

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

Introduction <i>Mrs Ann Dufaux/CLA</i> <i>Editor of the 6th Forum Report</i>	page 1	Table of contents
English Training Today: the Effect of Technology	page 5	
The Effect of Technology on English Language Training: Round table Day 2 <i>Chair: Mr Tony Roome</i> <i>UK CAA International Services, Gatwick, UK</i>	page 7	
Telematics and IT in Distance Learning <i>Mr Nick Slope</i> <i>Resource Based Learning Manager, Thames Valley University, London, UK</i>	page 11	
The Potential of Multimedia in English Language Training <i>Mr Simon Murison-Bowie</i> <i>Director of Oxford Interactive Learning, Oxford University Press, UK</i>	page 19	
Designing Multimedia Hyperdocuments: a new means to teach and learn Languages? <i>Mr Guy Arquembourg</i> <i>In charge of Language and Multimedia at MAFPEN, Lille, France and Language Didactics and the Intercultural Impact at The Université de Technologie de Compiègne, France</i>	page 29	
«Flying blind? The Internet for English Language Teaching, Training and Learning» <i>Ms Linda Thalman</i> <i>Director of Volterre-France / Web France International</i>	page 39	

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

CD ROM for Mechanics <i>Mr Philip Shawcross</i> <i>Director of English for Aircraft, Paris, France</i>	page 47
Aviation English on CD ROM <i>Mr Finian Connolly</i> <i>Director of Compact Media, Dublin, Ireland</i>	page 53
Aviation English Training in Japan <i>Mr Shozo Yokoyama</i> <i>Associate Professor of English, Civil Aviation College, Ministry of Transport, Japan</i>	page 57
How Aviation Affects Aviation Professions, Documentation and Training	page 67
The Effect of Technology on Aviation Professions: Round table Day 1 <i>Chair: Mr John A Williams</i> <i>Consultant, Former Manager, Training London ATCC, UK</i>	page 69
About the Use of Aviation English in the Cockpit <i>Mr Michel Menestrot</i> <i>Training Captain, France</i>	page 73
The Effects of New Technology for Aviation Professionals <i>Mr François Tondusson</i> <i>Ground Engineer, France</i>	page 75
ATC <i>Mr Jean-Pierre Lambert</i> <i>ATC Instructor, ADP, Paris, France</i>	page 77

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

Vital Link Transits into Data Link <i>Mrs Mirna Marincic</i> <i>ATC Language and RT Phraseology Instructor, Air Traffic Services Authority, Croatia</i>	page 79
Contribution of Linguistic Engineering Technology to the Production of Aircraft Maintenance Documentation <i>Ms Sylvie Régnier-Prost</i> <i>Aérospatiale, Louis-Blériot Research Center, Suresnes, France</i>	page 91
CBT: Aviation Training for the "Gameboy Generation" <i>Mr William Niggli</i> <i>Swissair Aviation School, Zurich, Switzerland</i>	page 95
Airliner Ai Limited Views on Training <i>Mr John Lyden</i> <i>Director of Airliner Ai Limited, Glasgow, Scotland</i>	page 115
A List of Abbreviations	page 121
A Who's Who	page 127
The CLA Aviation English Department	page 135

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

It does seem quite banal to state that the planet is becoming smaller everyday. Not only is air travel on the rise but computers, satellites, and now multimedia and internet are leading us down the road to this new world. The fact is the phenomenon is accelerating at such great speed that the professionals who tend to be affected - given our jobs - need to reflect on these technologies that are precipitating us into a new world as we near the 21st Century.

Those who gathered in Paris for the sixth Forum in April 1997, at the initiative of the International Aviation English Association, realize that they are at a crossroads of change. Be they the aeronautic professionals, engineers, pilots, captains, instructors, air traffic controllers, or the English language technical trainers and course creators, all can see how technology has entered their professional environment leading to great changes in the way they work.

At this event we were fortunate to have with us a number of distinguished researchers whose interests in distance learning and multimedia and whose role in promoting and integrating the new technologies is fundamental. Their experience and reflections sparked off fascinating debates and discussions as they met with those who are faced with the applications. As you read this Forum Report you will perceive how the researchers and educators and the technical professionals see this technology. Does everybody greet it wholeheartedly, do some on the contrary reject it, or do many of us need time to reflect on the implications of the changes the technology will bring about in our functions? It seems essential that all the actors see their new role, understand the implications of change before taking the new technologies on board. You will note when reading the 6th Forum Report that although concerns and roles overlap we have placed them under two major themes.

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

As our team prepared for the event we realized how important the issues were and therefore decided against joint workshops which would have implied some painful choices (and perhaps sacrifices). Instead we felt it more appropriate to bring everybody together for round tables and discussions and key presentations. Another innovation was the time allocated for presentations of new technological tools and the possibility to try them out during hands-on sessions. The companies provided us with relevant documents that we can send those readers who are interested.

We added a new event to our cultural program with its traditional regional Franche-Comté cocktail offered by the Centre de linguistique appliquée de Besançon and successful Bateau-Mouche boat trip on the Seine. People came out on a historic cultural walking tour in the old artists' quarter of Montmartre and spent an evening in another northern neighborhood for a very typical Paris dinner accompanied by the songs of a French accordeon player.

We wish to thank Fiona Robertson whose drive, imagination and contacts made the Forum possible. Joan Bellec was instrumental in getting people of the multimedia world interested in presenting their materials to us. Without Geraldine Vine registration and some very difficult accommodation problems would have led to chaos. She managed skillfully to smooth the situation out. Our colleagues from the CLA were equally instrumental in the Forum's success: Stéphane Delmotte, who set up all the sophisticated computer equipment with limited means at his disposal and Christiane Carry of the communication department, an excellent organizer. I tried my best to innovate the cultural program and to edit this report in conjunction with Christiane Carry more quickly than in the past. You will note an extension of our list of abbreviations, as new ones keep entering our sphere. Also to be found at the back of the report, a new «Who's who» for more information about our key speakers and chairmen.

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

May we also express our thanks to the British Council who financed the participation of our key speaker Nick Slope of Thames Valley University. We are equally grateful for our friends John Williams and Tony Roome, who chaired the two round table sessions. Finally, we would also like to mention the participation of La Maison de la Franche-Comté and the delivery of the International Herald Tribune on both mornings of the Forum.

We hope you enjoy the reading and look forward to seeing you at one of the forthcoming events.

Ann Dufaux
Paris, October, 1997

**English Training Today:
the Effect of Technology**

Tony Roome began the session by quoting the statistic that, with forecast air traffic growth and no reduction in the accident rate, there would be a major accident somewhere in the world every 8 - 10 days within 15 years. He commented that he did not believe that the civil aviation industry could sustain that rate of accidents without a serious loss of public confidence. He emphasised the role that all trainers had to play if actions to reduce the rate of accidents were to be successful.

He went on to say that human factors contribute to 70% of all accidents and that major efforts are thus being made with Crew Resource Management on board aircraft; with Team Resource Management in ATC and maintenance. He contrasted this concentration on teamwork in the operational environment with most of the training technology in use which teaches through individual, and often competitive, effort.

Nick Slope began by saying that he believed that the pressure for change facing English Language teaching was a common problem, faced by the whole education and training sector. Despite this pressure for change, he emphasised the need to aim for high standards and suggested that technology could be used to free teachers to provide 'quality time' with their students.

He also expressed the view that there was a great need to teach the technology, and teach the students to learn to use the technology, as well as using the technology available to help students learn. Only this approach brought the maximum benefits, he said.

Jurate Patasiute explained that she felt herself to be a 'conservative' teacher, who believed that there should always be a teacher in the classroom - no matter what technology is used. She supported Nick's call for high standards, saying that

**The Effect
of Technology
on English Language
Training**

Round Table Day 2

Chair:

Mr Tony Roome
*UK CAA International
Services*
Gatwick, UK

Participants:

- *Mr Guy Arquembourg*
MAFPEN
Lille, France
- *Mrs Jurate Patasiute*
Civil Aviation
Directorate
Vilnius, Lithuania
- *Mr Nick Slope*
Thames Valley
University
Slough, UK
- *Mrs Karen le Mau*
de Talance
DGAC South West
Biarritz, France

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

educationalists should demand accuracy, relevance and confirm the understanding of their students. She stressed the need for emphasis on communication and highlighted the fact that students find it difficult at first to communicate with those they cannot see - thus posing a real problem for pilot/controller exchanges.

Guy Arquembourg was optimistic about the future for new technology in the classroom, but pessimistic about its use in an institutional context. He expressed the view that it is essential that institutions recognise the role of the teacher in the use of technology and ensure that the teacher training process adapts fully to take account of this element of the job. He also said that it is essential that institutions acknowledge different teaching styles and train staff to take maximum advantage of their individual strengths.

Guy closed his remarks by emphasising the need for publishers and teachers to work together closely in order to achieve the best result.

Karen le Mau de Talance spoke of her belief that technology permitted her the time, as a teacher, to create 'privileged moments' with her students and expressed the view that this was the true role of technology - to enable the teacher more direct input to the students' learning process. She also said that she felt that students learned best when they understood the reason for learning a subject and had a clear structure within which to work. Finally, she stressed her agreement with earlier speakers' emphasis on the need to develop communicative skills and concentrate on pronunciation.

Speakers from the Forum:

- emphasised the role of the teacher in understanding the fear of technology which still exists for some learners and the need to demystify the use of technology in the classroom

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

- related their own experience of using CBT and, in one example which caused much nodding of heads, said that they found working through a whole CBT course a very boring experience
- emphasised the fact that those at the Forum were part of the 'transition generation', and that the fear of technology would be absent in future generations
- spoke of the vision of teacher, students and technological facilities interacting as a team in the learning process
- mentioned the reaction against yet more computer use (during their training periods) from pilots and air traffic controllers who wanted to talk to a human being when training as opposed to using computers all the time as they did at work
- likened offering an airline captain over 50 a computer-based grammar correction course to offering an airline meal tray rather than an evening in a good restaurant - but stressed that many younger pilots, particularly from the less developed countries, were very keen to use CBT
- pointed out that the DTP revolution had allowed teachers to be much more creative in the production of high quality documentation, and that the availability of the Internet now meant that teachers were not even limited by their own creativity
- suggested that increased use of technology in classrooms would have a negative impact on students' ability to communicate. This point was rebutted by one speaker who used the example of the effectiveness of e-mail and Internet groups in the enhancement of the ability to communicate across national boundaries

The panel summed up the discussion by saying that creative use of technology would change the methodology of teaching - but not for the worst. The final speaker emphasised that, for many students, the use of a computer could be a liberating experience; should carry no social stigma; and should be encouraged as an additional tool and resource available to the teacher.

Distance Education came of age in the middle of the Nineteenth Century when Isaac Pitman, a British entrepreneur, realised the potential of the newly created British Post Office and the 'Penny Post'. For the first time a letter could be sent and received at a reasonable price via a regulated government agency. Isaac started up correspondence education on a large scale by teaching students, by post, the skill of writing in shorthand. Since then Distance Education has grown to be one of the major delivery systems of education and training in the world. Technology and techniques have moved on however and a quantum leap was made in the 1960s with the setting up of national universities that were dedicated to teaching and learning using a philosophy of Open Learning that utilised, to a greater or lesser degree, the techniques of Distance Learning.

Open Learning is primarily about increasing access to the learning environment to students who have traditionally been unable to attend universities or colleges. The type of student who could benefit from Open Learning could be, for instance, someone who worked unsociable hours, someone who was raising a young family, someone who might be considered too old for a traditional university/college or who did not have the normal academic entry requirements. The new Open Universities utilised new technologies of the 60s such as telephones and TV that gave them an added dimension to the techniques of correspondence education.

Open and Distance Learning (ODL) has grown dramatically over the last 40 years. Sir John Daniels, vice-chancellor of the UK Open University (UKOU) records (Daniels, J. **Mega-Universities and Knowledge Media**, Kogan Page, 1966) that the world's ten largest universities are all Open/Distance universities with a combined population of around 3,000,000 students. There are now few countries in the world that do not possess either a national Open University or a national Open Learning Consortium. It is not only the large numbers of students that have passed through the virtual gates of the Open and

Telematics and IT In Distance Learning

Mr Nick Slope

Resource Based

Learning Manager

School of Business

Thames Valley

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Distance Universities/Colleges that have had a major impact on teaching and learning, it is also the members of staff who have worked with these institutions either in a part-time or full-time capacity. The ideas, philosophy and techniques of ODL have influenced these staff and this influence has had its impact on the more traditional, campus-based universities/colleges. For instance, the vice-chancellor of Thames Valley University was for ten years a Dean at the UKOU.

During the 1990s a number of converging influences have had, and are continuing to have, a major impact on teaching and learning on a global scale (Slope, N. **Resource Based Learning in an International Context**. Chapter of **Resource Based Learning**, ed. Brown, S, Smith, B, Koogan Page 1996). Almost all national governments are reducing the unit of resource per learner given to higher and further education. Furthermore, many governments are, at the same time, reducing the amount of financial support that they have previously given to the students themselves. There is an almost universal demand for the expansion of learner numbers in all aspects of education and training. The concept of 'life-long learning' where education and training is seen as a process of continuing professional development rather than as a 'one stop shop' is gathering momentum (for instance, 1996 was the European Year of Life-Long Learning). Public and private institutions are looking very hard at the education and training that their employees are receiving as well as looking for more flexible and cost effective employee skills development. The nature of the learner population is changing as more mature, disadvantaged and students with diverse backgrounds seek to enter the education and training arena.

Set against these changes in the nature of education and training is the communication and knowledge explosion that has been produced by the growth of Information Technology (IT) and telematics. The term «telematics» was originally used to cover the

use of land telephone lines in the conveying of information and communication such as the internet and video conferencing. Today the term has come to cover a broad spectrum of use that includes non-telephone line technology such as satellite transmission. The techniques and possibilities of IT and telematics is considerable and is growing rapidly. Curren, Fox and Goldrick, (Curren, Fox and Goldrick **Telematic Services for Tertiary Distance Teaching**, EU report, 1995) record the following list of telematic and IT services that they identified as having use in the educational and training environment:

- audio tape;
- Computer Based Training (CBT)/ Computer Assisted Learning (CAL);
- laboratory kits;
- CD ROM/CDI;
- video tape/disc;
- audio conferencing;
- video conferencing;
- e-mail (one-to-one);
- e-mail (group);
- news groups;
- Internet;
- Intranet;
- cable TV;
- desk-top video conferencing;
- desk-top conferencing;
- satellite;
- terrestrial TV;
- voice-mail.

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

All the above techniques have been used in an Open and Distance Learning environment. Listed below are a number of examples of telematics and IT in action.

At Anglia Polytechnic University, UK an educational programme at Masters level has been put onto the Internet. The programme concerns Islamic architecture and is based on the Iranian city of Isfahan. In one year the Web Site received a staggering 30,289 visits with a total user time of 3,404 hours. The site is used by individual learners and browsers as well as other educational establishments and has established itself as one of the premier educational Web Sites. The author of the site, Thomas Rochford, commented that the virtual city probably receives more visitors than the real one! The site can be accessed on:

<http://www.anglia.ac.uk/~trochford/isfahan.html>

A number of UK universities (Northumbria, East London and Anglia Polytechnic) are currently mounting existing text-based Distance Learning materials on an Intranet that will enable on-line, or demand publishing by any of the students of the consortia. This will give a wide access base for distance learning materials for traditional campus based students as well as distance learners.

The UK Open University is extensively using IT and Computer Conferencing as part of its student support on many of its programmes. In 1996 the UKOU required that 35,000 of its students had to have access to a computer and that 17,000 of its students had to have network access. On some of the UKOU programmes it is now mandatory to use computer conferencing.

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

The University of Surrey's Computer Based Teaching programme called SToMP (Software Teaching of Modular Physics) includes theory, simulated experiments, data-handling and text editing tools. The SToMP programme replaces lectures and allows staff to concentrate on small group work and allows students flexibility of study. For more information contact their Web Page:

<http://www.ph.surrey.ac.uk/stomp/>

The European Association of Distance Teaching Universities (EADTU) has started up a network of telematically linked study centres called Euro Study Centres (ESC's). This Europe wide network is based on existing study centres from national Open and Distance Learning universities as well as from campus based universities. The number of ESC's currently stands at around 60 based in 13 countries (UK, France, Finland, Sweden, Austria, Switzerland, Portugal, Germany, Spain, the Netherlands, Belgium, Norway and Ireland).

An initiative currently underway between a number of ESC's is the WIRE project. Each of the WIRE partner institutions is responsible for the development and delivery of a specific subject area:

- Marketing (Helsinki University of Technology)
- Educational Technology in New Learning Environments (University of Oulu)
- Mediaspace (University of Plymouth)
- Research Methods (University of Sunderland)
- Sexual Assault and Domestic Violence (Anglia Polytechnic University)

The subjects are delivered via a multi-medium (as opposed to a multi-media) approach.

The medium mix includes text based materials, Internet, satellite broadcasting, video conferencing and desk top conferencing. Student response has been particularly encouraging and at a recent WIRE video conferencing event students across Europe were able to talk directly to, and to question, the Finnish Prime Minister.

At Thames Valley University we use the Internet, e-mail, Desk Top Publishing, video conferencing, computer conferencing and voice mail in the teaching and learning environment. We have recently opened a purpose built Learning Resource Centre at our Slough Campus that has become the electronic hub of the university.

However the use of IT and telematics in teaching and learning does raise some important issues. In a recent evaluation of telematically delivered teaching and learning (Slope, N., **Evaluation of Telematically Delivered Teaching and Learning**, European Open University Network (EOUN), EADTU, 1996) a number of important issues were identified. Learners found the use of telematics exciting and stimulating, particularly in a multi-national environment. However, it was clear that much attention should be given to staff and student development in the use of the various technologies employed. It must not be assumed that because staff know their subject area and are good teachers that they will handle technologies easily. The same goes for learners. There was also seen to be a danger in the use of technologies for their own sake rather than establishing clear needs that the technologies could address.

In conclusion, it is clear that Open and Distance Learning (ODL) are becoming major factors in the teaching and learning environment and that this trend will continue into the foreseeable future. Information Technology and telematics offer the teacher and the learner a new and growing dimension in the delivery of education and training. Current

initiatives in these fields of ODL, IT and telematics have shown their worth and practicability. However, there are issues that must be addressed in the use of these tools. Therefore a rough guide is offered to those approaching the subject for the first time:

- be clear why you want to use IT and telematics;
- link use to learning objectives;
- ensure that all staff involved receive proper training;
- ensure that the technology can be properly supported;
- ensure that learners receive proper training;
- test the technology first: pilot;
- evaluate.

