The Status and Future Development of the International Cooperation in Aviation Technology Education in Taiwan

Authors:
C. S. Liu, National Huwei Institute of Technology, Huwei, Yunlin 632, Taiwan, R.O.C., Phone: 886-5-6329643 ext. 363 ext. 31, Fax: 886-5-6312415, csliu@sunws.nhit.edu.tw  
S. F. Liu, Transworld Institute of Technology, Douliou, Yunlin 640, Taiwan, R.O.C., Phone: 886-5-5370988 ext. 8123, anneliu@tit.edu.tw  
Y. L. Tsay, National Huwei Institute of Technology, Huwei, Yunlin 632, Taiwan, R.O.C., Phone: 886-5-6329643 ext. 363 ext. 38, Fax: 886-5-6312415, battery@sunws.nhit.edu.tw  
L. R. Chen, National Huwei Institute of Technology, Huwei, Yunlin 632, Taiwan, R.O.C., Phone: 886-5-6329643 ext. 363 ext. 38, Fax: 886-5-6312415, lrchen@sunws.nhit.edu.tw  
S. Y. Yang, National Huwei Institute of Technology, Huwei, Yunlin 632, Taiwan, R.O.C., Phone: 886-5-6329643 ext. 363 ext. 15, Fax: 886-5-6312415, anneyang@sunws.nhit.edu.tw

Abstract — The aircraft maintenance education at university level in Taiwan originates from 1999. As far as curricula, facilities and instructors in aircraft maintenance field are concerned, resources introduced from advanced countries in North America, Europe as well as Australia are urgently demanded. Therefore, Taiwan Ministry of Education has allocated budget to establish the academy-industry alliance of aircraft maintenance since 2001. Through this alliance, the performance of aircraft maintenance education in Taiwan has been significantly enhanced and promoted. In the past two years, with the concerted efforts of the work team, the academy-industry alliance has made some great achievements. Furthermore, with the assistance of Taiwan Ministry of Education_MOE_ and the Committee for Aviation and Space Industry Development (CASID), more international cooperation topics and actions about the aviation technique education will be continuously supported in the future, such as sister schools, exchange programs, visiting professors, research cooperation, intensive or certificated short courses, workshops, overseas expert courses, and students’ summer practical training.

Index Terms — International Cooperation, Aviation Technique Education, Academy-Industry Alliance, Taiwan

INTRODUCTION

The manufactures and managements on civil aircrafts are very internationalized as they are always flying between countries. For assuring the safety of flights, both the management unit for civil aviation of every country and the International Civil Aviation Organization (ICAO) have defined many rigid regulations on the checking procedures of aircraft maintenance. According to this, our aircraft maintenance technicians should be qualified by the technology examination formulated by the European and American nations - the main members of the ICAO. Thus, the internationalization of aircraft maintenance has become the main trend of our aviation development.

With the trend of internationalization on the development of aircraft maintenance, our current development policy for aerospace industry is focused on advancing Taiwan to become the aircraft maintenance center in Asia areas. Thereafter, various aircrafts will fly to Taiwan for regular maintenance or structure refit. Our maintenance members will therefore be strongly demanded to obtain the international qualified certificates for providing extensive service and more business chances. Apparently, the need of trained and qualified technicians will increase from the aircraft companies. For this, we look forward to developing the qualified maintenance education by way of the assistance from international resources and technology. Such an effort will not only meet the need from our aerospace industries but will also promote the technology level of our maintenance for ensuring more flight safety. To promote the progress of international exchange on aircraft maintenance, worldwide cooperation qualified and certified by ICAO is explored. The main objectives of this paper include: (1) materializing the internationalization of our industry alliance on aircraft maintenance, (2) integrating our internal resources and development plans between the industries and academic units during the process of implementation of
international cooperation, (3) carrying out the international alliance with foreign aircraft-maintenance companies or training schools, and (4) setting up an approved unit to effectively promote our technology education on aspects of aeronautic engineering.

NHIT’S ACHIEVEMENTS

The aspects of training education in the aeronautical engineering department of National Huwei Institute of Technology (NHIT) have fully included the related fields of both aircraft mechanics and avionics. This is very different from the related university or postgraduate education that is mostly oriented to fulfill the students with the ability of theory analysis on such subjects. As described above, the NHIT provides the students with various training programmers and therefore that how to quickly promote the training level has conducted to the pressing needs of looking for the support from other countries, especially, from the European or American nations. Since years, by way of executing the improvement projects of aerospace education which were supported by the Consulting Office in the Education Department of Taiwan, the National Huwei Institute of Technology (NHIT) has successfully run a lot of cooperation programs related to aircraft maintenance and has also set up an alliance relationship with many domestic air companies, industries and academic institutes. The NHIT obtained much significant achievement and is deemed as the aviation maintenance resources center of Taiwan. However, consider the further development of internationalization on aircraft maintenance can only be achieved by operating an international cooperation. We proposed this plan and wish to eventually obtain sufficient training resources and skilled technology from foreign nations, especially from America, Australia or Europe. Additionally, the operation of such a plan can also provide the alliance schools both experience and resources for integrating the vested resources and then programming the future development policy. In order to train the qualified maintenance technicians for providing support to our aerospace industry, it is aimed at enabling the NHIT to become an approved school with international training organization certificate. Based on this, we have obtained many achievements as follow.

