TECHNOLOGY IN LANGUAGE TEACHING

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Introduction

The use of technology in the transmission of language is at least contemporary with the introduction of writing in historical societies, as is witnessed by Babylonian inscriptions even before the Rosetta stone. Our childhood blackboard, so emblematic of one-way teacher-to-student instruction, is only a direct descendant of Egyptian, Greek and Roman wax tablets and slates.

Closer to us, Thomas Edison's phonograph (1890) and the spread of digital computer technology have paved the way for the two subsequent major steps in language teaching practice:

- from the late 1970s, the spread of the audio cassette enabled an intensive use of various types of language laboratory as an adjunctant to classroom teaching. This practice was supported by an audiolingual methodology that transposed many of the features of a rote-learning system from the text-inspired teaching of chalk and blackboard to the audio field, often resulting in a tendency to underplay communicative meaning;
- over the last ten years, interactive, multi-media courseware has enabled the various linguistic skills and the intellectual and sensory activities involved in language use to be integrated in a single platform.

Even if they are still only very partially implemented, computer-assisted language learning (CALL) and, more recently, web-enhanced language learning (WELL) have had a profound effect on the theory and practice of language teaching, and the expectations we have of it, by:

- making technology an indissociable component in the learning process;
- making a wider range of linguistic skill-forming activities available;
- integrating these activities into a single experience;
- providing access to an unprecendented range of authentic materials;
- supporting the cognitive and socio-cognitive theories of language teaching,
- facilitating peer learning and communication between learners;
- effectively creating a continuum between learning and the rest of social and professional experience;
- ensuring continuous learner feedback and teacher monitoring;
- and leading learners and teachers to question and redefine their respective roles.

Technologies – today and tomorrow

Applications using digital technologies can be delivered from two basic types of platform:

- CD ROM / DVD-based programs installed on standalone computers or distributed through local area networks by a server;
- Internet / Intranet-enabled programs with world-wide or institution-wide coverage using broadband technology.

Although within the terms of reference of the ICAO rating scale, four of the six linguistic fields listed are direcly related to oral and aural interactions only, complementary text-based skills may be relevant in the foundation work required for learners to reach communicative proficiency, for instance in vocabulary building and practising grammatical structures and sentence patterns. From a single work station, many different features may be available addressing the fundamental linguistic skills as an integrated whole.

The limits of the present paper do not allow any more than a nominal mention of some of the technologies available for language teaching today:

Reading skills
Interactive language exercices, hypertext, on-line magazines, concordancing programs, electronic libraries, testing, text corpora, vocabulary building activities etc.

Writing skills
e-mail groups, on-line publishing, asynchronous tutorials, spelling and grammar checkers, collaborative writing, text reconstruction etc.

Aural comprenhension
Interactive and subtitled video, multimedia simulation, asynchronous instructions, streaming audio, satellite TV, interactive exercices, testing (e.g. the web-based version of Parts 1 & 2 of the PELA test currently being validated) etc.

Pronunciation
Speech recognition and visual display systems.

Fluency and interaction
Speech synthesis, synchronous tutorials and chat groups, videoconferencing, ATC simulators, etc.

However the pedagogical and human implications of these new technologies should engage our attention and stimulate our critical sense, representing, as they do, both great potential and great challenges.

Quantitative gains resulting from computer-assisted learning include:

- 24-hour availability and therefore much increased learner exposure time and reduced training costs;
- permanent access to a vast body of authentic material;
- ease of updating and catering for specific needs;
- the ability to handle large and remote populations simultaneously;
- the capacity to create highly flexible corpora of oral examples and accents, a particularly critical factor in improving radiotelephonic communications and in fostering an awareness of and familiarity with phonetic diversity;
- the modular use of material allowing specific learner goals to be catered for and facilitating recurrent and remedial training to make life-long learning, and so the maintenance of standards, a practical reality, and
- real-time learner feedback and monitoring.

Less tangible but equally vital features are greater learner involvement and motivation due to the interactive and authentic nature of the material as well as the new freedom and availablity that teachers should ultimately derive from using such systems.

