South Pacific Nations' Absorptive Capacity for Air-advising Missions

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Abstract

In recent years, South Pacific leaders have advocated a "zone of peace" for the region, with their national security forces focusing on civil security to protect exclusive economic zones, conduct outreach, perform aeromedical evacuations, and deliver humanitarian aid. However, protecting a vast archipelago requires air capabilities that can reach remote islands quickly and are protected against threats. Developing a sovereign air capability depends on the country's aviation industry, which can be technically restrictive. This article examines the absorptive capacity of South Pacific nations to develop sovereign air capabilities to shape actionable air-advising plans. The analysis is framed around three pillars essential for building such capabilities: infrastructure, capability, and a sustainable indigenous workforce. While capabilities and infrastructure can be quickly established, maturing a skilled domestic workforce hinges on the strength of the educational foundation in recipient nations. Thus, the success of air-advising efforts depends on the recipient nations' educational attainment levels. We analyze demographic data to quantify workforce capacity for establishing a sovereign air force.

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South Pacific leaders have consistently advocated for a "zone of peace" across the region, a concept that prioritizes regional security, maritime surveillance, rapid response for humanitarian and disaster relief (HADR), and strong diplomatic partnerships.[1] Given the predominantly archipelagic nature of the South Pacific, with its small island nations dispersed across vast oceanic expanses, there is a pressing need to develop a sustainable and sovereign aviation capability. Such a capability must be able to reach remote islands in time-critical situations and be safeguarded against potential threats. A sovereign aviation enterprise is foundational for building an air defense capability or air force that supports civil security, maritime surveillance, and rapid HADR response.

[1] Patrick Kaiku and Faith Hope Boie, "A Pacific 'zone of peace'—what will it entail?," *The Interpreter*, 21 November 2023, https://www.lowyinstitute.org/.

Developed countries with established military air capabilities, including air forces and aviation wings, can play a crucial role in supporting South Pacific nations in building their own air defense capabilities through air advising.[2] Joint training and exchanges between partner forces can provide intermittent boosts in capability. However, these efforts will not yield sustainable outcomes unless the recipient nation can absorb the knowledge and skills within their own aviation system. The experience of air advising between the United States and Afghanistan highlights the challenges of ensuring sustainable outcomes when the recipient nation lacks the capacity to independently implement new initiatives.[3] Hence, it is essential to understand the fundamental factors of the recipient nation to ensure that air advisory missions are fruitful and enduring. This includes progressively adapting the air-advising lines of effort as the partner nation's capacity develops.

Building a sovereign air force, or any security air element, rests on three pillars: capability, infrastructure, and workforce. Capability encompasses systems and aircraft, while infrastructure includes air bases or airports and maintenance centers. The third pillar, an indigenous workforce, requires appropriate foundational education to participate materially in the technologically complex aviation enterprise and build sovereign capacity. While external providers or hybrid models can supplement the workforce, a foundational level of indigenous national capability is indispensable. A robust educational system, combined with opportunities to acquire advanced knowledge, skills, and competencies for aviation technical roles, provides the framework for a sovereign and self-reliant air force. Training for aviation-specific roles is time-consuming and costly due to the intensive practical and theoretical components. Therefore, to build a sovereign air force through an air-advising partnership, it is crucial to train an indigenous aviation-specific workforce that has already attained the necessary foundational education.

This article assesses the absorptive capacity of South Pacific nations to receive air-advising missions aimed at building sovereign air forces. For the purposes of this article, *air force* refers to military aviation capability, whether housed in a dedicated air force or another military branch, such as aviation wings. While some nations and territories in the region have some form of military air capability, often as part of the defense force or paramilitary/gendarmerie, or, in the case of

[2] Nicole S. Finch and Peter A. Garretson, "Air Advising: A Critical Component of Joint Engagement," *Joint Forces Quarterly* 70, no. 3 (2013): 34–39, https://ndupress.ndu.edu/.

[3] Forrest L. Marion, *Flight Risk: The Coalition's Air Advisory Mission in Afghanistan, 2005–2015* (Annapolis: Naval Institute Press, 2018); and Matthew A. Douglas and Jonathan Ritschel, "Air Advising in Afghanistan: Building an Organization in Flight," *Air & Space Power Journal* 32, no. 3 (Fall 2018): 85–91, https://www.airuniversity.af.edu/.

