



# ESP in Action



## Application of ESP Theory into Aviation English Teaching in the Chinese Context

Wang Aiguo

College of Humanity and Social Sciences, Civil Aviation University of China, Tianjin City, P.R. China

### ABSTRACT

“Aeronautical and/or Aviation English” is designed as ESP (English for Specific Purposes) curriculum for students in the fields of aeronautics and/or aviation. This is especially true in China. Various books have been published on the teaching of Aviation English. Learners of ESP are supposed to master specialty vocabulary concerned as well as English language skills. This paper states the importance of English in aviation industry and explores the methodology of teaching Aviation English in Non-English speaking countries, especially in the Chinese context, so that learners of ESP can learn the target language more effectively and meet the standards set by the International Civil Aviation Organization (ICAO). It focuses on a contrastive study of aviation language between English and Chinese and aims to work out a possible approach to ESP teaching more suitable to the Chinese context.

### 1.0 THE IMPORTANCE OF ENGLISH IN AVIATION INDUSTRY

Success of international civil aviation depends upon standardization of aviation procedures, of which air communication is an important one. As history has repeatedly shown, a breakdown in the communication process often leads to less than desirable events that can be illustrated as follows: 1) On November 13, 1996, a Saudi Arabian airliner and a Kazakhstan plane collided in mid-air near New Delhi, India. Investigations show that the Kazak pilot may not have been sufficiently fluent in English and was consequently unable to understand an Indian controller giving instructions in English; 2) In 1993, Chinese pilots flying a US-made MD-80 were attempting to land in northwest China. The pilots were baffled by an audio alarm from the plane’s ground proximity warning system. A cockpit recorder picked up the pilot’s last words: “What does ‘pull up’ mean?” These cases unanimously indicate the importance of English in the aviation industry as a prerequisite for safety and efficiency in aviation.

However, the level of English training that pilots and controllers require is still a matter of some dispute. Goertz (1997) feels that, because much of the critical information that is passed is based on numbers and letters (e.g. call-signs, altitudes, flight levels, radio frequencies, vectors, runways, wind

\* Correspondence to: Wang Aiguo (tel/fax: +8622 24092050)

velocities), a controller with a good command of the International Civil Aviation Organization (ICAO) phonetic alphabet and a limited number of standard phrases can avoid many air traffic controller (ATC)/pilot miscommunication problems. But Uplinger (1997) argues that the mastery of a specialized terminology is insufficient to avoid ambiguity. Developing functionality in a foreign language is a difficult task, she says, and a pilot or controller who knows 200–300 English ATC terms may have little functional ability. Uplinger cites the case of the crash of American Airlines in Columbia in December 1995. The controller complained that he did not have adequate English skills to resolve questions when the crew made illogical statements about the aircraft's position. The Boeing 757 killed 160 people when it flew into a mountain.

Obviously the potential for serious misunderstandings between controllers and pilots is high during international aviation communications. Safety experts and linguists are inclined to agree that phraseologies alone, no matter how extensive, are not sufficient to adequately cover all of the potential situations that can arise from human communication, particularly, in aviation, for urgent or emergency situations. No set of phraseologies, however extensive, can account for the breadth of human communicative need, even within the relatively constrained environment of air traffic control communications. In all those situations for which phraseologies cannot suffice, of urgency, emergency, or other non-routine but normal circumstances, controllers and pilots will use plain language.

## 2.0 PROBLEMS AND CHALLENGES FACED BY ESP PRACTITIONERS IN TEACHING AVIATION ENGLISH IN THE CHINESE CONTEXT

ESP teaching and research started late in China but has developed rapidly over the past years. This is because all trades and professions need composite talents who have not only a good grasp of English skills, but also a conscious command of professional knowledge. Research in educational psychology shows that learners may foster different interests due to various needs of their work (Li 2001). Business English has long been an ESP course in China. It highlights the great achievement of ESP teaching in China and sets a good example for the development of ESP in aviation industry – a rich new field, which will be of interest to ESP theorists and practitioners both domestically and around the world.