These exciting new possibilities are however tempered by a formidable array of challenges at many levels that need to be kept in mind:

- Large initial investments are required and substantial running costs have to be sustained. As a rule of thumb, one third of the budget may be required for hardware, one third for software and one third for staff support and training. Unfortunately, it is often observed that the budget is almost exclusively devoted to the first two visible items to the detriment of the third (Warschauer & Meskill);
- In-house development of courseware is extremely time-consuming even when the requisite know-how, skills and technology are available: 80-200 man-hours / hour of courseware (Brown; Brett);
- Gains in efficiency and effectiveness are as yet to be broadly substantiated (Green & Youngs; Stenson);
- To run smoothly, a system requires qualified maintenance and technical support;
- Teachers and management need a period of adaptation during which they have to rethink their roles and teachers have to learn how to work in classrooms 'without walls' in which the learner is at the centre of the learning process (Hara & Kling);
- Sufficient information, communication and guidance are prerequisites for success as is the setting up of a suitable pedagogical tracking system. Generally speaking, the successful integration of information and communication technologies does assume a new and challenging degree of intra- and inter-departmental co-operation;
- Finally, there is a constant need to combat the tendency to let the machine get in the way of the learner; it may be easy to forget that the computer is a tool to serve the curriculum and not a method to dictate to it.

Experience to date

The very fact that technology has developed so rapidly results in stable and significant data being hard to obtain. Most of the findings available come from school and university environments (Chapelle) which are not necessarily transposable to professions like aviation with its specific constraints and characteristics. In certain situations, research has revealed only minor differences between experimental multimedia and conventional control groups (Stenson, Downing). Initial learner enthusiasm can also be dampened if CALL is used indiscriminately without adequte teacher / facilitator guidance and not within an appropriately structured syllabus.

Certain definite trends do, however, stand out. There is a consensus on significant gains in accessibility, coverage and versatility. The systematic use of video is effective in improving aural comprehension (Verano; de Felix). Learners have generally positive and enthusiastic attitudes to multimedia and are convinced that their learning is more effective; people enjoy using computers. The more active the learner the better his / her retention does seem well substantiated by research (Jones). Furthermore, as the computer interface is an integral part of the pilot's and controllers's operational environment, it is gradually moulding their thought and learning patterns. The more teachers and learners work with technology, the more their use of it develops.

At this stage, a few tentative conclusions can be reached. Although there are very few appropriate aviation-specific materials available and CALL is not and can not be a substitute for face to face teaching, it can not be ignored as an integral part of any aviation language curriculum. Like any technology, however, it is only as good as the use we make of it. This implies a rigorous critical selection process from the start in the course of which we constantly need to ask what can be expected in practical terms of each technological application. Aviation subject matter in courseware does not necessarily guarantee that the

learner is acquiring the appropriate linguistic skills in the most efficient and effective manner. To be effective, computer-assisted teaching can not be considered as an add-on but needs to grow organically out of a curriculum based on specific behavioural objectives relating directly to operational situations.

Impact on Teaching Practice

Paradoxically, far from diminishing the human element in the learning process, the advent of computer technology as an integral part of teacher-led and classroom teaching, as well as of guided self-learning, provides an opportunity to reflect upon and implement principles that enhance the learner's status and expand the teacher's co-ordinating role.

Most teachers would probably agree in essence on the importance of respecting the particularity of each learner, on how self-esteem and involvement foster learning efficiency and how taking into consideration local conditions and specific requirements can only improve the quality of their teaching. Now, the technological features that have been briefly evoked above do enable precisely these features to be developed by providing the means to create a multi-faceted learning environment in which each learner or learning group can select pace, pitch and content to suit their specific learning needs and styles.