Introduction

I come from a background of ELT/ESP as a teacher and publisher - not from a technological one - and as such my perceived task is to present a general picture of the opportunities we are presented with by a broad consideration of the technologies that exist today. My task for you, the audience, is to pick out what attracts you and what is relevant to your situation, and to apply it.

As a publisher I operate within the bounds of a commercial imperative but always with the knowledge that nothing should be done which does not deliver the promise people have come to expect from the brand of Oxford.

We seek to understand the opportunities that exist now, knowing that we cannot know the future, much as creators of reduced pidgin languages cannot predict the ways in which elaborated creoles may evolve. However, by being involved in the process we may hope to influence the direction of developments, certainly more than we could as mere bystanders.

There is a distinction to be made between education and training, or *learning to think* and *training to do*. This is of course a continuum; we educate scientists and train technicians, and engineers come somewhere between. In this talk I will look first at the *impact* technology can have on a number of factors in both learning and training and then consider the *potential* of technology in the processes of both.

Finally, by way of introduction, I am considering the potential of multimedia not from the narrow definition of the term - the bringing together of video, audio, graphics, text, etc. into the common environment of e.g. CD-ROM - but from a wider consideration of

The Potential of Multimedia in English Language Training

*Mr Simon Murison-
Bowie
Director of Oxford
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delivering learning programmes by any and all off-line and on-line means at our disposal, one of which is CD-ROM.

The impact of multimedia technologies

• On learning environments

The environments in which we learn have traditionally been thought of as a set of options between the institution, the home and the work place. Technology is, however, blurring the distinction so that students increasingly wish to combine the options, choosing when and where they study. For education providers, the preparation and integration of materials and services which operate within these changing parameters become a challenge.

• On the content of learning

It is useful to distinguish between *fixed content* and *fluid content*. Fixed content is that which we as trainers, teachers, syllabus designers and authors determine to be part of the curriculum to be learnt. Within an electronic environment, however, learners have increasingly easy access to authentic language of potential relevance e.g. via the Internet. It is this uncontrolled language that one may term fluid content; our aim has to be to find ways of mediating it, by developing comprehension strategies, task-based approaches and dedicated software ‘intelligent agents’ which will select Web sites according to predetermined criteria which fit a learner’s profile. (The video and book publication *ITN World News*, OUP 1993, shows how this can be done within the context of news broadcasts.)

- **On the empowerment of the learner**

Technology empowers the learner by offering choice. We have already looked at issues of when and where study may take place and of the kind of content that may be appropriate. There is an additional issue of learning style. It is becoming increasingly clear that individuals differ markedly in their appreciation of and ability to learn from e.g. visual and textual material. It has been suggested moreover that those with powerful visual imaginations may be better equipped to understand the potential of computers than those traditionally thought more literate. (see Thomas West: *In the Mind's Eye*.)

- **On communication**

Again, technology allows communication to happen one-to-one, one-to-many, many-to-many and many-to-one. Publishers and teachers need to give thought to the strengths and weaknesses of each of these modes and then to find meaningful ways of encouraging learners to make use of the options. (See the section below on Online communication.)

The potential of multimedia technologies

- **As a cost/benefit issue**

Multimedia is expensive and in the medium term is unlikely to bring any cost savings, particularly in terms of saving money on teachers. We need to be looking, rather, to ways of increasing the number of students we can reach for a given investment, certainly in those areas of education or training where there is a demand much greater than is currently being fulfilled. (Is this pertinent in an area such as training for the aviation industry?) The Open University calculates only small increases in course development time when multimedia is used, but a doubling of the production time over courses delivered more traditionally.

Whether or not to use multimedia must, then, be made on the basis of whether or not there are real and intrinsic benefits. In order to make this judgement there are two questions to be asked: are there significant things that cannot be done without the technology? And are there significant things which can be done better with technology? The aim should be to make learning a more efficient and insightful process thereby justifying the extra expenditure and reducing the waste of resources that can be characteristic of traditional teacher-mediated, institution-based learning.

Things that cannot be done without the technology include

- the dematerialization of time and space: allowing students to study when and where they wish
- contact with potentially infinite amounts of authentic language, either as input for task-based learning/language awareness and experience using fast search and retrieval software, or for more detailed work (e.g. corpus-based learning using concordancing and other text analysis software. See Murison-Bowie: *MicroConcord Manual*, OUP 1993 and Murison-Bowie: 'Linguistic Corpora and Language Teaching' in *Annual Review of Applied Linguistics* 16, CUP 1996.)
- just-in-time training, an example of which is provided by the use of multimedia training manuals carried by oil-rig maintenance workers using portable CDI devices
- peer-group teaching, examples of which are provided by
 - Boeing's development of training materials by identifying the best-practice worker (not actor) and film with hand-held camera (appropriate production values), and by
 - the British Council's pilot distance learning programme where Swedish/Italian students correct each others' work.

Things which can be done better with technology include

- the choice of learning style
- the individualized tracking through resource and learning materials
- the monitoring of learner performance.

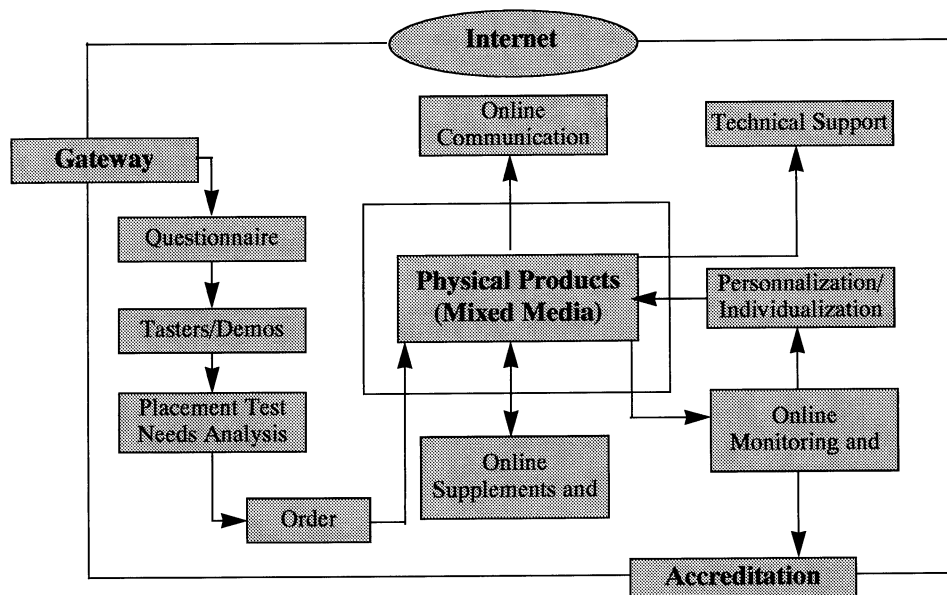
We will look briefly at these in terms of an integrated learning model below.

• **As an educational model issue**

In acknowledging technology's ability to render time and space immaterial, one is drawn into the traditional differentiation between teacher-mediated, institution-based learning on the one hand and distance learning on the other. The two overlap substantially, however. Institutions are looking to extend their reach to student populations in different places, even other countries. Students who are engaged in distance learning programmes look for tutorial assistance.

In Oxford Interactive Learning we are developing an integrated model of materials and educational service provision which will serve both types of need. The following diagram gives an indication of the possibilities that exist.

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM



This model has been constructed with a view to making use of what technologies can deliver now, though a number of language learning and technical issues, some of which are listed below, are by no means trivial.

In very general terms, the idea here is to draw the learner or trainee into the Website and, via a system of questionnaires, needs analyses and placement tests, to direct them towards learning materials which will be appropriate to their interest and level of achievement. These materials will in the first instance be physical products (CD-ROM, DVD, print - whatever is necessary and appropriate) but then to offer the learner various additional materials and educational services to support their learning. These will

include supplementary and updated materials, a variety of online communication possibilities, and the monitoring and testing of performance. In this last regard, our aim is to use this monitoring of performance as a step towards creating individualized learning paths through course materials.

Online communication

Remembering our criteria for using technology - only those things which cannot be done without and those things which can be done better - let us look more closely at just one of the boxes on the model: online communication. One can construct a matrix of the 'means' one has of communicating on the Internet (e.g. by e-mail or other text exchange, by discussion groups of various kinds, of Web noticeboards, of electronic whiteboards, of audio, video and internet telephony, etc) and the 'modes' of communicating (e.g. in terms of learner to learner, learner to tutor, tutor to learner, tutor to tutor; or in terms of one to one, one to many, many to one, many to many). Into this matrix one can then try to identify the kind of use to which each of the intersections can best be put. Thus learners can communicate with each other by e-mail to seek help on specific points, to work collaboratively on a particular task, or to have a general 'chat'. A tutor may wish to communicate with a learner by telephone (Internet or normal) and having an electronic whiteboard to hand so that particular parts of an assignment can be looked at collaboratively.

Examples of a Web bulletin board, of an interactive text site and of a Web conferencing site - all taken from the site of the Knowledge Media Institute of the Open University (<http://www.kmi.open.ac.uk>) - serve to illustrate the kinds of communication which are being developed for other purposes but which can be adapted to specific applications within a learning programme.

- **As a technical issue**

As already indicated, each of the boxes on the model hide a research agenda or even a set of agendas. There are *language learning issues* such as:

- modelling the learner's needs, preferred learning styles and so on, establishing best practice for online tutorials,
- diagnosing learner performance so that it can be used as the basis for creating a profile of the learner's success or failure, and
- routing models for directing learners through resource materials so that they will encounter only material which is going to serve their individual needs.

Then there are *programming and interface issues* such as how to present to the learner information and learning activities using an interface which is common to both off- and on-line delivery, how to create navigational systems that will facilitate an enriched set of communication options without confusing the learner, etc. Finally there are *database and information organization issues* which need to be thought about so that one can create materials which can be built on as the technology increases and improves without each time having to reinvent the wheel. The most promising framework for this at the moment appears to be the holding of all one's 'assets' (bits of video, audio, graphics or animations, text and so on) as separate objects in an object-oriented database and then having procedures or routines whereby one can assemble these assets or objects in whatever ways one wants to, apply to them program activities and then present them to the learner by means of a limited number of templates or screens.

Conclusion

It should be clear from the above that we in Oxford Interactive Learning believe there is very considerable potential for multimedia in education. A careful consideration of a

large number of factors and the associated costs is, however, essential. Without a clear mind as to where the benefits are to be had it is unlikely that one will spend one's money wisely. In short we are committed to being part of a technology-rich education and training market but do not wish to add to the pile of publications which have more to do with the multimedia hype than with the delivery of effective learning materials.

The interest in technology in language learning is no new phenomenon. Since the seduction of structural linguistics by sound recording, the history of Applied Linguistics, Language Pedagogy and Psychology of Education have been closely related to the evolution of technology. Whatever the technology involved, the integration and use of new tools within the institutional context is, however, conditioned by political, economic and technical discourse (Narcy 1997) which usually precedes relevant theory in Language Acquisition Research and often ignores it.

As far as Computer Assisted Language Teaching and Learning are concerned, it is thus comforting to note the growing interest in authoring tools which not only enable researchers to design elaborate language learning environments (such as JE VOUS AI COMPRIS, CAMILLE, ELEONORE, for the acquisition of French as a second/foreign language) but can also be used by teachers to create their own pedagogical material and by learners to construct their knowledge of the language they are studying.

Still more important is the renewal of research in language acquisition which the *multimedia revolution* generates and more especially the revival of interest in learning theories which have never been quite applied within the institutional context. Thus, Papert (1993), the inventor of LOGO, building upon Piaget's *constructivism*, insists on the importance of real constructions as the basis of mental constructions, and, as Renié and Chanier (1995) note, "a different type of learning" based on *collaboration or cooperation* and *interaction* is now being considered as "an alternative to traditional ones" by "the community working on Computer Assisted Learning".

Applying these notions which, as Renié and Chanier remark, date back to Deutsch (1949) or Vygotsky's and Piaget's work, to the use of an authoring programme, requires us to reflect on the various opportunities it offers such as raising *language awareness*

**Designing Multimedia
Hyperdocuments:
a new means to teach
and learn Languages?**

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or facilitating a *heuristic approach*. It also implies taking into account the implications it may have on teaching/learning styles as well as on teacher/learner autonomy.

It would be, of course, irrational to endeavour to go through such analyses within the time allowed for this presentation. So, the hyperdocuments shown in this Forum have to be considered "samples" of experimental proceedings in those grounds. They nevertheless aim at bringing answers to a certain number of questions concerning the appropriate type of software, the conditions of use of such tools and their utility for the learning of procedural knowledge.

The appropriate tool for the appropriate use

The observation of groups of teachers in various workshops dedicated to the use of authoring tools has shown that simple programmes are usually preferred to programmes which, even if they did allow them to create more elaborate products, are not always easy to master. In this respect, when choice was given, the software in which programming was hidden has had the favour of the vast majority of participants.

Thus the choice of *Polygraphe* has proved sensible. This user-friendly software provides the designer with a blank page on which he can write, place pictures and create hyperwords and buttons which will in turn open new spaces, call up more text and pictures, play sounds or videos... The importance of this easiness factor is considerable since the programme could also be used most efficiently by learners without adding any cognitive load to their task.

In a study carried out with groups of young learners, special attention has been given to

the specificity of the role which could be assigned to this tool for the learning of procedures, in relation to the other pedagogical materials available whether didactic (textbooks) or authentic (foreign television programmes). Thus, most of the hyperdocuments presented, whether designed by the teacher or by the learners, take part in a pedagogical process based on the solution of problems and the construction of knowledge.

In this respect it is essential to insist on the fundamental difference between video and television on the one hand and multimedia hyperdocuments on the other hand, even when the latter include video sequences. As I remarked in a previous paper, the use of television and video implies collective viewing but involves individual participation (sensory, reflective, emotional...). It therefore requires tight control by teachers but allows learners to communicate with each other as well as with the teacher. If, conversely, absence of control is usually advocated in the use of hyperdocuments, common sense tells us that the efficiency of self-learning tasks is conditioned by careful pedagogical mediation prior to the task. In other words, multimedia hyperdocuments, whether they are meant for the general public or for education, have to be considered as *didactic* materials and as such cannot be handled in the same way as *authentic* video materials. The idea of the user's freedom and the principle of navigation based on the association of ideas may in this respect be highly debatable.

It has been argued that hypersystems are more likely to suit learning contexts based on solving problems than those devoted to the acquisition of concepts (Depover, Quintin & De Lièvre 1993). But, as Black et al. (1987) have pointed out, "the best adapted form depends on the nature of what has to be learned" and, Dufrene, Jolin and Senteni (1990) who have carried out research on the use of "hypertext documents for the learning of procedures", have shown the limits of exploration environments in the context of

procedures. It is essential to recall that these reflections concern the use of existing products. The creation of multimedia hypertext by groups of learners obviously involves other learning processes based on *constructivism* as well as on *cooperation*. So, as far as language teaching/learning is concerned, I would differentiate *learning strategies* which apply to acquisition and rest upon motivation, and *perception/production* and *communication strategies* which concern the use of the language (Faerch & Kasper 1984, Tarone 1981).

Why should teachers create their own pedagogical materials?

The idea that it is rather absurd to advocate the learner's autonomy without considering that of the teacher is now starting to gain ground. More and more teachers also realise that efficient, easy-to-use tools can now help them to create the specific material they need and are no longer satisfied with simply consuming products. Yet the question of using authoring tools remains: *What for?*

I have previously insisted on the role which authentic audio-visual materials can play in the strategies mentioned above (Arquembourg 1990, 1991, 1994) and on the importance of the teacher's control in the learner's acquisition of both communication proficiency and ability to reflect on the language. Multimedia hypersystems now provide the learner with a double opportunity to explore the language (written/oral) while assisting him/her with visual data (pictures, video sequences) likely to facilitate the process of awareness. They allow the teacher/designer to *direct the learner's attention* in order to make him *notice* forms (Arquembourg 1994, 1996, Skehan 1996). They are thus based on a heuristic approach which encourages the learner to *reflect on the relation between meaning and form* (e.g.: my presentation of the forms used in French in a colloquial

dialogue) as well as on *the difference between the target language and his/her own language* (e.g. : my presentation on the use of the passive form in English as compared to French). Moreover, as they introduce "the notion of context and of language learning as contextual shaping" (Kramsch 1993), they are likely to bring an answer to the difficult question raised by the introduction of the communicative approach: *how can we work on the language without prejudicing communicative goals?* (Narcy 1993) as well as to the now debated relevance of authentic materials to carry out grammatical tasks.

As far as vocabulary acquisition is concerned, multimedia hypertext provides the teacher with the most suitable means to encourage learners "to work on the unknown words they meet, before resorting to a glossary or dictionary" (Singleton 1993): when creating a hypertext, the teacher can either provide the learner with definitions or lead him to infer by himself the meaning of a word in its context. The possibility of providing different levels of help is, of course, essential since it enables learners of various degrees of competency to achieve the tasks.

The last, but not the least, advantage of this tool is the opportunity given to the learner to open a note-pad in which he can, in turn, produce written language. As Renié and Chanier (1996) point out, "the main object of second language learning being precisely the ability to interact in that language, this production mode cannot be left aside during the process of acquisition."

As shown in this presentation, the authoring tool has been used to create various types of documents ranging from a quick document to use in the language class to elaborate products designed for self-learning tasks without teacher control. My main concern however has been to consider the role such programmes can play for language

acquisition and the learning of procedures once they are used by the learners themselves.

Designing multimedia hypertext: a learning technique?

The most positive outcomes of the emergence of multimedia are undoubtedly the revival of interest it has caused, as I said, for didactic theories as well as the undeniable enthusiasm for a learning process based on the learner's autonomy. Renié and Chanier note that in the last few years, such notions as *cooperative* learning (Deutsch 1949) or *collaboration* (Vygotsky 1978, Slavin 1983) and *interaction* have attracted the "community working on Computer Assisted Learning". They consider "interaction with a computer system" (or "companion-system") as a means to "make the learner reach a solution and not to make her (the learner) accept its (the computer's) solution". Relying on Vygotsky and Piaget's work, they insist on the "positive attributes of collaborative learning: learners are more aware of their errors, open to negotiation, motivated by a goal".

