI: 10.35631/IJEMP.830017

INTERNATIONAL JOURNAL OF ENTREPRENEURSHIP AND MANAGEMENT PRACTICES (IJEMP)
www.ijemp.com

GLOBAL ACADEMIC EXCELLENCE

THE INFLUENCE OF SELF-EFFICACY ON CAREER COMPETENCY AMONG AIRCRAFT LINE MECHANICS IN JAPANESE LCCS: MEDIATING ROLE OF EXPERIENTIAL LEARNING

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Article Info:

Article history:
Received date: 02.04.2025
Revised date: 24.04.2025
Accepted date: 20.05.2025
Published date: 24.06.2025

To cite this document:

Oyabu, T., Baba Rahim, N., & Nor, C. S. M. (2025). The Influence Of Self-Efficacy On Career Competency Among Aircraft Line Mechanics In Japanese Lccs: Mediating Role Of Experiential Learning. *International Journal of Entrepreneurship and Management Practices, 8* (30), 229-245.

DOI: 10.35631/IJEMP.830017

Abstract:

The Japanese aircraft industry faces serious issues with competent aircraft mechanics due to business changes, reduced tacit knowledge learning, increased aircraft reliability, diversity of work values, and an unstructured development system. Therefore, this study examines the influence of self-efficacy on career competency among the aircraft line mechanics in Japanese Low-Cost-Carriers (LCCs), using experiential learning as a mediator. Based on the expertisation and adult learning theories, this study attempts to test 12 hypotheses concerning the relationships of self-efficacy, experiential learning, and career competency, emphasising the mediating role of experiential learning. Data was collected using an online survey of 284 respondents, and 220 usable responses were obtained (77%). In this regard, validity, reliability, and empirical accuracy were assessed using the Partial Least Squares Structural Equation Modelling (PLS-SEM). 8 hypotheses out of 12 were supported. The test result showed that self-efficacy positively influences on experiential learning, some dimensions of experiential learning positively influence on career competency, and some dimensions of experiential learning mediate between self-efficacy and career competency. The findings of this study have significant implications across methodology, theoretical, and practical perspectives. However, several limitations should be acknowledged, and these form the basis for future research directions.

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Keywords:

Aircraft Line Mechanics, Self-Efficacy, Psychological Empowerment, Experiential Learning, Career Competency

Introduction

Japan's aviation industry has significantly changed over the past 15 years since Japan Airlines filed for bankruptcy in 2011. In 2012, aviation policy was deregulated, resulting in the emergence of new airlines and competition between new and existing operators. Each airline expanded its route networks to increase foreign tourists (Ministry of Land Infrastructure Transport and Tourism, 2022). To expand their business and maintain safety operations, it is critical to have competent aircraft mechanics because this industry is labour-intensive. These aircraft mechanics are strictly governed by Japan's Civil Aeronautics Law which has certification criteria requiring a thorough knowledge of specific aircraft types and hands-on experience.

The airline industry in Japan is experiencing a severe shortage of competent aircraft mechanics, aggravated by changing service contexts and an ageing workforce. According to International Civil Aviation Organisation (2011), by 2037, Japan would face a demand for 18,206 aircraft mechanics, compared with just 11,724 in 2017, with newly 12,644 required to maintain the operational requirements. Another pressing issue is the ageing workforce, with over 50 % of Class 1 aircraft maintenance engineers approaching retirement in their late forties to mid-sixties (Ministry of Land Infrastructure Transport and Tourism, 2022, 2023). However, smaller teams reduce knowledge transfer and technological advances that minimise the maintenance required to limit hands-on learning, resulting in tacit knowledge loss. Moreover, generational differences in work values threaten collaboration and continuity of competency development. In addition, poorly coordinated and uneven skills-building efforts across organisations make it hard to develop competencies systematically. These issues require proactive structured approaches to maintaining a skilled workforce; this is essential for the successful continuation of the industry in the long term (Ministry of Land Infrastructure Transport and Tourism, 2022). The main objective of the study is to investigate the influence of self-efficacy on career competency mediated by experiential learning among aircraft line mechanics in Japanese Low-Cost-Carriers (LCCs). Therefore, the study focuses on the following research objectives:

1. Does self-efficacy influence experiential learning among aircraft line mechanics in Japanese LCCs?
2. Does experiential learning influence career competency among aircraft line mechanics in Japanese LCCs?
3. Does experiential learning mediate the relationship between self-efficacy and career competency among aircraft line mechanics in Japanese LCCs?