'Guided freedom would be a feature of intelligent CALL, where the program would make suggestions, but the learner would make the choices.' (Warschauer & Healey)

The corollary of this is that the teacher's role expands beyond being a provider and assessor of knowledge and know-how (i.e. someone in front of the class) to being also a co-ordinator of media and a tutor (i.e. someone who is also in the midst of his/her learners). The indispensable volume of consolidating, experimental, remedial, recurrent and testing work can often be largely shifted from centralised, teacher-led activities to computer-assisted sessions. As a result, teachers become freer to use their time more efficiently by devoting more time to those who need their assistance most, by modulating the type of assistance they provide to different learners, by exercising more live communication and by discussing learning strategies with their students.

The inclusion of technological tools will result in teaching being more flexible, multifarious and unpredictable. Teacher training – reconceived teacher training – will be pivotal in making such a sea change in teaching practice successful.

The present writer's personal experience worldwide has been that the right technological tools can be extraordinary means of generating peer discussion, knowledge exchange, curiosity, motivation and relaxation: all prerequisites of effective learning.

The variable geometry of such a pedagogical environment demonstrates how learning can be multi-focal; how peer and self learning are meaningful options. It is a training ground for developing the students' ability to extend their learning beyond the classroom to the whole of their experience by realising that, more than just an activity, learning is a state of mind involving imagination, initiative, collaboration and pleasure. It prepares the way for life-long learning which, amongst many other effects, enhances an awareness on the job so vital for flight crew and air traffic controllers. So, as Stephen Corea aptly remarks about information and communication technologies in general, 'It is more important to invest in the cultivation of the patterns of behaviour that underpin the various technological innovations of modernization than to invest in the pervasive uptake of information and communication technologies.' (Corea)

Conclusions

In a drastically brief overview of technology in language teaching, the very brevity that forced the myriad details of CALL applications to be glossed over highlights what stands out as being essential: the human being involved in acquiring skills that will contribute to safety.

Upon the advent of the motor car at the beginning of the twentieth century, proud owners used their cars mainly for joy rides and social display. It took some time and democratisation with the Model T Ford for cars to become usefully integrated into society. The profusion of media and technology may well have a similar effect. It requires a conscious effort to focus on selecting media to fit pedagogy rather than devising courses to suit the technology at one's disposal. (Kozma)

The introduction of new technologies into the workplace and school is very often superimposed on existing organisational methods and pedagogy and does not in itself generate the kind of mental and social transformations that would be necessary to take full advantage of them (Kling & Zmuidzinas). New technology is first and foremost an opportunity to rethink teaching methods in order to make the most of the human potential of learners and teachers alike.

Ultimately, courseware in an aviation context needs to be assessed in the light of operational requirements. In other words, we should always ask ourselves what communicational situations a syllabus is, in some way or another, preparing a professional to deal with more effectively.

Mark Warschauer's work has been inspirational in the writing of the present paper. Therefore it is fitting to conclude with a remark of his that closely reflects the spirit in which the paper was written. 'I heard a very good expression the other day. It was something like "A good toy is 90% child and 10% toy." I think a good pedagogical device is 90 percent learner and 10 percent device.' (Anker 2002)

RESOURCES & REFERENCES

Journals

CAELL Journal (Computer-Assisted English Language Learning)
CAL Digest (Computer-Assisted Learning)
CALICO Journal (Computer-Assisted Language Instruction Consortium)
CALL Review (Computer-Assisted Language Learning)
EFL Magazine (English as a Foreign Language)
ELLS Technology Work Group
ELT Journal (English Language Teaching)
Journal of Interactive Media in Education
Language Learning and Technology Journal
Learning Technology
TESL Electronic Journal (Teaching English as a Second Language)
TESOL Quarterly (Teaching English to Speakers of Other Languages)

Associations

ALT Association for Learning Technology
CILT (Centre for Information on Language Teaching and Research)

EUROCALL (European Association for Computer-Assisted Language Learning)
IALLT (International Association for Language Learning Technology)
IEEE Computer Society
ICAEA (International Civil Aviation English Association)
TESOL (Teachers of English to Speakers of Other Languages)