Grammar-translation method has been dominating the approach to ESP teaching in China. It is actually an extension of traditional ELT methodology, and its basic mode is like this: analyzing sentences from the grammatical point of view, comparing the usage of some words and expressions, and then translating sentence by sentence into Chinese. The benefit of the grammar-translation method is that ESP students can have a better understanding and memory of the text. The defect is that this method is teacher centered, and students' roles are rather passive. They have little opportunity to speak or communicate with others. Consequently, the English they learn is not meaningful and purposeful, and thus they are unable to discuss the work-related matters in English on which they spend plenty of time. They fail to acquire the normal English proficiency required to freely exchange their ideas on issues in their discipline. So this method is obsolete and is constantly rejected.

Register analysis and discourse analysis are popular approaches to ESP teaching in the world. But they are more suitable for native English speakers or those who have long experience of working and studying in English language atmosphere. College students in China lack proficiency in English though most of them start to learn English in their primary schools. We find it hard for them to adapt to foreign ESP teaching methodologies. To teach ESP in China, we must take into consideration students' English proficiency, the learning backgrounds and proper teaching methods, and teach students in accordance with their aptitude. Contrastive approach plus linguistic analysis is now at its experimental stage. This is suitable for learners of ESP or other specialty in aviation industry. But ESP practitioners are faced with some challenges in implementing this approach.

The first challenge ESP practitioners face in designing ESP courses is a careful consideration of students' English level. It seems that an accomplishment of College English program( is a prerequisite for ESP courses. The second challenge comes from the need of self-improvement of ELT instructors; they have to renew their knowledge of English language and try to associate their linguistic skills with a specific domain or field. Furthermore, they have to give up their dream of teaching a certain book or a certain course life long, and cast the conservative idea of immutability. The third challenge is the opening up policy that brings in chances of cooperation with our international counterparts as well. General English is not enough to communicate the world as far as technology is concerned, so developing ESP courses in the Chinese context is indeed necessary if we want to get involved in the international community.

In China, there is a huge market for aviation industry. Being itself a part of globalization, the industry requires its pilots and air traffic controllers, cabin attendants and crew members, engineers and service staff to be able to communicate with their counterparts in the world on work-related issues in addition to the fact that English examination is almost a must if they want to get professional promotions. English is the right media of communication with the de facto of long time usage in this industry. This is especially true with international airports and airlines, at the time when China is carrying out the opening up policy and actively participating in international activities. ESP is closely related to the work of pilots, ATCs, engineers and those in various trades and professions. Learners, therefore, are well motivated and greatly interested in ESP. The boom of ESP teaching both in college education and continuing education is rightly the result of social demands on English language, rapid development of linguistics and educational psychology. With different objectives, different contents and targets, ESP teaching definitely needs its own methodology and curriculum in a different context.

Such a situation requires the teaching of Aviation English on a large scale to college students as well as adults, either in long term for strategic programs or in short term for current operations. Thus the necessity of teaching Aviation English as ESP in the Chinese context has come into being.

### 3.0 THE THEORETICAL BASE OF CLASSIFYING AVIATION ENGLISH INTO ESP

Aviation English can be defined as a comprehensive but specialized subset of English related broadly to aviation, including the 'plain' language used for radiotelephony communications when phraseologies do not suffice. Not restricted to controller and pilot communications, Aviation English can also include the use of English relating to any other aspect of aviation: the language needed by pilots for briefings, announcements, and flight deck communication; language used by maintenance technicians, flight attendants, dispatchers, or managers and officials within the aviation industry, for example. Radiotelephony English (RTFE) is a sub-category of Aviation English. RTFE is the language used in radiotelephony communications between air traffic controllers and pilots. It includes but is not limited to ICAO phraseology and can require the use of general English at times. Accordingly, Aviation English can be a subdivision of EST (English for Science and Technology), a part of ESP, while RTFE may be considered as a kind of special language. Although it is not mentioned and illustrated in the simplified Tree of ELT (Hutchinson & Waters, 1987), this is much closer to Carter's (1983) classification of ESP, namely English as a restricted language, English for Academic and Occupational Purposes, and English with specific topics. Thus the RTFE is an example of English as a restricted language. Mackay and Mountford (1978) clearly illustrate the difference between restricted language and general language with this statement:

... the language of international air-traffic control could be regarded as "special", in the sense that the repertoire required by the controller is strictly limited and can be accurately determined situationally, as might be the linguistic needs of a dining-room waiter or air-hostess. However,

such restricted repertoires are not languages, just as a tourist phrase book is not grammar. Knowing a restricted “language” would not allow the speaker to communicate effectively in novel situation, or in contexts outside the vocational environment (pp. 4–5).

