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Exploring Aviation English Teacher Preparedness: Scale Validation and Structural Equation Modeling

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Abstract
As the global aviation industry increasingly relies on English for safety and operational efficiency, the demand for qualified Aviation English instructors continues to grow. However, preparing teachers to deliver this highly specialized form of English for Specific Purposes (ESP) poses unique pedagogical and psychological challenges. This study explores the preparedness of TEFL students for teaching Aviation English by examining six interrelated constructs: extrinsic motivation, mastery experience, vicarious experience, anxiety, emotional state, and institutional preparedness. Grounded in Self-Efficacy Theory and Self-Determination Theory, data were collected from 368 TEFL students at two private universities in Almaty, Kazakhstan and analyzed using Structural Equation Modeling. The results revealed that extrinsic motivation significantly enhances mastery experience and reduces anxiety, while institutional preparedness positively predicts both mastery and vicarious experiences. Moreover, mastery experience strongly influences emotional state, which in turn reinforces extrinsic motivation. Anxiety negatively impacts emotional state but is mitigated by institutional support. These findings suggest that both psychological and institutional factors jointly shape teachers' confidence and readiness for Aviation English instruction. The study highlights the importance of targeted professional development in ESP contexts, especially in non-Anglophone countries.

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Introduction

The aviation industry is a globalized sector where effective communication in English is essential for ensuring safety, efficiency, and seamless operations (Alharasees et al., 2023). Aviation English, a specialized subset of English for Specific Purposes (ESP), is designed to meet these critical communication needs, particularly for pilots, air traffic controllers, and other aviation professionals (Azhar, 2024; Kim & Friginal, 2026).

According to the regulations of the International Civil Aviation Organization, English proficiency is assessed via the following criteria: pronunciation, structure, comprehension, vocabulary, fluency, interactions, and evaluated on a scale from 1 to 6 with 4 being the minimum requirement (ICAO, 2022). Interestingly, so-called "native speakers" are assumed to be at level 6 (Kim, 2026, p.1) and exempt from taking the test called English Language Proficiency for Aeronautical Communication (ELPAC). This exemption implicitly reinforces the perception that non-native English speakers are more likely to experience communicative limitations, positioning linguistic competence as closely tied to nativeness rather than to specialized training and operational experience. This phenomenon, coined by Holliday as "native-speakerism" (2005), is widely affecting EFL instructors as well (Llurda & Calvet-Terré, 2025) and still remains one of the most controversial issues to tackle (Kamali et al., 2024), especially in non-Anglophone countries such as Kazakhstan (Hajar, 2026).

As the demand for Aviation English proficiency grows (Anayatova et al., 2024; Estival, 2025), so does the need for qualified instructors capable of teaching this highly specialized form of English (Demirdöken, 2021; Dumdumaya, 2025; Rochmawati et al., 2023). However, preparing non-native teachers to instruct Aviation English presents unique challenges that extend beyond general language teaching competencies (Dumdumaya, 2026; Mahmood et al., 2023).

We believe that teacher preparedness in Aviation English is influenced by a variety of psychological and institutional factors, including motivation, self-efficacy, anxiety, emotional well-being, and institutional support. Grounded in Self-Efficacy Theory (Bandura, 1997) and Self-Determination Theory (Ryan & Deci, 2020), this study seeks to explore how these factors interact to shape teachers' readiness for Aviation English instruction. Self-Efficacy Theory emphasizes mastery experiences and vicarious learning to build confidence, while SDT highlights extrinsic motivation, such as career advancement, in driving goal achievement (Gagné et al., 2022). Examining the impact of these factors on future TEFL teachers' intention to pursue Aviation English instruction may offer a more nuanced understanding of how both individual and institutional elements influence teachers' preparedness and willingness to engage in this specialized field.

Thus, this study aims to address the following questions:

RQ$_1$: How do extrinsic motivation and institutional preparedness influence teachers' mastery experiences and vicarious learning?
RQ$_2$: What role does anxiety play in shaping teachers' emotional states and overall readiness?
RQ$_3$: How can institutions better support teachers willing to engage in Aviation English?

To answer these questions, we propose a structural equation model (SEM) that examines the relationships between six constructs: extrinsic motivation (EM), mastery experience (ME), vicarious experience (VE), anxiety (ANX), emotional state (ES), and institutional preparedness (IP). By validating a newly developed scale tailored to assess Aviation English teacher preparedness and testing the proposed structural equation model, this study seeks to make both theoretical and practical contributions. Theoretically, it advances our understanding of teacher development in ESP contexts by integrating self-efficacy and motivational frameworks. Practically, it offers actionable insights for higher educational institutions on how to enhance teacher readiness through targeted interventions such as professional development programs, curriculum alignment, and emotional support mechanisms. We believe that the findings of this research have implications not only for Aviation English instruction but also for broader ESP teaching contexts where specialized knowledge and skills are required, not only in Kazakhstan, but also in other non-Anglophone countries.

