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Expectations versus Reality: Students' Perceptions of Educational Service Quality in the Aviation Program at War Studies University and Career Implications

Svajone BEKESIENE[1], Agnieszka WILCZYŃSKA-STRAWA[2*]

[1]General Jonas Žemaitis Miltitary Academy of Lithuania, Silo g. 5A, LT-10322 Vilnius
[2] War Studies University, gen. Chruściela 103, 05-500 Rembertów, Poland

*Correspondence: * a.strawa@akademia.mil.pl*

Abstract

Staff shortages are a global problem in the aviation sector. Women constitute an underutilized talent pool for air transport. The aim of the study was to assess the gap between expectations and reality of the educational offerings of the Aviation program at the War Studies University in the context of preparing students for entering the aviation labour market from the perspective of the respondents' gender. The SERVQUAL method was used. Female students perceived a greater discrepancy between their expectations of their studies and their practical experience, although these differences were generally small. A significantly greater disparity was noted in the evaluation of the Aviation program and its content directly applicable to the aviation labour market. This research was conducted as a pilot study.

KEY WORDS: *educational service quality; higher education Poland; student expectations and perceptions; gender, SERVQUAL method.*

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1. Introduction

The civil aviation sector generates approximately 86.5 million jobs globally, while in Poland employment in this sector is estimated at 290,000 jobs [1].

The group of factors that fundamentally shape the demand for labour in the aviation industry can be assumed to be: the value of demand for air operations, including forecasts regarding the transport needs of people and goods, investment and development plans of airports, and forecasts regarding the purchase of new aircraft by airlines [2]. It is forecasted that under the central scenario of air transport development, aviation will generate 135.4 million jobs in 2043 [1].

The implementation of the Port Polska investment program, which includes a modern airport and an integrated railway system, including High-Speed Rail (HSR), as well as the construction of new roads around the emerging airport, is seen as one of the greatest development stimuli for the Polish labour market in the coming decades. It will translate into the creation of tens of thousands of jobs and the creation of new career paths in advanced technology-based fields. By the opening of the new domestic airport in 2032, approximately 35,100 employees will be employed at the airport itself and in its immediate vicinity [3]. The total staffing requirement for the domestic airport is divided into five main categories: airport operators, the aviation industry, port and terminal operations, airport services, and the airport environment, including entities directly related to the aviation industry and the service sector (including hotel and office workers, sales and passenger service staff at airport service points). With the development of the airport and the increase in passenger traffic, employment will steadily increase to 45,300. people in 2042 and subsequently to 53.3 thousand people in 2050 [3].

Women in the aviation workforce are a vital resource for meeting the personnel needs [4]. The gender structure in the aviation industry remains highly diversified due to the nature of their duties. For example, cabin crew employment is heavily dominated by women, while flight deck crew (including pilots) is largely male-dominated. Globally, women comprised 4.7% of all pilots, 3.1% of aircraft maintenance engineers, and 21.1% of air traffic controllers [5]. In Poland,

women currently account for approximately 3.4% of licensed mechanics, 27% of air traffic control personnel, and 4% of ATPL(A) pilots [6].

To achieve real change, action is necessary, including [7]:

- cultural transformation: engaging leaders in diversity and inclusion initiatives,
- early education: outreach to children as young as 10 years old to build interest in aviation (the "see it to be it" principle),
- data transparency: the industry must share diversity data to effectively monitor progress and the effectiveness of its efforts.

In 2019, IATA (International Air Transport Association) launched the global 25by2025 initiative to enhance diversity, equity and inclusion in the aviation industry [8]. Through 25by2025, signatories are committing to boosting female representation in both senior positions and roles where women are traditionally under-represented, typically in the flight deck, maintenance, and engineering [6]. It is important to promote the role of women in the aviation sector as part of a broader human resources management strategy, including: ensuring an appropriate level of employment, employee retention, improving the recruitment process, training and development of employees, changing the perception of the aviation industry as an unattractive and low-paid place of employment [9].