French territories, provided through external training and support regimes, this article examines the potential to build military air capability from within. The absorptive capacity of a nation during an air-advising mission depends heavily on its available education and training systems, which are fundamental to technology transfer. To assess absorptive capacity, we analyze the educational systems and demographics of South Pacific nations. By understanding these critical factors, a tailored air-advising mission can incorporate foundational education courses and workforce capacity building to provide a lasting contribution to the recipient nation.

Requirements for Building Up an Air Force

An aviation-specific workforce is the third pillar, alongside infrastructure and capability, for establishing a sovereign air force. For the purposes of this paper, aviation-specific professions include pilots, air traffic controllers (ATC), command-and-control (C2) controllers (C2C), aircraft maintenance engineers (AME), and flight dispatchers. While entry into military-specific roles requires additional training, the basic skills needed for general aviation professions (commercial or professional roles) can serve as a benchmark, considering that South Pacific nations may not require kinetic airpower. Becoming a professional pilot or aircraft maintenance engineer necessitates distinct educational requirements. Conversely, training for ATC or C2C involves awards of ratings for specific duties, analogous to pilot and AME ratings for specific aircraft.

While various aviation-specific professions require specialized training, a secondary education is a shared prerequisite for entry into all these professions.[4] Studies have shown that trainees with secondary or post-secondary education who have undergone US ATC training were more successful compared to those without secondary education.[5] Additionally, the recency of attaining higher education has been identified as a significant contributor to success, often more so than the level of education itself.[6] Hence, the fundamental requirement for South Pacific nations to develop a sovereign air force is an indigenous workforce that has at least completed secondary education, along with accessible aviation training infrastructure shortly thereafter.

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[4] Nancy Shane, "The Relationship of a Pilot's Educational Background, Aeronautical Experience and Recency of Experience to Performance In Initial Training at a Regional Airline" (dissertation, University of North Dakota, May 2016), https://commons.und.edu/; and Bart B. Cobb, Carol L. Young, and Barbara L. Rizzuti, *Education as a factor in the selection of air traffic controllers* (Washington: Federal Aviation Administration, June 1976), https://www.faa.gov/.

[5] Janet S. Hansen and Clinton V. Oster, Jr., eds., *Taking Flight: Education and Training for Aviation Careers* (Washington: The National Academic Press, 1997).

[6] Hansen and Oster, *Taking Flight*.

Using the completion of secondary education as a benchmark, the road map toward building an air force involves training the necessary workforce in aviation-specific professions. On average, it takes approximately four years to complete an aviation-specific technical qualification from the completion of secondary education. Similarly, the construction of necessary infrastructure and the acquisition of new assets can be scheduled to match this four-year lead time. While assets can be provided in a shorter timeframe, through assistance or donations, the lead time required to develop the necessary indigenous workforce cannot be shortened and must be taken into account. Other deviations from this model may include training an indigenous workforce elsewhere and repatriating them to their respective country to serve, or recruiting or temporarily embedding already-trained foreign nationals. In any case, building a sustainable and sovereign air force hinges on the training of an indigenous workforce as a major consideration.

Workforce for a Sovereign Air Force in the South Pacific

Completion of secondary education is not the sole consideration when building a workforce for a sovereign air force in the South Pacific. It is equally important to implement a standardized secondary education curriculum, particularly in subjects like mathematics and physics, which must align with the requirements for pursuing an aviation career in the air force. Our recent analysis of the mathematics and physics curricula in South Pacific nations assessed their coverage relative to the baseline Australian curricula.[7] As a near neighbor with a well-advanced aviation industry, the Australian curriculum serves as a benchmark. Where the South Pacific curricula omit topics, sections, or elements from the baseline curriculum, secondary education completion does not provide the same level of foundational education, necessitating further training for indigenous workforce candidates to enter aviation technical professional training.

The coverage of South Pacific national curricula, weighted by relevance to derived aviation technical professional theory training prerequisites and aggregated for mathematics and physics, is shown in Supplementary Table 1.[8] Nations that implement foreign curricula have been assessed based on the Australian curriculum for Nauru and the French curriculum for French territories of French Polynesia, New Caledonia, and Wallis and Futuna. It is also important to note that Pitcairn Islands has a population of fewer than 50, and all secondary education is undertaken in

[7] Paul Bowes, Victor Daria, and Cristian Birzer, "Human resource potential for a sovereign aviation enterprise in the South Pacific," *Transportation Research Interdisciplinary Perspectives* 23 (January 2024): 101023, https://doi.org/.