The study which I have carried out with groups of young learners distinguishes itself from the reflections which precede since the learners here have to use an authoring tool in order to produce a hyperdocument themselves and therefore benefit from having to build something together (O'Malley 1992). They work in pairs and in this way interact with each other as well as "with the companion-system". It must also be added that they benefit from the support of the teacher when necessary. Yet, it is interesting to note that this study confirms the positive attributes quoted above.

In the first stage of the study the learners had to complete documents prepared by the teacher and presented before the class. The tasks consisted in exploring a text or video document studied in class, to spot the key-sentences and key-words in order to build the structure of the document, working on the unknown words and producing definitions, matching text with visual data (provided by the teacher), recording oral comments or dialogues...

Although the discovery of the tool involved a lot of playing with colours, graphic symbols, pictures, etc. at first, the learners soon focused on a goal and applied themselves to the organization of text and the correction of errors which involved negotiation and collaboration

Now familiar with the process, the learners have acquired more autonomy and have started to work on their own projects which requires document research as well as writing. The activity has quickly turned into a writing workshop, with choices ranging from free-expression to text analysis with particular concern for the forms recently studied in class.

In this respect, the study also revealed, as could be expected, the differences in learning styles or behaviours. Although the computer undeniably motivated a majority of learners, it soon became obvious that some would not easily benefit from this type of task. An alternative had to be offered to answer a need for tutorial work.

Conclusion

While technology is providing teachers and educators with new, efficient tools, research in Language Acquisition, Applied Linguistics, Cognitive Psychology and Computer Assisted Learning offers a new description of teaching and learning strategies based on *constructivism, collaboration or cooperation and interaction.*

Although it is still too early to measure the impact of multimedia hypersystems on language acquisition, the opportunity they offer to raise the learner's awareness and to give him/her an active role in the learning process has already attracted a number of researchers and teachers who consider the use of hyperdocuments as a means to reconcile *meaning-oriented* and *form-based* learning.

The presentation of 'home-made' multimedia hypertexts has a double aim. Firstly, it has to be considered as an account of investigations carried out in the field of computer-assisted teaching and learning to know in what ways an authoring tool can be used and to what extent it can facilitate teaching and learning. The various needs (of the teacher and learner) have been examined in order to determine the role such a programme can play in presentation teaching situations as well as in self-learning or semi-directed learning tasks. Special emphasis has been put on the use of a hypertext generator by the learners within a collaborative learning context. Secondly, if we consider that creating appropriate tasks based on authentic material remains an essential part of the teacher's role, it is a way to show that multimedia technology can be used to serve other pedagogical purposes complementary to the use of specific environments.

The various multimedia hypertexts presented in this Forum dedicated to the use of English for aviation, whether produced by the teacher or the learner, obviously do not concern the teaching and learning of English for this specific purpose. Yet, they should produce evidence of the potentialities offered by authoring tools in that sphere. It would not be honest however to suggest that a teacher need only to be creative to be efficient. Whatever the technology used, designing tasks needs training. However simple, the use of POLYGRAPHE may be, designing hypertext also entails training. One can only wish for this form of *technological culture* to be introduced into the teacher curriculum.

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Writing about the Internet and using this amazing tool is a hard task – rather like trying to describe what a good wine tastes like but without letting you have even a sip from the glass.

For readers with Web access, start at Volterre-Fr at <http://www.wfi.fr/volterre> and explore the hundreds of resources for teaching and learning English.

The Bibliography handed out at the Aviation Forum is now in Volterre-Fr and has already been updated. Go to: <http://www.wfi.fr/volterre/biblio.html> for the most recent version.

My talk “Flying Blind? The Internet for English Language Teaching, Training & Learning” was a who, what, where and why approach to the Internet. It included Aviation, English for Special Purposes and General English resources on the Internet – particularly email and the World Wide Web.

“Flying Blind? The Internet for English Language Teaching, Training and Learning”

*Ms Linda Thalman
Director of Volterre
France*

*Web France
International*

*thalman@wfi.fr
<http://www.wfi.fr/volterre>*

Who is on the Internet? teachers from around the world and maybe you should be too...

What are teachers doing with the Internet?

- teaching, training and learning
- email projects: in-house, tandem, international
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- and more

Why? Because the Internet is a tool!

“Thus E-mail is not a magic wand that, once waved, replaced previous pedagogy. It is

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a powerful new tool that can help teachers **implement** good pedagogy...”
(Mark Warschauer, E-Mail for English Teaching, 1995, Tesol Publication)

Aviation English Resources

English for Special Purposes Resources

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This is an unmoderated discussion list designed for teachers of English for Science and Technology (EST). And it's a very good list at that!

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Volterre-Fr, English & French Language Resources, <http://www.wfi.fr/volterre>

Meta sites

Marc-David Seidel's Airlines Of The Web <http://www.itn.net/airlines> (Everything to do with Airlines. Huge site)

Air Traveler's Handbook

<http://www.cs.cmu.edu/afs/cs/user/mkant/Public/Travel/airfare.html> (the FAQ posting for the rec.travel.air newsgroup).

In general you can find: Airport Information, schedules, fares, promotional offers, corporate information, practical details, cargo services, etc. on airline web sites. Frequent flier, airports, aviation organizations, (US Department of Transportation, FAA, ATA, IATA, for example), manufacturers and suppliers, travel, travel agents, air-related travel services on the Web.

May I suggest you seriously consider using a flight simulator not a real one but a program like Microsoft's flight simulator. There is nothing better for learning the basic concepts and terminology of flying. You'd be hard pressed to find New York's Kennedy airport from Boston's Logan airport, for example, without using flight instruments. What's the function of the rudder? Try it out. What is the proper flap setting for a takeoff with a Boeing 737-400? Experiment.

The MS flight simulator also has an excellent tutorial complete with videos. And there are active, even fanatic, support groups throughout the world through the Internet where you can also find free scenery add-ons and aircraft. Try these URLs for starters.

<http://www.microwings.com> (Notes from Linda Thalman: The International Association For Aerospace Simulations)

<http://www.microsoft.com/games/fsim> (Microsoft Flight Simulator for Windows 95)

<http://simflight.com/mikem/> (Flight.com aviation news headlines, chat, mailing list on flight simulation...)

<http://ourworld.compuserve.com/homepages/cranenburgh/fs6.htm> (Pros and cons of FS6/Microsoft Flightsimulator 95).

Although you can fly immediately (just hit F4 on the opening screen and you'll soon be in the air over downtown Chicago) there is an endless amount to learn and I would suspect the students would soon be teaching the instructor. Not a bad idea. I would also use the flight simulator with foreign students thinking of studying in the US or Britain (or just about anywhere else for the matter). It's a great way to learn geography. Terry Fredrickson, Manager, Educational Services, The Bangkok Post

<http://www.bangkokpost.net/education/home.htm>

terryfrd@KSC15.TH.COM

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Martin Jack - <martjack@post3.tele.dk> Home fax: +45 86 46 90 20 Aarhus Business College, Dk - suggest getting a copy of "AECMA Simplified English" (AECMA Document N-B0 PSC-85-16598) from the: Association Européenne de Constructeurs de Matériel Aérospatial, 88 Boulevard Malesherbes, 75008 Paris, France
Tel: +33 (0)1.45.63.82.85 - Fax: +33 (0)1.42.25.15.48

Elaine H Marcus, eharcus@vines.colostate.edu, is/was seeking help for her aviation English course in Colorado.

Larry Kelly at iteslj@ge.aitech.ac.jp (The Internet TESL Journal) wrote: "The Internet TESL Journal has one thing about flying... sort of"
<http://www.aitech.ac.jp/~iteslj/quizzes/mc-jb-skysports.html> (paragliding is the topic!)

Have you tried a request to US Airforce or RAF or other aviation branches of the world's armed services? Also, I imagine there are lots of teachers in Saudi Arabia teaching flying to pilots. I'd look outside of ESL Teachers. Just an idea.

Our company developed a multimedia CD-ROM program called "Aviation Communication" to teach pilot to air traffic control communication about 18 months ago. The program was never officially released because of conflict with our partner. However, the Defense Language Institute at Lackland AFB now uses the program in teaching foreign pilots and a couple of small schools are using it as well. Unfortunately, we cannot sell the program but we are willing to give a beta copy to institutions which purchase either our Active English or our Accelerated English series of ESL programs. The cost for either series is \$395.00. If you would like information on our various ESL programs please let me know.
David Welch USECPI@aol.com

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Meg ESLTEACHER <teacher@dorsai.org> writes: There was a discussion group at TESOL on Aviation English, led by Angel Bishop Petty and Antonio Martins, both of the Defense Language Institute at Lackland Air Force Base, in Texas. I checked the email listings given for presenters and apparently neither is on-line (seems strange, but - hey!).

Also suggested during the Presentation:

<http://avweb.com>

<http://aaib.gov.uk>

The NASA web site and the Boeing Web site

URL for the Bibliography: <http://www.wfi.fr/volterre/biblio.html>

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Email Linda Thalman, Editor thalman@wfi.fr

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Here is a selected bibliography of books that I have personally found useful and/or have been recommended by other teachers on the Net. Good reading!

The Internet Guide For English Language Teachers, Dave Sperling, Prentice Hall Regents, 1997, ISBN 0-13-841073-9 (sperling@eslcafe.com)

<http://www.phregents.com>

(The most up-to-date compilation in print of Internet resources today).

Order from Simon & Schuster at:

<http://merchant.superlibrary.com:8000/catalog/hg/PRODUCT/PAGE/01384/bud/0138410739.html>

Or Amazon Books at:

<http://www.amazon.com/exec/obidos/ISBN=0138410739/1205-1561563-646647>

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(Order from: Simon and Schuster and/or Amazon.com)

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ISBN 0-872-30595-X.

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Trifolium Books, 228 Davenport Road, Suite 28, Toronto, ON, Canada M5R 1J6
(K-12 focus)

Netlearning - Why Teachers use the Internet, Ferdi Serim und Melissa Koch, O'Reilly & Associates, 1996, ISBN 1-56592-201-8

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Virtual Connections: Online Activities and Projects for Networking Language Learners. Mark Warschauer, 1995, Second Language Teaching & Curriculum Center, ISBN 0-8248-1793-1

E-Mail for English Teaching, Mark Warschauer, TESOL, 1995. ISBN 0-939791-62-5
URL for Mark: <http://www.lll.hawaii.edu/markw> - for full details on all his books see Recent Publications. Order this book from publ@tesol.edu

An International Survey of Distance Education and Teacher training: From Smoke Signals To Satellite II, compiled and edited by Richard Cornell & Karen Murphy, University of Central Florida, Orlando, FL, USA. Oct. 1995

Write Around the World, by Mark Irvine, Reporter Publications, Excerpts can be seen at <http://www.mclink.it/com/reporter/write.htm>, Reporter Publishing, Via Manzoni 31, 50018 Scandicci, Italy - tel: +39-55-2578346 - fax: +39-55-250868
E-mail: mc3022@mclink.it (25 US dollars)

The Internet for Teachers, Bard Williams, IDG Books, 1995, ISBN 1-56889-600-2

The World Wide Web for Teachers, Bard Williams. IDG Books, 1995, ISBN 1-56884-604-5

Background

In 1994 a large-scale training programme was designed for Air France with a view to preparing the transition from a maintenance environment in which most of the technical documents used were translations into French to one in which technicians and mechanics would work directly from the manufacturers' documentation in English. As in many other carriers world-wide, this decision was aimed at reducing translation costs, increasing the speed at which revisions were incorporated, extending the airline's ability to cater for third party airlines whose documents were mainly in English and finally prepare the way for computerised documentation.

The programme, entitled **Access to maintenance documentation**, had to comply with three conditions:

- it was to be a cascade training project, relying mainly on facilitators with a sufficient mastery of at least written technical English. In most cases they came from the Engineering departments;
- the classes had to be tolerant of considerable differences of linguistic ability within the groups;
- the training had to be specific to nine different areas of aircraft maintenance and overhaul, namely : aircraft systems, engine overhaul, cabin maintenance, structure, electronic workshops, electro-mechanical workshops, machine tool workshops, provisioning and stores.

Following teacher training sessions and co-teaching of classes, the project was launched in January 1995. The initial five-day course was based on the nine specific versions of the training manual and their pocket glossaries.

CD ROM for Mechanics

*Mr Philip Shawcross
Director of
English for Aircraft
Paris, France*

The curriculum

Given the wide range of age and language ability of the potential population of some three thousand technicians, a much more thorough and structured curriculum was obviously required to ensure that everyone could expect to reach the necessary degree of competence. The idea was to create a supportive learning environment and cater for individual needs by the interaction of a whole series of measures:

- an initial assessment of basic syntax, technical vocabulary and reading skills;
- basic language acquisition in a conventional classroom, English language teacher operated situation, only using material taken from the manuals, with a view to enabling trainees to follow the rest of the curriculum successfully. This part of the training was called Open Access;
- revising the use of English in technical documents and developing different reading skills with a facilitator in the five-day course;
- recurrent practice on specific documentation (B 737, B747, A 320 etc.) during short training sessions of two to six hours each, using a package of texts and activities on transparencies with notes for the facilitator, Access Training;
- computer-assisted learning in a classroom situation with a facilitator, in small groups within the work team or individually using «Self Access to maintenance documentation»;
- on-job validation of individual competence.

Why CBT?

A computer-based component seemed particularly desirable to provide the facilitators with an attractive and dynamic teaching tool, to cater for different levels of linguistic ability and the irregular availability of shift workers, to prepare users for the advent of

computerised documentation and allow learners to become more involved in the project, work at their own pace and assess their progress without the stress and complexity of organised testing sessions. This appeared to be the most effective way of ensuring the continuity of the learning process in an environment where it is often difficult to make up regular groups.

Facts

The programme has been developed on Asymetrix Toolbook 4.0, using Adobe Photoshop, Corel draw and Microsoft Access on Windows 95. It is designed for a 800x600 screen resolution in 256 colours but with a setting of 65k colours to avoid palette shift problems. For best results, it requires a Pentium 133 with 800 Mo hard disk, 16 Mo RAM, 2 Mo VGA card, 16-bit Sound Blaster card, a CD ROM drive and preferably a 17 or 21-inch screen or a video projector with compatible resolution. Depending obviously on initial level, the programme is able to provide in the range of 100 hours of use per student.

Content

The programme was built around two main parts : the Text Modules, which represent the corpus of some forty maintenance texts, each with a series of technical and linguistic activities, and the Language Steps, which allow the learner to consolidate fifteen different aspects of the English used in technical documents through 120 graded activities (See figure). The programme also features a guided tour or exploratory module, a battery of 800 multiple-choice questions with a diagnosis of the learner's results guiding him towards those parts of the programme he needs to use and a User File memorising total time spent and test results.

[Refer to the table *Access to Maintenance Documentation*, page 52]

Text modules

The twenty Text Modules use on average two texts per module (one procedure and one description), covering most aircraft systems and taken from seven types of document of increasing complexity (lists, table of contents, removal, warnings, repairs, troubleshooting, inspection, adjustment and tests). Examples are taken from Airbus Industrie and Boeing aircraft, although over-specific material has been avoided. Particular attention has been paid to graphics, as in maintenance, figures are an integral part of the text.

In each module, seven distinct activities make it possible both for an inexperienced reader to start using a difficult text by a visual approach in Look, by hearing part of the text read in Listen and by collecting information in Scan and for a more advanced reader to find interest in a relatively easy text through detailed comprehension in Read and language application in Use.

Features include text scrolling, calling up the figure at any time for reference, an on-line glossary of terms used in the texts, hot tips about learning techniques, use of the language and facts and figures about aeronautics.

Language steps

If a problem or question is encountered, or if students prefer to work from a language point of view, fifteen major areas of importance in technical texts (word groups, location and movement, quantifiers, word endings etc.) can be selected. In this part of the course, the accent is much more on a game-type approach. Trainer or learner can

choose from three levels of difficulty in each area, refer to Summary pages giving explanations and examples in their own language, display the transcript and translation of the oral instructions or call up a graphic-based demonstration.

Despite the reassuring presence of L2 explanations, the activities themselves are all done within purely English terms of reference with the help of photographs, graphics and direct association.

Conclusions

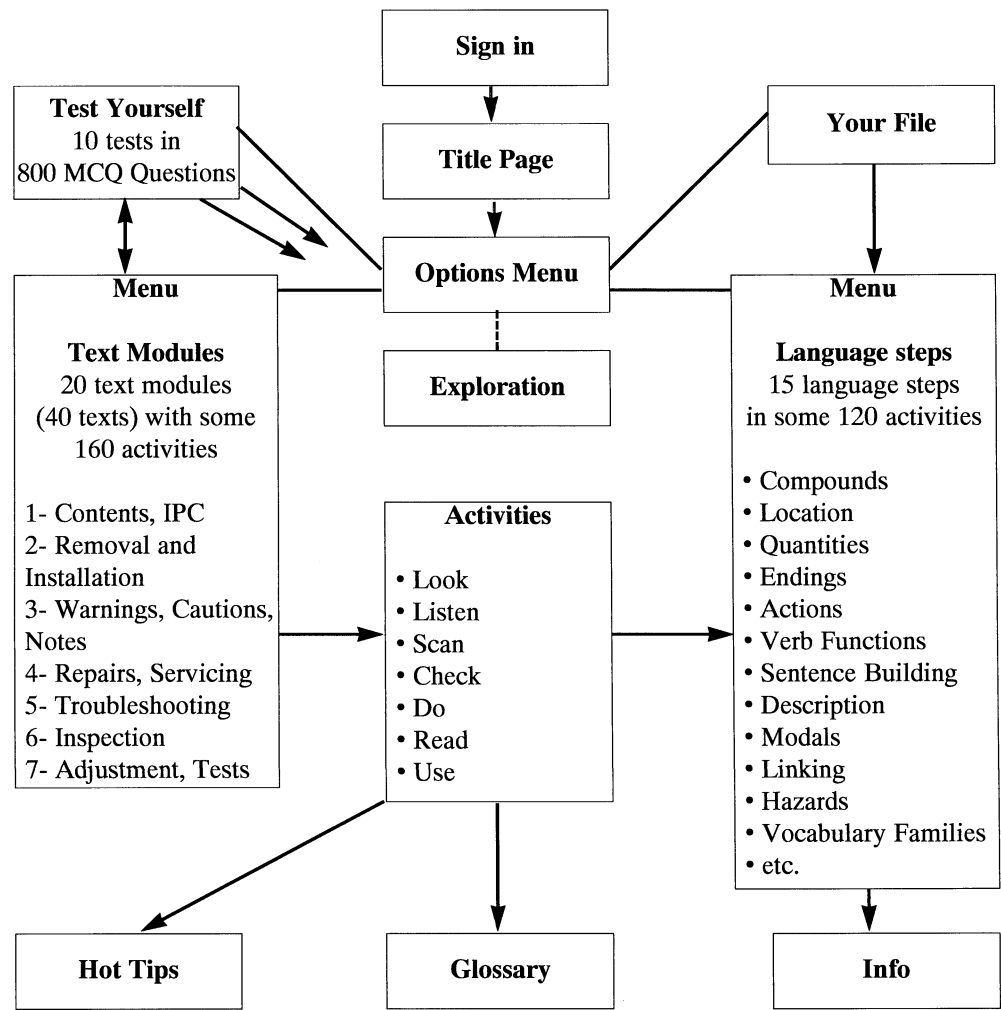
Originally developed for a French public, all the instructions and explanations belong to data bases that can be transferred into any other second language.