Although RTFE can be classified into the first type of ESP, we do not think it will stop there, as students in aviation or aeronautical universities grow more and more interested in Aviation English and are proud of learning Aviation English in a systematic way, we can further develop this subject by referring to the second type of classification which is further developed by Jordan (1997) into the two main branches of ESP: EOP (English for Occupational Purpose) and EAP (English for Academic Purpose). RTFE falls into EOP as it is mainly targeted at pilots and ATC while aviation linguistics falls into EAP.

The research base on Aviation English for ESP is still in its infancy. One of the reasons for this is that, with the rapid development of aviation industry in the world, especially in developing countries like China, RTFE for EOP has started to be taught in aeronautical colleges and universities for the training of ATC and pilots. Meanwhile there has been a corresponding steady increase in the proportion of papers on EOP and development of EAP courses. The teaching of EAP falls within the framework of what is generally called ESP, taking place in essence, and as its name suggests, in an educational environment (Dominguez & Rokowski, 2002). Then Aviation English courses taught in colleges and universities can generally be regarded as EOP and /or EAP, although it is hard to make a clear-cut distinction between the two. The RTFE for EOP is more suitable for adult training in the continuing education while Aviation linguistics for EAP is for college students of ESP major. It is more systematic and academic in comparison with EOP:

Aviation English (specifically RTFE for EOP) = typical selections of language corpus in the field of air communication + register analysis and/or discourse analysis (with focus on aviation terminologies) → for practical use

Aviation English (specifically aviation linguistics for EAP) = linguistic processing of language corpus in the field of aviation industry + register analysis and/or discourse analysis (with focus on phonetics and English language proficiency) → for language study

#### 4.0 SOME ACCEPTED METHODOLOGIES OF TEACHING AVIATION ENGLISH IN THE CHINESE CONTEXT

##### 4.1 Trials and Explorations of ESP Teaching Methodologies in China

While teaching ESP in China, we should not forget to encourage students to become proficient in both English and Chinese, with the focus on ESP and standard Putonghua. A dual language program is designed to achieve such a result in classroom teaching. This program also helps students to learn aviation language in a contrastive method. Integrated, holistic, and purposeful reading and writing activities are also important, as is teacher–student and student–student collaboration in practicing dialogues (of air communications).

Computer–assisted language learning gives ESP professionals the opportunity to interact with ESP learners working in aviation industry. The language of air communication is recorded on disks to help students acquire it through various forms like cloze, dictation, multiple choice, dialogues, and vocabulary. This program is targeted at students with their spare study time.

In China, the time devoted to teaching general English and academic skills far outweighs the time devoted to the teaching of Aviation English, which is further divided into English air communication

and aviation linguistics. The former is intended to teach adults and professionals while the latter is targeted at college students and is now in its infancy stage. The time ratio of teaching Aviation English (both the former and the latter as a whole) to that of teaching general English is about 1 to 4. But it does not seem enough for the aviation language instructor to finish the entire teaching program; there was such an overlap between content knowledge, academic proficiency, and general language that we consider to adjust the range of ESP while keeping in mind students' language ability.

## 4.2 Cases of Contrastive Approach to Teaching Aviation English

### 4.2.1 Phonetic Contrast

Aviation phonetics is part of the curriculum in ESP. On the basis of learning international phonetics systematically, learners will focus on aviation phonetics. These include the reading of numbers, alphabets, time, code of airport, air pressure and aircraft type, etc. In comparison with the Chinese phonetic system (Pinyin) and ICAO phonetic regulations, learners of Aviation English in the Chinese context could have a better understanding of phonetic knowledge. For example, in Chinese air communication, "0" is read as /dòng/ instead of /líng/ as usual; "1" is read as /y\_ò / instead of /y\_ / as usual; "2" is read as /li\_ǎng/ instead of /èr/ as usual; "7" is read as /gu\_i / instead of /q\_ / as usual; "9" is sometimes read as /g\_u / instead of /ji\_ / . Similarly, in English air communication "3" is read as /TREE/ instead of /\_ri:/ as usual, "4" is read as /FOW-er/, "9" is read as /NIN-er/ instead of /nain/ as usual, because, to pronounce the sound /\_ /, we have to put the tongue between the teeth; in addition, it is voiceless and this makes it difficult to be heard by the listener in communication, so the /\_ / sound is replaced by the alveolar plosive /t/ in air communication, and the word "thousand" is pronounced as /TOU-SAND/.