[8] Bowes, Daria, and Birzer, "Human resource potential for a sovereign aviation enterprise."

New Zealand, while secondary students in the Cook Islands also travel to New Zealand to complete their secondary education. The curricula for Kiribati, Palau, Tokelau, Tonga, and Tuvalu were excluded as their curricula were not available. The majority of mathematics curricula in the South Pacific surpass 80 percent of the comparative breadth and depth of the Australian curriculum. Conversely, Papua New Guinea, Marshall Islands, Micronesia, and the Northern Mariana Islands fall below 80 percent. For physics, the Federated States of Micronesia had the lowest coverage at 28 percent, while the Marshall Islands, Mariana Islands, and Solomon Islands also had coverage levels below 80 percent.

When the data for mathematics and physics curricula coverage are pooled, our analysis shows that the Federated States of Micronesia, the Marshall Islands, and the Mariana Islands have insufficient curricula coverage (<80 percent), making it difficult for those completing secondary education in these nations to commence aviation technical professional training.[9] Fiji, American Samoa, Samoa, Solomon Islands, Vanuatu, and Papua New Guinea have incomplete coverage, but the gaps are smaller. Countries implementing foreign curricula or sending secondary students overseas are ranked high (100 percent) and have an indigenous workforce that can potentially pursue aviation technical training.

Since the goal of this work is to investigate the South Pacific nations' capacity for supporting a sovereign air force, the assessment of the mathematics and physics curriculum needs to be correlated with the number of people between the ages of 15 and 39 years. This age group is selected based on their trainability and potential to serve in the force after training.[10] Figure 1 illustrates such correlation and capacity, in terms of educated human work years, based on census data compiled in our previous work.[11] The pie graphs in Figure 1 depict the fraction (dark green) of the population between the ages of 15 and 39 years who have acquired at least a secondary or Year 12 education. The diameter of the pie graph represents the size of the population within the age group, as indicated in the top left legend. The base color of the pie charts represents Year 12 curriculum readiness based on the data in Supplementary Table 1. The raw census data acquired within a particular year is shown in Supplementary Table 2.

From Figure 1, we observe that the French territories of New Caledonia and French Polynesia have reasonably sized populations (>50,000) within the defined age group, with significantly higher secondary completion rates (>55 percent) and

[9] Bowes, Daria, and Birzer, "Human resource potential for a sovereign aviation enterprise."

[10] The age requirement to be an enlisted Airman in the US Air Force is between 17 and 42 years. *See* "Join the Air Force Active Duty," US Air Force, n.d., https://www.airforce.com/.

[11] Bowes, Daria, and Birzer, "Human resource potential for a sovereign aviation enterprise."

mathematics and physics curricula that meet the standards for pursuing an aviation-specific career. These territories have the highest potential for a successful air-advising mission. However, as French territories, New Caledonia and French Polynesia have defense capabilities provided by the French Armed Forces, with personnel deployed to the islands. This differentiates them from their neighbors. Nonetheless, the basis for developing home-grown capabilities is useful in informing possible futures for air forces in these territories.

It is important to note that Fiji has a much greater estimated capacity than Papua New Guinea, despite the latter having an overall population ten times larger. This disparity aligns with the significantly disproportionate secondary education completion rates between the two nations, which are 3.4 percent for Papua New Guinea and 40 percent for Fiji. Interventions to increase access and graduation rates in Papua New Guinea are likely to yield positive outcomes for a sovereign air force and, by extension, aid local development of other technologically complex industries and enhance the capability of the Papua New Guinea Defence Force. This is a critical factor for consideration, as Papua New Guinea has increased the size of its air wing over the past 20 years and is seeking to further increase personnel numbers and broaden the role of the air wing to undertake intelligence, surveillance, and reconnaissance tasks.[12] While there are identified gaps in the curricula for these two countries, air-advising missions could consider avenues for supplementary training to address those gaps.

