

The Importance of Transfer of Technology in Providing a World-Class Aviation Training

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Abstract

The development of MIAT, from a small aviation school in Malacca with technical support from Northrop-Rice to a full fledge aviation training institute supplying skill technicians and licensed engineer to the industry is something need to be shared for. The case is one of the success stories in transfer of technology from a technology provider (Northrop-Rice Inc.) to the local team of trainers. The process involved several phases, and now, MIAT planned to leapfrog into a full aviation university (under UniKL) that provides aviation training, education and research in graduate and post-graduate level. It is now manned by local trainers and lecturers, whose expertise and knowledge is at par with the original technology provider. The Transfer of Technology is deemed very important since it helps the institute to establish its aviation training and academic programmes in line with the industry demand. The training received by staffs, and the amount of equipments and technical materials transferred has put MIAT in a strong footing to further propel its role in the coming years. The whole process is part of the efforts taken to establish Malaysia as one of the aviation training provider in this region, at par with the global trend in aviation training. UniKL-MIAT is being setup to fulfill this goal.

Keywords: Aviation Training, Transfer of Technology

1. Introduction

The history of aviation is a long one – starting in the days of mythology and continuing on today. As aviation grew from sport to industry, it was initially self-governing and learned primarily through trial and error. As the industry grew, airlines realized that without outside regulation, the industry would become unsafe. The certification of airlines, pilots, mechanics and engineers, and other personnel is very important in the sense that they have direct influence on the safe operation of the aircraft. In other words, the more experience and competent personnel in such industry, the safer the industry will be.

Experience and competency can most be demonstrated by certificates and licenses issued to the personnel or organization from the certifying agency. In the United States, the majority of the recognized certifications in aviation are issued by the Federal Aviation Administration (FAA). On the other side of the region, which is in Europe, the Joint Aviation Authority (JAA) certifies personnels within the European Countries. In Malaysia particularly, all aviation

personnels certifications are put under the Department of Civil Aviation (DCA). The DCA of Malaysia is established as an organization under the Ministry of Transport Malaysia to provide efficient and safe air transportation. The mission of DCA is to ensure every flight within Malaysian airspace is safe, orderly & expeditious, and their vision is 'Towards Safer Skies' [1].

2. Background

The first part of this paper emphasizes the importance of having a world-class training in producing a world-class highly competence personnel in aviation workplace and at the same time, improving the safety and effectiveness in the particular industry. The second part of the paper focuses on the importance of technology transfer in aviation training, as what has been done in UniKL-MIAT in providing world-class aviation training, and to be at par with other aviation training institutions around the world.

3. The Importance of having World-Class Training

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Everyday, somewhere in the world, events occur which could have been prevented if the participants had been better trained. Take these examples, for instance.

In October 1994, a Boeing 747 took off from Sydney Airport bound for Japan. An hour after take-off an engine had been shut down and the crew decided to return to Sydney. On final approach, the aircraft's nose-wheel failed to lower and the aircraft touched down with no nose gear. The investigation revealed deficiencies in the competence of the Flight Engineer as well as serious mismanagement of the crew training associated with the introduction the aircraft into service, a factor which contributed to the situation [2].

In September 1997 a member of a cabin crew aboard an MD-80 aircraft was approached by a ground handling agent who asked about a toilet door that needed fixing (reported by the in-bound crew). The agent talked about the toilet in the First Class section needing some 'WD-40' lubricant, but didn't have one onboard. They substituted the WD-40 with another type of lubricant that they managed to get. The job done, the cabin crew member commented on the strong smell in the cabin. After take-off, a passenger and 2 of the cabin crew became ill and needed hospitalization, which resulted in the aircraft being diverted. The passenger handling agent was an office manager, not a technician, and his substitute for WD-40 was a highly-toxic lubricant which was not to be used in confined spaces, a fact clearly marked on the container [3].

In June 1998 a 747 taking off from San Francisco, again bound for Japan, experienced problems with an engine soon after rotation. The First Officer (FO), who was flying the aircraft, applied the wrong technique to keep the aircraft under control. The aircraft lost speed sufficient for the stall warning stick shaker to be activated. The aircraft cleared San Bruno Mountain, 5 miles northeast of the airfield, by 100 feet, missing the radio masts rising a further 600 feet above the mountain top. The subsequent investigation found that most FOs rarely handled the controls on take-off and landing. In fact, some were flying for up to 2 years without touching the controls during these critical stages of flight [4].

