NIHERST

International Labour Organization

REPORT BRIEF

Assessment of 21st Century Skills Across Emerging Sectors

Aviation Sector

Volume 5

Key points

- Technological change in the aviation sector is accelerating, reshaping job profiles and amplifying the need for continuous upskilling. The adoption of AI, automation, and data-driven systems is increasing the demand for higher-level digital and interdisciplinary skills across the workforce.
- In Trinidad and Tobago, the aviation sector faces persistent recruitment difficulties driven by a limited pool of applicants with the required technical skills and practical experience. Challenges in filling both STEM and non-STEM roles, particularly for technical and mid-level positions, reflect large skills mismatches.
- The demand for hybrid technical–digital skills is estimated to rise, especially for workers who can integrate engineering or operational proficiency with information technology (IT), data literacy, and advanced problem-solving skills to effectively respond to evolving technological environments.
- Education and training systems are not fully aligned with employer needs, particularly in practical and emerging skill areas. Employers highlight gaps in job-ready skills, limited industry exposure, and the need for stronger links between training institutions and the aviation sector.

HEADLINE STATISTICS

60%
Of aviation establishments were small enterprises

70%
Of firms employ STEM-qualified workers

60%
Of employers have vacancies

20%
Only 20% of STEM vacancies were filled

100%
Of employers rate communication skills as critical

#1
The main barrier to filling STEM roles was a low number of applicants with the required skills

INTRODUCTION

The aviation industry in Trinidad and Tobago plays a key role in national development, improving international and regional connectivity while contributing significantly to trade, tourism, and productive employment. Technological advancements, including automation and digital navigation systems, data-driven maintenance and AI-powered operations, are reshaping the aviation industry and changing job profiles. Workforce skill readiness is key to meet these latest advancements and industry needs.

The Assessment of 21st Century Skills Across Emerging Sectors: Aviation Sector, conducted by NIHERST in collaboration with the ILO (2023–2025), gathered data from aviation establishments in Trinidad and Tobago using an establishment skills survey aligned with standards of the International Labour Office Geneva, the European Training Foundation, and the European Centre for the Development of Vocational Training. The survey frame was developed using business listings from the Central Statistics Office, the National Agricultural Marketing and Development Corporation, and the National Training Agency, with the sample selected through systematic random sampling. Data collection was conducted through structured, face-to-face interviews with employers and senior managers, examining firm characteristics, workforce composition, job vacancies, recruitment challenges, core skills needs, skills mismatches, and current and projected demand for Science, Technology, Engineering and Mathematics (STEM) occupations.

The findings of the survey highlight that the aviation sector in Trinidad and Tobago is undergoing rapid

transformation, with growing demand for higher-level technical, digital, and transversal skills that are not yet fully met by the current workforce or training systems. Persistent recruitment challenges, notable skills mismatches, and evolving technological demands underscore the urgency of aligning education and training systems with industry needs. These findings are critical for informing evidence-based policy, strengthening workforce planning, and supporting the competitiveness and sustainable growth of the sector.

FIRM CHARACTERISTICS AND WORKFORCE COMPOSITION

The survey sample consisted of small enterprises (60%), each employing fewer than 49 workers, alongside a smaller proportion of medium enterprises (40%) with more than 50 employees. The distribution of activities shows that most participating firms operate in air-cargo services (60%), followed by enterprises engaged in aircraft maintenance and repair (20%). A limited number of firms are involved in commercial air transport operations and regulatory or oversight functions.

Employment structures are characterised by a strong concentration of technical and operational occupations, alongside an increasing share of workers classified within the occupational group of professionals. Most establishments employed fewer than 100 workers, both women and men. Women are more frequently represented in clerical support occupations and are equally present among service and sales workers, while men dominate in managerial, professional, and technician and associate professional categories. These gender imbalances limit women's access to higher-level occupations and constrain their opportunities for career advancement.

JOB VACANCIES AND RECRUITMENT CHALLENGES

VACANCY PROFILES

At the time of the survey, vacancies were concentrated in technical, operational and digital occupations, reflecting the changing skills requirements of the aviation sector. Employers reported high demand for professionals and technicians who combine technical expertise with digital competencies, particularly in areas such as maintenance, diagnostics and systems operations. The limited supply of candidates with these skill sets suggests that vacancy profiles often require prior work experience, sector-specific exposure or job-ready skills, thereby reducing opportunities for new labour-market entrants. This trend points to a narrowing of traditional entry pathways and underscores the importance of work-based learning and practical training in supporting effective school-to-work transitions.