The finding of this study provides methodological, theoretical and practical implications regarding the influence of self-efficacy on career competency and the mediating role of experiential learning between self-efficacy and career competency among aircraft line mechanics in Japanese LCCs. More specifically, it outlines the potential influence of self-efficacy on career competency with the mediating role of experiential learning: a potent way of developing employee human resources (Nadler & Nadler, 2012). This study is theoretically based on the '10-Year Rule' (Ericsson et al., 1993) and 'intellectual skill theory' (Koike, 2005), emphasising structured skill acquisition. Practically, this study also helps LCCs improve

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training systems, promotes employees studying throughout their careers, and leads educators in aviation vocational training to tailor programs to meet industry needs.

Literature Review

Self-Efficacy

Psychological empowerment is an important part of career development, competency and performance in work and education environments. Traditional theories emphasise on experience as key to expertise (Ericsson et al., 1993) yet emphasise deliberate practice, while Smith & DeFrates-Densch (2009) emphasise motivation and autonomy as key to self-directed adult learners. According to Thomas & Velthouse (1990) and Spreitzer (1995), psychological empowerment comprises four dimensions: meaning, self-efficacy, self-determination and impact. Founded on the principles laid forth by Deci et al. (1989) and supported by Ryan & Deci (2000), these dimensions coalesce to increase intrinsic motivation, which means the absence of any dimension will dilute motivation, leading to decreased empowerment.

Self-efficacy means the belief that one can do things well and accomplish what one wants to do. It grows in skill and efficacy (Bandura, 1982; Gist, 1987) and is associated with leadership, career advancement, and performance on the job. It boosts motivation, resilience, and productivity (Luthans et al., 2007) a core variable for psychological empowerment (Spreitzer, 1995). Bandura (1982) listed four sources: active mastery, role model observation, verbal persuasion and physiological states. This confidence, versatility, and involvement that results from high self-efficacy translate to better empowerment and success in the workplace.

Experiential Learning

The relationship between experience, adult learning, and leader development is embedded in the educational philosophy of John Dewey, which holds that meaningful learning emerges from interactions between the individual and their experiences/environment (Dewey, 1997). Adults reflect on their learning to use it in the future or build on what they already have learned, as reflection links what they have learned and will still learn (Boud, 1994). McCall et al. (1988) focus on 'quantum leap experiences'—significant events that can hugely propel the arc of growth of their personal and professional lives. These challenging experiences influence self-awareness, worldviews and behaviour in ways formal schooling does not. According to McCall (1998), the most effective leadership development happens in less formalised settings, where leaders experience pivotal career moments.

Concrete experience is the basis for meaningful learning according to Kolb's (1984) experiential learning theory, and it requires direct multisensory interaction (Konak et al., 2014). So, high-quality experience matters, as reflection transforms sensory input into experience into actionable knowledge (Rodriguez, 2020; Zull, 2006). Reflective observation provides an opportunity for critical discussion and analysis of those experiences, which serves to deepen understanding (Konak et al., 2014). This is where abstract conceptualisation comes in, allowing learners to generalise experiences — but it may be impeded through cognitive overload (Sweller, 1988). In high-stakes domains, such as medicine and aviation, active experimentation is the most impactful of learned theories when applied in actual and simulated environments (Bradley, 2006).

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Career Competency

As Ahmad et al. (2019) defined, career competency includes the knowledge, skills, attitudes and behaviours required for professional success. It includes self-awareness, goal setting, networking, lifelong learning, and transition resilience. Higher-order intellectual skills, including problem-solving, creativity and adaptability, complement technical knowledge, especially in knowledge-based labour markets (Koike, 2005). The network reinforces academic and vocational skills by exchanging enterprises and resources (Arthur, 1994). Firms promote job-related expertise through career development, training and education, which increases employee productivity, agility and innovation to remain competitive.

Hypotheses Development

Self-Efficacy and Experiential Learning

Through a creative storytelling workshop aimed at building self-confidence and trust among adolescents, Rizzi et al. (2020) found that self-efficacy enhances engagement at all stages of experiential learning, from active participation in concrete experiences to reflective observation, abstract conceptualisation and active experimentation. Therefore, the following hypotheses are proposed:

H1a: Self-efficacy has a positive influence on concrete experience among aircraft line mechanics in Japanese LCCs.
H1b: Self-efficacy has a positive influence on reflective observation among aircraft line mechanics in Japanese LCCs.
H1c: Self-efficacy has a positive influence on abstract conceptualisation among aircraft line mechanics in Japanese LCCs.
H1d: Self-efficacy has a positive influence on active experimentation among aircraft line mechanics in Japanese LCCs.