Theoretical Framework and Hypotheses Development

Self-Efficacy Theory and its Limitations in ESP Teacher Training

Self-Efficacy Theory states that individuals' confidence in their ability to perform tasks successfully is influenced by mastery experiences, vicarious learning, social persuasion, and physiological states (Bandura, 1997). In EFL teacher education, self-efficacy plays a crucial role in instructional practices, classroom management, and student engagement (Lu & Mustafa, 2021). However, despite its broad applicability, this theory has limitations when applied to ESP teacher training, particularly in Aviation English instruction. One major critique is that self-efficacy is often domain-specific and does not always transfer across teaching contexts (Yim, 2023). According to Emery (2021), the challenge lies in bridging the gap between aviation expertise and language instruction, requiring a delicate balance of technical accuracy and language clarity to ensure effective aviation English teaching. In Aviation English, instructors must be familiar with technical terminology, which is often beyond their linguistic training. These differences can result in inflated self-efficacy beliefs that may not translate into effective teaching performance. Moreover, self-efficacy is mostly influenced by prior experience (Davis et al., 2000), but many TEFL-trained instructors lack exposure to Aviation English before entering ESP instruction (Demirdöken, 2021). This limitation suggests that while self-efficacy can predict teacher preparedness in general language instruction (Fu & Wang, 2021), it may be insufficient in evaluating preparedness for specialized teaching without complementary training in subject-matter expertise.

Self-Determination Theory: Strengths and Critiques in ESP Teacher Training

Self-determination theory (SDT) emphasizes intrinsic and extrinsic motivation in shaping learning and professional development. (Ryan & Deci, 2020). While the theory has been widely applied in education, its relevance to ESP teacher training, particularly in Aviation English, needs scrutiny. While SDT has been successful in promoting autonomy and competence in educational settings, its effectiveness in ESP contexts is less clear. In Aviation English, extrinsic motivators such as career advancement and certification often dominate, challenging SDT's focus on intrinsic motivation (Rochmawati et al., 2023). In our study, we also focus on extrinsic motivation as a separate construct, as emotional state (ES) includes statements dedicated to intrinsic motivation as well. Moreover, the specialized nature of Aviation English demands technical knowledge that may not be fully addressed by general SDT-based training approaches. Despite these challenges, adapting SDT principles to support ESP teachers' autonomy and competence could enhance their engagement and effectiveness in this highly specialized field (Bojanek et al., 2021; Sánchez-Oliva et al., 2017).

Thus, we believe the proposed hypotheses below will help to explore the interplay of the mentioned psychological and institutional factors:

The role of extrinsic motivation in teaching confidence

Motivated teachers are likely to engage in professional development, leading to increased self-efficacy and reduced anxiety (Zhang et al., 2021; Nwoko et al., 2023; Richter et al., 2024). Higher extrinsic motivation may strengthen teaching confidence by reinforcing the desire for professional growth (Zhang et al., 2021). According to Tschannen-Moran and Hoy (2007), “The feelings of joy or pleasure a teacher experiences from teaching a successful lesson may increase her sense of efficacy, yet high levels of stress or anxiety associated with a fear of losing control may result in lower self-efficacy beliefs” (p. 945). Research indicates that mastery experiences exert the strongest impact on teachers' self-efficacy (Tschannen-Moran & Hoy, 2007). Therefore, based on this understanding, we can hypothesize the following:

H1: Extrinsic Motivation (EM) is positively related to Mastery Experience (ME).
H2: Extrinsic Motivation (EM) is negatively related to Anxiety (ANX).

The influence of vicarious and mastery experience on teaching readiness

To explore the effect of various types of experiences on teaching readiness, first terms need to be defined. Vicarious experiences, which involve observing experienced instructors, are particularly beneficial for pre-service teachers who have limited direct teaching experience. These experiences allow novice teachers to model effective teaching strategies and build confidence by comparing themselves to competent models (Pfitzner-Eden, 2016; Yim, 2023). Mastery experiences, on the other hand, are direct, hands-on engagements in teaching tasks, providing tangible evidence of competence therefore, significantly impacting self-efficacy development (Huang et al., 2023; Wang et al., 2022).