Stereotyped preconceptions of the capacities and expected behaviour of women and men still often influence the manner in which they acquire and use their skills, and their perceptions of their work [10-13]. Using aircraft maintenance personnel, a key player in civil aviation safety, demographic variables have been shown to significantly determine career progression. An analysis of aviation engineering graduates revealed significant gender disparities in employment: women face more significant barriers to entry into the MRO (Maintenance, Repair, and Overhaul) industry and experience professional discrimination compared to men [14].

The study was conducted on a purposefully selected group of Aviation students at the War Studies University. The sample selection was dictated by the researchers' direct access to the student population, resulting from the affiliation of one of the co-authors and her teaching and research role within the university.

War Studies University offers degree programs in Aviation at both undergraduate (bachelor's) and graduate (master's) levels, with specializations including: Unmanned Aircraft Systems, Aviation Organizations, Air Traffic Management (bachelor's) and Aviation Organizations, Aviation Safety Management (master's). As part of the curriculum, students learn about the functioning of aviation organizations, the principles of air traffic management, flight safety and aviation operations, aviation law, and the economics of air transport [15]. The education offered by the War Studies University in the field of aviation is an important element in preparing students for work in aviation in Poland [16]. The War Studies University actively encourages young people to pursue studies in the field of Aviation, including [17]:

- valuable and engaging content regarding research, teaching, and student activity is regularly posted on social media,
- paid advertising campaigns are launched in mass media in the period preceding enrollment,
- lecturers and students participating in television and radio broadcasts highlight the benefits of studying Aviation,
- during visits to high schools, students are introduced to the development prospects of the aviation industry and encouraged to make informed decisions about further education,
- an "Aviation Knowledge Competition" is organized, which is enjoying growing popularity and allows young people to expand their knowledge in this field,
- "Open Days" are held during which prospective students can meet lecturers and students and learn more about the study programs.

In this context, this study attempted to analyse how aviation students perceive the alignment between their expectations and the realities of aviation studies in relation to future employment in the aviation industry, with particular emphasis on potential gender differences. By focusing on expectation–reality discrepancies across key aspects of educational content, industry engagement, employability support, and career prospects, the study seeks to address the lack of empirical evidence on whether aviation higher education equally fulfils the career-related expectations of women and men, especially within the national context of Poland.

2. Methodology

The developed research procedure is an attempt to expand and deepen the conclusions drawn from a study conducted in 2024, which focused on the preparation of graduates of air transport-related programs for employment in the aviation sector [18]. The study on preparation for employment in the aviation sector was based on the opinions and experiences of 143 students from five academic centers (Silesian University of Technology in Katowice, Rzeszów University of Technology named after Ignacy Łukasiewicz, Polish Air Force University in Dęblin, War Studies University, and SGH Warsaw School of Economics) and focused on assessing:

- the level of theoretical knowledge of graduates,
- the amount of professional experience acquired during internships and industry placements,
- the level of awareness of the specifics and requirements of the aviation work environment.

The data collected in 2024 served as a reference point for an in-depth analysis of the quality of educational services, currently conducted using the SERVQUAL method to optimize education in light of labour market requirements.

The research process was inspired directly by the need for a user-centric approach to educational services in the Aviation field of study. Given that the aviation sector is actively seeking staff to address the identified global labour shortage, and that women still represent untapped potential, it became necessary to examine whether the educational process significantly supports graduates of this field of study entering the aviation sector labour market, taking into account the gender perspective of the evaluators.

The research procedure was diagnostic in nature and focused on assessing the quality of the educational offerings in the Aviation program at the War Studies University in terms of their adaptation to the requirements of the contemporary aviation labour market. A three-stage research procedure was planned and implemented, its course is presented in Table 1.