Experiential Learning and Career Competency

Waheed & Waseem (2023) found that concrete experience and abstract conceptualisation promote adaptive competencies (e.g., clinical reasoning, problem-solving, professional grooming) among medical students. Through a literature review on reflective learning in nursing, Uswahzulhasanah & Arofiati (2021) found that health students showed that reflective practice significantly improved critical thinking and problem-solving skills and explained that these skills are essential for professional competence in the health professions. Skaltsa et al. (2022) demonstrated that active experimentation has a positive impact on the economic formation of students and recommended that students have the opportunity to implement skill development for their profession through active participation in sustainable agriculture projects. Therefore, the following hypotheses are proposed:

H2a: Concrete experience has a positive influence on career competency among aircraft line mechanics in Japanese LCCs.
H2b: Reflective observation has a positive influence on career competency among aircraft line mechanics in Japanese LCCs.
H2c: Abstract conceptualisation has a positive influence on career competency among aircraft line mechanics in Japanese LCCs.
H2d: Active experimentation has a positive influence on career competency among aircraft line mechanics in Japanese LCCs.

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Mediating Effect of Experiential Competency

Previous studies found that the self-efficacy of psychological empowerment positively influences experiential learning (Rizzi et al., 2020). On the other hand, other studies demonstrated that experiential learning has a positive influence on career competency (Skaltsa et al., 2022; Uswahzulhasanah & Arofiati, 2021; Waheed & Waseem, 2023). Therefore, the following hypotheses are proposed:

H3a: Concrete experience mediates the relationship between self-efficacy and career competency among aircraft line mechanics in Japanese LCCs.
H3b: Reflective observation mediates the relationship between self-efficacy and career competency among aircraft line mechanics in Japanese LCCs.
H3c: Abstract conceptualisation mediates the relationship between self-efficacy and career competency among aircraft line mechanics in Japanese LCCs.
H3d: Active experimentation mediates the relationship between self-efficacy and career competency among aircraft line mechanics in Japanese LCCs.

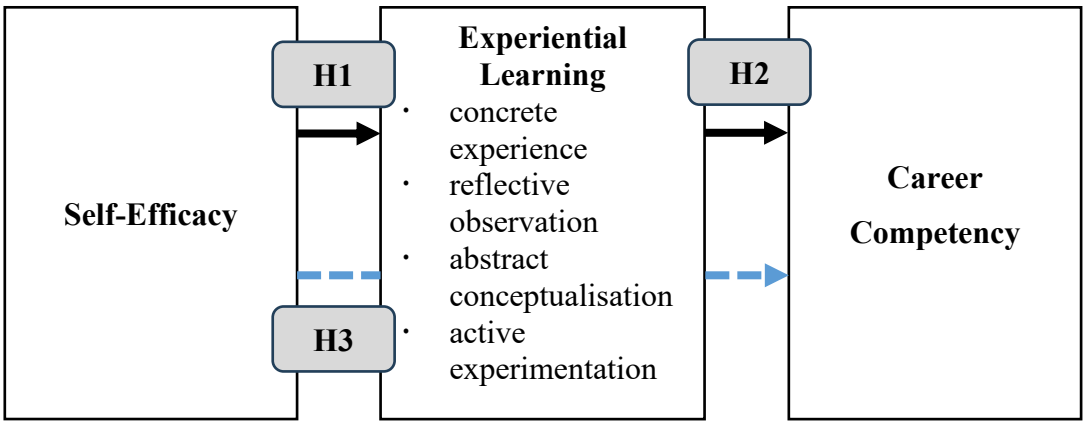

Figure 1: Conceptual Framework

Methods

Research Design and Sampling

Self-reporting is one of the most substantial measures of personality and behaviour (Schwarz & Oyserman, 2001). This is particularly relevant for measuring subjective criteria such as psychological empowerment. Validated scales were used, and a pre-test was run to ensure validity, the latter can be considered the limit of the study. Podsakoff et al. (2003) provide examples of how the anonymity of participants reduces bias and improves rating scales.

This study focuses on the aircraft mechanics of Japanese LCCs, including active certifying staff and inactive mechanics working in technical support or managerial roles. While 405 were reported in FY2023 LCC safety reports, the pre-surveys estimated 450 LCC active mechanics considering the inactive mechanics. Adhering to the recommendations of Roscoe (1975) and Asenahabi & Peters (2023) regarding the focus on accuracy, a minimum sample size was determined to be 208 using a 95% confidence level, ±5% precision, and a population proportion of 0.5 for representativity.