KEY RECRUITMENT BARRIERS

The main barriers to recruitment include the limited number of applicants possessing the required technical skills, insufficient practical and work-based experience, and significant gaps in core cognitive and socio-emotional skills, including problem-solving, decision-making and emotional intelligence. Em-

ployers also reported that the educational attainment of job candidates often fell short of enterprise requirements and that available training programmes were sometimes outdated or misaligned with workplace realities. Taken together, these constraints point to systemic challenges in skills development and underscore the need for stronger alignment between training provision and labour-market demand, as well as expanded opportunities for practical training and industry exposure.

CORE SKILLS NEEDS AND MISMATCHES

KEY SKILLS

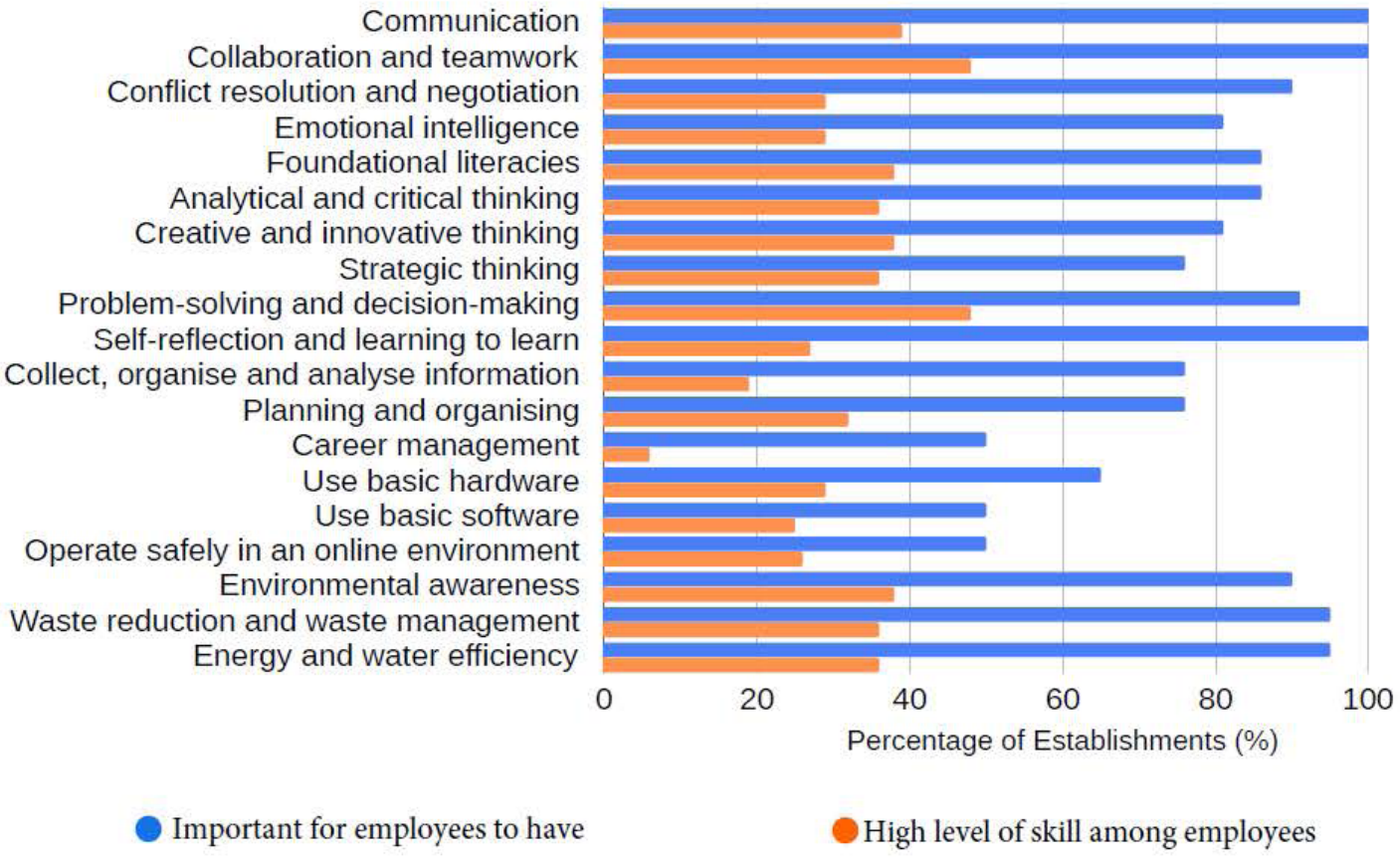
Employers place priority on a balanced mix of technical, digital literacy and transversal skills, reflecting the increasing complexity and technology-intensive nature of work in the aviation sector. In addition to occupation-specific technical expertise and IT skills, strong importance is attached to communication, collaboration and teamwork, as well as adaptability to evolving operational requirements and technological change. Problem-solving and decision-making skills are also highly valued, particularly in environments that require rapid responses and high levels of safety and precision. While most employers consider these core skills to be critical for achieving business objectives, the findings point to several skills gaps, especially in strategic thinking, emotional intelligence, and self-reflection and learning to learn, indicating a need for more emphasis on the development of cognitive and social-emotional skills.