Given the specialized nature of Aviation English, where precise communication is critical (Dumdumaya, 2026), both vicarious and mastery experiences are essential. Therefore, we assume that vicarious experiences can help teachers develop strategies for handling complex aviation terminology and scenarios, while mastery experiences provide the practical skills needed to effectively teach these concepts. Teachers exposed to experienced mentors or professional workshops may gain confidence in their Aviation English teaching abilities. These insights lead to the following hypothesis:
H3: Vicarious Experience (VE) is positively related to Mastery Experience (ME).

Anxiety and emotional state in teaching aviation English
Anxiety is a key factor affecting teachers' emotional well-being and confidence in specialized teaching (Zhou et al., 2024). High levels of anxiety can hinder engagement and preparedness, especially among pre-service teachers (Novious & Yawe, 2021). Institutional support can mitigate these negative effects (Kumpikaitė-Valiūnienė et al., 2021; Suchikova et al., 2024). Therefore, we developed the following hypotheses:
H4: Anxiety (ANX) is negatively related to Emotional State (ES).
H5: Institutional Preparedness (IP) is negatively related to Anxiety (ANX).

The role of institutional preparedness in teacher development
Institutional preparedness plays a pivotal role in the development of teachers of Aviation English, as it directly impacts their ability to deliver effective instruction in this specialized domain. Research highlights that institutions often fail to provide adequate support, such as training, resources, and curriculum development tailored to the unique demands of Aviation English. Teachers frequently face challenges, including limited access to aviation-specific materials, inadequate training in English for Specific Purposes (ESP), and heavy workloads that hinder their ability to prepare lessons effectively. For instance, a study conducted in Malaysian aviation schools revealed that teachers struggled with slow progress due to insufficient institutional support and limited knowledge of aviation contexts, which affected their confidence and teaching effectiveness (Mahmood et al., 2023). Similarly, Soto Torres (2023) emphasized the need for comprehensive capacitation programs that equip Aviation English instructors with both pedagogical skills and an operational understanding of aviation contexts. He recommended extended training courses that focus on familiarization with aviation-specific terminology, learner needs analysis, and material design to address institutional gaps in teacher preparation. Institutional preparedness is thus essential for empowering Aviation English teachers to meet the complex requirements of this field effectively. Taking into account the hypothesis we developed earlier, we believe that the following assumptions can be made:
H6: Institutional Preparedness (IP) is positively related to Mastery Experience (ME).
H7: Institutional Preparedness (IP) is positively related to Vicarious Experience (VE).

Emotional engagement and teaching satisfaction

Emotional well-being plays a critical role in teachers' motivation and overall professional engagement, influencing their ability to manage classroom dynamics, adapt to challenges, and sustain long-term career satisfaction (Burić et al., 2020). Teachers with a strong sense of emotional well-being are more likely to exhibit resilience, enthusiasm, and commitment to their instructional roles, which in turn enhances student learning outcomes (Richter et al., 2024). In the context of ESP instruction, particularly Aviation English, where teachers must navigate both linguistic and technical content, emotional stability can significantly impact their confidence and effectiveness. Mastery experience as the process of successfully performing a task and developing competence, has been shown to contribute to positive emotional states and to reinforce self-efficacy and motivation (Bandura, 1997). When teachers gain experience in delivering effective lessons, receive positive feedback from students, or observe improvements in learner performance, they develop a greater sense of professional accomplishment, which fosters motivation and reduces anxiety (Tschannen-Moran & Hoy, 2007). In Aviation English instruction, teachers who feel proficient in integrating aviation-specific terminology and communication strategies are more likely to experience job satisfaction and engagement (Mahmood et al., 2023; Yang et al., 2025). Conversely, a lack of mastery experience can contribute to stress, self-doubt, and disengagement, highlighting the need for structured professional development and institutional support to enhance teachers' confidence and emotional well-being (Gebauer et al., 2020; Capa-Aydin et al., 2018; Loo & Choy, 2013). Therefore, we formulated the following hypotheses:

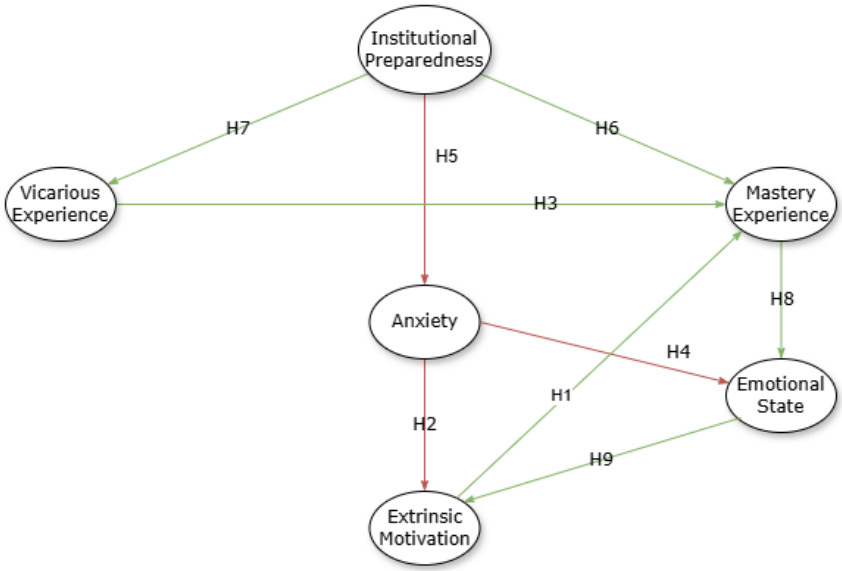
H8: Mastery Experience (ME) is positively related to Emotional State (ES).

H9: Emotional State (ES) is positively related to Extrinsic Motivation (EM).

Thus, we designed the following research model (Fig.1 below) based on the developed hypotheses (red lines indicate negative relationships, green – positive):

Figure 1

Hypotheses of the Proposed Model



Methodology

Participants

This study employed a non-experimental, quantitative, survey-based methodology. The population consisted of 368 bachelor's and master's degree students enrolled in a TEFL program at two private universities in Almaty, Kazakhstan, selected through non-probabilistic purposive sampling. Purposive sampling was chosen due to the specificity of the target population, ensuring that respondents possess relevant linguistic backgrounds and pedagogical exposure (Ilker et al., 2015). The study assesses TEFL students' preparedness for Aviation English instruction based on their general ESP knowledge and pedagogical training. While they may not have direct experience in Aviation English, their responses provide insight into the potential readiness of future instructors in this specialized field. The survey was conducted in late 2024. As seen from Table 1 below, the respondents' demographic data revealed that the majority (78.3%) were female, while 21.7% were male. Most participants (78.3%) fall within the 18-25 age range, with smaller proportions in the 26-30 (8.7%), 31-35 (4.4%), 36-40 (4.4%), and above 40 (4.4%) age groups. Regarding teaching experience, 43.5% had no prior teaching experience, while 28.3% had less than or up to a year of experience. A smaller percentage had 2-3 years (8.7%), 4-5 years (8.7%), or more than five years (10.9%) of teaching experience. Additionally, only 10.9% of respondents had experience teaching or learning aviation English, whereas the vast majority (89.1%) did not:

Table 1

Respondents' Demographics

#		Item	%
1	Gender	Male	21.7%
		Female	78.3%
2	Age range	18-25	78.3%
		26-30	8.7%
		31-35	4.4%
		36-40	4.4%
		>40	4.4%
3	Teaching experience	I have no prior teaching experience	43.5%
		Less than/or a year	28.3%
		2-3 years	8.7%
		4-5 years	8.7%
		More than 5 years	10.9%
4	Have you had any experience teaching or learning aviation English?	Yes	10.9%
		No	89.1%

Additionally, the respondents were asked whether their university offers an ESP (English for Specific Purposes) course specifically designed for aviation English and, if not, whether they would like such a course to be included as a mandatory subject in the curriculum. The data indicated that nearly half of the respondents (47.8%) reported that their university does not offer an ESP course designed for Aviation English, while 45.7% were unsure about its existence. Only a small percentage (6.5%) confirmed that such a

course is available. When asked whether they would like an aviation English ESP course to be included in the university curriculum as a mandatory subject, 47.7% expressed support for its inclusion, while 45.5% were indifferent, and 6.8% opposed the idea. This suggests that while a significant proportion of students recognize the potential value of an aviation English course, there is also a considerable degree of uncertainty and neutrality regarding its necessity in the curriculum.

Ethical Considerations

Before completing the online questionnaire, students were informed about the study's purpose. Data collection was conducted anonymously using a form that contained no identifying information except for demographics, specifically gender, age and teaching experience. Throughout the data collection process and in the presentation of results, participants' identities and confidentiality were safeguarded, ensuring the anonymity of their responses. The form outlined confidentiality measures, data protection protocols, and how the collected data would be used solely for research purposes.

Data Collection Timeline

Data collection including the expert validation of the scale and pilot study was conducted between September and December 2024. The process involved distributing online surveys to TEFL students at two private universities in Kazakhstan. Participants were given a two-week window to complete the survey, ensuring sufficient response time. Regular follow-ups were conducted to maximize participation, and incomplete responses were filtered out to maintain data integrity.