The Text Modules attempt to create a user environment in terms of the different types of reading activity (scanning, checking etc.), page layout, use of figures and scrolling to find information, which is as close as possible to the actual way in which technical documents are used.

Activities are designed to call upon a combination of linguistic and extra-linguistic skills, without ever cutting the tie between the learner and his surroundings.

In a nutshell, there has been the desire to bring the monochrome characters alive, to create a bridge between the text and a reality whose visualisation will enable the student to come back to the text with a better understanding.

Access to Maintenance Documentation



SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

«Aviation English» on CD ROM is the complete international language tutor for aviation.

Aviation English on CD ROM

Co-developed by a tripartite venture comprising of Aer Lingus, the Irish Airline Pilots' Association, and Compact Media, «Aviation English» is a high quality CD ROM which teaches newcomers to the aviation industry the basics of the English language as used in aviation.

*Mr Finian Connolly
Director of Compact
Media
Dublin, Ireland*

It aims to assist non-native speakers of English with the technical terminology used by English language speakers in the aviation industry. It will also help familiarise new CPL pilots and operations staff how a jet transport operation fits together.

The 50 hour programme is based on the operation of an actual Aer Lingus 737-500 flight, through the pilot prospective, from check-in to disembarkation. It defines over 2,700 terms in the glossary, gives examples of their use and shows how they fit into the aviation environment. This is achieved by combining multimedia aspects (slides, video and sound tracks) into the overall presentation.

«Aviation English» consists of six modules which are further subdivided into units. Topics covered include an overview of the aviation industry, the pre-flight procedures from crew check-in to pre-departure inspection, the flight from one airport to another, and post-flight activities including disembarkation through to Arrivals Hall.

There is an examination at the beginning of the programme to test the user's knowledge of English. Also included are revision questions at the end of each module and a final examination at the end of the programme.

The CD ROM is designed to run on a basic platform multimedia PC i.e. a 486 CPU with 4 megabytes RAM and double speed CD ROM supported by a 16 bit sound card.

Course outline

1 - Introduction

- English standard required
- How to use the course
- The Partners
- Course Objectives
- Course Overview
- Revision

2 - Industry

- Overview
- Civil Aviation
- Airlines - General
- Aircraft - General
- Flight
- Introduction to the Boeing 737-3/4/500 series
- Revision

3 - Pre-Flight

- Overview
- Crew check-in

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- Flight planning and Documentation
 - Operations Control
 - Aviation Weather
 - Air Information Service
 - Company Bulletins
 - Performance
 - The Flight Plan
 - The ATC Flight Plan
 - Crew Pre-flight Dialogue
- Cabin Crew Briefing
- Passenger Check-in and Boarding
- Loading
- Fuelling and Maintenance
- Pre-departure Inspection
- Revision

4 - Flight

- Overview
- Safety Checklist
- Pre-start Checklist
- Push-back and Start
- Taxi out
- Line-up and Takeoff
- Climb
- Cruise
- Descent
- Approach and Landing

- Taxi in and Shutdown
- Revision

5 - Post-flight

- Overview
- Disembarkation
- Immigration
- Baggage Collection
- Customs
- Arrivals Hall
- Flight Crew Duties
- Revision

6 - Safety and Security

- Overview
- Safety
- Dangerous Goods
- Security
- Revision

7 - Course Conclusion

- Overview
- Revision
- Test
- Course Conclusion
- Acknowledgements

The purpose of this paper is to give an overview of aviation English training in Japan, focusing primarily on the major institutions involved.

There are two national aviation institutions in Japan: the Civil Aviation College and the Aeronautical Safety College. Both of them belong to the Ministry of Transport. The Civil Aviation College trains pilots and has graduated almost 2,600 students to major airlines in the past, whereas the Aeronautical Safety College trains air traffic controllers. In this paper, I would like to focus attention on the aviation English syllabus and its implementation at the Civil Aviation College first, and then touch upon in-house material and the possibility of integrating general English and aviation English. Finally, Computer Assisted Instruction (CAI) for ATC at the Aeronautical Safety College will be described briefly.

**Aviation English
Training in Japan**

*Mr Shozo Yokoyama
Associate Professor of
English
Civil Aviation College
Ministry of Transport
Japan*

Civil Aviation College: Pilot Training

The Civil Aviation College was established in 1954 in the Miyazaki prefecture, as an institution attached to the Ministry of Transport. Since its founding, many changes have had an effect on the system and enrollment of students, reflected by the social economic situations of the times. The College now enrolls 108 students, of which 10 students are in a helicopter pilot course. Most of the students are university graduates, although the requirement for College application is a junior college diploma or the completion of 2 years of a 4 year university program.

The Airline Pilot Course lasts for 2 years and 4 months, including an 8-week leave. The academic period of 28 months is as follows.

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Stage	Period	Content
1. Ground School Stage	8 months	full-time ground school
2. Basic Flight Stage	4 months	basic flying and ground school
3. Intermediate Flight Stage	8 months	intermediate flying and ground school
4. Advanced Flight Stage	8 months	advanced flying and ground school
(total) 28 months		

Ground School Course Syllabus

The students concentrate on ground training for the first 8 months after admission to the college. The ground training syllabus covers the following subjects: English, Physical Education/Gymnastics, Air Transport, Mathematics, Aerodynamics, Aircraft Dynamics, Aircraft Structures, Basic Instruments, Engine, Electrical Engineering, Electronics, Avionics, Flight Assistance Service, Aviation Law, Air Traffic Control, Meteorology, Flight Control, Computer Science, Aeronautical Engineering Lab and Navigation.

During the ground school class, instruction is given in 100-minute periods of which there are four in a day (from 8:30 to 4:30).

The ground school during the flight stage offers the following: English, English Conversation, Meteorology, Navigation and Gymnastics.

English Language Training Syllabus

Instruction is given in a Language Laboratory, so that the audio-visual materials can be incorporated into the class content.

Since the students already have their university degree, their reading ability and knowledge of grammar are quite good so long as they deal with semi-professional documents. The ground school stage provides 120 hours of English. The syllabus of the first 8 months is organized so as to meet the need of today's pilots in Japan; that is, to primarily enhance their communicative or conversational competence. The syllabus at this stage comprises four tasks as follows.

- i. oral communication
- ii. listening and dictation
- iii. readings in current English
- iv. aviation English

The core of the syllabus is oral communication, listening and dictation, which make up about two thirds of the total hours.

Even at junior high or high school levels, recent years have seen an emphasis on communicative proficiency instead of grammatical competence as a primary goal of language learning. This attitude brings us to focus interest on the content or the topic of the conversation as well as on functions of speech such as suggestions, requests or orders. An analysis of our students' needs also showed that they are anxious to improve their speaking ability both in the professional setting and in everyday life situations which they will be faced with in their in-company training in the U.S., if hired by national Japanese carriers. Due to the time constraints in language training at our college, we finally decided to concentrate on communicative proficiency, leading us to the latest teaching methods based on 'notional functional syllabus'. One of the textbooks used for oral communication is *New Person to Person* published by Oxford University Press. For those unfamiliar with this textbook, it is written and based on the notional functional syllabus. I believe it is one of the best materials for those who wish to acquire a practical ability in English in a limited period of time, something our students have to do.

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

The oral communication component includes listening/reading activities of a dialogue followed by pair-work or role-play with a partner on the topic or the functional expression in a given unit. As for our students, they are mostly graduates from science programs, such as engineering, and rarely have had the chance to use English in real communication; they are starving for communication in English, in a sense. In fact, they have become so interested and active in the class since we adopted this syllabus that some of the students voluntarily attend conversation classes with a native speaker of English after regular school hours. As the results of performance evaluation show, all of the students have evaluated the material very highly and positively.

Listening and dictation are instructed by audio and video materials. Reduced forms of spoken American English such as contractions, assimilation, connections and reductions are practiced with sentences and we aim to achieve comprehension of short colloquial dialogues. Video dramas in British English, on the other hand, are very useful for the students to broaden their understanding of the varieties of English; that is, the difference between American and British English.

Readings in current English are focused on the semi-professional or general social issues at this early stage, with the intent of giving an open-minded, broad-based education now required of international line pilots. The readings are taken from newspapers, aviation magazines, and essays of contemporary writers.

Basic aviation English (or RT phraseology) is instructed at the end of the ground school period intensively with in-house materials. This will be mentioned in detail in the following chapter.

Ground lessons of English at the flight training stage offer English composition, readings in aviation and RT communication training. English composition focuses on writing about social affairs or daily events in their lives or sometimes refers to major

news events found in newspapers. Readings are taken from aviation history and news in papers and magazines. Finally, *Airspeak* by F.A. Robertson is used for RT training.

Teaching RT Phraseology: In-house Materials

It seems that RT phraseology at the earlier stages of flight training in Japan does not necessarily require much language training or at least a thorough knowledge of RT on behalf of the students. Student pilots at our college, for example, mostly concentrate on the touch and go procedures or air-work training for the first 4 months of initial training. Material such as *Airspeak* we mentioned, which is designed for international pilots, is therefore hard to use for basic flight trainees, although it is well-designed and suitable for the advanced flight course at our college.

This naturally led me to decide the editing of our own in-house material for basic flight trainees, in spite of the warnings against attempting to do so by many authors. Robertson aptly stated: (quoted from Newsletter No 4 of the International Aviation English Association, F.A.Robertson.)

"Creating training materials is time consuming and expensive and it always takes much longer to write than one has estimated.

A piece of advice about writing specialized language materials gleaned from one of the annual ESP weekends in France: DON'T write your own materials if you can possibly avoid it. The corollary: if it's published, use it. It may of course need adaptation to be appropriate for your course but it can save you a lot of time and free you to develop certain trickier parts in more detail."

(International Aviation English Association, Newsletter No 4, 1994)

Perhaps Robertson was right, in the sense that even my work was expensive, time consuming, and required great patience. Nevertheless, it was a very rewarding job for me.

The process included analyzing the students' needs, designing a syllabus, designing material (including taking photographs) and evaluating. First of all, the evaluation of existing materials have provided me a good source for ideas. It took two years to prepare the in-house material with the use of a computer for word processing, the drawing of pictures, pasting of photographs, editing and printing out of the manuscript. And it was finally published as *Aviation English for the CAC Students* in 1994; followed by the second edition in 1996.

The material was based on a situational syllabus, in order for the students to easily learn the RT material according to their progress in flight training. It was written in English so that the learners could get themselves accustomed to thinking and expressing what they were doing in flight training in English. Owing to the students themselves, many authentic RT dialogues collected from real training situations were incorporated into examples, or into the exercises. There are many photographs and pictures of training fields and some notes for necessary parts available in the book to familiarize the trainees with the training context. It can therefore be called a 'contextualized textbook'.

It is evaluated fairly positively by the students with regard to its content, arrangement and explanation, whereas some of the students express uneasiness about the fact that the language used in it is English. Although this is an expected reaction to some extent, we should make our concept and philosophy of language teaching clear to every learner at the outset.

The experience of writing materials firmly convinced me of the following need for material development:

- 1 - a linguistic analysis of RT phraseology,
- 2 - an option for the Japanese version of the material,
- 3 - the integration of audio-visual aids and
- 4 - budget support for publishing.

English: General and/or Specific

Let us now move on to the issue of how we should integrate general English training with specific training, or aviation English.

As I pointed out earlier, it is certain that RT communication within Japan is not a problem; Japanese pilots and controllers easily understand each other due to phonetic reasons. For instance, it is easier for a Japanese pilot to understand the Japanese say 'Kontakto', pronounced as [kontakto:] with 4 syllables and Japanese vowels than to understand 'contact', 2 syllables and English sounds. However this does seem to be the only factor for which Japanese pilots find it difficult to communicate with foreign controllers. One of the reasons could be attributed to the nature of communication itself. RT communication in America, for instance, sounds more conversational than that prevailing in Japan, because it incorporates much more colloquial expressions.

And it should be noted that the most difficult situations where pilots should have a perfect command of English are non-routine situations. To transmit an emergency message precisely and accurately, the specialized vocabulary - 'depressurization' for decreasing cabin pressure, for example - is truly essential, but what is basically needed is a wide range of abilities for communication to handle any unpredicted emergency. So the syllabus for pilot English training should be carefully designed to deal with specific purposes as well as general, or in other words, general English proficiency should at least be the basis of the specific use of it. A better command of general English will surely increase the confidence in fluency and will help the trainees deal more successfully and in a shorter time with non-routine situations, as Elena H. Antova pointed out at the Fifth Aviation English Forum in Paris, 1994.

There is another aspect; major airlines in Japan such as Japan Air Lines, All Nippon Airways and Japan Air System normally send new pilots to in-company training in the

United States, where the instruction is given in English by American instructors. They also require communicative competence in and out of training, at least enough as is necessary for everyday life in America. To get them to survive this, in a sense, is our job. Never had I realized it more keenly than that time when I made a visit to the Japan Airlines' flight training center in Napa, California in 1995. The visit was so successful that I could strongly confirm my aforementioned ideas and the English teaching at the institute was not far from what we are aiming at and doing at our college. Interviews of the graduates there also proved that the syllabus and materials at the college were evaluated very highly by the students. Some of the students were dissatisfied with the insufficient training hours in the English language.

Training hours for English are quite limited. We cannot increase on general training to the detriment of the specific phases in training or vice-versa. Nevertheless, we have to explore possible means of maximizing students' potentiality for communication. The problem we are confronted with, is the following: how can we best achieve the balance between learning English for general purposes as opposed to learning it for specific purposes within a limited amount of time? To deal with this problem and make our teaching methods more efficient, perhaps we should start developing materials that are attractive for the student pilots so they are more motivated to work on them. These new materials should include topics related to the real life of pilots, conversations with mechanics, small talk with a co-pilot or a captain, a short stay overseas after an international flight, and so on. Taking into consideration the balance of language skills, we may also have to devote chapters to aviation texts, collected from professional or semi-professional documents such as magazines, brochures and manuals, for example, and writing on professional issues. These materials should be adapted to the flight course rather than for ground school training, since it would be more appropriate to the students who have some knowledge of flying.

I advise consulting the book *Manuel d'anglais parlé du pilote de ligne* written by Yves Rengade at the Ecole Nationale de l'Aviation Civile. This book can be very helpful for us as an aid for designing such material even for Japanese pilots, as far as the professional settings in the book are concerned.

We have to keep in mind that the materials would be complementary and not mutually exclusive, so it is very important to select carefully, taking advantage of important parts and to assemble them with the ones now in use.

There are, of course, other considerations such as teaching techniques, although they cannot be discussed here for lack of space and time.

Computer Assisted Instruction (CAI) at the Aeronautical Safety College

The Aeronautical Safety College has a CAI system to teach Air Traffic Control. This self access system has been developed as a subsidiary program for regular classes, in collaboration with the instructors of the college and NTT, the Nippon Telegraph and Telephone Corporation, several years ago. The introduction of the system aims to prepare the students for ATC lectures beforehand or to review lessons after class, and it has proven to be effective in supporting regular class activities.

A unit of the system consists of a CPU, a display and a laser-disc player with software. It allows students to customize their training, according to their learning pace and starting level. For example, chapter 1 starts by explaining the map of an airport, (alpha airport), with the narration, illustration and animation of a taxiing aircraft, and then shows the photograph of an ATC room. Control zones, traffic patterns and instrument approaches are explained in the same manner. Chapter 2 deals with taxi instructions. There are typical exchanges between a pilot and a controller presented with the narration and illustration of a moving aircraft on a taxiway.

Since it is a trial product, it does not address many areas of the ATC lexicon, and of course, needs much improvement. It should be linked to the RT training as well as the lecture on ATC procedures. Still, it is a great first step we have long awaited, and something that opens a new horizon for more systematic and flexible ways of teaching RT.

On the other hand, the Civil Aviation College has not introduced the CAI system for RT training so far, although I feel we should consider the implementation of such a system.

Conclusion

I have tried to give the outline of RT training in Japan and to shed some light on the problems concerning the syllabus and the materials. Limited time available for research only allowed me to touch upon the computer based instruction briefly, although it is one of the main issues at this Forum. As a conclusion, I believe this forum is our best tool to evaluate and learn from other participants involved in RT training around the world, and maybe we can contribute reciprocally to it by using new technology, for example, by a mailing list of internet. It enables us to advance our training methods in RT and improve the educational system in the field of aviation.

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**How Aviation Affects Aviation Professions,
Documentation and Training**

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

The panellists first outlined their experience, Francois was a ground engineer on the modern Airbus fleet, Michel a training pilot on A320 and A340, Jean Pierre a tower and approach controller at Charles de Gaulle airport specialising in English instruction, Jean Paul an A320 and A330 pilot having started his aviation career crop spraying. Etienne was a ground instructor for French Airports.

All agreed that there had been a great change in communication over the last ten years but they emphasised that the main changes seem to be driven by economics not necessarily for an improvement in communication. There was a great contrast between the provision of satellite communication for the arm rest telephones of the passenger and the poor quality of the RTF transmissions received in the cockpit. The modern flight deck is a noisier place than in the past and it was now necessary to wear headsets to receive messages rather than, as our participants recalled, in the halcyon days of the Caravelle when a loudspeaker sufficed.

There had been improvements in the relaying of company and technical messages with the advent of ACARS which had proved a benefit to both the maintenance crews and the ATC, in that messages could be written in the cockpit or tower and be received by the relevant personnel. ATC clearances and information were now passed in this way and faults reported to the company, enabling a quicker turnaround to be achieved.

