

Education and Performance in Aviation: Realising and Sustaining Benefits

Dr. O.B. Aliu, ICAO Council President

Responses to Hermes Interview Questions

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Who will bear the cost of education and training in the aviation sector?

Globally the circumstances relating to educational and training subsidization are too diverse to suggest any sort of single response to this question. Country-to-country there will naturally be variance in how much the individual student, corporate stakeholders in the sector in question, and government bodies will assume the costs.

Apprenticeships and internships relating to more specialized aviation responsibilities, for example pilots and controllers, are often assumed by industry operators who see a clear value in investing in the assurance of a sustainable future workforce with the skills and capabilities they project to be needed. An airline or air navigation service provider, for example, will often carefully select ab initio cadets who are trained to their organizational specifications, as well as to meet specific licensing requirements for these positions.

ICAO also encourages greater public sector investment in national or local human resources development for aviation, mainly as countries also stand to benefit socio-economically when their local workforce is suitably skilled and prepared to ensure that local air operations are up to ICAO standards.

Are aviation industry stakeholders willing to become more proactive partnering with existing educational institutions and/or setting up their own academies?

For those specialized operational jobs like pilots and air traffic controllers - absolutely. And it is not just for those jobs. For example, some airports are expanding and including an onsite training facility for a wide range of aviation jobs as part of an “airport as a community” concept.

With an expected doubling of both air passenger and freight traffic volumes by 2035, airlines, airports and air navigation service providers are placing increased value on people development. They know that the steadily increasing air traffic will generate significant risks and that they need to have a competent workforce capable of meeting the needs and challenges of the global aviation community into the future. With the current focus on competency-based training and assessment for aviation professionals, in order to integrate technical skills development with those related to judgment and people management, many aviation organizations today are either enhancing their own course curricula or developing courses with universities or aviation training institutions.

ICAO is also partnering with various universities and other aviation educational institutions throughout the world to offer e-learning and certificate courses, and to establish graduate and post-graduate courses in such areas as Aviation Safety Management and Data-driven Decision-Making. Such activities support the

mission of ICAO's Next Generation of Aviation Professionals (NGAP) Programme to ensure that the global aviation community, States, and service providers, have sufficient numbers and types of competent aviation personnel with the adaptability and flexibility to maintain safe, secure and efficient operations in a rapidly evolving air transportation system.

And there are increasingly more examples of international and national aviation associations partnering not just with universities, but with education and government departments to offer aviation learning opportunities to younger people still in secondary, or even elementary school, because they have recognized the need to be proactive in order to attract the best and brightest.

One example of this would be how the U.S. Aircraft Owners and Pilots Association is presently developing a four-year high school STEM program that falls along two tracks – flying and unmanned aircraft systems or drones. This will see high school kids undertaking real-world applications of STEM subjects as they work towards completing their secondary school education – and with the possibility of a certification or industry-accepted test when they finish, all before they enter university or the job market. Many of these students would not have even considered the possibility of a career in aviation without such exposure, which speaks to the value of these approaches.

As part of ICAO's Next Generation of Aviation Professionals (NGAP) Programme, we are looking at ways to foster further partnerships and facilitate similar approaches in other countries.

Part II

How do education and industry dynamics shape the future of industrial relations and human resources management in the aviation sector?

Educational dynamics play an important role in the future of Human Resources Management. For the first time, industry is experiencing a workforce composed of several generations, and the dynamics within the current educational system needs to address this.

Industry dynamics will shape the future as well. The aviation industry is competing with numerous sectors to attract today's best and brightest candidates, and will need to focus on aspects such as branding, establishing strong employee propositions, embracing diversity and inclusion, and increasing the progressiveness of management relations, in order to address this.

What should be the educational background of future aviation managers?

This depends on the aviation specialization in question and the specific managerial level. However as with every role in air transport there will be a need for a reasonable level of technical knowledge and awareness, which in combination with strong business competencies will generally result in well-prepared aviation managers.

Is there a clash between operations/technical-oriented and soft-skills oriented organizational culture or is there real room to explore educational synergies to improve the effectiveness of management?

There's not just room for synergies between an operations/technical-oriented and soft-skills oriented organisational culture – there's an absolute need for it.

The so-called “soft skills” are the ones that make for a more engaged, committed and positive workforce. They also help ensure that a necessarily standards- and procedures-driven industry is more flexible and adaptable while keeping the aviation system safe.

The days of becoming a manager by being the best or most senior technical officer are, or should be, over. Effective management today is defined by the application of appropriate “soft skills” that build on a clear understanding of operational context, and buttressed by a solid system-wide perspective.

How can education and training in aviation affect sectoral gender balance and industrial relations in the future?

The aviation sector is in general a male dominated industry today. But with the level of attrition and expansion now forecast, and in light of how significant our need for new recruits is, the gender gap is expected to decrease because we will absolutely need large numbers of both women and men to address the current and expected shortfalls.

This speaks to why cultural norms and biases need to be addressed to lay down the foundation for girls to aspire to educational paths leading to skilled careers. That means we need to work to see more gender equal access and encouragement for these educational objectives, including programmes related to Science, Technology, Engineering and Mathematics (STEM). Continued training and development for women already in the sector is also necessary in order to retain and promote women.

In 2016, the ICAO Assembly reaffirmed its commitment to gender equality and the promotion of women in the global aviation sector through States' endorsement of the ICAO *Gender Equality Programme*.

Part III

What are the challenges set by automation and artificial intelligence for the future of aviation education and training?

While the demand for air travel continues to expand exponentially, the rate of change in the aviation system and increasing levels of automation make it difficult to know what the aviation jobs of the future will actually look like. I expect there will be many that we can't even imagine yet.

For this reason, aviation employers will need to recognize the importance of a comprehensive educational foundation and not just specialized training if tomorrow's air transport human resources are going to be resilient and flexible enough to respond to the accelerating changes in aviation-related technologies and operations.

As technologies have become more advanced and complex, the human role has begun to shift from one of an operator to that of a supervisor. Supervisory control has been a great advance in human-machine interaction, but rather than simply reducing human workload, it has shifted the onus from manual to cognitive demands. Ironically, the more advanced the automation, the more crucial the human contribution, because humans are left to do the tasks which could not be automated. What's more, human resources must be prepared to intervene when automation fails, or when it encounters conditions it hasn't been programmed to accommodate.

So the future education and training challenges set by automation relate not just in understanding the algorithms on which the outputs are based, and what they mean operationally, but also in dealing with the unexpected and systems thinking, with a focus on managing change within the aviation system.

How can aviation ensure that people who are currently (or in the next ten years) educated and trained in the sector will not become unemployed in thirty or forty years' time?

To produce the next generation of aviation professionals, educational institutions will need to adapt their curricula to provide students with the resilience and flexibility needed to respond to the rapidly-changing aviation system. This is that educational foundation I just mentioned.

At the same time, the aviation industry will need to place a large emphasis on continual upskilling and upgrading of competencies across an individual's career wherever they are in the aviation occupational spectrum. Lastly there is a personal onus upon every professional to maintain their relevancy and effectiveness through proactive skills upgrading as their area of specialization evolves around them.