Vanuatu and the Solomon Islands have a lower probability of success due to their small populations between the ages of 15 and 39 years (~15,000) and relatively large gaps in mathematics and physics curricula. The lowest probability of success is for those with extended gaps in curriculum (Micronesia and Marshall Islands) and low population sizes, as is the case with Samoa, American Samoa, Cook Islands, Nauru, Niue, Pitcairn Islands, Tokelau, Tuvalu, and Wallis and Futuna.

[12] "Future Papua New Guinea Defence Force Air Capability," Air and Space Power Centre, 12 December 2022, https://airpower.airforce.gov.au/.

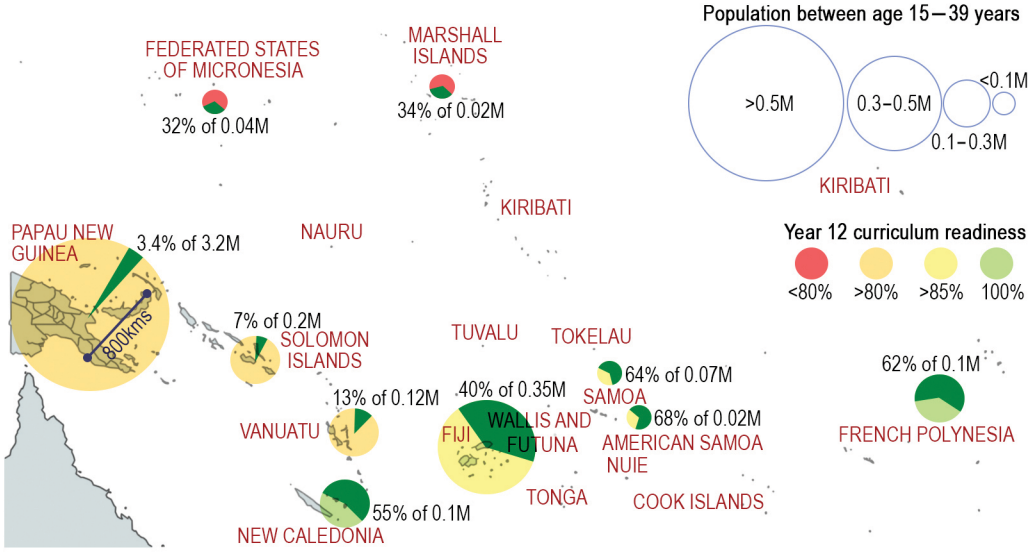

Figure 1. Absorptive capacity of South Pacific nations to build a sovereign air force via air-advising missions. The pie charts show the relative size of the trainable workforce (diameter) between the age 15-39 years and the fraction (Green) that have completed secondary education (Year 12). The background color of the pie charts show the % readiness of their Year 12 Maths and Physics coverage readiness. 100% (light green) represents a curriculum that is equivalent to the Australian Secondary School curricula, which corresponds with derived aviation technical professional theory training prerequisites (see Supplementary Table 1).

The Nexus Between Education and Air-advising Success

Historical experience indicates that aligning the scope and objectives of air-advising missions with the educational attainment levels and curricula of recipient nations is crucial for achieving positive outcomes. These outcomes manifest through material growth in the sovereign air capabilities of recipient nations in areas significant to them. For donor nations, success is measured by the contribution of air advising to collaboration and the reliability of the relationship with the recipient, as "presence requires access, access requires a relationship."[13]

The recent and protracted example of aviation capacity building in Afghanistan provides many lessons, despite the mission's focus on rapidly building sovereign combat airpower, in contrast to the comparatively peaceful objectives of capacity building among South Pacific nations. Low levels of literacy and numeracy constrained all aspects of the Afghanistan military advisor mission, particularly in

[13] Kevin Ruddell, "SOCPAC Science and Technology" (presentation, Pacific Operational Science and Technology Conference, 8 March 2021), https://ndia.dtic.mil/.

aviation, where working levels of English are required.[14] Beyond language, in the technologically complex discipline of aviation, literacy was often conflated with education.[15] As English is the internationally mandated lingua franca of aviation, English language skills are a fundamental precursor to undertaking aviation technical professional training. In the Afghanistan example, a solution to address the education gap in mathematics and physics was to include foundational education in these subjects at the Afghan Air School in Kabul, delivered by mentors from the NATO Training Mission–Afghanistan (NTM–A).