These 3 cases may raise a few eyebrows but each highlights a problem which most aviation professionals encounter everyday, lack of training.

Aviation training is governed by strict regulations from the authority, and the technology players need always to improve and update their skills and expertise. In effort for Malaysia to have a pool of competent

aviation workforce, the aviation training in the country needs to be at par with the global trend in aviation training.

4. The Importance of Technology Transfer in Aviation Training

Training is all about optimizing performance [5]. We want people to be able to perform efficiently, either through their own efforts or in terms of their ability to exploit the tools of the trade, so to speak. As the matter of fact, there have been many reports of poor communication between flight deck and ground crew. Quite often, poor performance is the consequence of inadequate investment. For instance, the people can do the job but have the wrong tools.

Generally speaking, *Technology Transfer* is the sharing of knowledge and facilities among laboratories, industry, universities etc. It is also meant, sharing of technical information by means of education and training. Successful technology transfer in our context means that it is necessary to a broad view of "Technology" to mean the skills, abilities, knowledge, systems and processes necessary to perform the job efficiently. Thus technologies are meant to be total systems that include know-how, procedures, goods and services, as well as organizational and operational measures [6].

Aviation industry is a unique and viable industry. An airplane can fly from one region to another without any physical barrier. Therefore, the world's airspace is being operated by the international standards, including the technical standard and organizational standards. From the technical point of view, in order for an individual to work in various technical fields in the MRO industry, they must have a certification from the local aviation authority. In Malaysia for instance, the Department of Civil Aviation (DCA) is the accountable organization pertaining all aviation matters [1].

Aviation training in Malaysia is quite new, although the Malaysian Airline Systems (MAS) was established in 1972, and the history goes further beyond the year. The government has recently adopted various strategies in developing the country as the regional hub in the aviation industry as laid down in various documents such as the Malaysian Industrial Master Plan produced by the MITI, the Blue Print Of the Malaysian Aerospace Industry by MiGHT and the various five-year Malaysia Plans. The aviation industry in Malaysia is to focus in three (3) specialty namely; the part and components

manufacturing, maintenance, repair and overhaul (MRO) and the international aviation training [7].

Until today, MAS has spent millions of dollars, sending their pilot and engineers abroad for training and getting the certification from the international aviation authority, until they realized the importance of having the training locally. This is how the transfer of technology in aviation training became so important. The transfer of technology in our sense is actually the transferring of “Technological Know-How” from the technology provider. The “Technological Know-How” in our context is actually the technical requirements and specifications specified by the aviation authority, which enables the individual trainees to be certified by the aviation authority upon completion of the course.