Table 1.
Three-step research procedure and main activities

Research Procedure Stage	**List of Actions Taken**	**Implementation Results**
Research preparation	– analysis of the literature related to the research topic; – diagnosis of the current problematic situation regarding the research subject; – consultation on the research concept as part of the undertaken research internship; – as part of the development of the survey questionnaire, a bank of questions was created and, in consultation with the research internship supervisor, the questions were selected, the answers to which were most important from the point of view of the assumed purpose of the study.	Pilot study concept - development of the objectives, scope, and methodology of the initial research procedure.
Research implementation	– distribution of the research questionnaire to aviation students at the War Studies University; – consultations with experts during the research internship regarding the research process.	Quantitative data acquisition and organization – collecting data from a selected group of respondents and preparing it for analysis.
Research completion	– analysis of data and study results; – discussion of the collected data and study results; – proposal for the use of the collected data and results in further research.	Presentation of the pilot study results – summary and preliminary interpretation of the data.

The survey questionnaire used to conduct the study consisted of three parts: introductory (information), demographic (respondent metrics), and substantive. The substantive section consisted of nine questions. Before conducting the survey with a broader sample of respondents, the tool was tested for its content and organizational structure. The questionnaire was available online from March 19 to March 29, 2026.

The SERVQUAL model was used to assess the gap between students' expectations of "what you think it should be like" and the perception/reality of "what you think it actually is" of the educational offerings of the Aviation study program at the War Studies University, as part of graduates' readiness to enter the aviation industry job market, with particular attention to whether this gap differs by gender. SERVQUAL is a concise, multi-item scale with high reliability and validity, which allows organizations to reliably diagnose the expectations and satisfaction levels of service recipients [19]. Due to its universal nature, the SERVQUAL method can be used to measure service quality across various industries. However, the generality of the statements often necessitates the adoption of other, more specific, methods [20]. The theoretical foundation for the adopted model for assessing the quality of educational services is the concept of "quality gaps" (gap model), adapted to the context of higher education [21]. This model allows for a systematized approach to measuring the discrepancy between the expectations of Aviation students and their actual experiences. The assessment included the following dimensions: curriculum, practicality of teaching, collaboration with external stakeholders within the educational offerings, and the university's preparation of graduates for the aviation industry job market, measured on a 5-point Likert scale (1 = completely disagree; 5 = completely agree).

Disproportion indices were calculated for the following statements:

1. The Aviation study program contains content directly useful in the aviation industry job market;
2. Aviation studies provide beneficial contact with aviation industry employers (e.g., meetings with aviation industry representatives, industry conferences, practical workshops);
3. Aviation studies provide real assistance in obtaining employment in the aviation industry;

4. Aviation studies provide the appropriate knowledge, skills, and competencies to work in the aviation industry;
5. The university actively supports students in seeking and completing internships with aviation industry employers;
6. The university should help build the student's image as an attractive employee in the aviation industry (projects, certificates, experience);
7. Aviation graduates are attractive to aviation industry employers;
8. Aviation studies are a good career choice in the aviation industry compared to other fields;
9. I can obtain a job in the aviation industry that meets my professional expectations (e.g., salary, development, stability).

The disproportion index for each statement was calculated as the difference between respondents' expectation scores and perceived reality scores. Positive values indicated that expectations exceeded perceived reality, negative values indicated that perceived reality exceeded expectations, and a value of zero reflected congruence between expectations and reality. Subsequently, independent-samples Student's t-tests were performed to examine gender-based differences (men vs. women) in these disproportion indices. Introducing a gender perspective into the assessment of the quality of educational offer is essential for a more comprehensive understanding of the effectiveness of education in the aviation sector.

A total of 152 aviation students at the War Studies University participated in the study (N=152). The characteristics of the research sample were developed based on the adopted criteria, including: degree level, year of study, gender, professional experience in the aviation sector. The characteristics of the research sample are presented in Table 2.

Table 2.