The glidepath to capability must consider both the broad educational attainment of the indigenous recruiting base and the effort required to upskill education toward the contemporary standards of a developed country. The Afghanistan air-advising effort was adversely affected by the transition to technologically complex Western systems from the legacy ex-Soviet systems that were more familiar to the Afghans, such as the Mi-17 Hip transport helicopter to the UH-60 Black Hawk. Compounding the challenge is the increased reliance on detailed technical manuals to correctly maintain and operate these complex machines compared to simpler platforms. A specific challenge for Afghanistan was that the original equipment manufacturers for aircraft would not convert their publications into Dari or Pashtu due to translation concerns with the nontechnical nature and limited vocabulary of these languages.[16]

Conversely, the post-World War I air-advising mission between France and Japan was initially successful in fostering a close relationship between the two nations.[17] France aimed to develop an export partner, but Japan already possessed a sovereign aviation industry. Nonetheless, the highly educated and technically capable Japanese workforce quickly and adeptly mastered the contributions offered by the French. This rapid mastery eventually diminished the export potential for France, leading to Japan losing interest in further offerings.[18]

The lesson to be observed is that an air-advising mission to the Pacific must remain cognizant of the educational advancements and competencies among the sovereign workforce and recruiting base. It is crucial to pivot appropriately to new avenues of collaboration to ensure an enduring relationship that contributes positively to the overall internation relationship.

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[14] Kenneth P. Moorefield et al., *Progress of U.S. and Coalition Efforts to Train, Advise, and Assist the Afghan Air Force* (Washington: US Department of Defense, 4 January 2018), https://media.defense.gov/.

[15] Marion, *Flight Risk*.

[16] Moorefield et al., *Progress of U.S. and Coalition Efforts*.

[17] Donald Stoker and Edward Westermann, eds., *Air Force Advising and Assistance: Developing Airpower in Client States* (Warwick, UK: Helion & Company Limited, 2018).

[18] Stoker and Westermann, *Air Force Advising and Assistance*.

Education, Aviation, and the Strategic Context

As South Pacific nations gained independence, they recognized the importance of developing sovereign educational systems to produce educated graduates for governance and management.[19] These systems needed to evolve, tailored to domestic needs. However, with limited industry and private sector opportunities, many graduates struggled to find employment, diminishing the incentive for youth to pursue education. This is evident in Vanuatu, where education is often perceived as low value due to the scarcity of professional jobs.[20] Poor educational outcomes and low attainment levels have been linked to instability, corruption, and governance failures.[21]

In 2018, Australia announced a Pacific Step-up policy and followed with a strengthened focus on bolstering Pacific relationships through local-led development, with an objective of a "free and prosperous Pacific."[22] The United States subsequently embraced Pacific development and preservation of free and open societies through the enhanced Pacific Islands Partnership announced in 2023.[23] In this context, stimulating commitment to and the development of local education capacity and quality is crucial. Strengthening these systems builds resilience against coercion, acceding to poorly informed foreign loan debt, and the erosion of democratic principles, which can be exploited by unscrupulous strategic competitors. While the connection to aviation might seem indirect, aviation—with its blend of prestige, romanticism, and utility—provides a unique opportunity for South Pacific nations. It not only offers direct employment in highly cognitive roles but also creates indirect opportunities requiring substantial technical expertise, breaking down barriers to global connections and opening doors to new possibilities. Technologically advanced development may offer a stimulus to nation populations to seek greater educational attainment and, in turn, create a reinforcing feedback loop driven by accompanying socioeconomic development.

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[19] Tupeni L. Baba, "Education in the Pacific Islands," in *The Pacific Islands in the Year 2000*, edited by Robert C. Kiste and Richard A. Herr (Honolulu: University of Hawaii at Manoa, 1985), 125–50, https://scholarspace.manoa.hawaii.edu/.

[20] Kylie Mullins, *Vanuatu Barriers to Education Study* (Port Vila: Vanuatu Monitoring, Evaluation and Research Team, September 2018), https://education.gov.vu/.

[21] Eric M. Uslaner, "Inequality, Education, and Corruption," in *The Oxford Handbook of the Quality of Government*, ed. Andreas Bågenholm et al. (New York: Oxford Academic, 2021), https://doi.org/.

[22] "Stepping Up Australia's Engagement with Our Pacific Family" (fact sheet, Department of Foreign Affairs and Trade, Australia, September 2019), https://www.dfat.gov.au/.