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The survey was conducted against active certifying personnel and inactive mechanics. That is important to ensure the validity of the data with a clear focus on participants on line mechanics who had already worked in Japanese LCCs for at least three years, as well as in prior roles as aircraft line mechanics and certifying staff. LCCs are characterised based on operation and maintenance policy (e.g., fleet size and level of maintenance outsourcing). This guarantees compliance with the purpose of the research, which is to evaluate the self-efficacy, experiential learning and career competency of aircraft line mechanics.

This study utilised purposive sampling to achieve the objectives of this study because a non-probability method was suitable for eliciting valuable data considering the specificity of the population (Palinkas et al., 2013; Tongco, 2007). Although selection bias is a limitation of the study, we adopted clearly defined inclusion criteria to produce valid and reliable findings (Patton, 2015; Tongco, 2007), thereby minimising subjectivity in selecting study participants.

Data Collection Procedure

The survey was conducted through SurveyMonkey for selected participants. Each participant received a consent form, instructions, and survey sheet from the representatives from selected LCCs. Respondents had four weeks to answer the survey, with reminders halfway through the period. The questionnaire employed in this study was suitable for quantitative research since it could help systematically summarise the information collected for analysis to determine potential relationships (Kabir, 2016). Established scales from prior research were employed to assess critical variables: self-efficacy of psychological empowerment (Spreitzer, 1995), which uses three items; experiential learning (Kimura et al., 2011), which comprises four items each for concrete experience, reflective observation, abstract conceptualisation, and active experimentation; and career competency (Ahmad et al., 2019), which encompasses sixteen items. Participants evaluated all topics using a 5-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree").

Data Analysis Technique

SEM (Structural Equation Modelling) validates and confirms the measurement model, ensuring it is reliable and providing a solid basis for strong results. Ensuring observed variables accurately demonstrate numbered theoretical constructs, is vital before proceeding to structural relationships analysis (Hair et al., 2019). Assessment is closely tied to validity and reliability. An important aspect of this is validity, which refers to whether the model measures what it is supposed to measure with a high degree of convergent validity (meaning that the correlations between indicators of the same construct) and the extent to which different constructs are empirically distinct (discriminant validity). Reliability measures the consistency of the indicators, usually reported using adjusted Cronbach's alpha or composite reliability to guarantee that the indicators consistently measure a particular construct.

In SEM, path coefficients evaluate the strength and significance of variables' interactions with numbers between -1 and +1. So, the absolute value determines the strength, which is more significant in the positive coefficients that show a positive relationship and in the negative coefficients a negative relationship (Hair et al., 2019). So now, these coefficients can be used for hypothesis testing where we can check the statistical significance through p-values/ confidence intervals. Direct, indirect (mediated), and total effects of path coefficients in the original path model can be expressed and will thus reveal even more specifics about direct and indirect relationships in the model. They are essential for evaluating causal relationships, identifying meaningful contributors, and encouraging theoretical development in SEM.

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Results

Profile of Respondents

The survey aimed at 284 aircraft mechanics, with a response rate of 77 % (220 replies), which is considered outstanding in a controlled setting. The sample of aircraft mechanics was overwhelmingly male (97.3%), 1.8% female, and 0.9% preferred not to say. Most workers were middle-aged, with the most significant number in each age group in order of size being 50-59 (29.5 %), 30-39 (29.1 %) and 40-49 (264 %). Vocational qualifications were common (68.6% of the respondents), but fewer had tertiary qualifications. The work experience of the respondents was variable, with 38.6% having 10-19 years and 30.9% having 30+ years. There was pronounced career mobility, with 42.7 % working in two companies.

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Table 1: Demographic of the Respondents

		Frequency	Percent
Gender	Male	214	97.3
	Female	4	1.8
	Prefer Not to Say	2	0.9
	Total	220	100.0
Age	Under 30	7	3.2
	30 and over, but under 40	64	29.1
	40 and over, but under 50	58	26.4
	50 and over, but under 60	65	29.5
	Over 60	26	11.8
	Total	220	100.0
Educational Background	Junior high school	0	0.0
	High school	20	9.1
	Vocational school	151	68.6
	Technical college or junior college (associate degree)	18	8.2
	University (bachelor's degree)	29	13.2
	Graduate school (master's degree)	2	0.9
	Graduate school (doctor degree)	0	0.0
	Total	220	100.0
Years of experience as an aircraft mechanic	Under 10 years	15	6.8
	10 years and over, but under 20 years	85	38.6
	20 years and over, but under 30 years	52	23.6
	30 years and over	68	30.9
	Total	220	100.0
Number of companies worked as an aircraft mechanic	1 company	70	31.8
	2 companies	94	42.7
	3 or more companies	56	25.5
	Total	220	100.0