Therefore /tr/ is likely to replace /\_r/ in this case. The pronunciation of the number "4" gets easily confused with that of the preposition "for", so the vowel /er/ is added (/FOW-er/) to distinguish the two sounds. In pronouncing number "9", the second /n/ sound in /nain/ is a nasal and this makes it difficult to be heard too, so it would be safer and easier to be heard if we read it as /NIN-er/, with a vowel /er/ added to it. The method of phonetic contrast is frequently used in class instruction. For example, the reading of air pressure is presented in Table 1:

**Table 1** The reading of air pressure

Air pressure	Read in Chinese	Read in English (ESP pronunciation)
QFE* 1003	y_ch_ǎng /y_ò dòng dòng s_n	QFE WUN ZE-RO ZE-RO TREE
QNH 1000	xi_zhèng h_iy_/y_ò dòng dòng dòng	QNH WUN ZE-RO ZE-RO ZE-RO

The benefit of phonetic contrast is that learners acquire every sound by identifying different phonetic systems in addition to pure imitation; they realize the place of articulation and manner of articulation of specific sounds like /v/ and /w/, with the former a labiodental and the latter a bilabial in place of articulation and respectively, fricative and approximant in the manner of articulation, while in the Chinese context it is very hard to distinguish these two sounds. Take "wán bì" (out) for example, it does not make much difference if it is pronounced /wán bì/ or /ván bì/. But in English, **WILCO** must not be pronounced as **VILCO**.

\*QFE is the pressure at the station (or aerodrome) level. QNH is the pressure at mean sea level, reduced from QFE by applying corrections according to the International Civil Aviation Organization's standard atmosphere.

### 4.2.2 *Semantic Contrast*

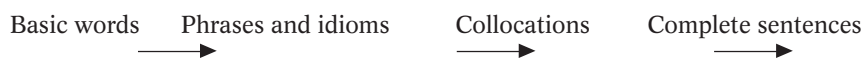
The *de facto* use of English as the international language of air traffic control is proof that English has become the international language of aviation. Terminal buildings and airports are becoming the language center of hub spoke pattern of air transportation. This does not apply only to those directly involved in flying or air-traffic control, but virtually to all those employed in aviation sectors who are required to communicate with international passengers and customers, pilots, dispatchers, operations center technicians and regulatory agencies. To facilitate the interchange of information among them, English has evolved to become the global language for all aviation needs, and a strong command of both general English and its specialized varieties, has become an essential prerequisite for safety, efficiency and effective communication.

Language-related misunderstandings of various kinds have been a critical contributing factor in aviation accidents, as often illustrated by the familiar fatal accident in Tenerife in 1977 where the death of 583 people resulted in part from misunderstanding of the phrase *at takeoff*, which was used by the flight crew to indicate that they were “in the process of taking off” but was understood by the tower controller as meaning “at the takeoff point”. So the pilot was not warned that another Boeing 747, shrouded in fog, was already on the runway. It seems that the reason for the wrong usage on the part of the Dutch pilot was his code switching between Dutch and English language, translating the Dutch idiom (preposition “at” + the infinitive) instead of using the present continuous tense of English language. Many of the occurrences of similar misunderstandings, according to Cushing (1994), can be attributed to a clash between individual cognitive and social interactive factors of language use.

This shows the importance and necessity of semantic study in Aviation English. As Hortas (2002) points out, “we have entered a new millennium, the ability and the need to understand and communicate with each other has become increasingly important, at times even urgent. An international exchange of ideas – from environmental issues such as the thinning ozone layer and the warming of the planet, to medical topics such as genetic engineering, to political crises – is essential. To meet these communication needs, more and more individuals have highly specific academic and professional reasons for seeking to improve their language skills”.

### 4.2.3 *ESP Collocation*

When learners of English language reach an intermediate level, they may find that collocation is something difficult to grasp. From a lexical and semantic point of view, collocation can be considered as the third step of mastering the English language:



This is equally true with Aviation English (not just confined to RTFE). When students have learned quite a number of words and expressions, they are faced with the problem of collocation. Therefore, it is the teacher’s responsibility to help them discover the rules and regularities of collocating words and phrases, especially with specialty vocabulary. Meanwhile we must bear in mind to explain them in ESP. For example:

- (1) *Black box*\* : The flight recorder, as on a military or commercial aircraft, that documents preflight checks, in-flight procedures, and the landing. (*h\_xiázi*)

\*Italicized terms from here on to the end are aviation terminologies either in English or in Chinese Pinyin.