[23] "Enhancing the US Pacific Islands Partnership" (fact sheet, The White House, 25 September 2023), https://www.whitehouse.gov/.

Tailored Air Advising and Beyond

To succeed in air advisory missions, it is crucial to understand the requirements of the recipient nation. Additionally, recognizing the recipient nation's absorptive capacity is essential for them to sustain the capabilities independently. The defense priorities of South Pacific nations necessitate the development of a nonkinetic air force, which includes capabilities for intelligence, surveillance, and reconnaissance to monitor their borders and exclusive economic zones (EEZ), including fisheries. Furthermore, these nations require capabilities for HADR and rapid response to crises using airlift capabilities, medical support, and logistical aid. These capabilities provide critical supplies, evacuate victims, and restore essential services, exemplifying the role of the air force in alleviating human suffering and stabilizing affected South Pacific regions without engaging in combat.

An air force capable of providing HADR services requires assets such as cargo aircraft like the C-17/A Globemaster III and C-130 Hercules, which transport supplies and personnel. These large aircraft, particularly the C-17, require substantial air basing support and clear access, which are rarely available in the South Pacific. In the mountainous areas of Papua New Guinea, for example, small and fragile landing areas limit access to rotary-wing and smaller transport aircraft, such as the C-27J Spartan. This means that advisory teams must also be cognizant of the specific operating environment and infrastructure capacity. Helicopters, such as the HH-60 Pave Hawk, are also important for search and rescue operations. These assets enable rapid deployment, delivery of aid, and evacuation efforts in times of crisis. To operate these assets, a sovereign air force requires the aviation-specific professionals mentioned earlier, in addition to support personnel with aviation indoctrination, such as medical teams, search and rescue teams, logistics specialists, communications officers, and security personnel.

Air advising must cater to the specific air capability requirements of South Pacific nations. Additional effort is needed for countries like Papua New Guinea and Fiji, where the level of mathematics and physics coverage in secondary schools needs to be uplifted as part of the air-advising mission. This can be achieved by including supplemental training to fill gaps in mathematics and physics coverage and promoting this educational need in broader development programs. It is important to note that some nations follow a 13-year secondary school model, such as the Cook Islands, Fiji, Kiribati, Niue, Samoa, Solomon Islands, Tokelau, and Vanuatu.[24] In these nations, the additional year is generally regarded as preparation for university, which motivates students to undertake and complete the program.

[24] Bowes, Daria, and Birzer, "Human resource potential for a sovereign aviation enterprise."

As our study assessed curriculum readiness for all nations at Year 12, suggested supplemental training for aviation-specific careers could be incorporated into the additional year for those nations where this option is available.

Beyond air-advising missions, improving the overall quality of life in South Pacific nations by enhancing basic education will contribute to these countries' absorptive capacity for a sovereign aviation capability. Educational aid programs in the South Pacific focus on improving access to quality education, enhancing educational infrastructure, and building local capacity. Australia invests close to 50 percent of its 2023–24 Official Development Assistance–Education budget in educating the youth in the South Pacific.[25] New Zealand invests 62 percent of its Partnerships for International Development fund to support educational projects that enhance teaching quality and learning outcomes in the South Pacific.[26] The United Nations Children's Fund Pacific Islands implements programs to improve early childhood education, access to primary education, and inclusive education for children with disabilities.[27] The Asian Development Bank funds projects to build and refurbish schools, provide learning materials, and integrate technology in classrooms.[28]

Investment and educational programs for South Pacific nations could bolster secondary completion rates. In the cases of Papua New Guinea (3.4 percent) and Solomon Islands (7.1 percent), increasing the proportion of youth completing secondary education would not only increase the intake into aviation-specific professions or their respective defense forces but could also have a profound impact on their entire economy. It is also important to note that boosting primary school completion rates is a prerequisite to improving secondary completion rates. Another significant factor in providing quality education for South Pacific nations is the existence of well-trained teachers and an optimal teacher-student ratio. Developmental aid programs aiming to train teachers in the South Pacific should be pursued. Hence, investments in educational infrastructure and teacher training programs will improve access to education, ensure the availability of an indigenous workforce for a sovereign air force, and increase the absorptive capacity to receive air-advising missions.

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[25] "Education and Skills: Development Cooperation Factsheet" (fact sheet, Department of Foreign Affairs and Trade, Australia, 2023).