Data Analysis

Data was analysed using SEM test using SmartPLS. In the first place, the measurement model was performed to get the values of outer loading, Cronbach alpha values (Alpha), Composite reliability (CR), average variance extracted (AVE) and Heterotrait-Monotrait (HTMT) ratio. In addition, discriminant validity and correlation analysis were conducted to examine the theoretical model. In addition, common method bias was applied, including variance inflation factor (VIF), coefficient of determination (R2), predictive relevance (Q2) and Goodness of Fit (GoF).

Assessment of Measurement Model

This study verifies that the reliability and validity of the measurements exceed acceptable criteria. The outside loadings exceeded 0.50, indicating the indicator's dependability. Cronbach's alpha scores ranged from 0.741 to 0.927, indicating substantial internal consistency, but Hair et al. (2019) warn that values of more than 0.9 may indicate redundancy. For the first-order constructs, CR values were between 0.773 and 0.935, indicating the minimum value of 0.7 was obtained for established scales and exploratory studies, and the 0.6–0.7 range was obtained. All AVEs were above the 0.5 threshold, thus confirming adequate convergent validity. The results confirm that the model retains high reliability.

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Table 2: Measurement Model

Latent	Items	Outer Loadings	Alpha	CR	AVE
Self-Efficacy	PE_SE_1	0.923	0.886	0.887	0.814
	PE_SE_2	0.91			
	PE_SE_3	0.873			
Concrete Experience	EL_CE_1	0.538	0.741	0.819	0.568
	EL_CE_2	0.882			
	EL_CE_3	0.848			
	EL_CE_4	0.698			
Reflective Observation	EL_RO_1	0.865	0.863	0.867	0.71
	EL_RO_2	0.891			
	EL_RO_3	0.823			
	EL_RO_4	0.788			
Abstract Conceptualisation	EL_AC_1	0.52	0.741	0.773	0.58
	EL_AC_2	0.804			
	EL_AC_3	0.883			
	EL_AC_4	0.789			
Active Experimentation	EL_AE_1	0.823	0.893	0.896	0.758
	EL_AE_2	0.857			
	EL_AE_3	0.922			
	EL_AE_4	0.878			
Career Competency	CC_1	0.668	0.927	0.935	0.51
	CC_2	0.779			
	CC_3	0.791			
	CC_4	0.76			
	CC_5	0.735			
	CC_6	0.619			
	CC_7	0.761			
	CC_8	0.687			
	CC_9	0.773			
	CC_10	0.74			
	CC_11	0.679			
	CC_12	0.679			
	CC_13	0.674			
	CC_14	0.629			

Assessment of Discrimination Validity

According to Hair et al. (2019), less than 0.90 is accepted in some circumstances; otherwise, the HTMT ratio is smaller than 0.85, and discriminant validity is discovered. In this study, the HTMT ratios were all less than 9.0.

Table 3: Discrimination Validity (HTMT Ratio)

	CC	EL_AC	EL_AE	EL_CE	EL_RO	PE_SE
CC						
EL_AC	0.617					
EL_AE	0.498	0.893				
EL_CE	0.657	0.684	0.599			
EL_RO	0.459	0.779	0.752	0.638		
PE_SE	0.532	0.537	0.434	0.452	0.452	

Assessment of Structural Model

The robustness of this study was assessed by multicollinearity, explanatory power, predictive relevance, and model fit. Theoretically, 5 or less is ideal, and those higher than 5 reflect

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multicollinearity issues (Hair et al., 2019). 2 of the 33 VIF values were over 5 (maximum 6.883) but below 10, so these were retained in this study. Values of R2 range between 0 and 1, while 0.75 indicates strong explanation power, 0.50 moderate explanation power, and 0.25 or less weak explanation power (Hair et al., 2019). Although the majority of the R2 values obtained in this study were lower than 0.25, thus pointing to some limited explanatory power, it should be highlighted that in disciplines such as psychology, even lower values of R2 (e.g., 0.10) can be considered informative (Falk & Miller, 1992). Regarding Q2, 0.002 is minimum predictive relevance and 0.15 is mid-predictive relevance. In this study, most Q2 values are between 0.126 and 0.207, indicating some predictive relevance. Finally, the model fit was appropriate, with the GoF index of 0.369, indicating an oversized fit exceed 0.36 (Tenenhaus et al., 2008).