Research Instrument

In this study, we developed a new survey instrument based on the Motivation, Anxiety, and Self-Efficacy Scale (MASS) by Rochmawati et al. (2023), originally designed for Indonesian aviation cadets. While the MASS scale provided a strong foundation for measuring motivation, anxiety, and self-efficacy in learning Aviation English, we adapted and expanded it to better suit the context of TEFL students, who are potential future instructors of Aviation English. In addition to refining existing constructs, we introduced a new dimension, namely Institutional Preparedness, to assess the extent to which educational institutions provide adequate support, resources, and training for Aviation English instruction. The newly developed scale underwent expert validation involving five specialists in ESP from one private Kazakhstani university and two Aviation English instructors from the Civil Aviation Academy of the Republic of Kazakhstan. These experts were selected based on their extensive experience in ESP pedagogy, aviation communication, and teacher training. The validation process consisted of three rounds of feedback collection. In the first round, the experts evaluated the relevance, clarity, and comprehensiveness of the items. In the second round, they provided suggestions for refining ambiguous statements and eliminating redundancy. In the final round, a consensus was reached on the revised scale, ensuring alignment with the study’s

theoretical framework. To further enhance validity, a pilot study was conducted with a sample of 46 TEFL students before full-scale implementation. As such, the final instrument was composed of 28 Likert-scale questions. Each factor was measured on a five-point Likert scale from 1-Totally disagree to 5-Totally agree. Table 2 below shows the items of each dimension together with their corresponding codes:

Table 2

Final Survey Instrument

Construct	Code	Description
Extrinsic Motivation	EM1_1	I want to teach Aviation English as a means of self-improvement and professionalism.
	EM1_2	Teaching Aviation English would help me grow as an English teacher.
	EM1_3	I am motivated to teach Aviation English to improve my qualifications and career prospects.
	EM1_4	I would put effort into learning about Aviation English to gain recognition for my teaching abilities.
	EM1_5	Teaching Aviation English could help me qualify for better teaching opportunities or professional programs.
Anxiety	ANX2_1	I am concerned about the challenges of teaching aviation-specific terminology.
	ANX2_2	I worry about not meeting the expectations of aviation professionals in my teaching.
	ANX2_3	I feel nervous about my ability to prepare students for Aviation English exams
	ANX2_4	I am afraid of unsuccessful communication in teaching Aviation English.
	ANX2_5	Learning materials related to Aviation English seems tiring and overwhelming.
	ANX2_6	I find it difficult to master every linguistic aspect required for teaching Aviation English.
	ANX2_7	I feel that I am not fully prepared to teach Aviation English effectively.
Mastery Experience	ME3_1	I believe my prior experience in general English teaching has sufficiently prepared me to teach Aviation English.
	ME3_2	I feel confident in using vocabulary that relates to aviation topics.
	ME3_3	I believe my knowledge of English grammar is sufficient to support my learning and teaching of Aviation English.
	ME3_4	I am familiar with some aviation-related topics and could integrate them into my teaching.
Vicarious Experience	VE4_1	I am confident that attending previous workshops on Aviation English would help me teach it effectively.
	VE4_2	I believe that advice from senior teachers who have experience in Aviation English teaching would help me in my teaching efforts.
	VE4_3	Tips from my supervisor or colleagues help me feel more confident in teaching Aviation English.
Emotional State	ES5_1	I am curious and eager to learn more about teaching Aviation English.
	ES5_2	I feel no physical or mental strain when preparing to teach Aviation English.
	ES5_3	I would be patient and persistent in learning new materials to improve my understanding and teaching of Aviation English.
	ES5_4	I would enjoy every step of the learning and preparation process involved in teaching Aviation English.
Institutional Preparedness	IP6_1	My institution provides sufficient training opportunities for teaching English for Specific Purposes (ESP), specifically Aviation English.
	IP6_2	The curriculum at my institution includes components relevant to teaching Aviation English.
	IP6_3	My program offers practical guidance on teaching industry-specific English courses, such as Aviation English.
	IP6_4	The resources provided by my institution (e.g., materials, workshops, or tools) are adequate for preparing me to teach Aviation English.
	IP6_5	The faculty in my program have expertise in teaching aviation English.