[26] Mark McGillivray et al., *Evaluation of the MFAT's Partnerships Fund* (Auckland: New Zealand Ministry of Foreign Affairs Trade, 12 March 2018), https://www.mfat.govt.nz/.

[27] Simon J. Molendijk, Steven J. Coombs, and Madhumita Bhattacharya, "Bridging the Gap between Education Policy, Planning and Practice: Establishing and Effecting National Minimum Quality Service Standards for Effective Schools in Pacific Island Countries" UNICEF, 19 December 2017, https://www.unicef.org/.

[28] Kowsar P. Chowdhury, ed., *Better Learning, Better Future: Education and Training Sector Strategy in the Pacific* (Manila: Asian Development Bank, 2005).

The level of educational infrastructure is a reflection of the country's economy and political policies, which are also necessary to sustain a sovereign air capability and maintain operational readiness, secure funding, and ensure strategic consistency. Political stability enables clear defence policies, while economic stability provides necessary resources for training, equipment, and technological advancement.

Conclusion

A crucial element in building a sovereign air force is an indigenous workforce with the appropriate foundational education for pursuing aviation-specific careers. In this article, we assessed the absorptive capacity of South Pacific nations to acquire aviation-specialist knowledge via air-advising missions and sustain a sovereign air force. Our analysis shows that the French territories of New Caledonia and French Polynesia have the highest potential for a successful air-advising mission. These territories have curricula that meet the standards for pursuing aviation-specific careers and maintain a reasonable-sized population (>50,000) within the age group (15–39 years) that could be trained and serve in the force.

While Papua New Guinea has the highest population among South Pacific nations, its secondary school completion rate is low at 3.4 percent, compared to Fiji's 40 percent. However, both countries have a reasonable-sized population (>100,000) within the same age group. These two countries have gaps in their curricula that could be addressed during air-advising missions. Vanuatu and the Solomon Islands have a lower probability of success due to their smaller populations in the same age group (~15,000) and larger gaps in curricula. The rest of the South Pacific nations have the least probability of success due to extended gaps in curricula and very low populations.

In conclusion, the success of air-advising missions in the South Pacific hinges on understanding the educational landscape and tailoring efforts to address specific gaps. By investing in foundational education and aligning air-advising missions with the unique needs of each nation, we can build sustainable and sovereign air forces that contribute to regional stability and security. ✪

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Ms. Carroll is a senior security, defense, and public policy advisor and researcher, specializing in international relations, security, defense, and counterterrorism, and an officer in the Royal Australian Air Force. She has been a senior research fellow at The Australian National University's National Security College and was the inaugural head of Australian Strategic Policy Institute's Counter Terrorism Policy Centre. Ms. Carroll has held senior executive roles in the Australian government, working in the Department of Defence and the Attorney-General's Department, and a range of military appointments. Her experience includes strategic policy and planning, national security, intelligence, counterterrorism, border security, space, military operations, campaign planning, and scenario development. She graduated with honors from The Australian National University, and holds postgraduate qualifications from Flinders University, the University of Sydney, and Deakin University. She is a graduate of the Australian War College's Defence and Strategic Studies Course, and the Defence and Industry Study Course. She is a graduate member of the Australian Institute of Company Directors (GAICD) and a member of the Australian Institute for International Affairs and the Institute of Public Administration Australia (MIPAA).

Dr. Vincent Daria

Dr. Daria is the Deputy Director for Research and Engagement at the Royal Australian Air Force's Air and Space Power Center (ASPC). He earned his PhD in applied physics and built-up a career in biomedical photonics, where he designed and built microscopes that incorporated holograms to study microscopic objects and living cells for probing brain function. As a scientist, he has written more than 100 articles and has been cited more than 2,500 times. In 2021, he joined ASPC to manage the center's research fellows who are pursuing graduate degrees as well as engage with academics, think tanks, and international partners. He is also the editor of the center's blogs, monographs, and journal, *Contemporary Issues in Air and Space Power*. He convenes the center's Maritime Security Research Program where they host a number of defense scholars from neighboring countries to work on the effective use of air and space power to meet maritime security challenges within the Indo-Pacific.