- (2) *Sniffer dog* : Dog whose work is to sniff the drugs, especially in Customs. (*xiù tàn qu\_n*)
- (3) *Base leg* : A flight path at right angle to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline. (*sì bi\_n*)
- (4) *Downwind leg* : A flight path parallel to the landing runway on the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg. (*s\_n bi\_n*)
- (5) *Crosswind leg* : A flight path at right angles to the landing runway off its upwind end. (*li\_ng bi\_n*). Similarly, the equivalent of *upwind leg* in Chinese is *y\_bi\_n*.

Collocation training can help students realize the peculiarity of ESP, so that they get into the habit of speaking English in its specialty domain and using terminologies at proper times. Compare the following expressions and collocations in Table 2:

**Table 2** Expressions and collocations

Aviation language in Chinese	Expressions in general English	Aviation language in English (ESP terms)
<i>Tóng yì</i>	Permission for proposed action granted	<i>Approved</i>
<i>Zhào bàn</i>	I understand your message and will comply with it	<i>WILCO</i>
<i>Q_luò jià</i>	Devices for takeoff and landing	<i>Landing gear</i>
<i>Zh_ngzh_q_f_i</i>	Stop the takeoff	<i>Abort the takeoff</i>

## 5.0 CONCLUSION

This paper has discussed the importance of English for safety and efficiency in aviation, addressed the development of ESP teaching in the Chinese context, explored methodologies of teaching ESP in the Chinese context and illustrated some cases of contrastive approach to teaching Aviation English. The content of the paper was determined by a need based on my dual professional experience as an ESP and ELT instructor designing and delivering the content-based language program — aviation linguistics in Civil Aviation University of China, an important component of the Aviation English course. These issues, where possible, have been supported by current and pertinent academic literature. By teaching aviation linguistics and thereby developing the Aviation English course, I perceive a prosperous future of teaching Aviation English as an ESP both in China and in the world. A systematic and comprehensive curriculum of Aviation English will be perfected with the joint efforts of language practitioners. It is my sincerest hope that my efforts will lend insight into the challenges facing the ELT instructor acting as ESP curriculum developer.

**Points for comment:** what issues concerning the ESP teaching approach in China need to be further addressed by ESP professionals? How do methodological issues in the Chinese context relate to ESP teaching in other contexts and to ESP in general? To what extent and how can ESP professionals further develop Aviation English course and its components?

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### REFERENCES

- Cushing, S. 1994. *Fatal Words: Communication Clashes and Aircraft Crashes*. Chicago: University of Chicago Press.
- David C. 1983. Some Propositions about ESP. *The ESP Journal*. 2: 131–137
- Dominguez, G., and P. Rokowski. 2002. Bridging the Gap Between English for Academic and Occupational Purposes. [http://www.esp-world.info/ESP\\_list.htm](http://www.esp-world.info/ESP_list.htm). (accessed on 15/8/2005)
- Goertz, H. 1997. New Approach to ATC English Proficiency. *Journal of Air Traffic Control*. July–Sept: 46–50.
- Hortas, J. D. 2002. English for Specific Purposes. *TESL – Teaching English as a Second Language*. <http://globalopps.org/associates/esl/> (accessed on 15/8/2005)
- Hutchinson, T., and A. Waters. 1987. *English for Specific Purposes: A Learner-Centered Approach*. Cambridge University Press. 19.
- Jordan, R. 1997. *English for Academic Purposes: A Guide and Resources Book for Teachers*. Cambridge: Cambridge University Press.
- Li, H. 2001. Development of ESP and Joint Teaching. *Journal of Foreign Language Education*. 1 (22): 40–43.
- Mackay, R., and A. Mountford. 1978. *English for Specific Purposes: A Case Study Approach*. London: Longman. 4–5.
- Uplinger. 1997. English–Language Training for Air Traffic Controllers must Go Beyond Basic ATC Vocabulary. *Airport Operations (Flight Safety Foundation)* 23/5. Notes that many non–routine situations needing communication occur in aviation. Favorably mentions a 300–hour Russian course for controllers.