On the maintenance side it was now a matter of replacing one black box with another, one did not have to delve into the contents any longer. The complete assembly was removed and sent away for servicing.

The use of bilingual speech was raised. French and English is still used in RTF transmissions between air and ground, (this led to the inevitable comments on its advisability from the floor). Data transfer by ACARS tended to be written in the mother

The Effect of Technology on Aviation Professions

Round table Day 1

Chair:

*Mr John A Williams
Consultant, Former
Manager, Training
London ATCC, UK*

Participants:

*Jean-Pierre Lambert
Controller
ATC Instructor*

*Mr Jean-Paul Maurel
Captain*

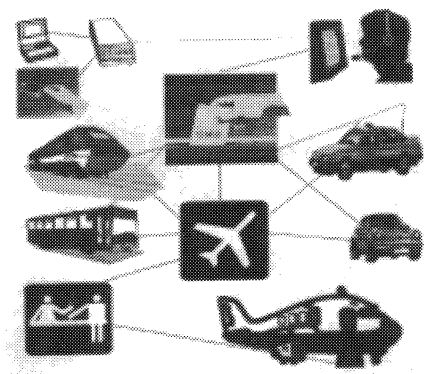
*Mr Michel Menestrot
Training Captain*

*Mr Etienne Meyer
Ground Instructor*

*Mr François Tondusson
Ground Engineer*

tongue of the persons concerned. It was pointed out that the common incidence of multi-cultural cockpits these days led to a standardisation in the use of English for communication. In respect of ground facilities many languages were catered for including English and French. Documentation was still mainly in English.

Etienne joined the panel at this stage having been held up by the strikes and Parisian traffic. He outlined for us the developments that would be forthcoming before the millennium with 'smart chips' issued on boarding cards with passive detectors at gates preventing access to those who were unauthorised.



Passenger service

- > Seat allocation on initial booking
 - confirmed at transport station or car park
- > Passport control
 - by palm print
- > Pre-flight briefing
 - In back TV automatic translation to requested language
- > Meals
 - pre-ordered

In Flight Phase

- Communication by data link
- Airfield information - pre-recorded digital voice
- Taxiing by automatic lights - computer controlled blocks
- Line up and take off could be automatic
 - suspect that this will remain human
- En-route communications - data link automatic

- translation to selected language
- messages input by computer
- linked flight management system to control centre
- automatic collision avoidance and warning
- ATC monitor and pass control messages by data link
 - conflict detection automatically determined
- Verbal communication - back up only

At this point the chairman presented his futuristic scenario, outlined above, with booking via the internet or telephone with preferences of language, meals, entertainment all bookable; automatic check-in at the transportation station or car park, seat confirmed and booking smart card issued. Other innovations might be: automatic readout at check points and boarding also automatic luggage deposit and routeing, airport transportation by automatic driverless computer controlled trains, electronic rejection if at incorrect location.

On board meals could be served automatically at the seat; safety briefings by back seat television, but in language of choice.

He also painted a picture of total reliance on computers with humans purely for back up if the machines fail - or even automatic flight. Taxiing, line up and take off could be achieved automatically and all messages be relayed by data link and direct ATCC to Flight Management systems.

The panel considered this scenario as feasible but not likely, the main problem being the need for the passengers to have human contact. Etienne pointed out that the ground handling side of the scenario was realistic and a lot of the equipment was in the process of being delivered. The ATC and flight crew members were very sceptical and pointed out that the computers would have to be very reliable and that if a crew member were carried as a failure backup, then they should be involved in active participation as humans make very poor monitors.

The future face of communications was discussed with FANS (Future Air Navigation System) and ADS (Automatic Dependent Surveillance) already coming into use in those areas of the world where ground facilities were sparse; the Pacific and Africa.

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

These depended upon satellites for their communication needs with positions automatically transmitted to remote ground stations. Satellite RTF communication would certainly improve the quality of reception and should be able to counteract the current problem of frequency blockage when two or more transmit at once.

More money needs to be invested into improving the quality of reception of RTF; car radios these days have a far better quality of reception than that in the aircraft. One of our pilots even envisaged having to enter the passenger cabin to 'borrow' a telephone to contact his own company.

What was clear was that improvements are made which bring in extra income or reduce turn around time; if it is for better reception or having an improved working environment, then it is unlikely to be introduced.

However, it was universally agreed that passengers would not be flying in pilotless aircraft or leaving from or arriving at unstaffed airports for a very long time.

The chairman concluded by thanking the panel for their very interesting contributions and in particular for their fluency in English.

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

About The Use of Aviation English

Pilots who are non native speakers use English once they are outside their country.

They also use English with passengers.

Standard ICAO phraseology exists, but it covers only standard normal and abnormal situations.

In other non-standard situations, they use simplified English due to their lack of knowledge of the language, but this simplified English is not defined and varies from one country to another.

Pilots and Communication

See following table.

About The Use of Aviation English in the Cockpit

Mr Michel Menestrot
Training Captain
France

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

Type of communications	Present	Improvement in the last 20 years	Possible future improvements
Pilots to other Crew Members in the Cockpit	<ul style="list-style-type: none"> Noise level in cockpit still high Headsets still needed at least for departure and arrival (noise + mix of ground, cockpit and ATC communications + hands needed for other tasks) 	<ul style="list-style-type: none"> Noise level changed a lot with the introduction of jet planes, but has not improved since 	<ul style="list-style-type: none"> Quiet cockpits
Pilots to Pax and Commercial Crew	<ul style="list-style-type: none"> Public address not very good Usually no direct control of the volume from the cockpit 	<ul style="list-style-type: none"> No improvement 	<ul style="list-style-type: none"> Adjustable level of volume Good sound equipment
Pilots to ATC	<ul style="list-style-type: none"> VHF <ul style="list-style-type: none"> reception level still to be adjusted manually depending on the level of broadcast possibility of frequency blockage 	<ul style="list-style-type: none"> No improvement 	<ul style="list-style-type: none"> Automatic devices adjusting volume level in cockpit and preventing frequency blockage (technology already exists)
	<ul style="list-style-type: none"> HF: very bad 	<ul style="list-style-type: none"> No improvement 	<ul style="list-style-type: none"> Sound equipment as good as in most cars
	<ul style="list-style-type: none"> Satellite: not used yet 	<ul style="list-style-type: none"> No improvement 	
	<ul style="list-style-type: none"> Data Link (ACARS) <ul style="list-style-type: none"> for clearances and weather requests used for non urgent communications 	<ul style="list-style-type: none"> Only real significant improvement in the last 20 years 	<ul style="list-style-type: none"> Will be used for enroute clearance
	<ul style="list-style-type: none"> ATIS: some are good quality, some very bad 	<ul style="list-style-type: none"> Not much improvement 	<ul style="list-style-type: none"> Generalization of automated weather stations
Pilots to Company	<ul style="list-style-type: none"> HF on old aircraft 	<ul style="list-style-type: none"> No improvement 	<ul style="list-style-type: none"> Satellite voice systems use data links
Planes to Pilots	<ul style="list-style-type: none"> Audio (synthesized voice) and written information (on screens) 	<ul style="list-style-type: none"> Inexistent 20 years ago 	<ul style="list-style-type: none"> Electronic copilot (assistant software)
Pilots to Planes	<ul style="list-style-type: none"> Via MCDU (manual inputs on alphanumeric keyboards) 	<ul style="list-style-type: none"> Inexistent 20 years ago 	<ul style="list-style-type: none"> Improvement of keyboards Use of mouse Use of voice recognition software to give orders

• Use of satellite COM
PAX use system

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

About the effects of New Technology on aviation Professions, François Tondusson made the following comments:

ACARS (aircraft communications addressing and reporting system) is one of the main technical improvements and a very useful tool in the area of mechanics.

The system is based on the continuous contact between the aircraft in-flight or on the ground and its main base on the ground. Thanks to VHF contacts and via the SITA network we are able to know the status of one aircraft and even of an entire fleet, in real time.

For an airline such as Air Inter, this is of paramount importance, as our turnaround times are very short. We must be very efficient in a minimum amount of time.

In flight, we are advised as soon as a failure occurs. A failure message is automatically sent by the on-board computers and it appears on a specific printer that is located in our headquarters.

This enables the condition of a fleet to be tracked and allows the maintenance department to begin investigating the file of an aircraft and to check its background. Thanks to these parameters we can begin troubleshooting and if necessary we may order a spare part.

So when the aircraft is grounded, we are able to decide whether we must consider repairs or whether we can dispatch the aircraft for the following flight according to the importance of the failure/breakdown.

As soon as the engines are shut down and after each flight the status of the aircraft is

The Effects of New Technology for Aviation Professionals

*Mr François Tondusson
Ground Engineer
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SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

sent off. This is what is called the "Post Flight Report". All of the information is also sent through our computer network and therefore everyone in charge of the aircraft can check their status.

ACARS offers the flight crew additional information such as weather reports no matter what the location, flight duration, engine start-up and shut-down times, etc.

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English is both complex and straightforward. Phraseology has pared communications to a bare minimum acceptable for purely technical two-way exchanges between controllers and pilots.

But a number of situations cannot be coded and translated into basic concise and safe phraseology messages. Therefore a number of situations are handled in a language which is technically orientated but not fool-proof since it is used mainly in exceptional circumstances (hazardous situations, adverse weather, security problems etc.).

ATC

Mr Jean-Pierre Lambert

ATC Instructor

Aéroports de Paris

- ADP -

Paris, France

Technically radio-communications are slowly reaching the end of their useful lives. The ever increasing number of aircraft raises the workload of the controller and more sectors with more frequencies are introduced to try and keep apace with this situation. A number of systems have been introduced to alleviate this problem.

«CONTRAN» alerts the pilot of a blocked frequency. The 25 kHz spaced radiotelephony channels are slowly giving way to 8.33 kHz channels. But these new palliatives will only improve marginally a system already bursting at the seams.

Automation is the answer for the long term. New technologies have already been introduced to relieve the controller's and the pilot's radiotelephony workload. Clearance Delivery for start-up is slowly being replaced by the VHF-datalink ACARS / CLAIRE systems. No need to ask for a Standard Instrument Departure from an airport, this will automatically be transmitted via a fax machine in the cockpit. The same applies for transatlantic clearances. ATIS (Automatic Terminal Information Systems) are gradually being replaced by synthetic voices or datalink systems.

On a more futuristic note we are not far from the moment when all ground to earth radiocommunications are digitalised and beamed by computers in the radar and in the

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cockpit. Traffic Collision Avoidance Systems already compulsory in the USA will be coupled with other computerised communicating devices. «Free flight» is for tomorrow when flights will automatically opt for the best and the safest routes decided by computers manned by silent controllers!

Will radiotelephony as we know it today be kept for extreme circumstances when the safety of the plane is at stake?

Will it still be safe to rely on an outdated system which is only used in exceptional situations?

Time will tell but radiotelephony as we know it today is slowly becoming a technological dinosaur!

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In his 1985 opening speech Jan Gordts (President of EGATS) in 1985 said: "Whether we like it or not, the microphone and the headset or loudspeaker for the less disciplined ones amongst us, are the tools which enable steady communication between ground and aircraft and though the voices may sound familiar, the faces are not. It is therefore essential that ground and air people meet on occasions like this one, be it only to discover the real faces corresponding to the anonymous voices on the VHF channels. That is, of course if the industry cannot provide us with small video screens alongside the loudspeakers yet".

One of the motives to have chosen R/T as a forum subject was the fact that we expected that traditional voice communications might sooner or later become integrated into the magic world of new technology, so that our voices will become totally dehumanized and replaced by more efficient data signals.

In the meantime we are to live and work with the good old system and we want to make the best use of it, which means that we want to apply correct ICAO procedures, knowing that we can also make use of reliable equipment.

At the very same Forum Captain Gerard Plukkel, KLM B747 first officer said about R/T : "R/T - the vital link"? or should I say "R/T , the link we would do well without, the link to which extinction had better come soon. I think the sooner we come close to that goal the better. The sooner R/T is only a means of redundant communication, perhaps only in emergency situations, the safer aviation will become."

The words uttered both with confidence and passion have almost become reality.

Air - Ground Data Link was the subject of fine talks, elaborate speeches and hot disputes at Maastricht Forum in February this year. Again, we witnessed different standpoints from pilots and ATCOs who obviously want to change something in radio communication. Indeed, they are aware of its deficiencies, overloads and frequency

Vital Link Transits into Data Link

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blockings, weak links, selective hearing, the growing amount of errors induced by the way the communication is carried out, the introduction of non-standard phraseologies specially by English native speakers, ideas that phraseology is boring in itself and that on certain occasions steps aside from standards simply have to be made.

Misunderstandings in given clearances, instructions and other messages are rather frequent. Everybody is familiar with the call sign confusion, the use of several frequencies, the complete inadequacy of the use of HF frequencies and absurdity to have a pilot-communicator link instead of a pilot-controller link.

Mr H. M. Vermeulen said "In the present technological era it is inexcusable that there are still no plans for a worldwide VHF coverage. It is even worse that large parts of the world have, in theory, an ATC system of some sort but in fact these systems do not function and aircraft operate in environments without records of their movements at all".

The only ones worrying about this seem to be the pilots. I particularly wish to refer to the greater areas of Africa, the Indian Ocean and the Far East. It is perhaps significant that forums such as this one take place in areas where the only problems seem to be the increase in traffic. It seems that well organized bodies worry about small dark spots and refinement of their systems rather than improvement."

Almost the same observation was made by a respected and now retired ATCO, a dear old friend of mine Mr. Gillett at Maastricht. I will try to paraphrase his words as follows: "One should have the decency and remember that three quarters of the world have not been covered by radio communications and here we talk of whether to use Mode S or Satellite links in air-ground data links. I have heard the word *profit* at least twenty times and have not heard once the word *benefit* either for the pilot or for the ATCO."

Sometimes it seems that everything is well organized: the aircraft well equipped, the personnel on the ground and in the air well trained, except for one thing: the communications aspect. And on top of that, the world is full of trouble spots, where even basic communication requirements are not met. Over Africa, amongst others, IATA carriers years ago instituted a still valid blind broadcast procedure for enroute traffic, because great doubts existed about the quality of the AFTN like direct speech circuits.

The USA is an R/T problem in itself for non US pilots, especially when operating in terminal areas. In almost every incident or accident investigation, poor communication, lack of R/T discipline have been named as at least contributing factors and sometimes even as the so called cause. But for the present we are stuck with R/T as the primary means of communication in aviation. And as long as we have to live with it we should cope with its original problems by maintaining and improving the technical and procedural standards and also by indoctrinating the personnel involved in the use of R/T to stick to the basic rules and phraseologies. For the future, R/T perhaps should be abolished altogether, except for emergency situations. Some means of doing that are already available. In the States there is the ARINC ACARS system operational, reducing by more than 60 percent the R/T-part of the quite high volume of company radio traffic, the so called Airline Operational Control (AOC). Datalink by communication satellites should become the next step in which aircraft on long range routes - without radar surveillance at regular intervals - automatically transmit their positions via satellite to an assigned control station. ATS messages are transmitted on the return link. There should be no more erratic position report reading and read backs, no more time consuming discussions on the radio, no more waiting for the gap in the chatter and clutter to transmit the message.

The advantages of a data link are numerous, just to mention a few:

A dependent satellite communications surveillance system might have saved 269 lives

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

aboard KAL007 in 1983, one navigation satellite with data link capability could have solved the problem. The whole African airspace can be controlled from one center, even outside Africa if necessary, but also many AFTN problems would be solved with one dedicated communications satellite. There would no longer be problems caused by the use of different languages. There will be much less direct and active involvement of the human voice in the future!

It is considered that the success of the adoption of a common international language for aviation was due to the will to succeed. Abetted by the fact that the safety of human lives and commercial expediency were paramount to the international body, ICAO. Its adoption was debated and agreement reached by consent. New methods of communication, particularly between air and ground, will doubtless be advanced with the advent of modern technology. The exploitation of SSR for this purpose is already well advanced. SSR allows an aircraft to be interrogated and information to be obtained without recourse to the use of R/T speech circuits. Presently the information obtained from the aircraft transponder in this manner is generally limited to aircraft identity and the altitude at which it is flying.

However, because this facility exists it can also be exploited for forms of two-way intelligence. Mode S is the clue. S stands for the selective and in this concept of its application, it acts as an aircraft-ground. As its name implies aircraft carrying this Mode S transponder can be contacted individually without other aircraft being involved, which of course is not the case when R/T is used. In other words an aircraft has an automatic private line via the MODE S transponder to the ground station computer and therefore information can be exchanged by data transmissions rather than by speech circuits. Such a method of air-ground communication opens up wide horizons and they are certainly not limited to ATC. However, whatever form these communications may

take, it is considered vital that the principle of a worldwide standard format, the symbols and phrases to be used follow a similar forum of international agreement as has been the case with radiotelephony.

Generally it is felt that it would be impossible to replace the voice link. The vital link has proven safe and irreplaceable in most cases despite its failures. The question of replacement is only valid when something else has proven fully effective. Data link has yet to develop its applicability in complete automatization. Mode S is particularly promoted by FAA but there is fine hope that all of Europe will be radar covered by the end of this century.

Questions

1. Which medium to use?
 - MODES, VHF, SAT, ATN others
2. Same medium used worldwide for all aircraft?
3. Average transmission speed pilot / controller?
4. Man-machine interface?
5. English or national languages?
6. Party line effect?
7. Correct aircraft receiving messages?

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

8. Security of transmissions?

9. Monitoring workload and behaviour?

10. Will transition be conceptual?

11. How will controllers retain their mental picture of the whole environment?

These questions were asked at the ATC 97 EGATS DATA LINK FORUM presentation introducing the theme of P.Domagala's talk, (former EGATS president).

He tried to point out the following

Data link is not new. The first operational data - link machines were used commercially in 1956 by the NARTEL organization then in existence to cover the North - Transatlantic Routings.

It was on board the DC6s, DC4s and Constellations of the time, that decoding and encoding automatically Q Codes on wireless (W/T) Morse Frequencies occurred.

But Voice Communication was becoming a reality as VHF R/T started to emerge and very soon the "encoding machines" were obsolete. They were in fact only used for about 18 months.

It was judged a revolutionary idea at the time and they must have had a symposium on the topic at some time in the 50's.

We are going to use Data Link in the next years for more than 18 months...