LARGEST SKILLS GAPS (IMPORTANCE X PROFICIENCY)

Survey respondents were asked to identify the extent to which a set of core skills were present among recent graduates (2021–2023) applying for positions within their enterprises. The findings suggest that employers face relatively limited difficulty in sourcing core skills such as creativity, critical thinking, collaboration, communication, IT and decision-making. However, problem-solving and decision-making skills, as well as emotional intelligence, were identified as very difficult to source among recent graduates.

Survey respondents were also asked to provide their assessments of the core skill levels of their workforces. The study findings point to large gaps in a set of cognitive and socio-emotional skills. These skills were rated as highly important, yet employers assessed their workforce's proficiency in them as relatively low.

ESTIMATED SKILLS GAPS (IMPORTANCE OF SKILLS TO MEET BUSINESS GOALS X PROFICIENCY LEVEL AMONG EMPLOYEES)



In addition, while survey respondents reported that workers demonstrate relatively strong basic digital skills, these are insufficient to meet emerging industry needs. Overall, the findings point to skills gaps that may constrain productivity and firm-level performance, while limiting the sector's capacity to remain competitive in an increasingly technology-driven and globalised aviation industry.

TECHNOLOGIES RESHAPING THE SECTOR

The sector is undergoing rapid transformation driven by digitalisation, automation, and data-driven processes. In the aviation industry, technologies such as artificial intelligence and machine learning for predictive maintenance, biometric security systems for passenger processing, big data analytics and the Internet of Things (IoT) for real-time monitoring, and autonomous systems for airport operations are reshaping service delivery and operational efficiency. Moreover, the adoption of green aviation fuels and fuel-efficient technologies is advancing sustainability objectives. These developments are improving safety, reducing downtime and costs, and enhancing the passenger experience; however, they are also raising the demand for higher-level technical, digital and interdisciplinary skills, particularly in areas such as data analysis, systems engineering, cybersecurity and environmental management.

This transformation is reflected locally through initiatives such as the digital transformation of Caribbean Airlines, where technology integration has improved operational efficiency and service delivery, demonstrating the sector's potential to leverage innovation for competitiveness.

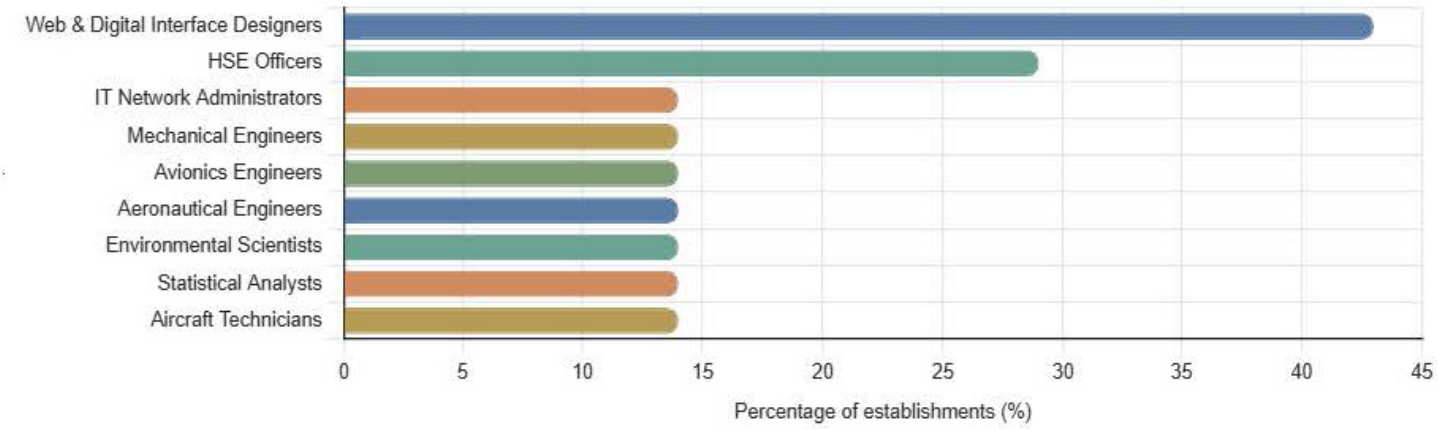
For Trinidad and Tobago, these trends signal an urgent need for continuous upskilling and reskilling, alongside greater focus on innovation, cybersecurity, and sustainability, supported by stronger industry–academia collaboration to develop a future-ready aviation workforce.