Characteristics of the research sample

Respondent Characteristics	Categories		N	%
Degree Level	• Bachelor's level		114	75
	• Master's level		38	25
Year of Study	• Bachelor's level	I	49	43
		II	47	41
		III	18	16
	• Master's level	I	18	47
		II	20	53
Gender	• Female		59	39
	• Male		87	57
	• no information		6	4
Professional Experience in the Aviation Sector	• experienced		62	41
	• non-experienced		90	59

The analysis excluded responses from respondents who did not indicate their gender (N=6, 4% of the sample). Because the study focuses on gender differences, the detailed analysis was conducted only on the group of people identifying as either female or male.

As part of the metrics section of the survey, respondents were also asked about their interest in pursuing employment in the aviation sector after graduation. The question about career plans was not just a demographic characteristic of the sample, but a strategic predictor that allowed us to distinguish students for whom the program had real market value from those who viewed it as a general education. Respondents show a clear preference for employment in the aviation sector after graduation. The results are as follows: 82% of respondents declare a willingness to work, 16% remain undecided, and 1% express no interest in employment in the aviation industry.

3. Results of the Research

Disproportion indices were calculated for each of the nine statements by subtracting students' reality ratings from their expectation ratings, allowing for an assessment of the direction and magnitude of the mismatch between what students anticipated and what they actually experienced during their aviation studies. Positive values indicated that expectations exceeded perceived reality, whereas negative values would reflect situations in which reality surpassed initial expectations; a value of zero denoted full consistency. Mean disproportion scores and standard deviations were computed separately for female and male participants, and Student's t-tests for independent samples were applied to examine gender-based differences in these discrepancies.

Study results show that the majority of statements revealed higher expectation-than-reality scores for both women and men, suggesting a general tendency toward unmet expectations regarding the study program's alignment with the aviation labor market. However, gender differences were largely small and statistically non-significant, as reflected by low t values, wide confidence intervals crossing zero, and small Cohen's d effect sizes.

One statistically significant difference emerged for Statement 1 ("*The Aviation study program contains content directly useful in the aviation industry job market.*"), concerning the direct usefulness of the aviation study program for employment in the aviation industry. Women reported a significantly higher level of disproportion than men ($t = 2.21$, $p = 0.029$), indicating that their expectations exceeded perceived reality to a greater extent. Although the effect size was small to moderate ($d = 0.37$), this finding suggests that female students may perceive a stronger gap between anticipated and actual job-market relevance of their studies, while perceptions in other areas remain broadly comparable across genders. Details of the evaluation results for the nine statements are presented in Table 3.

Table 3.

Comparison of the level of disproportion between reality and expectations for 9 statements from the perspective of female and male participating in the study.

Statement	*female (n = 59)*		*male (n = 87)*		*t*	*p*	*95% CI*		*d Cohen*
	M	*SD*	*M*	*SD*			*LL*	*UL*	
1. The Aviation study program contains content directly useful in the aviation industry job market.	0.73	0.87	0.41	0.83	2.21	0.029	0.03	0.60	0.37
2. Aviation studies provide beneficial contact with aviation industry employers (e.g., meetings with aviation industry representatives, industry conferences, practical workshops).	0.93	1.31	0.59	1.20	1.65	0.101	-0.07	0.76	0.28
3. Aviation studies provide real assistance in obtaining employment in the aviation industry.	0.86	1.22	0.66	1.00	1.13	0.259	-0.16	0.57	0.19
4. Aviation studies provide the appropriate knowledge, skills, and competencies to work in the aviation industry.	0.66	0.96	0.48	0.89	1.15	0.251	-0.13	0.48	0.19
5. The university actively supports students in seeking and completing internships with aviation industry employers.	0.83	1.40	0.59	1.28	1.09	0.279	-0.20	0.69	0.18
6. The university should help build the student's image as an attractive employee in the aviation industry (projects, certificates, experience).	1.17	1.35	1.05	1.31	0.55	0.582	-0.32	0.57	0.09
7. Aviation graduates are attractive to aviation industry employers.	0.69	0.99	0.62	1.05	0.43	0.668	-0.27	0.42	0.07
8. Aviation studies are a good career choice in the aviation industry compared to other fields.	0.53	0.84	0.41	0.87	0.77	0.441	-0.17	0.40	0.13
9. I can obtain a job in the aviation industry that meets my professional expectations (e.g., salary, development, stability).	0.61	0.81	0.49	0.97	0.75	0.452	-0.19	0.42	0.13