Table 4: Structural Model

	VIF	R2	Q2	GoF
CC	1.752 – 6.883	0.436	0.207	0.368
EL_AC	1.156 – 2.085	0.188	0.176	
EL_AE	2.017 – 3.588	0.149	0.139	
EL_CE	1.179 – 1.948	0.147	0.133	
EL_RO	1.756 – 3.137	0.137	0.126	
PE_SE	2.136 – 3.139	---	---	

Hypothesis Test

Firstly, 4 hypotheses concerned the influence of self-efficacy on concrete experience, reflective observation, abstract conceptualisation and active experimentation, and all four hypotheses (H1a, H1b, H1c, and H1d) were supported. Secondly, 4 hypotheses concerned the influence of concrete experience, reflective observation, abstract conceptualisation and active experimentation on career competency, and 2 hypotheses (H2a and H2c) were supported. Finally, 4 hypotheses were concerned with the mediating role of concrete experience, reflective observation, abstract conceptualisation and active experimentation between self-efficacy and career competency, and two hypotheses (H3a and H3c) were supported.

Table 5: Hypothesis Test

Hypotheses	Statistical Paths	Path Coefficient (β)	Standard Deviation	t values	p values	Decisions
H1a	PE_SE -> EL_CE	0.383	0.062	6.161	0	Supported
H1b	PE_SE -> EL_RO	0.37	0.062	5.953	0	Supported
H1c	PE_SE -> EL_AC	0.433	0.058	7.438	0	Supported
H1d	PE_SE -> EL_AE	0.386	0.066	5.814	0	Supported
H2a	EL_CE -> CC	0.428	0.087	4.948	0	Supported
H2b	EL_RO -> CC	0.003	0.083	0.036	0.486	Not Supported
H2c	EL_AC -> CC	0.22	0.086	2.548	0.005	Supported
H2d	EL_AE -> CC	0.121	0.094	1.288	0.099	Not Supported
H3a	PE_SE -> EL_CE -> CC	0.164	0.04	4.056	0	Supported
H3b	PE_SE -> EL_RO -> CC	0.001	0.031	0.035	0.486	Not Supported
H3c	PE_SE -> EL_AC -> CC	0.095	0.042	2.248	0.012	Supported
H3d	PE_SE -> EL_AE -> CC	0.047	0.04	1.177	0.12	Not Supported

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Discussion

Self-Efficacy and Experiential Learning

4 hypotheses concerned the influence of self-efficacy on concrete experience, reflective observation, abstract conceptualisation and active experimentation, and all 4 hypotheses (H1a, H1b, H1c, and H1d) were supported. The finding of this study indicates that self-efficacy has a positive influence on experiential learning among aircraft line mechanics in Japanese LCCs. Mechanics with high self-efficacy learn by doing, taking more risks, and persevering in challenging contexts (Kolb, 1984). Self-efficacy promotes problem-solving and cognitive adaptability, which underlines the need for structured on-the-job training, simulation-based learning and feedback on performance. The increase in the self-efficacy of mechanics can lead to an increase in mechanics' engagement in the approachable organisational learning process, according to this study. Mechanics with more autonomy are more likely to reflect on their work reflexively, develop cognitive problem-solving techniques, and adapt (Seibert et al., 2011; Spreitzer, 1995). Empowered employees take ownership and challenge the status quo (Conger & Kanungo, 1988), which aligns with this supposition. Mentorship and feedback mechanisms further bolster self-efficacy within high-stress LCC settings, resulting in enhanced safety performance and operational efficiency. The results also provide evidence of self-efficacy enhancing higher-order thinking as mechanics utilised practical experiences to facilitate conceptual learning. They facilitate a learning culture that embraces innovation and fosters active experimentation and reflection. Interventions, feedback, and mentorship are all keys to developing self-efficacy and creating an atmosphere of collaboration and sharing knowledge (Kolb & Kolb, 2005). Self-efficacy-based learning ultimately develops the organisational resilience necessary for the implementation strategy of aircraft maintenance operations to be both safer and more effective. Potential insights of this study can contribute to workforce development for LCCs aiming towards operational excellence.