DEMAND FOR STEM LABOUR

The demand for STEM-qualified workers in the aviation sector is shifting, with growing emphasis on occupations that integrate engineering skills with digital technologies and data analysis. Although overall demand across establishments was relatively modest at the time of the survey, the highest need was observed in Computer Science and other IT-related fields. Employers identified IT technicians, software developers, computer programmers and web and digital interface designers as priority occupations. Engineering-related roles, including electrical, mechanical, civil and aeronautical engineers, as well as health, safety and environment (HSE) officers and environmental scientists were also identified among the key STEM occupations currently demanded by employers.

Looking ahead, the STEM labour demand is expected to grow, particularly for web and digital interface designers (43% of employers) and HSE officers (29%), reflecting increasing digitalisation and regulatory requirements. Nevertheless, supply-side constraints remain evident, notably in the persistent difficulties faced by employers in recruiting for STEM occupations, reflecting a limited availability of suitably skilled candidates. This challenge underscores the need of targeted interventions to strengthen workforce development in STEM.

MOST DIFFICULT STEM OCCUPATIONS TO FILL



TVET FINDINGS

The survey employed the STEM in TVET Curriculum Guide, developed under the ILO Women in STEM for Workforce Readiness and Development Programme, to gather information from respondents on the work-readiness of their current workforce and of recent Technical and Vocational Education and Training (TVET) recent graduates (2021–2023) applying for positions within their enterprises.

Employer feedback on TVET was limited, with low response rates to TVET-related questions. This may suggest gaps between training providers and industry, highlighting the need for stronger mechanisms to facilitate regular dialogue and collaboration. Where evidence is available, employers reported gaps in practical, hands-on training, as well as curricula that are not sufficiently aligned with rapidly evolving industry and technological requirements. Training is often perceived as overly theoretical, with limited exposure to real-world operational environments.
Employers underscored the need to expand apprenticeship programmes, strengthen collaboration between training institutions and industry, and reinforce the practical application of skills within training provision. These findings highlight the importance of modernising TVET systems to meet the skills needs of the aviation sector and better support school-to-work transitions.

RECOMMENDATIONS

The recommendations presented in this section draw on direct inputs from surveyed employers, alongside a comprehensive analysis of the overall findings of the study. Employers provided practical, demand-driven insights on strengthening skills development, improving recruitment outcomes, and enhancing workforce readiness. These are complemented by additional recommendations derived from the evidence on skills gaps, technological change, and labour market trends identified in the study. Together, they provide a comprehensive set of priority actions for consideration by policymakers, education and training institutions, industry stakeholders and social partners.

INVEST IN UPSKILLING AND RESKILLING PROGRAMMES FOCUSED ON DIGITAL AND ADVANCED TECHNICAL SKILLS

The study highlights that technological advancements including AI-driven maintenance, data analytics, automation, and digital systems, are reshaping job roles and increasing demand for higher-level technical and digital competencies across the aviation sector. At the same time, employers report skills gaps in both advanced cognitive skills and job-specific technical capabilities, alongside difficulties in recruiting candidates with the required expertise. While workers demonstrate relatively strong basic digital skills, these are insufficient to meet emerging industry needs. In this context, targeted upskilling and reskilling initiatives are essential to enable the current workforce to adapt to technological change, improve productivity and operational efficiency, and support the sector's competitiveness. Such pro-

grammes should prioritise areas such as IT systems, data analysis, engineering applications, and safety and environmental management, while also strengthening problem-solving and adaptive skills required in increasingly complex work environments.