Data Analysis Procedure

This study employed the Partial Least Squares (PLS) method, which is based on principal component analysis. As a type of structural equation modeling (SEM), PLS allows for the evaluation of both the measurement model and the structural model. The analysis was conducted using SPSS version 30, and SmartPLS software, specifically calculating:

1. Internal Consistency and Convergent Validity: to assess reliability, we calculated Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) for all six constructs;
2. Discriminant Validity: we calculated the Fornell-Larcker criterion, which establishes discriminant validity if the square root of a construct's AVE is greater than its correlations with other factors; Heterotrait-Monotrait Ratio (HTMT) analysis, where values below 0.85 indicate sufficient discriminant validity (Henseler et al., 2015; Clark & Watson, 1995);
3. Structural Model Evaluation: The significance of path coefficients was tested using the bootstrapping method with t-statistics, specifically assessing the strength and significance of relationships between variables using path coefficients (β), t-values, p-values, and effect sizes (f^2). To confirm the adequacy of the sample size (N=368), we followed Kline's (2015) recommendation that SEM models require a minimum of 200 cases, suggesting our sample size is sufficient.

Findings

Internal Consistency and Convergent Validity

As can be seen from Table 3 below, the reliability and validity analysis of the instrument demonstrates strong internal consistency and acceptable construct validity. Cronbach's Alpha (1951) values for all constructs exceed the recommended threshold of 0.7, ranging from 0.740 (Vicarious Experience) to 0.996 (Extrinsic Motivation), indicating high reliability. The Composite Reliability (CR) values are also above 0.7, confirming the internal consistency of the constructs. Convergent validity, assessed through Average Variance Extracted (AVE), meets the 0.50 threshold for all constructs, with values ranging from 0.51045 (Emotional State) to 0.78176 (Mastery Experience), suggesting that each construct adequately explains the variance in its observed variables. Institutional Preparedness (AVE = 0.61564, CR = 0.77944) and Anxiety (AVE = 0.61204, CR = 0.72532) show particularly strong validity and reliability. While Vicarious Experience (AVE = 0.52227, CR = 0.78588) has the lowest reliability among the constructs, it still meets the acceptable range (Hair et al., 2019). Overall, the results confirm that the survey instrument is both reliable and valid, making it suitable for further structural equation modeling analysis:

Table 3

Constructs' Reliability

Construct	No. of Items	Cronbach's Alpha Value	AVE	Composite Reliability
Extrinsic Motivation (EM)	5	.996	0.57078	0.86921
Anxiety (ANX)	7	.892	0.61204	0.72532
Mastery Experience (ME)	4	.804	0.78176	0.70403
Vicarious Experience (VE)	3	.740	0.52227	0.78588
Emotional State (ES)	4	.848	0.51045	0.73424
Institutional Preparedness (IP)	5	.905	0.61564	0.77944
Total:	28	.977		

Discriminant Validity

As Table 4 below shows, the square root of the AVE for each construct (diagonal values in grey) was higher than most of the inter-construct correlations, indicating an acceptable level of discriminant validity.

Table 4

Fornell-Larcker Criterion

	EM	ANX	ME	VE	ES	IP
EM	0.755^{sqrt}					
ANX	.386	0.782^{sqrt}				
ME	.332	.543	0.884^{sqrt}			
VE	0.055	.734	.642	0.723^{sqrt}		
ES	.643	.841	.841	.541	0.714^{sqrt}	
IP	.643	.583	.443	.346	.443	0.714^{sqrt}

^{sqrt} – square root of AVE

Further, the Heterotrait-Monotrait (HTMT) ratio of correlations was examined to assess discriminant validity among the constructs (Table 5). The results indicate that all HTMT values are below the conservative threshold of 0.85 (Henseler et al., 2015), suggesting acceptable discriminant validity. The highest correlation is observed between Institutional Preparedness (IP) and Extrinsic Motivation (EM) (HTMT = 0.637), indicating a moderate association. Similarly, Anxiety (ANX) and Emotional State (ES) (HTMT = 0.486) show a moderate correlation but remain within acceptable limits. Vicarious Experience (VE) demonstrates the lowest correlations with other constructs, confirming its distinctiveness. Overall, these findings support the discriminant validity of the measurement model, indicating that each construct is adequately differentiated from the others.