But R/T is still superior in quality and speed to data link so, why then is there a need to change?

There are reasons other than speed and quality. He also did not want to discuss the reasons of pushing Data Link Communications for Air Traffic Control.

Those questions were not necessarily fears of the unknown or fears for change but rather **worries** that needed to be addressed.

It was not because new technology became available that it automatically and immediately had to replace old proven technology.

Why do we need a new way of communicating with aircraft ? One of the first things mentioned in every document on datalink is the increase in capacity that its implementation would bring. This argument seems to be mainly of interest to the airline companies and the air traffic administrations, who will end up paying for the implementation and use of datalink. As it appears now, the introduction of new air and ground equipment will cost a considerable amount of money, not to mention the cost of passing all the data over a network. So it is only natural that the investors want a substantial return for their investment. And what is more substantial in the aviation world than capacity ?

Things may be different in areas where traffic is now mainly controlled procedurally, such as ocean airspace. Here, the potential increase seems more logical, because of the possibility of reducing the separation standards. We must remember that datalink will not only allow control messages but also a huge variety of other messages, including more accurate position reports available to the controllers. In this environment, as well in all places where datalink is introduced, new systems, procedures and training programs will have to be worked out very carefully to allow controllers to cope with the technology and with a possible increase in traffic.

Philip Marien, President of EGATS stated:

"All these questions: Will that increase capacity? / Are the other measures in place? / Is backup available? / Is the system and the training of pilots and controllers adequate, all these considerations will play a part in the cost-benefit calculations that have to be made before the implementation. Personally, I'm not so sure that it will pay off and certainly not in the first few years of implementation. I don't really care whether a piece of information is sent over Mode S, a VHF channel, satellite, fax or Federal Express. All that matters to me is that information gets to where it is supposed to be, as fast or faster than a voice message!"

I cannot agree more.

But what if we increase the number of partners: more aircraft, more ground centers (Air traffic control, flow control, weather offices, maybe even military ATC centers), airports and airlines? There would no longer be a centralised place where the data could be collected. Just distributing all this data efficiently (meaning where it has to be at the right time), will take enormous processing power. Processing it and making it into useful data, whether for the controller, pilot dispatcher, flow controller, weather forecaster, ... will require even more computer capacity.

One should try to imagine all the different message formats and priorities. For the controllers, everything they want to "say" to an aircraft, has to receive priority over other people's messages. And within their own set of instructions, there are also different levels of urgency. It is also certain that an airliner dispatcher feels that some of his messages can be rather urgent, not to mention flow controllers.

What pilots do need is some sort of idea of whether a controller is busy or not. It could influence his requests for levels, direct routes, etc. In a frequency environment, it is easy: if the controller is talking constantly, he is busy.

If there are breathing spaces, he probably has got some time on his hands to arrange direct routings. Exactly how, in a datalink environment, pilots would be told that a controller has a lot of things to do, is unclear.

A frequency provides a very important means of cross checking. Assistance cannot intercept mistakes made by the radar controller, while a radar controller can listen to his/her assistant's phone-coordination, without taking his eyes off the radar, thus reducing the need for in-sector coordination to a minimum. This cross checking is a vital safety issue and listening in helps all the controllers on one sector to follow what is going on. With datalink, it becomes very hard to follow exactly what someone else is doing. Visual indications on the radar screen may provide a solution, provided they are implemented correctly. The danger is that too much information is presented on the screen for the controller to take in. He would not see the wood for the trees, and might miss important messages, no matter how color coded they were. I don't think visual triggers have the same effect as aural stimuli. More "warnings" in daily life (even in cockpits) are given by audio-signals, rather than by flashing lights.

What about the security of this system? It is true that at present, frequency has not got much to offer in that respect either, and that practically anybody with a VHF transceiver could issue false instructions to aircraft. However, the number of such individuals capable of doing that is limited, because very specific preliminary knowledge has to be obtained. With a wide computer network, it is not hard to imagine someone faking messages and directing them to an aircraft. The other problem is that such a hacker would be impossible to trace.

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

There is a real danger of the overload of information.

At the moment information comes in via different channels: ATCOs listen to the frequency and the telephone line, and see the strips, electronic displays and radar screen. Data link focuses ATCOs' attention to visual senses and the possible consequence is the lack of "party line effect". Since there will be less or no talking on the frequency, pilots will inevitably lose the general concept of the traffic with a possible impact on safety.

There are many unresolved issues surrounding the use of data link in air-ground communication and I should say that both pilots and ATCOs have to be involved in its implementation for their own sake and benefit.

I do not think that my students' generation will discuss the problem in such a manner, since they are all so computer conscious and rightly in love with computers.

My generation simply cannot take the responsibility of making the decision to automate everything and this is obviously the future step. The airmen are to be trained in a different way, the language of computers is already theirs.

I think that computers have to be mastered and remove the unnecessary load as they already have in FDPS or weather or ground-ground data, but the ability to hear and react and intervene without "interrogating" the NEW MASTER.

CPDLC according to ICAO Circular 256-AN / 152 is a means of communication between controller and pilot, using data link instead of voice for ATC communications" The CPDLC application provides the ATS facility with data link communication services. The services defined herein include clearances, expected clearances, requests

reports and related ATC information. A "free-text" capability is also provided to exchange information not conforming to defined formats.

CPDLC will be applied in order to remedy a number of shortcomings of voice communication such as voice channel congestion, misunderstanding due to bad voice quality and/or misinterpretation and corruption of the signal due to simultaneous transmissions.

The implementation of CPDLC will significantly change the way pilots and controllers communicate. The effect of CPDLC on operations should be carefully studied before deciding the extent to which voice will be replaced by data link.

Voice communications will continue to be required. Their inherent short transmission delays are well suited to those applications where a rapid exchange, short transactions communication style is required, for example, in high-density en-route or terminal air-space and for emergency and non-routine communications. The current level of safety will be maintained despite a change from a voice only-based ATC system to a voice and data linkbased ATC system.

AEROSPATIALE must manage and produce huge amounts of documentation written in different languages. It already has significant experience in using and evaluating textual information processing systems for document production and manipulation.

Since the beginning of the 1980's, the Information Department of the Joint Research Center of AEROSPATIALE has been involved in the experimentation and evaluation of linguistic tools ranging from terminology extraction and management systems to authoring tools and computer-assisted or machine translation software. Various terminology dictionaries and databases have been developed for the specific activities and application domains of the various entities of the Group. The three Machine Translation systems ARIANE, SYSTRAN and LOGOS have also been intensively tested and compared. An evaluation method based on test suites and industrial requirements has been developed and used since 1989.

Since the early 90's, the Natural Language Processing (NLP) team has been involved in several European projects, such as EUREKA GRAAL, LRE TRANSTERM, MLAP INDOCREN, LRE TSNLP and LE DiET, where it has been active in the specification and testing of a variety of linguistic tools for their integration in industrial user environments.

General Context

During the past few years, there has been an increasing awareness, in the European aerospace community, of the necessity to improve and harmonise the linguistic quality of the documentation produced and distributed worldwide.

The Airbus consortium has recently launched a large project to redefine the documentation production process. In this context, there is an increasing need for adequate linguistic resources and state-of-the-art assistance tools and methods for the creation and production of documentation, to be integrated in the new architecture.

Contribution of Linguistic Engineering Technology to the Production of Aircraft Maintenance Documentation

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Prost
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Objectives

The major objectives are the following:

- improve the linguistic quality of maintenance documentation,
- build and maintain reference terminologies,
- enhance the documentation updating process, and
- anticipate the multilingual documentation production needs.

Linguistic techniques to specify needs and tools

To meet these requirements, the Research Center of AEROSPATIALE uses a variety of tools and has developed methodologies and techniques.

- **Linguistic studies and writing recommendations**

Linguistic techniques are first used to specify the needs and the tools.

A first phase consists in a detailed linguistic exploration of aircraft documentation. The purpose of such corpus studies is to highlight the characteristics of the current documents, in terms of model and structure, lexical and terminological content, syntactic and semantic specificities, as well as the possible linguistic variations from one document to another.

On the basis of these results, writing recommendations are then produced. The method consists in measuring the compliance of documents to existing writing rules (especially the AECMA Simplified English guide) and in designing new specific linguistic guidelines, in addition to existing controlled languages.

- **Specification of documentation production environment and constraints**

In this first specification phase, it is also necessary to define the documentation production environment and constraints. The goal is to identify the current and expected information workflow, including the processes, the human factors (users' needs and

profiles), and the languages (choice between a unique reference language and multilingual production). Existing resources are also collected and described. Another major issue is to specify the types of objects to be controlled or translated.

Building reference linguistic resources

Once the needs have been specified, reference linguistic resources have to be built.

Various types of resources are needed if they are to be used in linguistic engineering applications. In addition to reference terminologies, standard repetitive sentences as well as writing and translation memories are necessary. A set of ordered writing rules, applicable to the type of documents to be controlled, is also needed.

Methodological criteria are also established to help determine the expected scope and use of the terminology repository to be created. Major issues include the types of terminology elements to be collected (noun phrases, verb phrases, etc.), the coverage and objectives (terminology database, thesaurus, glossary), the requested formats and tools, the terminology model and links to general vocabulary, and the strategies of terminology structuring and organisation.

Optimising the writing process

Linguistic engineering technology also provides methods and tools to enhance the documentation creation and updating process. Authoring assistance involves different levels of controls, such as general spelling and grammar checking, checking the compliance to writing rules, checking the compliance to restricted lexicons, checking the coherence of terminology.

In terms of functionalities, attention should be paid to the following criteria:

- nature of the output: from diagnoses to automatic corrections,
- correction mode (batch or interactive),

- overall coherence of the corrections performed,
- adaptation and maintenance of resources, and
- modularity of controls (according to languages, text types, writing rules, etc.).

Optimising the translation process

Translation assistance systems are another type of NLP applications. In order to enhance the translation process, different strategies may be adopted and influence the choice of translation tools. Major issues concern the selection of language pairs, the definition of translation scenarios, and the expected status of translations with reference to controlled languages.

For translation tools, the major crucial functionalities to be taken into account when selecting an application appear to be the following :

- fully automatic translation process and/or translation assistance (translation memories),
- adaptability to syntactic and terminological specificities,
- revision / proofreading facilities, and
- integration of bilingual terminology resources.

Conclusion

In conclusion, it clearly appears that introducing NLP tools in an operational production environment requires preliminary detailed specifications.

Most existing authoring and translation systems need to be adapted to meet the users' specific linguistic and architectural needs and constraints.

Experience in large European companies also shows that, for clearly defined types of documents, linguistic engineering technology contributes to the significant improvement in the quality and coherence of technical documentation.

A Study of the Success of Computer-Based Training at the Swiss Civil Aviation School

Introduction

Some of the basic skills required in the early days of aviation to pilot an aircraft safely, such as physical co-ordination and the ability to judge speed, have been gradually replaced by technological innovations in the cockpit such as computer-controlled systems. This has resulted in a change in the abilities required to fly a modern aircraft, a task which is rapidly changing from a physical to a mental one.

The versatility of the computer has meant that it is being increasingly applied as a vehicle for teaching the theory of aviation to ab initio trainee pilots. It is now estimated that seventy per cent of the world's airlines use CBT as an instructional tool in training their pilots to apply their acquired skills in the cockpit of a modern computerised aircraft (Mathews 1995). Therefore, as the pilot is increasingly required to perform mental rather than physical tasks, it would seem that a computerised approach to training such as CBT would be an ideal medium through which pilots could acquire the necessary skills.

If computer-based training is to be implemented in a learning environment, it is vital that human resource development professionals should consider trainees' perceptions of CBT. Decisions taken without an understanding of the needs of the learner (Schneck 1984) can lead both to expensive CBT projects being abandoned and to a return to classroom-based instruction (Wallace 1993). Consequently, it can be argued that the productivity and efficiency of the learning environment will vary directly with the degree to which it integrates and learns from the responses of previous groups of trainees.

CBT: Aviation Training for the "Game Boy" Generation?

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This paper presents such responses as offered by sixty six ab initio trainee pilots to a study I carried out at the Swiss Civil Aviation School, (SLS) Zurich, Switzerland. The target group of my study comprised of 64 male trainees and 2 female trainees. This paper resulted from initial discussions and subsequent open discussions in which attitudes towards, and personal experience with CBT were voiced by some of my students at the SLS. The fact that such discussions arose at all led me to conclude that CBT was not understood by trainees to be a priori a method of training superior to traditional classroom tuition.

My research focused on thirty-eight days of PPL theory instruction, which was completed by a total of sixty-six pilot trainees. Within this period, a total of 211 hours of classroom instruction (66 hours of which were devoted to CBT) was allocated to each member of the research group. My research began in June 1995 and was completed in March 1996.

Students at the SLS are selected and trained to become pilots in a structured, highly-focused programme which aims to produce competent members of a flight crew within 18 months. During the selection process, students underwent a medical examination which included an eye sight test set to the standard considered necessary for pilots (PUM), (this information will be relevant when we come to consider the question of eyestrain and CBT). The target group's eyesight can be said to be at least 25 per cent better than average

Methodology

An initial questionnaire was given to thirty-six trainees. The trainees had experienced varying amounts of CBT (14-45 hrs) at the time the questionnaire was distributed. Delayed deliveries of suitable CBT handouts and a shortage of courseware authors to produce CBT lessons on schedule meant that CBT had been phased into the course

gradually. The same questionnaire was presented to another class approximately four months later under identical conditions. All trainees agreed to complete the questionnaire.

A second, revised questionnaire was presented to a third group of eighteen trainees six weeks after the first group had responded. The third group was the first class to experience the total allocated time, sixty-six hours, of CBT. This revised questionnaire was compiled on the assumption that some of the questions offering a 'yes/no' format in the first questionnaire had been restrictive. Consequently, to allow trainees more scope when replying, some of the yes/no questions from the first questionnaire were amended to a Lickert scale format in the second questionnaire. Another class of trainees was presented with the same questionnaire in October. Again, all trainees responded.

Finally, a third questionnaire was presented to the second group. This questionnaire arose from a question which a trainee asked a colleague in class. The question concerned whether any of the class would recommend the PPL theory course they had experienced on CBT.

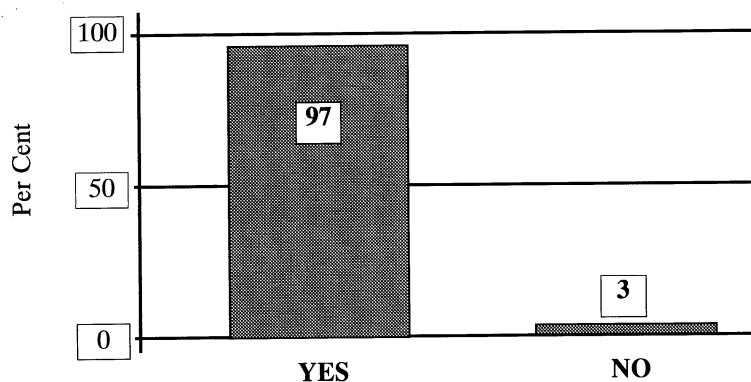
Results from the Questionnaires

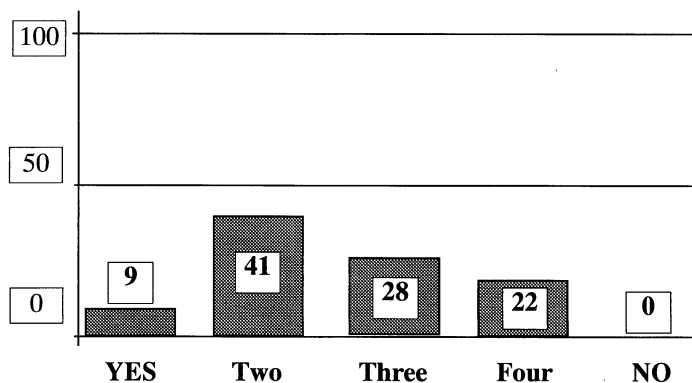
In analysing trainees' replies to the questions, it should be remembered that the responses quoted were offered by non-native speakers of English. Although ninety-seven per cent of the first group believed CBT could be an effective teaching tool (Graph I), the responses provided by the second group, who had experienced the full sixty-six hours of CBT, offered more detailed insight. Several trainees felt that, "depending on the subject", CBT can be an effective teaching tool. However, not all

trainees agreed (Graph II). Although one trainee believed "you can learn several things faster on CBT than in [a] classroom, you need afterwards some time to read it again in a book, so that you can put it in your long-term memory. And I'm not sure that you can learn more stuff per day by CBT. You're faster, but you're also faster tired". Other trainees remarked that with CBT "it's difficult to show connections between different topics", and that the learning objective is "to pass the questions at the end of the lesson".

Graph I

CBT is an Effective Teaching Tool. Group 1



Graph II**CBT is an Effective Teaching Tool. Group II**

One trainee was of the opinion that "the computer smothers one with information resulting in passive learning", which might generate a "tendency to superficial learning", and would mean "you just go through the stuff as fast as you can". One respondent suggested that her/his experience of CBT did not "represent the understanding of a lesson at all", since "nearly everything goes into the short-term memory": hence, "you are never sure you got it into your long-term memory", and, consequently, "two days later you don't even know what you saw on the screen". These responses clearly indicate that underlying concepts have to be understood if information is to be internalised and retained over time.

It is interesting to note that in suggesting ways which might improve their understanding of the topics, many trainees expressed views that effective learning requires interaction with the organisation. Ninety-one per cent of the respondents

believed that classroom support was beneficial, even "absolutely necessary" in providing them with a deeper understanding of the concepts involved. For some trainees, classroom support allowed them to "become aware of other problems raised by colleagues which one may have missed out on" and "to see if we got the topic knowledge". Indeed, half of all trainees believed that without classroom support they would not have been able to pass their written theory examinations at all. It is clear that these responses support arguments that - particularly in the case of adult learners - cooperative learning with classmates and teachers is essential.