(1). For implementing the idea of aircraft maintenance internationalization and obtaining the supports including the teaching resources, facilities and maintenance regulations, we have visited four foreign schools including Royal Melbourne Institute of Technology (RMIT university) and Kangan Batman TAFE in Australia, IAS in France and Tangin Institute of Civil Aviation in Mainland China.

(2). The closer relationship with the visited schools is reached and this does conduct a good way for our teachers or students to get study or training chances from these schools. Such an achievement really promotes the level of our maintenance technology.

(3). By ways of the international cooperation and resource exchange, the new teaching materials and facilities will be introduced to Taiwan. In addition, with the assistance of above foreign schools our students will be allowed to learn some professional courses which are difficult to run the limitation of our facilities or qualified teachers. These courses may include aircraft maintenance programming, aviation management, aviation English and international regulations on aviation etc.

(4). The experts from Australia or France will be invited to come and give us some special speeches or short courses in the near future. These professional experiences and teaching resources can be distributed and shared with our any other related school.

THE AVIATION MAINTENANCE RESOURCES CENTER (AMRC)

In view of human resources demand of the Aerospace industry in Taiwan, the Aerospace Engineering Program Office (ASEPO) has been established since 1997. The ASEPO manages to promote the Aerospace Science and Technology Education by developing the cooperation mechanism of industry-academy strategic alliance and by establishing resources centers and partner schools in four major industry-related field, including aerospace quality assurance and certification, avionics, aerospace parts and components manufacturing, and aviation maintenance [1,2].

The National Huwei Institute of Technology (NHIT) establishes the Aviation Maintenance Resources Center (AMRC) and has 8 partner schools to promote the aviation maintenance education with Taiwan’s aviation industry. The center also coordinates and shares the international cooperation with partner schools, including certificated short course, workshop training course, overseas experts, summer student oversea practice, and academic exchange program. In the past two years, with the concerted efforts of the work team, the academy-industry alliance has made some great achievements as follows:

(1) Being the sponsor for “2002 IEEE/ASME International Conference on Advanced Manufacturing Technologies and Education in the 21st Century”;

Being the cosponsor for the 2001 international aviation and education exhibition in Taipei, 
(3) Student’s avionics training with the Civil Aviation University of China in China (the accumulated number of students 
is up to 50 during 2001 and 2002 summer).
(4) The NHIT invited experts from the certified center in Australia for the evaluation on the aviation maintenance 
education, and has obtained the basic scope for being an ATO certification unit from the final assessment report.
(5) Holding many workshops and intensive short courses by inviting experts and professors from advanced countries 
including France, USA, Canada, Australia, and China.
(6) The team obtained many experiences in aviation education from visiting nine universities in five countries, and reached 
an agreement with them.

The international cooperation of the partner schools for the aviation maintenance resources center are listed as below.
(1) Chung-Huwa Institute of Technology

The Chung-Huwa Institute of Technology and the Lufthansa Technical Training (in Germany) established the China 
Aviation School for training the aviation maintenance. The two instructors from the Lufthansa Technical Training have 
jointed this program to enhance the certificated course following the CCAA147 since 1999. The total number of the 
students graduated from this school is 197 and about 76 percent of these students service in the aviation company [3].

(2) Kao-Yuan Institute of Technology (KYIT)

The KYIT has executed the international cooperation with the Civil Aviation University of China (CAU) since 2001. 
The major cooperative program focuses on the Avionics Engineering and includes the summer student oversea practice 
and the visiting professor. The AMRC is actively jointing this program in 2003. The cooperative items are listed in Table 1.

(3) Flysky Air Group (FAG)

The FAG has signed the cooperative agreements with the international partner schools (listed in Table 2) and is 
developing cooperative program with the ARMC. The main goal is to help the student to obtain the pilot certificate or 
the mechanic’s certificate [4]. The corresponding numbers of graduated pilots and the Airframe/Pow plant mechanics 
are tabulated in Table 3.

Taipei International Aerospace Education Fair

“Taipei International Aerospace Education Fair” was held on April 1-3, 2001 in National Taiwan University. The goal is to 
combine the industrial demand with aerospace educational achievements through industrial resources [5]. A total of 59 
exhibitions joined this event, including Taiwan’s aeronautical organizations, Taiwan’s aviation industry, overseas colleges 
and aviation industry. This exhibition includes 16 oral presentations made by school, from Taiwan, UK, America, Canada, 
France and Australia. These presentations, helped international students understand better the characteristics of school, 
their curriculum and application procedures. For the Exhibition, Committee for Aviation and Space Industry Development 
(CASID) also invites many international Aeronautical and Academic Organizations to take part in these symposiums. It 
promotes the discussion, exchange between the organizations, and more intimate cooperation between companies and 
academies.