Table 5

HTMT Results

	EM	ANX	ME	VE	ES
EM					
ANX	0.532				
ME	0.271	0.144			
VE	0.067	0.182	0.071		
ES	0.162	0.486	0.062	0.235	
IP	0.637	0.447	0.312	0.136	0.374

Structural Model Evaluation

Finally, the hypothesis testing results in Table 6 below provide strong empirical support for the relationships among the constructs. First, extrinsic motivation (EM) was found to be a significant predictor of mastery experience (ME) (H1: $\beta = 0.191$, $t = 8.533$, $p = 0.000$, $f^2 = 0.07$), suggesting that external incentives and rewards positively contribute to individuals' development of mastery. However, extrinsic motivation had a strong negative effect on anxiety (H2: $\beta = -0.501$, $t = 25.365$, $p = 0.000$, $f^2 = 0.05$), indicating that when individuals are externally motivated, their anxiety levels tend to decrease, potentially due to increased confidence and clarity in goal-setting. Additionally, vicarious experience (VE) had a significant positive impact on mastery experience (H3: $\beta = 0.549$, $t = 25.607$, $p = 0.000$, $f^2 = 0.09$), reinforcing the idea that observing successful role models enhances personal mastery. This aligns with social learning theory, emphasizing the importance of modeling in skill development. Anxiety (ANX), on the other hand, negatively influenced emotional state (ES) (H4: $\beta = -0.242$, $t = 11.627$, $p = 0.000$, $f^2 = 0.10$), highlighting how increased anxiety diminishes positive emotional states, which could hinder learning and motivation.

Institutional preparedness (IP) emerged as a critical factor in reducing anxiety (H5: $\beta = -0.068$, $t = 2.437$, $p = 0.015$, $f^2 = 0.10$), suggesting that well-organized institutional support systems help individuals manage stress and uncertainty. Moreover, institutional preparedness positively influenced both mastery experience (H6: $\beta = 0.465$, $t = 16.642$, $p = 0.000$, $f^2 = 0.02$) and vicarious experience (H7: $\beta = 0.243$, $t = 9.403$, $p = 0.000$, $f^2 = 0.02$), indicating that structured and well-resourced institutions play a crucial role in fostering both direct learning experiences and learning through observation. Furthermore, mastery experience significantly contributed to an improved emotional state (H8: $\beta = 0.392$, $t = 15.267$, $p = 0.000$, $f^2 = 0.12$), suggesting that individuals who feel competent and capable tend to experience more positive emotions. Finally, emotional state was positively related to extrinsic motivation (H9: $\beta = 0.270$, $t = 9.091$, $p = 0.000$, $f^2 = 0.03$), demonstrating that individuals with a stable and positive emotional state are more likely to be driven by external incentives.

Overall, these findings underscore the interconnectedness of motivation, emotional well-being, and institutional support in shaping individuals' learning experiences. Reducing anxiety through institutional preparedness and fostering mastery and vicarious experiences are key strategies to enhance both emotional well-being and extrinsic motivation.

Table 6

Hypothesis Testing Results

	Hypothesis	Path Coefficient (β)	t-value	Significance Value (*p*-value)	Effect size (f^2)
H_1	EM -> ME	0.191	8.533	0.000**	0.07
H_2	ANX -> EM (neg.)	-0.501	25.365	0.000**	0.05
H_3	VE-> ME	0.549	25.607	0.000**	0.09
H_4	ANX -> ES (neg.)	-0.242	11.627	0.000**	0.10
H_5	IP -> ANX (neg.)	-0.068	2.437	0.015*	0.10
H_6	IP-> ME	0.465	16.642	0.000**	0.02
H_7	IP-> VE	0.243	9.403	0.000**	0.02
H_8	ME-> ES	0.392	15.267	0.000**	0.12
H_9	ES -> EM	0.270	9.091	0.000**	0.03

*p<.01; **p<.05

Discussion

This study set out to investigate the psychological and institutional factors that contribute to TEFL students' preparedness to teach Aviation English. By integrating Self-Efficacy Theory and Self-Determination Theory, the present research validated the strong predictive role of extrinsic motivation on mastery experience and anxiety reduction. This suggests that, in emerging ESP domains such as Aviation English, professional instrumentalism may precede intrinsic commitment. Unlike general language teaching contexts, where intrinsic interest often initiates engagement (Ryan & Deci, 2020), in this study pre-service teachers appear to engage in competence-building not primarily because of intrinsic passion for aviation pedagogy, but because of perceived career value, employability, and certification advantages.

From a theoretical standpoint, this finding refines Self-Determination Theory by suggesting that extrinsic regulation does not necessarily function as a motivational constraint in early-stage professional learning. Instead, within niche domains requiring specialized competencies, extrinsic motivation may serve as a developmental catalyst that initiates sustained engagement (Ryan & Deci, 2020; Dörnyei, 2009). One possible explanation lies in the perceived risk associated with Aviation English instruction. Because communicative errors in aviation-related contexts may carry operational or safety implications (ICAO, 2022), students may perceive competence acquisition as a professional necessity rather than an optional interest (Kim, 2026). Consequently, instrumental motivation becomes a rational and adaptive response to anticipated professional demands. This interpretation aligns with emerging literature suggesting that professional identity formation in ESP domains is often shaped by external regulatory structures such as certification standards and industry expectations (Rochmawati et al., 2023).