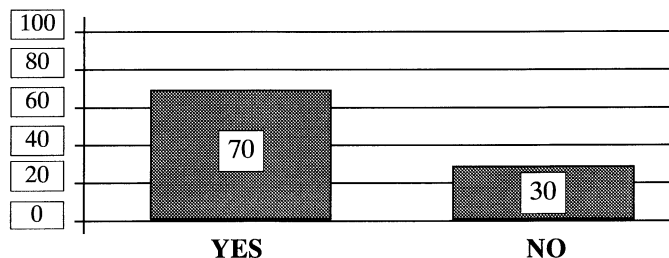
Furthermore, these responses show that students in a computer environment rely heavily on each other in their effort to understand the course work. In fact, in many cases trainees made remarks specific to the question of co-operation and camaraderie within the group. Several of them regretted the "loss of communication" and the "loss of contact with classmates during an important phase such as the initial PPL course". A number of respondents believed that "discussing certain subjects", "with colleagues and instructors", "is essential to understand the matter in depth", since "in the classroom you get more ideas yourself on how to solve problems".

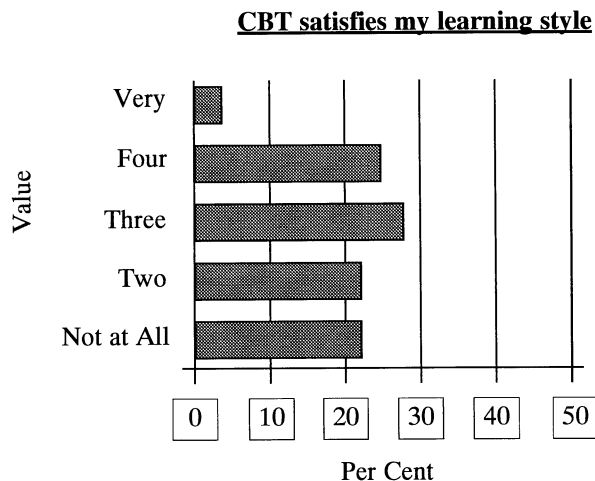
This demand that CBT should be combined with classroom discussion also suggests that CBT should be combined with other learning methods if effective learning is to occur. Some trainees described the implementation of CBT as a "good support to classroom instruction, and not as the only [method of] instruction". Respondents were largely in agreement that CBT would be most effective if it were closely related to the work done in class. One student suggested that ideally there should be a "good balance between CBT and classroom lessons". Other trainees saw CBT's role more specifically as that of a support to classroom instruction rather than that of an equally weighted part of the course. Others, however, saw the role of the classroom as a support to CBT: "Classroom support", indeed "intensive support lessons" "which are well coordinated

would be a great help" because "the experiences from the teacher", who "brings motivation and fun" into a classroom, can allow the trainee to "ask questions right on time, when they arise". Indeed, more than half the respondents, sixty-three per cent, thought that subjects were better explained in the classroom, although one trainee reminded the author "it ought not to happen that the support lessons turn into 'normal' school hours, i.e. that the subject matter is repeated again from A-Z", and suggested that "concrete questions need to be addressed" in class.

Finally, one other consideration has to be taken up here: the question of trainees' different approaches to learning. As Graph III shows, in the first group CBT satisfied seventy per cent of the trainees' learning styles. However, the more detailed responses required of group two revealed that trainees were not unanimous in their opinions (Graph IV). It should be noted that only three per cent were wholly in favour of CBT, while a total of seventy-two per cent of trainees awarded CBT an average mark or a below average mark (with a total of forty-four per cent awarding CBT a value in the lower half of the scale). Such findings would once more suggest that any single method of training will have a great deal of difficulty in satisfying the many different approaches to learning in a given group of trainees, and that if one single method of training is relied on, effective learning cannot be guaranteed.

Graph III **CBT satisfies my learning style**



Graph IV

Such then were trainees' responses to CBT from the point of view of education and, primarily, training. But before I conclude these findings in detail, we turn here to a discussion of the advantages and disadvantages of CBT as became apparent in practice at the SLS.

CBT at the SLS: Its Advantages and Disadvantages

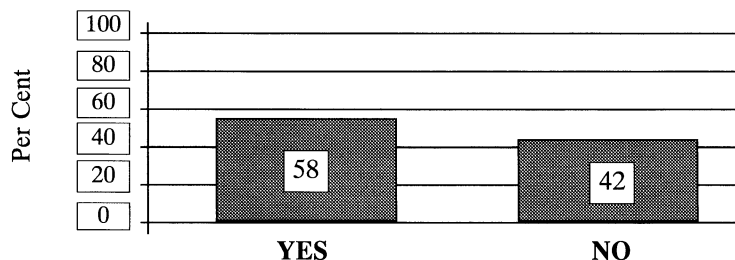
The trainees who responded to the questionnaires clearly liked CBT from the point of view of self pacing, as it allowed them to "have the freedom to choose [their] studying time". Many trainees felt that the ability to decide their own rate of "progress" or "rhythm of learning" in a "nice and comfortable way" helped them "to get the general information on all important subjects". In addition, self pacing offered trainees the

opportunity to "review parts [they] didn't get the first time as much as [they liked] without disturbing the teacher". Trainees responses to the questionnaires left no doubt, that CBT was considered an effective learning tool because it allowed trainees to control their own course scheduling.

However, self pacing did have its disadvantages. Fifty-eight per cent of the trainees at the SLS found the CBT environment to be competitive (Graph V): "When one sees others finish sooner, one also wants to go". One trainee said s/he felt competition "if somebody worked beside me on the same subject", and when asked if s/he had felt the environment was competitive, another trainee replied "Badly, yes".

Graph V

Feeling of Competition. First Group



In addition, there was one other disadvantage to CBT and self pacing, which research to date has perhaps failed to identify. One trainee indicated that "I take a lot of notes during a CBT lesson. That causes almost every lesson to take me more time than indicated on our schedule". This remark would suggest that without the guidance of the

teacher, trainees, when left to shape their CBT sessions themselves, have no way of prioritising the information presented to them. Other trainees put the case more bluntly, suggesting that for "those students who had no idea of certain subjects, it is difficult to differentiate between what is important and what is less important", or, as another respondent remarked, between "need to know and nice to know". This concern was frequently expressed by trainees as they tried to establish the specific learning required by the Swiss Civil Aviation Authorities Flying License Examination. Fifty per cent of the trainees felt that classroom support would have helped in such a selection process.

The second major advantage to CBT was its ability to offer immediate and corrective feedback, a facility which is essential for mental correction (Smith & Boyce 1985). Yet trainees found the corrective feedback offered by CBT to be "greatly restricted" and "very limited". "If something is not understood, watching the lesson a second time does not help a lot", nor does "hearing it explained in the same way"; "if you have a problem you have to take it with you until the next support [lesson] and this can be the reason for misunderstanding the following steps". Here too we can see that if control of the learning environment means no more than being free to repeat material whenever it is convenient, that control is of limited relevance to effective learning, since repetition in no way constitutes explanation. The wider implications of this restricted corrective feedback were that some trainees perceived CBT to be a "boring" and "monotonous one-sided method of transferring knowledge". As a result, claims that feedback inspires greater learner motivation would have to be modified in the case of the respondents studied here, since the ability to review a particular topic at will did not necessarily motivate them to learn more. In some cases, the opposite was achieved.

The question of tedium also arose when trainees were asked for their opinions of the purely physical aspects of the CBT environment. For some trainees, a room with "no

windows" and which was therefore "too dark" and "lonely" quickened a sense of "boredom". On the whole, however, trainees were largely in agreement as to the benefits of visual presentation. Contrary to their colleagues, some respondents found that the material was presented in a "physically and mentally pleasant" and "quiet environment".

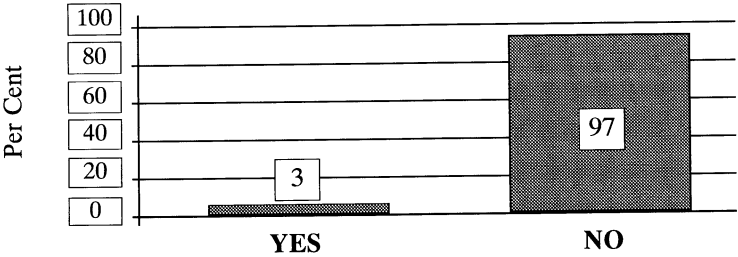
One other clear advantage that CBT offered lay in the field of standardisation. The argument that CBT can help standardise the course content was supported by two trainees. "Consistency of learning material", noted one, means "everyone has the same stuff and should know the same, therefore there will be no difference between the flight schools", which the respondent commented, have found in CBT "a modern method of teaching". These final two advantages - visual presentation and the standardisation of the course work - brought some trainees to describe CBT both as "the modern way to learn" and as a "fun" approach to learning.

Further Considerations

In reply to the first questionnaire (Graph VI) ninety-seven per cent of the respondents stated that they had experienced no difficulties in understanding the English spoken in the modules. Yet thirty-one percent of the respondents (Graph VII) encountered difficulties in understanding technical English. Interestingly, when asked whether they had felt confident in understanding the content of the modules, the same number, thirty-one per cent, replied 'no' (Graph VIII). It can be argued therefore that although trainees might consider themselves competent in understanding English, or even state, after the event, that they had understood the English used in the modules, it would be necessary for training agencies to test, or concentrate on improving, trainees' understanding of the technical English involved if the content of the modules is to be correctly understood. Such steps could help avoid any misinterpretation.

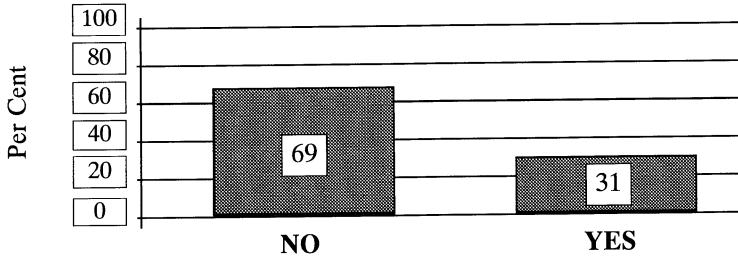
Graph VI

Problems in Understanding. First Group



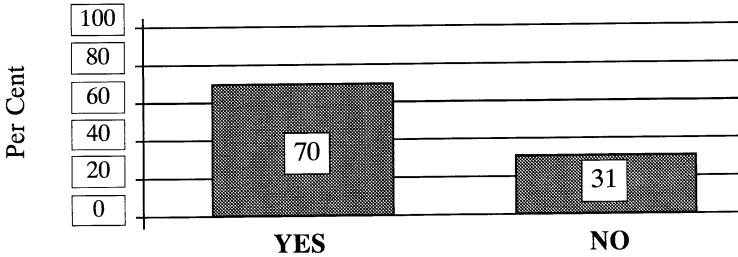
Graph VII

Difficulties with Technical English

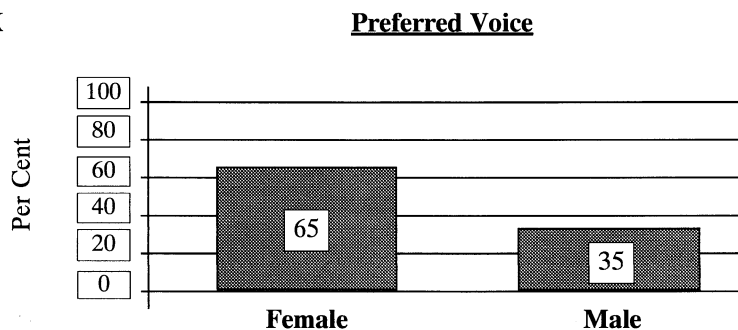


Graph VII

Understood the Module Content



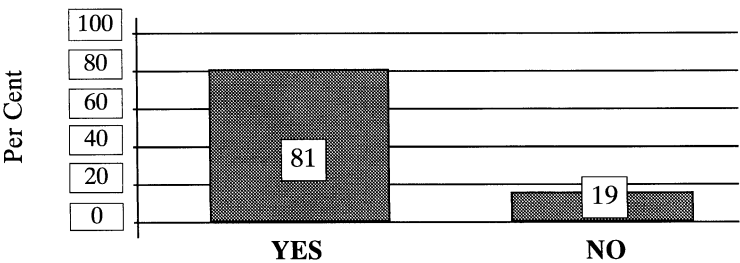
Another issue which the questionnaires raised was the advantage of having a female voice deliver information in the CBT environment. Greater clarity and, therefore, increased attention is reportedly created by a voice (natural or synthetic) that lies within the frequency and range of the female voice. Consequently, in many cockpits, primary aural warnings, e.g. fire warnings and ground proximity warnings, are delivered synthetically within the frequency range of the female voice. In keeping with such findings, sixty-five per cent of the trainees in the first group stated a preference for the female voice (Graph IX). What the questionnaire did not reveal, however, was whether this preference was dependent on the gender of the listener. I was unable to ascertain whether female trainees demonstrated a preference for the male voice. However, until such time as research offers the answer to such a query, it may be safe to conclude that male pilots, trainee or otherwise, respond with greater attention to a female voice, and that such a feature of the CBT environment could facilitate more effective learning.

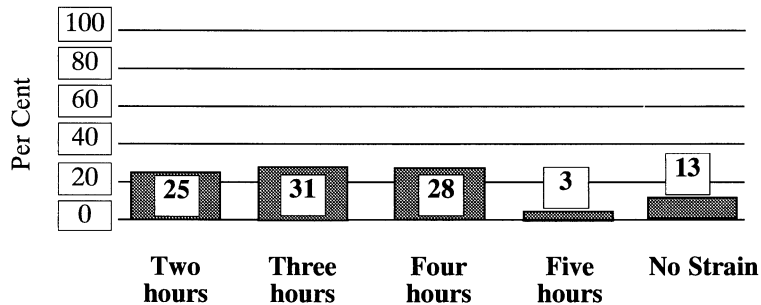
Graph IX

The third new issue brought to light by the questionnaires was the question of eye strain. Eighty-one per cent of those trainees who responded to the first questionnaire (Graph X) said that they had experienced eye strain (Graph XI). In response to the same question in the second questionnaire, twenty-five per cent of the trainees said they had felt eye strain after two hours, a further thirty-one per cent after three hours, twenty-eight per cent after four hours and three per cent after five hours. Thirteen per cent said they had felt no eye strain "More than three hours of screen work can stress the eyes badly and decreases efficiency of learning significantly", suggested one trainee, who added, "combine CBT always with regular teacher lessons". Trainees felt that any more than three to four hours of CBT per day resulted not only in fatigue and possible eye strain but, interestingly, in the danger that "discipline decreases, one tries to finish the programme as fast as possible; that means that no learning takes place, only 'zapping'".

Graph X

Visual Strain on the Eye. First Group



Graph XI**Eye Strain Experienced After**

To conclude, our findings from the questionnaires, many trainees believed the computer encouraged a superficial and short-term understanding of the subject matter, a shortcoming which could be resolved, they felt, by discussion. It was noted, that trainees at the SLS felt such interaction would have afforded them a greater opportunity to reflect on the course material and, significantly, that such an opportunity would have given them the chance to discuss the work with each other.

In the light of these findings we are now in a position to conclude this study of CBT by making a number of concrete recommendations.

Conclusion

The purpose of this study was to assess the benefits and disadvantages behind the implementation of CBT in a learning environment. That assessment was based on the way CBT was perceived by those trainees who dealt with it in practice at the SLS.

We have noted that if the long-term retention of course work is to be achieved, any training system must provide trainees with an understanding of the underlying concepts. We have also seen that, particularly in the case of adult trainees, such understanding means affording students the opportunity to interact with the institution and engage with each other in discussion.

It is essential therefore that any training agency that implements CBT should endeavour to strike the right balance between CBT lessons and traditional classroom teaching, all the more so because, as we have seen, any one single training method is unlikely to be able to accommodate the different approaches to learning present in a given group of trainees. If such a balance and such interaction can be achieved, the research and the results from the questionnaires suggest that student motivation is likely to increase, as are the chances, therefore, that the trainees will achieve metacompetence.

With regard to self pacing, students should be warned, before they begin studying independently with CBT, of the dangers in adopting a superficial approach to learning. They should also be made aware of the pressure that self pacing can bring to bear on other members of the group, and ought to be dissuaded from spending too long in front of the computer at any one sitting. What training agencies should also try to provide is some facility that would allow the "self appraisal" of the material by the student, such as prioritising of the different parts of the course could be conducted in the classroom or introduced into the computer programme itself.

As far as feedback is concerned, our findings show that trainees are not generally appreciative of a facility which merely allows them to repeat a lesson. Perhaps the corrective feedback offered by CBT could be 'layered' and could guide the trainee through ever increasing degrees of the simplification of the problem until the problem

has been understood or the trainee has the necessary insight into the concepts behind the question concerned.

Finally, trainees should be made aware of the likelihood of eye strain and both they and the training agency should take steps to understand fully the relationship between eye strain and levels of concentration - both on the ground and in the cockpit . Addressing such considerations could improve trainees' understanding, attentiveness and concentration, all of which are prerequisites of effective learning. It would seem, therefore, that in order to be effective any training must be so designed as to accommodate different learning strategies, and that "learning is more correctly attributable to well-orchestrated design strategies than to inherent superiority of various media". (Rathje 1995 p 17).

However, a cognitive approach may not be required of either the training agency or the trainee if the pilot of the future need only push a green button when the computer displays a flashing amber light. If, on the other hand, flying an aircraft is to continue to be a mental task, a task that requires a holistic understanding of the procedures involved, then training agencies must clearly define the role of CBT within the framework of a multi-faceted approach to training. Failure to do so, as we can see from the arguments presented in this study, may result not only in the stifling of the potential CBT could have as an effective support to established teaching methods in education and training but also in a possible reduction in the quality of training offered to future trainees.

Neither Bleriot's aircraft of 1910 nor the Boeing 747 of 1969 could be considered examples of aeronautical perfection. Rather, they can be seen as products, evolved from progressive developments in technology, developments intended to improve capacity, performance and adaptability in accommodating a perceived need in the transportation

of goods and people. Similarly, CBT can be seen as accommodating a perceived need in the efficient transfer of information in a training environment. The present state of CBT can, therefore, be considered one stage in a series of developments within education and training. Like the aircraft themselves, the potential of CBT is yet to be fully researched and developed. The successful implementation of CBT depends certainly on the availability of the necessary financial resources, but, like everything else in the airline industry, it depends above all on the lessons that can be learned from past experience.

In preparing itself for the future, any training agency today faces the challenge of how to bridge the gap between personal interaction, cognitive understanding and computer literacy. One way of uniting those separate elements is to continue with research into the way individuals learn in a computer-based environment. The results of such inquiry might enable training agencies to prepare for the next generation of ab initio pilots by helping to develop, improve and fulfil the potential of CBT, an approach to training which one trainee referred to as "the modern method of teaching for the coming 'Game Boy' generation".