Notes*:* M – mean; SD – standard deviation; t – t-test result for independent samples; p – significance; 95%CI – confidence interval. LL – lower limit; UL – upper limit; Cohen's d – effect size coefficient.

The results of the gender-based comparison of disproportion indices across the nine statements are summarized in Figure 1. The figure provides a visual overview of the mean differences between expectations and perceived reality for female and male students, allowing for an intuitive comparison of both the direction and magnitude of disproportion across domains related to study content, labor market relevance, employer contact, and career prospects.

The results of the gender-based comparison of disproportion indices across the nine statements are summarized in Figure 1. The figure presents a synthesized visual comparison of mean differences between expectations and perceived reality among female and male aviation students, enabling a clear assessment of how both groups evaluate the alignment of their studies with future employment opportunities in a rapidly expanding aviation labor market. Given the dynamic growth of civil aviation globally and in Poland—driven by increasing air transport demand, large-scale infrastructure investments, and long-term forecasts indicating substantial job creation—the adequacy of higher education in preparing students for industry careers is of particular importance.

Figure 1 illustrates that, across all analyzed domains, disproportion indices are predominantly positive for both genders, indicating that expectations generally exceed experienced reality. This pattern reflects the high career aspirations of aviation students entering a sector widely perceived as technologically advanced, stable, and offering long-term employment prospects.

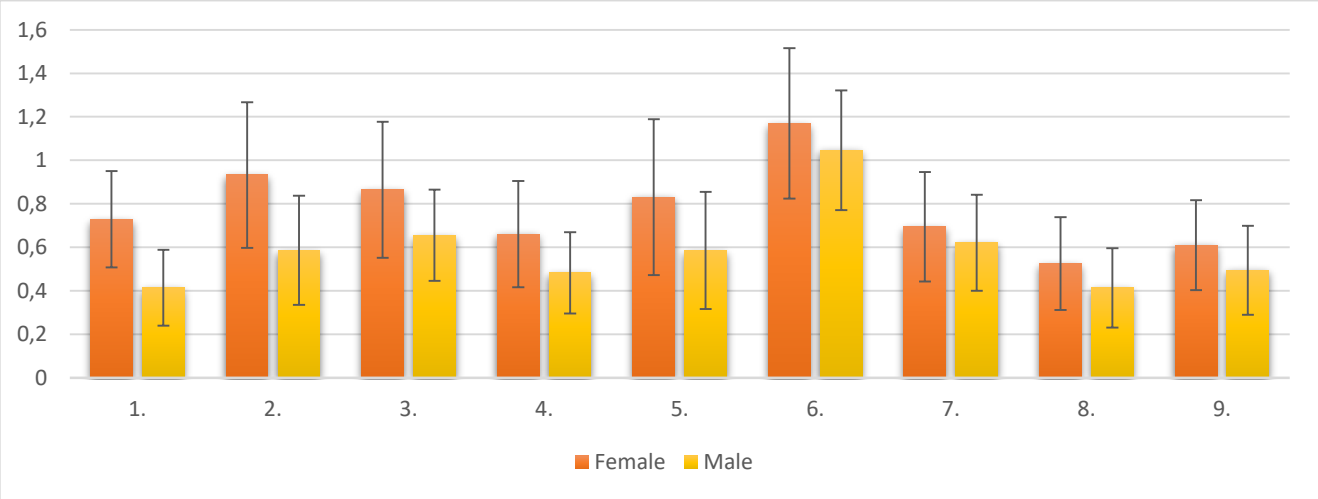

Fig. 1. Mean expectation-reality gaps (with 95% CI) for 9 SERVQUAL statements by gender. *Full statement wording presented in Table 3. Due to space constraints, Figure 1 displays statement numbers (1-9) corresponding to Table 3.*

The graphical representation allows for immediate identification of similarities between female and male responses, as well as subtle differences in the magnitude of perceived gaps. While overall trends are comparable, the figure highlights that women tend to report slightly higher disproportion levels in selected areas, most notably regarding the perceived direct usefulness of study content for the aviation job market.