5. UniKL-MIAT Experience

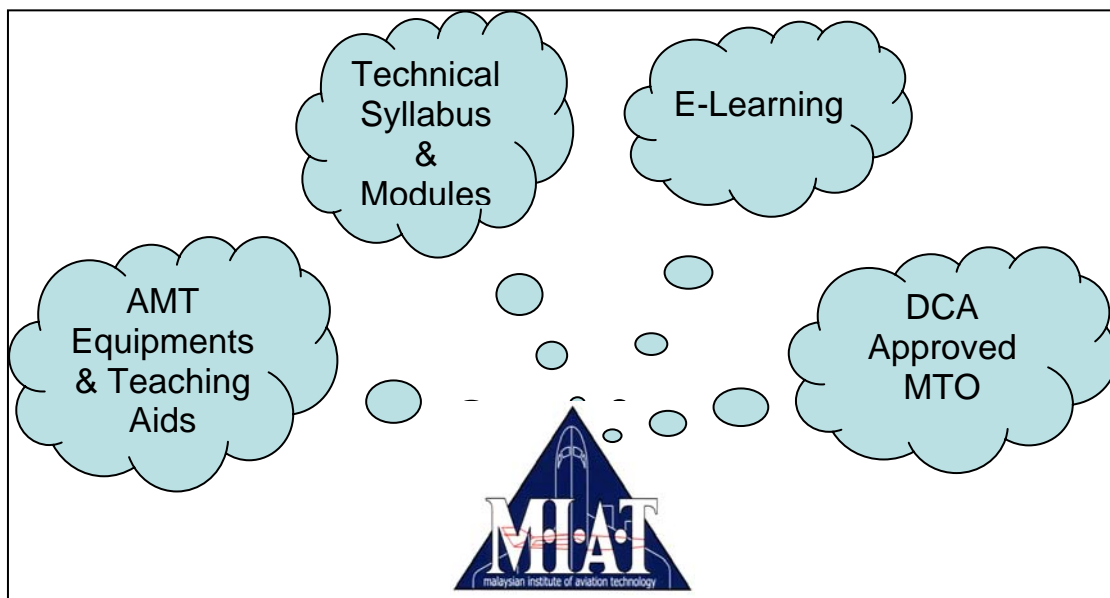


Figure 1. Four Main Components of UniKL-MIAT's Technology Transfer

The process began in 1997, and the DCA Approval was first received in the year 2000. The first 50 students have successfully graduated and all of them were offered a job as a certified mechanic in various aviation companies throughout the country. The quality of the program is also monitored and audited by the DCA Malaysia for its compliance to the worldwide aviation standards and accepted by the industry [9].

Currently we are in the second stage of the development where MIAT planned to leapfrog into a full aviation university (under UniKL) that provides aviation

The transfer of technology in UniKL-MIAT is being done in two stages. The first stage is the transferring of “Technological Know-How” from Northrop Rice (NRUSA). NRUSA is a FAR Part 147 – Approved Training Facility, under the Federal Aviation Administration (FAA), USA. The technological transfer includes technical management, technical knowledge and facilities, techniques of teaching, attitude and responsibilities and also in quality control [8]. Basically, there are four main components involved in the technology transfer, as shown in the figure;

- Aviation Maintenance Training (AMT) and Teaching Aids.
- Technical Syllabus and Modules.
- DCA Approved Maintenance Training Organization (MTO).

training, education and research in graduate and post-graduate level. It is now manned by local trainers and lecturers, whose expertise and knowledge is at par with the original technology provider.

6. Conclusion

Aviation industry is a unique and viable industry, which can be profitable to the country. The words 'aviation' and 'safety' are the two words that are interrelated to each other [10]. In aviation world, safety issue is always being the priority then any other issues. Failing to comply with this issue is considered as unforgiving. Because of that, any aviation industry in the world is governed by a tight laws and procedures that follow the international standards. The people who are working in the aviation industry must be highly skilled and trained.

The projection that was made by MiGHT stated that the MRO industry in this country will required from 6600 to 11,000 licensed aircraft mechanics and engineers for the period 2000-2020 to cater the work load created by the rapid development of airlines and other aircraft service facilities in the country [7]. By looking at this scenario, the existence of an Approved Aviation Maintenance Training Facilities has become a priority. The only way to establish the training facilities and at the same time getting an approval is by the transfer of technology from another approved facility.

The existence of MIAT eventually, as an approved maintenance training organization by the DCA of Malaysia could be seen as coming at the right time when the country needs it. The transfer of technology in aviation training from NRUSA to MIAT has successfully changed MIAT from an ordinary technical school like any others, into an 'approved' aviation maintenance training organization that will (at least) cater the needs of skilled manpower for the country's aviation industry [11]. The training received by staffs, and the amount of equipments and technical materials transferred has put MIAT in a strong footing to further propel its role in the coming years. The whole process is part of the efforts taken to establish Malaysia as one of the aviation training provider in this region, at par with the global trend in aviation training.

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Biographical information

Mr. SHAHRUL AHMAD SHAH has a background in Electronics and Computer Engineering. He started his career as an assistant lecturer for two years at Johor Bahru. Then he went to the United States where he gets his FAA Mechanic License with a two-year experience working in the field of general aviation near Hobby Airport, at Houston, Texas. He joined UniKL MIAT in January 2001 as one of the pioneer teaching staffs, and he is now focusing on Avionics (Aviation Electronics) trait in teaching and some R&D activities.

Ir AHMAD JAIS ALIAS started his career as an Engineer with Sony Video (M) Sdn. Bhd. for 4 years, an experience which qualifies him to attain the Professional Engineer title. Then he joined Universiti Kebangsaan Malaysia as lecturer for ten years, before recently moved to Universiti Kuala Lumpur. UniKL is known for its industrial-based fields of study, and he is now sharing his experience to train the future aviation industry workforces.