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SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

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Foreword

Airliner Ai Limited's views of Aviation training are based upon internal and external observation of ATM Training. In addition, the experience of the company's chief designer working as an engineer in modern production environments was the catalyst for the Company's unique, proprietary training system.

In simplest terms, the strategy relied upon is TQL (Total Quality Learning) in the same sense as the production engineering strategy TQM (Total Quality Management). The key to the TQM strategy is that you make each unit perfectly, first time, every time and as a result, you waste no production effort. Thus, you have an efficient and cost-effective process where nothing is wasted.

The current situation, current training systems and their problems

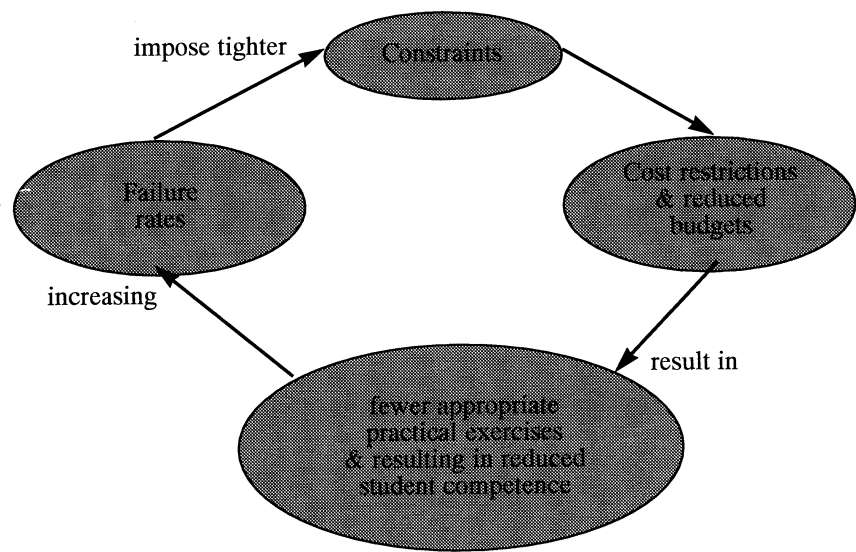
The following diagram summarises Airliner Ai Limited's views of current generation training systems and their failings:

Airliner Ai Limited Views on Training

*Mr John Lyden
Director of
Airliner Ai Limited
Glasgow, Scotland*

[Diagram 1]

Current Training Systems



It is important to note that nothing in this document is intended to be critical of current training systems as we recognise that the key constraints acting upon these systems are the inflexibilites of current simulation and support equipment. It is the punitive costs of running these systems that limits practical training time and available training methods.

As a result of *constraints of support manpower required by current training or simulation systems*, there is a very real, commercial need to restrict the hours of practical training. As a result, most of the current ATM training is passive; reading manuals, reciting lists and being lectured to. As such, it is inappropriate to the practical ATM task.

The end-effect of this dependency-cycle is that of limited practical competence and confidence which in turn, inevitably result in significant levels of student boredom, incomplete understanding or misunderstanding which lead to incompetence and failure. As European and US National Aviation Authority experience since the early-eighties shows, there is no conventional solution to this quandary.

The cost-effort-failure vicious circle in present ATM training systems

Diagram 1 (page 116) shows the relationships (more effort=more cost, less effort=more failure) that cause the economic consequences of current theory-heavy training with resultant failure rates. This diagram is a vicious circle where every attempt at improvement carries with it a prohibitive cost, while conversely, every attempt at cost-containment has an inevitable, knock-on increase in failure rates as a direct, negative and unavoidable side-effect.

The psychology of failure

Simplified, the company's views on the psychological effect of failure on a student are simple. It can be shown from case histories that there are 3 classic student behaviours

in the current training system: the student who continuously succeeds, the student who fails early and continues to fail until termination and the student who was previously exemplary until point of failure, but henceforth continuously fails and is eventually terminated.

Current ATM training systems require detailed examination of Student controllers and this results in a large number of assessments, each of which are opportunities for student failure. In addition, students are tested very early in the process before they are truly competent.

As a result, some fail. What pressures and motivations become dominant once a failure trend becomes established? We believe that this system runs on a strong stick/weak carrot basis and results in student negativity and lack of confidence and competence, and eventually student anxiety and fear. Also evident in this system is an expected behaviour that students will not declare problems which they believe the system is unaware of. This lost feedback denies the system the opportunity to improve.

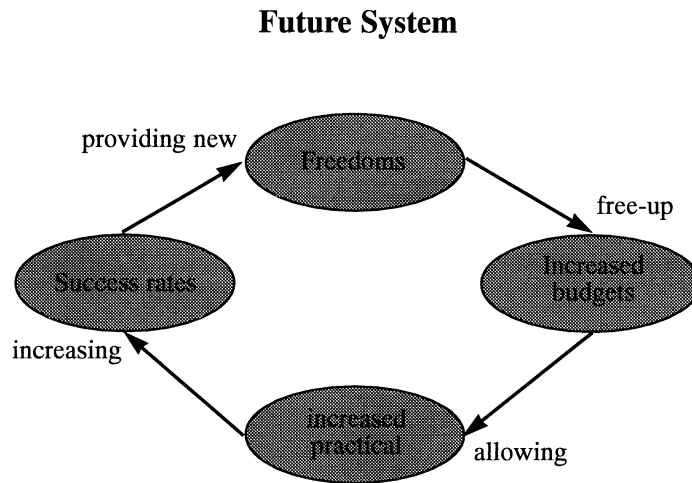
The Airliner Ai Proposed system

Diagram 2 (page 119) shows the equivalent process unlimited by support or input-staff. This model inverts the current theory-heavy inappropriate learning to practical-dominant, experience-based, appropriate learning, (i.e. learning that truly reflects the real world ATM tasks). Also in this model, errors are corrected immediately on occurrence.

In this new model, we have introduced a new training resource (TacPro). This training

resource has no cost or manpower overhead apart from initial capital purchase. Thereafter, all pressures in the new system are positive; resulting in continuous improvement in quality standards and student grades, with increased pass rates, budget flexibilities, reduced pressures and demands on the training system, those working within or subject to it, and as a result, reduced pressures on operational ATCOs and managers:

[Diagram 2]



As a result of this new tool providing unlimited practical, experiential learning and error correction at source, we make possible an alternative view of the (perfect) world if we can prevent students from failing or delay the onset of failure. If we prevent failure, then we remove all the pain associated with it, both to the individual student and to

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National Aviation Authority budgets. This model proposes a high-carrot no-stick method (except for students showing no commitment or ability).

This model's progress can be further accelerated by linking Student salary increments to critical career development stages (course examinations) thereby appealing to the individual's self interest in career progression and associated financial benefit. (Funding for this purpose could be found by marginal restructuring of current Student remuneration packages and/or from savings through decreased failure rates). Finally, part of the budget savings could be returned in the form of a reward to personnel involved in the training of Students thereby giving strong incentives for instructor / mentor loyalty to the Student.

In conclusion, we have greatly simplified our training strategy for the purposes of keeping this document within the required tolerance. We can however provide further, more detailed information to interested parties.

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A List of Abbreviations

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

ACARS	Automatic Communications and Recording System / Arinc Communications Addressing & Reporting System
ACC	Area Control Centre
ADS	Automatic Dependent Surveillance
AECMA	Association Européenne des Constructeurs de Matériel Aérospatial (European Association of Aerospace Equipment Manufacturers)
AFTN	Aeronautical Fixed Telecommunications Network
AOC	Airline Operational Control
ARINC	Aeronautical Radio Inc (non-profit research organisation responsible for aeronautical standards, ground aids)
ATA	Air Transport Association of America
ATC	Air Traffic Control
ATCC	Air Traffic Control Centre
ATCO	Air Traffic Control Officer
ATIS	Automatic Terminal Information Systems
ATM	Air Traffic Management
ATS	Air Traffic Services
CAA	Civil Aviation Authority
CAI	Computer Assisted Instruction
CAL	Computer Assisted Learning
CALL	Computer Assisted Language Learning
CBT	Computer Based Training
CDI	Compact Disc Interactive
CD ROM	Compact Disc Read-Only Memory
CENA	Centre de Navigation Aérienne (Air Navigation Centre)
CLA	Centre de linguistique appliquée de Besançon
CPDLC	Controller/Pilot Data Link Communication
CPL	Commercial Pilot's Licence
CPU	Central Processing Unit
DGAC	Direction Générale de l'Aviation Civile (French Central Civil Aviation Authority)
DRAC	Direction Régionale de l'Aviation Civile (French Regional Civil Aviation Department)
DTP	Desk Top Publishing

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DVD	Digital Video Disc/Digital Versatile Disc
EADTU	European Association of Distance Teaching Universities
EAO	Enseignement Assisté par Ordinateur (Computer Assisted Teaching)
EATCHIP	European ATC Harmonisation and Integration Programme
ECAC	European Civil Aviation Conference
EFL	English as a Foreign Language
EGATS	Eurocontrol Guild of Air Traffic Services
ELT	English Language Teaching
ENAC	Ecole Nationale de l'Aviation Civile (National Civil Aviation College)
EOUN	European Open University Network
ESC	Euro Study Centres
ESP	English for Specific Purposes
EST	English for Science and Technology
EU	European Union
FAA	Federal Aviation Administration
FANS	Future Air Navigation System
FDPS	Flightplan data processing system (or service)
IAL	International Air Traffic League
IATA	International Air Transport Association
IATEFL	International Association of Teachers of English as a Foreign Language
ICAO	International Civil Aviation Organization
IFALPA	International Federation of Airline Pilots Association
IFATCA	International Federation of Air Traffic Controllers
IT	Information Technology
ITN	Independent Television Network
JAA	Joint Aviation Authorities
JAR	Joint Airworthiness Requirements
MCDU	Multifunction controller/display unit
MS	Military Standard (US)
NARTEL	National air radio telecommunications (UK)
NLP	Natural Language Processing
ODL	Open and Distance Learning

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OLF	Open Learning Foundation
OUP	Oxford University Press
PPL	Private Pilot's Licence
QRI	Qualification de la Radiotéléphonie Internationale (French International Radiotelephony Qualification)
RAM	Random-access memory
RBL	Resource Based Learning
RT	Radiotelephony
RTF	Radiotelephony
SE	Simplified English
SFACT	Service de la Formation Aéronautique et du Contrôle Technique (Aeronautic Training and Technical Testing Service)
SITA	Société Internationale de Télécommunications Aéronautiques (serves over 330 airlines)
SLS	Swiss Civil Aviation School
SSR	Secondary Surveillance Radar
SToMP	Software Teaching of Modular Physics
TCAS	Traffic Alert and Collision-Avoidance Systems
TEFL	Teaching English as a Foreign Language
TESOL	Teachers of English to Speakers of Other Languages
TOEFL	Test Of English as a Foreign Language
TOEIC	Test Of English for International Communication
TQL	Total Quality Learning
TQM	Total Quality Management
UKOU	United Kingdom Open University
VHF	Very High Frequency

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A Who's Who

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

Arquembourg, Guy is an English teacher and researcher in the field of language acquisition at the University of Technology of Compiègne (France).

He has organized language teacher-training for the Audiovisual and Multimedia Department at the *Educative Technologies Innovation Centre* of Lille since 1991.

He is a consultant for the *Centre for Modern Languages* of the *Council of Europe* where he coordinates a workshop on the use of multimedia and of authoring programmes for teaching and learning languages.

His interest in the pedagogical application of authoring programmes for language teaching and learning has led him to encourage the use of authoring tools by *teachers and learners* to create multimedia hyperdocuments based on authentic materials.

He is now observing the impact of the use of an authoring tool by young learners in tasks based on collaborative work and interaction.

Key Speakers and Moderators

At the 6th International
Aviation English
Forum

Connolly, Finian: His background is in the field of education. After some time he started up his own business training school. He saw the growing demand for multimedia training and started to produce training courses on CD-ROMs. He is now Managing Director of his own company Compact Media group and the materials he presented were developed in conjunction with a team from Aer Lingus, in particular with Stephen Boyle who was present at the Forum. Stephen has spent over thirty years in the aviation business, having started as a clerk in the Aer Lingus Cargo department in London Heathrow and was part of the management team before transferring back to the Personnel Department in Dublin in 1978. For the past 18 years he has been based in the training section and is currently Personnel Programmes Superintendent.

Marincic, Mirna: She is an English teacher as well as an ATCO. She graduated from Zagreb University with a BA in English in 1966 and got her Master's degree in English literature in 1969. She then graduated from the ATC College in 1973 and became an R/T instructor in 1976 (has been with ATS since 1969). She is a State examiner for aviation English and R/T phraseology for pilots and ATCOs. She has been a lecturer on Aviation English and R/T Phraseology for civil and military pilots as well as ATCOs in

the Department of Aeronautics at the faculty of Traffic Engineering (Zagreb University) since 1990.

She has published several manuals on Aviation English and R/T and is now working on her PhD, also in the area of R/T Phraseology.

Murison Bowie, Simon: Simon Murison Bowie is currently director of Oxford Interactive Learning. This is a new division of Oxford University Press which he set up to take advantage of the opportunities which arise from the convergence of the need for lifelong learning with the emergence of technology which permits the delivery of distance learning in interesting and effective new ways.

Simon came to his current position from OUP's English Language Teaching Division, where he was the director of Electronic Publishing, responsible for having initiated video and software publishing in the Press. Over a long career in ELT (English Language Teaching), he has been involved in curriculum development, and in textbook commissioning and writing. He has worked and lectured in Europe, the Middle East, Eastern Africa and North and South America. He has taught and published in the area of English for Specific Purposes, and for more than ten years has been involved in the application of technology to the learning of languages.

His recent publications have included a Perspectives article in the TESOL Journal entitled: *TESOL Technology: Imposition or Opportunity*, and a contribution to the *Annual Review of Applied Linguistics* entitled *Linguistic Corpora and Language Teaching*, an area of interest stimulated by his responsibility for setting up a major collaborative initiative, the British National Corpus.

Niggli, William, has been teaching English at Swissair to trainee pilots and maintenance personnel for the past sixteen years. His interest in CBT stems from students' feedback on the effectiveness of CBT as a teaching aid. His concern for training issues in pilot training led him to study for a Masters in Training and Human Resource Development at Warwick University which he successfully completed this year. William still enjoys sharing with his students «the development of aviation through living English» when time allows after more «practical» objectives have been achieved.

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

Regnier Prost, Sylvie: She works within the Information-Documentation Department at the AEROSPATIALE research Centre and belongs to a group of linguistic engineering specialists. There she is in charge of applied research activities in natural language processing tools and methods, with a special emphasis on terminology, controlled languages, translation, quality control and linguistic exploration as well as evaluation. In addition to linguistic studies carried out for internal and external customers, this group is involved in a number of European research projects for the specification of tools, the definition of methodologies and the evaluation of state-of-the-art linguistic applications.

Roome, Tony: He began his air traffic control career at the London Air Traffic Control Centre in 1968. After a period at Glasgow Airport he became an instructor at the CAA College of ATC in Bournemouth. During his time at the College he was responsible for the management of all non-UK courses, and this began his interest in the teaching of aviation English.

In 1985 he became a consultant in the CAA's International Services Department, becoming in turn Head of International Training and General Manager.

Shawcross, Philip: He started working in aeronautics when he joined AEROFORMATION as a technical translator in 1972. He was subsequently involved in editing technical courseware, training ground and flight instructors to work in English, and teaching non-English speaking flight crews basic technical English before type qualifications. Having created his own company (English For Aircraft) in 1975, he worked for the aeronautical, aviation, space and telecommunications industries. He has recently devoted time to teaching technical reading skills, editing in Simplified English, producing courseware and training facilitators.

He is a co-founder of the International Aviation English Association and edited its Newsletter for a number of years.

Slope, Nick: He is the Resource Based Learning (RBL) manager for the School of Business at Thames Valley University (TVU). In that capacity he manages an undergraduate Open Learning programme thanks to which 7,000 students are studying throughout ten countries. He also leads the school forward in teaching and learning in an RBL context. He represents Thames Valley University at the United Kingdom Open Learning Foundation (OLF) and through the OLF at the European Association of Distance Teaching Universities (EADTU) Euro Study Centre (ESC) project. The ESC project is aimed at linking European Open Learning study centres telematically. In 1996 he published the chapter of a book on RBL in an international context and wrote an evaluation report on telematics in action as part of a European Project the same year. He has been selected as an expert by the European Union PHARE project in assisting Eastern and Central European countries in setting up Distance Education.

Thalman, Linda: She is currently director of WebFrance International and editor of Volterre-Fr.

She has a Master's Degree in Linguistics and TEFL (Teaching English as a Foreign Language) and has taught English in Europe for 15 years; from children age 9 on up. Her special interest and expertise are in the area of professional English for scientists, engineers and engineering students.

She has spent most of her recent teaching at Commissariat à l'Energie Atomique (CEA) and at INSTN (Institut National des Sciences et Techniques Nucléaires) and the Ecole Supérieure d'Optométrie. At INSTN she set up several international Internet projects, particularly one involving Finland, Hong Kong and France.

She has authored several articles on teaching and the Internet and has been called an "Internet Godmother" because she has pushed and shoved so many people to get online!

She has been active in TESOL France and also webmaster of their site.

She started using the Internet full time in January 1993 and has not left her computer room since!

Williams, John: John has spent forty years in aviation, and started his career as a navigator in the Royal Air Force. The planes he flew in then are now all museum pieces. He subsequently joined the Air Traffic Control Service and ended up as the training

F I F T H I N T E R N A T I O N A L A V I A T I O N E N G L I S H F O R U M

manager of the London Air Traffic Control Centre. His interest in aviation English stems from the time that he was Secretary of the UK RTF Phraseology Working Group and continued throughout his ATC career with responsibility for both training and incident investigation at the ATCC.

He 'came down to earth' eighteen months before the Forum with his retirement and now puts his hobby to good use teaching geology to adults at the Natural History Museum in London during winter and leading field trips during the summer.

Yokoyama, Shozo: Is Assistant Professor of English at the Civil Aviation College (Ministry of Transport, Japan). He has been teaching English and Aviation English at this institution since 1990. He originally majored in Persian linguistics, an interest he still pursues.

He is now focusing on ESP especially in the area of Aviation. He is eager to increase his knowledge and improve his strategies in the field.

SIXTH INTERNATIONAL AVIATION ENGLISH FORUM

The CLA Aviation English Department

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