Internationalized aerospace talents are the core competency for establishing aerospace industry. With aim of promoting 
international cooperation and fostering aerospace elite for Taiwan, “2003 International Aerospace Technology and Education 
Fair” will be held on by CASID and Ministry of Education (MOE) on August 14-17, 2003. This fair will also combine with 
the education fairs held by foreign representative offices in Taiwan and the annual inter-campus competition held by 
Aeronautical and Astronautical Society of the Republic of China to increase the fair effects. This fair intends to offer students 
more information on study opportunities locally and overseas, in addition, it hopes to enhance international cooperation on 
aerospace education and promote the regional industry development [6].

The International Cooperation in Aviation Technology Education between Taiwan and France

As for the development of Human Resource, the International Cooperation in aviation technology education between 
Taiwan and France was established using the French Aeronautics and Aeronautics and Space Industry Award (FASIA) in 
1998. In Taiwan, the MOE together with CASID have been promoting the industrial-educational cooperation for many years. 
The goal is to combine the industrial demand with aerospace educational achievements through efficient use of industrial 
resources. In France, The IAS (Institut Aéronautique et Spatial) is responsible for runing FASIA and provides Taiwan’s
institutions with a whole range of integrated support and training solutions in France. The comprehensive partner schools are listed below and the cooperation items are listed in Table IV.

1. ESC (Ecole Supérieure de Commerce)
2. ENAC (Ecole Nationale de l'Aviation Civile)
3. ENSAE (Engineering School of Ministry of Defense)
4. SUPAERO (Ecole Nationale Supérieure)
5. ENSICA (Ecole Nationale Supérieure d'Ingénieurs de Constructions Aéronautiques)
6. CNES (Centre National d'Études Spatiales)

In order to ensure participants’ adaptation, IAS has put together an iterated package of associated support. The cumulative students coming from Taiwan reach 16 persons in the different major study.

CONCLUSION

The team of this work sincerely hopes that this study can provide constructive suggestions to highlight the status and future development of the international cooperation in aviation technology education in Taiwan. The concrete results from the being achieved items are that we obtain many experiences on aircraft maintenance from international cooperation in aviation technology education. And this will do help to improve our current training courses and facilities to meet the real needs of our aviation industries. It will efficiently promotes our education level of maintenance training and also do assistance to our students to get the certifications. These above significant results are all really pointing out the importance of international cooperation and exchange on aircraft maintenance.

ACKNOWLEDGEMENT

The Authors of this paper would like to acknowledge the funding from the Ministry of Education to this Program.

REFERENCES


FIGURES AND TABLES

TABLE I

<table>
<thead>
<tr>
<th>Year</th>
<th>Summer Student Oversea Practice</th>
<th>Topics</th>
<th>Visiting Professor</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>30 students</td>
<td>2 instructors</td>
<td>Avionics</td>
</tr>
<tr>
<td>2001</td>
<td>20 students</td>
<td>1 instructor</td>
<td>Avionics</td>
</tr>
</tbody>
</table>
## TABLE II
**INTERNATIONAL PARTNER SCHOOLS OF FAG**

<table>
<thead>
<tr>
<th>School</th>
<th>country</th>
<th>Items</th>
<th>Training Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omni Aviation school</td>
<td>Philippine</td>
<td>ICAO, PPL / CPL</td>
<td>200 days</td>
</tr>
<tr>
<td>Skywalker Aviation school</td>
<td>USA</td>
<td>FAA, CPL, CFI</td>
<td>200 days</td>
</tr>
<tr>
<td>Eastern Aviation school</td>
<td>China</td>
<td>CAAC, CPL</td>
<td>100 days</td>
</tr>
</tbody>
</table>

P.S.: 1. PPL: PRIVATE PILOT LICENSE  
2. CPL: COMMERCIAL PILOT LICENSE  
3. A/P L: AIRFRAME/POWER PLANT MECHANIC LICENSE

## TABLE III
**GRADUATED PILOTS AND MECHANICS FROM FAG**

<table>
<thead>
<tr>
<th>Graduated Pilot</th>
<th>Graduated Technician</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPL 36</td>
<td>FAA A/P License 2</td>
</tr>
<tr>
<td>CPL 76</td>
<td></td>
</tr>
</tbody>
</table>

## TABLE IV
**THE INTERNATIONAL COOPERATION ITEMS OF THE AVIATION EDUCATION BETWEEN TAIWAN AND FRANCE**

<table>
<thead>
<tr>
<th>University</th>
<th>Aeronautical Topic</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESC MBA</td>
<td>Communication, Navigation, Surveillance, Aeronautical Operations, Airport Management</td>
<td>Master</td>
</tr>
<tr>
<td>ENAC</td>
<td>Aeronautical Engineering, Space Engineering</td>
<td>Master</td>
</tr>
<tr>
<td>ENSAEE,</td>
<td>Aeronautical Maintenance and Production, Helicopter Engineering</td>
<td>Master</td>
</tr>
<tr>
<td>SUPAERO</td>
<td>Air Transport Management</td>
<td>Master</td>
</tr>
<tr>
<td>ENSICA</td>
<td>Aircraft Airworthiness</td>
<td>MASTER</td>
</tr>
</tbody>
</table>