Experiential Learning and Career Competency

4 hypotheses concerned the influence of concrete experience, reflective observation, abstract conceptualisation and active experimentation on career competency, and 2 hypotheses (H2a and H2c) were supported. The finding of this study affirms that concrete experience and abstract conceptualisation dimensions of experiential learning have a positive influence on career competency among aircraft line mechanics in Japanese LCCs. Hands-on learning developed with structured in-house training, job rotations, and work simulations (Kolb & Kolb, 2005; Kolb, 1984) helps develop career competency (experience). Integrating experiential learning into career development frameworks, such as mentorship and feedback systems, enhances professionalism and operational safety (Hall et al., 2004). In strictly controlled, time-sensitive maintenance settings, the function of reflective observation is restricted. While contemplation may cultivate significant abilities (Eraut, 2004; Schön, 1983), organised interventions, like debriefings and mentorship programs, are essential to realising its advantages (Boud et al., 1985). To optimise this effect, LCCs should include systematic reflection processes and cultivate essential abilities, such as abstract conceptualisation, that foster self-education, critical thinking, and adaptive problem-solving (Waheed & Waseem, 2023). LCCs may provide cognitive improvement instruments, including interdepartmental information exchange and training frameworks, to foster conceptual intellectualisation and career advancement using LCCs (Kolb, 1984). The active experimentation stage is limited by some constraints, such as regulatory requirements around safety, but structured experimentation (e.g. controlled pilot programs and innovation initiatives) can help balance

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compliance with personal capability development (Billett, 2010; Kolb, 1984). LCCs formalise their risk-taking approaches, enabling them to learn and be operationally efficient.

Mediating Effect of Experiential Competency

4 hypotheses were concerned with the mediating role of concrete experience, reflective observation, abstract conceptualisation and active experimentation between self-efficacy and career competency, and 2 hypotheses (H3a and H3c) were supported. The finding of this study demonstrated the mediating role of concrete experience and abstract conceptualisation in the relationship between self-efficacy and career competency and no mediating role for reflective observation and active experimentation. Self-efficacy significantly improves participation in concrete experiences, enabling mechanics to cultivate problem-solving, confidence and technical skills through experiential learning (Rizzi et al., 2020; Waheed & Waseem, 2023). Mechanics with high levels of self-efficacy actively engage in maintenance tasks and improve their professional skills. Practical experience influences the relationship between self-efficacy and career competency, highlighting the need for organised on-the-job training, peer mentoring and cross-functional exposure to facilitate sufficient competence development. In contrast to previous research, this study did not find a significant mediating influence of reflective observation. Due to strict safety standards and time constraints, mechanics prioritise task completion over systematic thinking (Bakker & Demerouti, 2007). Japanese LCCs should use planned debriefings, peer mentoring, and structured reflection to leverage the advantages of reflective learning. Self-efficacy enhances abstract conceptualisation, enabling individuals to convert experiences into organised learning (Kolb & Kolb, 2005). Skilled mechanics employ advanced cognitive processes, improving problem-solving strategies and advancing professional growth. Unexpectedly, active experimentation did not serve as a mediator in the association between self-efficacy and career competency. The strict procedural rules in aviation maintenance limit learning by trial and error (Seibert et al., 2011). Structured simulation-based training and regulated experimental environments provide safe avenues for innovation.

Implications

Methodology Implication

The study presents a comprehensive framework for the influence of self-efficacy on career competency, mediated by experiential learning. Using a mixed methods approach and advanced statistical techniques such as SEM, this study provides a replicable methodology for investigating similar phenomena in other sectors or regions. The inclusion of specific constructs such as self-efficacy, alongside the experiential learning dimensions of concrete experience, reflective observation, abstract conceptualisation and active experimentation, facilitates a nuanced analysis of career competency development. Furthermore, by focusing on the aviation industry and aircraft line mechanics in Japanese LCCs, a research model is created focused on a specific theme. This methodological approach underlines the need to customise research techniques to meet the special demands and requirements of a profession of great technical and safety relevance. Future studies should widen this paradigm to investigate more mediating elements and the long-term consequences of experiential learning on professional growth.

Theoretical Implication

This study clarifies career competency development by combining self-efficacy in psychological empowerment and experiential learning. It supports and expands current ideas in technical professions such as aviation maintenance, including Kolb's experiential learning

International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 8 Issue 30 (June 2025) PP. 229-245
DOI: 10.35631/IJEMP.830017

theory and Spreitzer's psychological empowerment framework. The study investigated the mediating role of experiential learning in translating organisational and individual attributes into tangible career competency. The finding of the study contributes to theoretical discussions on the mechanisms through which structured and reflective learning processes drive competency acquisition. Furthermore, investigating empowerment dimensions, such as self-efficacy, in the cultural and organisational context of Japanese LCCs provides novel insights into the dynamics of career development.