Placing these findings within the broader context of persistent gender imbalances in aviation employment, the visual summary underscores the relevance of examining educational experiences through a gender-sensitive lens. As women constitute a crucial yet underrepresented workforce reserve in many aviation professions, understanding how well academic programs meet their expectations is essential. Figure 1 therefore not only complements the statistical analyses but also situates student perceptions within ongoing efforts to expand, diversify, and sustain the aviation workforce in Poland and beyond.

4. Conclusions

Analysis of the disproportion indices in the study sample revealed that female consistently reported higher mean expectation–reality discrepancies than male across all statements assessing the educational offerings of the Aviation program at the War Studies University and perceived readiness for entry into the aviation industry labour market. This overall pattern suggests that female students tend to perceive a larger gap between what they expect from their studies and what they experience in practice, although these differences were generally modest.

Statistical testing indicated that gender-based differences reached significance for only one statement. Women exhibited a significantly greater disproportion in their assessment of the statement “The Aviation study program contains content directly useful in the aviation industry job market”. Specifically, the mean disproportion score was higher among women ($M = 0.73$, $SD = 0.87$, $n = 59$) than among men ($M = 0.41$, $SD = 0.83$, $n = 87$), $t(144) = 2.21$, $p = 0.029$, 95% CI [0.03, 0.60]. The corresponding effect size (Cohen’s $d = 0.37$) indicates a small but meaningful difference in perceived curriculum relevance.

For the remaining statements, gender differences in disproportion indices were not statistically significant, suggesting broadly comparable evaluations between women and men with respect to other dimensions of educational quality, industry engagement, and employment preparation.

This study examined gender differences in aviation students’ expectation–reality discrepancies regarding educational quality and preparedness for employment in the aviation industry at the War Studies University. Across all analysed dimensions, women participating in the study reported higher mean disproportion indices than men, indicating generally larger expectation–reality gaps among female students.

A statistically significant gender difference was identified only for the assessment of the statement “The Aviation study program contains content directly useful in the aviation industry job market.” Women reported a greater discrepancy than men, although the effect size was small. No significant gender differences were observed for the remaining statements. These findings suggest that gender-related differences in perceptions of aviation education are limited and primarily concern evaluations of curriculum applicability to industry practice. The results highlight the relevance of strengthening the practical

orientation of aviation study programs and point to the need for further research on gender-specific expectations and career preparedness in aviation education.

The presented results and conclusions from the study are based on the individual expectations and perceptions of students in the Aviation program at the War Studies University, which vary significantly and are related, among other things, to personal characteristics. It cannot be assumed that students' expectations and perceptions are constant, as they change as a result of subsequent events during their studies, for example, obtaining good or bad exam results. Only a selected group of factors was analysed to assess the quality of educational services provided to students in the Aviation program at the War Studies University. Students from a single program at a single university were invited to participate in the study, which prevents generalization of the obtained results and conclusions to other student groups. The Aviation program was selected because it has a specific nature, which may influence expectations regarding the quality of educational services. The study was conducted as a one-time event, which prevents the identification of changes in student expectations and perceptions.

The entire research process was pilot-based and primarily aimed at testing the research tool, both organizationally and substantively. Based on the collected results, a full study is planned. The findings indicate the need to expand the set of statements used to assess students' expectations and actual perceptions, in order to more accurately identify areas requiring improvement and more effectively prepare students for professional roles in the aviation sector.

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