Supplementary Table 1. Scored coverage of reference curriculum (Australia) by nation (Bowes, Daria, & Birzer, 2024). Subjective rating scale: 3, all elements of reference curriculum topic are included; 2, majority of elements of reference curriculum are included; 1, some elements of reference curriculum are included; 0, no elements of reference curriculum are included. The last three columns sum up the ratings (for Maths, Physics and Maths & Physics combined) and normalized with the maximum score (%). Color code: Green >90%; Yellow 85-90%; Orange 80-85%; Red <80%.

Country	Maths									Physics								
	Arithmetic	Rates, Ratios and Time	Algebra	Geometry	Coordinate Geometry	Trigonometry	Calculus	Vectors & Mechanics	Probability & Statistics	Units and Measurement	Mechanics & Kinematics	Oscillations, Waves, and Fluids	Thermodynamics	Electromagnetism	Optics	Maths (%)	Physics (%)	Combined Maths and Physics (%)
Cook Islands	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100	100	100
French Polynesia	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100	100	100
Nauru	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100	100	100
New Caledonia	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100	100	100
Niue	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100	100	100
Pitcairn Islands	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100	100	100
Wallis and Futuna	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100	100	100
American Samoa	3	3	3	3	3	3	3	3	2	3	3	3	3	1	2	96	83	91
Samoa	3	3	3	3	3	3	2	1	3	3	3	2	2	3	3	89	89	89
Fiji	3	3	3	3	3	2	2	2	2	3	3	3	3	2	2	85	89	87
Vanuatu	3	3	3	3	3	3	2	0	3	3	3	2	2	3	2	85	83	84
Solomon Islands	3	3	3	3	3	3	2	0	3	3	3	2	2	2	2	85	78	82
Papua New Guinea	3	3	3	3	2	2	0	1	3	3	3	3	3	3	1	74	89	80
Northern Mariana Islands	3	3	2	2	3	3	1	2	3	2	2	2	2	2	2	81	67	76

Supplementary Table 1 (*continued*)

Country	Maths									Physics								
	Arithmetic	Rates, Ratios and Time	Algebra	Geometry	Coordinate Geometry	Trigonometry	Calculus	Vectors & Mechanics	Probability & Statistics	Units and Measurement	Mechanics & Kinematics	Oscillations, Waves, and Fluids	Thermodynamics	Electromagnetism	Optics	Maths (%)	Physics (%)	Combined Maths and Physics (%)
Marshall Islands	3	2	3	2	3	2	1	0	2	2	3	3	0	2	1	67	61	64
Federated States of Micronesia	3	2	3	3	3	2	2	1	2	1	1	2	1	0	0	78	28	58
Kiribati	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Palau	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tokelau	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tonga	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tuvalu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Supplementary Table 2. South Pacific nations' total (and portion of) population within training/working age ranging from 15–39 Years for the year when census was acquired. Demographic shows population with year-12 education.

Country	Total Population	Census year	Population of age group between 15-39 years	Population of same age group with Year 12 education	%Population of the same age group with Year 12 education
Papua New Guinea	7,254,441	2011	3,228,226	109,807	3.4%
Fiji	884,887	2017	350,980	139,624	39.8%
Solomon Islands	515,870	2009	210,048	14,865	7.1%
Vanuatu	300,019	2020	116,865	15,056	12.9%
French Polynesia	275,918	2017	107,466	66,271	61.7%
New Caledonia	271,407	2019	99,691	55,079	55.2%
Samoa	187,820	2011	69,834	44,489	63.7%
Kiribati	119,438	2020	48,546	8,512	17.5%
Federated States of Micronesia	102,843	2010	41,531	13,406	32.3%
Tonga	100,610	2016	37,531	21,621	57.6%
Marshall Islands	53,158	2011	21,923	7,598	34.7%
American Samoa	55,519	2010	20,622	13,975	67.8%
N Mariana Islands	53,883	2010	18,902	13,129	69.5%
Palau	17,614	2020	6,005	4,659	77.6%
Cook Islands	17,434	2016	5,846	1,259	21.5%
Nauru	11,450	2019	4,979	1,317	26.5%
Tuvalu	10,645	2017	4,164	2,853	68.5%
Wallis and Futuna	11,558	2018	3,514	1,196	34.0%
Tokelau	1,499	2016	554	189	34.1%
Niue	1,460	2017	467	160	34.3%
Pitcairn Islands	41	2019	6	6	100.0%