INCREASE RESEARCH ON STEM CAREERS EMERGING FROM TECHNOLOGICAL ADVANCES IN THE AVIATION SECTOR

The adoption of AI and machine learning for predictive maintenance, IoT and big data analytics for real-time operations, biometric systems, and green aviation technologies are contributing to evolving STEM roles within the aviation sector. Employers identified priority demand in IT and Engineering fields, including roles such as software developers, data analysts, web and digital interface designers, and aeronautical and environmental engineers. Limited labour market information on emerging occupations and skills requirements constrains effective education and training planning. Expanding research on STEM careers is therefore essential to inform curriculum development, career guidance, and workforce planning, and to ensure that training systems remain responsive to technological trends and future skills demand.

IMPROVE THE ALIGNMENT BETWEEN TERTIARY EDUCATION PROGRAMMES AND INDUSTRY NEEDS

The study identifies a persistent mismatch between the skills supplied by tertiary education and those demanded by employers in the aviation sector. Employers reported that the educational qualifications of job candidates frequently did not align with enterprise requirements and that available training programmes were sometimes outdated or insufficiently relevant to workplace needs. While recent graduates demonstrated relatively strong basic digital skills, gaps remained in cognitive and socio-emotional skills, as well as in practical, job-ready experience. In addition, recruitment challenges, particularly the low number of applicants with the required skills and experience, point to weaknesses in transitions from education to employment. Strengthening the alignment between tertiary education programs and industry skills requirements is therefore critical to ensure that curricula reflect current technological developments, integrate practical training components, and contribute to develop both technical and transversal skills required by employers. Enhanced collaboration with industry, including through internships, apprenticeships and curriculum co-design, can support more effective school-to-work transitions and improve workforce readiness.

INCREASE TRAINING IN STEM FOR TEACHERS

The study highlights the growing importance of STEM occupations in the aviation sector, driven by rapid technological change and increasing demand for digital, engineering and analytical skills. However, the findings also point to gaps in both foundational and advanced skills among graduates, suggesting that current education and training systems are not fully equipping learners with the skills required by industry. Strengthening the capacity of teachers in STEM disciplines is therefore essential to improving the quality and relevance of education outcomes. Enhancing STEM training for teachers can support the integration of practical, technology-oriented learning approaches, improve student engagement, and contribute to the development of a future-ready workforce aligned with the evolving needs of the aviation sector.

ENCOURAGE STUDENTS TO PURSUE IN-DEMAND STEM STUDIES AND CAREERS

Employers reported difficulties in recruiting candidates with the required technical and digital skills, alongside a limited pool of applicants in key STEM fields such as IT and Engineering. At the same time, future demand is expected to increase for roles such as engineers, and HSE professionals, reflecting ongoing digitalisation and regulatory requirements. These findings point to the need for early and sustained promotion of STEM pathways, including increased awareness of aviation careers, targeted career guidance, and incentives to encourage student participation in priority fields. Particular attention should be given to expanding access for underrepresented groups, especially women, and strengthening linkages between education systems and industry to build a diverse and skilled workforce for the sector.

ENCOURAGE MORE LABOUR FORCE STUDIES ON STEM SKILLS AND STEM JOBS

Undertaking more labour force studies on STEM skills and STEM jobs is crucial for understanding labour market trends, emerging occupations, and evolving workforce requirements within the aviation sector. As technological advancements such as AI-driven maintenance systems, automation, data analytics, biometric technologies, and green aviation solutions continue to reshape the industry, there is an increasing need for timely and reliable labour market intelligence to identify current and future skills demands. Expanded research on STEM occupations and workforce trends will enable policymakers, education and training institutions, and industry stakeholders to develop targeted policies, programmes, and training interventions to address identified skills gaps and improve alignment between education and training systems and industry needs. Strengthening labour market intelligence can also support curriculum development, workforce planning, career guidance, and the development of a future-ready aviation workforce capable of supporting sector growth, innovation, and competitiveness.

Questions related to the report can be directed to:
sharon.parmanan@niherst.gov.tt

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