Practical Implication

To LCC employers

The finding offers a guideline for designing and improving human resource development systems in Japanese LCCs. Employers can build psychological empowerment by enhancing supportive leadership and assigning meaningful work that enhances experiential learning.

To LCC employees

This study highlights that the individual should become genuinely engaged in learning. Employees are advised to practice reflectively, accept difficult work, and use the learning and growth opportunities offered by the organisation for their professional advancement. With the significance of self-efficacy, employees can be more active in their career trajectory and be resilient and adaptive to differences especially in the ever-evolving airline industry.

To aviation educators

This study offers significant information for matching industrial needs with educational initiatives. Training organisations and educational institutions are urged to incorporate experiential learning approaches into their courses and deepen cooperation with LCCs. Encouragement of industry-academia relationships and a legislative environment that supports aviation sector workforce development and talent transfer would help these initiatives.

Limitations and Suggestions for Future Research

Limitations

This study is limited because it only applies to Japanese LCCs, which are governed by a unique regulatory, cultural and organisational environment. Thus, the results might not necessarily extend to other areas of the airline industry, significantly where processes for certifying systems, corporate organisation structures and cultural norms vary. Additionally, the cross-sectional design, which is based on data collection at a single point in time, restricts the analysis to correlational results. This adds difficulty to the empirical analysis of the causal relationships of self-efficacy, experiential learning and career competency.

Self-reported data is another issue that deals with the facts. This method carries the risk of bias related to social desirability and self-enhancement. While validity and reliability could be considered through a mixed method approach, the self-report survey method may still result in bias from misinterpretation of survey questions and preference selection. In addition, although these factors were not included in the analysis, external factors such as the economy, technology development and policy reforms can significantly impact experiential learning and career competency opportunities. Addressing these issues would raise the overall reliability of this study.

International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 8 Issue 30 (June 2025) PP. 229-245
DOI: 10.35631/IJEMP.830017

Finally, although the potential mediating role of experience learning was examined, none of the potential moderating variables included organisational size, team dynamics, or leadership style. As they contribute to extending the perception of self-efficacy, this factor points to more contextual courses and relationships to be explored.

Suggestions for Future Research

Future research might extend the current work by making similar comparisons in other locations, sectors or organisational settings to assess whether the findings will prove relevant when scaled in this way. Moreover, qualitative methodologies (for example, through interviews or case studies) beyond the quantitative ones could contribute to building a holistic view of the complexity of experiential learning and career development. Other variables (e.g., team dynamics, organisational culture, or leadership style) impacting the relationships explored in this study should be examined in future research. Lastly, assessing individual diversity (e.g., personality traits, learning styles, and motivations) could help specify customised training programs for a particular population.

Conclusion

This study examined the influence of self-efficacy on career competency, mediated by experiential learning, among aircraft line mechanics in Japanese LCCs. The result emphasises the essential part experienced learning plays as a mediator turning organisational and personal elements into improved career competency. Through investigating the self-efficacy of psychological empowerment, the study emphasises the need of creating an environment that fosters ongoing education and professional growth.

By verifying and extending accepted frameworks, such Kolb's experiential learning theory and Spreitzer's psychological empowerment framework, inside the setting of technical and safety-critical professions, the study offered important theoretical advances. The empirical result of this study provides relevant insights not only in the aviation industry but also in other sectors facing similar labour challenges since they support the interaction between systematic learning processes and career skill development.

Notwithstanding these contributions, the study notes some limits including its emphasis on Japanese LCCs, dependence on self-reported data, and omission of outside variables. These constraints draw attention to chances for future research to expand the discipline, including investigating the possibilities of developing new technologies in experiential learning, using longitudinal designs, and reaching research to many settings.

Finally, this study demonstrated the connections between self-efficacy and experiential learning, therefore advancing the debate on the development of career competency. By addressing important gaps and offering pragmatic ideas, the study adds to theoretical knowledge and offers stakeholders with actionable methods to build a strong and capable workforce in the aviation sector and beyond.

Acknowledgements

First and foremost, I would like to express my sincere gratitude to all individuals and institutions who have supported me throughout the course of this research project. I wish to extend my deepest appreciation to Global Academic Excellence (M) Sdn Bhd for their generous support through the Publication Grant Scheme, which was instrumental in the successful completion and publication of this work. Their dedication to promoting academic

International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 8 Issue 30 (June 2025) PP. 229-245
DOI: 10.35631/IJEMP.830017
research and supporting scholars is truly commendable, and I am profoundly grateful for their invaluable contribution. I am also thankful to my academic supervisors, colleagues, and family for their unwavering guidance, encouragement, and understanding throughout this journey.

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