Moreover, the mediating role of institutional preparedness provides a critical structural explanation for why anxiety does not entirely undermine readiness. In contexts like aviation, anxiety is not merely an individual psychological deficit but a rational response to perceived instructional inadequacy. This finding highlights that teacher readiness in

specialized ESP domains cannot be conceptualized solely at the individual level; it is co-constructed within institutional ecosystems. When institutions provide structured resources, students appear better able to regulate anxiety and convert uncertainty into competence-building behaviors (Mahmood et al., 2023; Torres, 2023). This finding underscores the importance of institutional scaffolding in specialized ESP domains, where preparedness is co-constructed through access to structured learning environments rather than through individual effort alone.

The reciprocal link between emotional state and extrinsic motivation suggests a feedback mechanism not fully articulated in classical Self-Efficacy Theory. Positive emotional regulation appears to sustain professional ambition, while ambition generates further engagement. In Aviation English, where communicative errors may carry operational consequences, emotional stability may be especially salient. This implies that emotional competence should be considered as one of the core components of Aviation English teacher education rather than as an ancillary psychological variable.

Finally, the model demonstrates that vicarious experience plays a particularly strong role in pre-service contexts. A plausible explanation for this divergence lies in structural limitations affecting access to authentic Aviation English teaching contexts. In many non-Anglophone settings, including Kazakhstan, opportunities for direct practicum in aviation-specific environments remain limited (Anayatova et al., 2024). As a result, observational learning, mentorship, and exposure to modeled teaching practices become primary mechanisms through which students develop confidence (Bojanek et al., 2021; Sánchez-Oliva et al., 2017). Rather than representing a deviation from theoretical expectations, the prominence of vicarious pathways may reflect adaptive learning strategies in contexts characterized by restricted experiential access.

Taken together, we believe that the results validate the proposed model and extend prior research by contextualizing teacher preparedness in Aviation English. From a practical perspective, the findings carry several implications for Aviation English teacher education programs. First, curricula should explicitly incorporate career-oriented framing to leverage extrinsic motivation as an entry point into sustained professional engagement (Ryan & Deci, 2020). Second, institutions should prioritize the development of structured learning ecosystems that include authentic materials, simulation-based tasks, and guided mentorship opportunities. Third, teacher education programs should incorporate emotional regulation strategies and confidence-building interventions to address the affective demands associated with high-stakes communication environments (Gebauer et al., 2020; Capa-Aydin et al., 2018).

The study offers broader implications for theoretical development within ESP and teacher education research. By demonstrating the catalytic role of extrinsic motivation and the contextual significance of institutional mediation, the findings challenge

traditional assumptions that prioritize intrinsic motivation and individual agency as primary drivers of teacher preparedness. Instead, the results suggest that professional readiness emerges from dynamic interactions between individual dispositions and systemic conditions.

Conclusion

Our study illustrated novel insights into the factors influencing pre-service TEFL teachers' preparedness to teach Aviation English by examining psychological constructs such as motivation, anxiety, emotional state, and efficacy-building experiences, alongside institutional support. The findings affirm that both individual and institutional dimensions play a critical role in shaping teacher readiness for specialized ESP instruction.

From a theoretical standpoint, the research integrates Self-Efficacy Theory and Self-Determination Theory, offering a framework for understanding how confidence and motivation are developed in pre-service teachers preparing for non-traditional English teaching roles. Practically, the study highlights the need for ESP-oriented professional development programs, targeted mentorship opportunities, and strong institutional support. Universities and teacher education programs in Kazakhstan and similar non-Anglophone countries should invest in capacitation programs that bridge the gap between language pedagogy and subject-matter expertise in aviation. By fostering both emotional well-being and technical competence, institutions can better prepare the next generation of English instructors for the demands of globalized, high-stakes communication settings. We assume that future research could expand the model by incorporating longitudinal data and exploring the impact of actual teaching practice on efficacy and motivation. In sum, this study not only enriches the growing body of work on ESP teacher education but also responds to the urgent global need for qualified Aviation English instructors equipped with both pedagogical and technical competencies.

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World Medical Association (WMA) Declaration of Helsinki–Ethical Principles for Medical Research Involving Human Participants
The present study did not involve any medical research or clinical interventions with human participants. The design and execution of this research, however, were conducted with strict adherence to ethical standards applicable to research in education. Informed consent was obtained from the participants.

Competing Interests
The authors declare that they have no competing interests.

Data Availability
The authors will provide the raw data underlying the findings of this article without any unnecessary restrictions.

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