Web Sites

www.aviation-esl.com
www.basair.com
www.bwise2.com
www.cilt.org.uk
www.civilaviationenglish.com
www.eastment.com
www.ed.gov/databases/ERIC_Digests/ed350883.html
http://edvista.com/claire/internet-esl.html
www.erli.us/aviationeng.html
http://eslcafe.com
www.eurocall-languages.org
www.flyer.co.uk/
www.gse.uci.edu/markw/tslt.html
www.hull.ac.uk/elearning
www.ilc.cuhk.edu.hk/english/tesol/2004
www.linguistic-funland.com/scripts/ (scripts for educators)
http://llt.msu.edu/
www.moliere.byu.edu/volume/intro.htm
www.mtsu.edu/~itconf/proceed03/99.html
www.oktesol.net
www.panamacademy.com/airtraffic.asp?id=71
www.polyglot.lss.edu
www.public.iastate.edu/~jagdish/journal%20review.htm
www.rmitenglishworldwide.com/aviation/aviation.asp
http://roland.lerc.nasa.gov/~dglover/dictionary//content.html
www.staff.ncl.ac.uk/f.r.jones/definitions.htm
www.sussex.ac.uk/languages
www.virtual-languages.com
www.well.ac.uk
www.wfi.fr/volterre/biblio.html

Speech demos on the web

Elan, Lucent, Festival and Real Speak.

Articles

- Anker, W. (2002). The Challenge and Opportunity of Technology: an interview with Mark Warschauer. *English Teaching Forum*, October 2002.
- Brett, P. (2000). Is multimedia effective for language learning? An intuitive, theoretical and empirical perspective. *http://pers-www.wlv.ac.uk/~le1969*
- Brown, J. (1998). Computers in Language Testing. *http://polyglot.cal.msu.edu/llt/vol1num1/brown.*

- Chapelle, C. (1995). A framework for the investigation of CALL as a context for SLA. *CAELL Journal* 6 (3).
- Chapelle, C. & Hegelheimer, V. (2003). The English Language Teacher in the 21st Century. In Fotos, S. & Browne, C. (eds.) *New Perspectives on CALL for Second Language Classrooms*. Lawrence Erlbaum Assoc.
- Coniam, D. (1998). The use of Speech Recognition Software as an English Language Oral Assessment Instrument. *CALICO Journal* 15 (4).
- Corea, S. (2000). Cultivating Technological Innovation for development. *The Electronic Journal on Information Systems in Developing Countries.*
- Eskenazi, M. (1999). Using a Computer in Foreign Language Pronunciation Training: What advantages? *CALICO Journal* 16 (3).
- Godwin-Jones, R. (2000). Speech Technologies for Language Learning. Language Learning and Technology, 3 (2).
- Green, A. & Youngs, B. (2001). Using the web in elementary French and German courses: Quantitative and Qualitative Study Results. *CALICO Journal*, 19 (1).
- Jones, C. (1986). It's not so much the program, more what you do with it: the importance of methodology in CALL. *System*, 14.
- Kern, R. (1995). Restructuring classroom interaction with networked computers: Effects on quantity and quality of language production. *Modern Language Journal*, 79 (4).
- Kling, R. & Zmuidzinas, M. (1994) Technology, ideology and social transformation: The case of computerization and work organization. *Revue Internationale de Sociologie.* 2
- Kling, R. (2000). Learning about Information Technologies and Social Change: The Contribution of Social Informatics. *The Information Society*, 16.
- Kozma, R. (1991). Learning with media. *Review of Educational Rsearch, 61.*
- Morrison, S. (2002). Interactive Language Learning on the Web. *CAL Digest.*
- Reynard, R. (2003). Using the Internet as an instructional Tool: ESL Distance Learning. *Proceeding of the 8th Annual Mid-South Instructional Technology Conference.*
- Stenson, N., Downing, B. Smith, J. & Smith K (1992). The effectiveness of computer-assisted pronunciation training. *CALICO Journal* 9 (4).
- Warschauer, M. & Whittaker, F. (1997). The Internet for English Teaching: Guidelines for teachers. *TESL Reporter* 30, 1.
- Warschauer, M. & Healey, D. (1998). Computers and Language Learning: An overview. *Language Teaching*, 31.
- Warschauer, M. (2000). The changing global economy and the future of English teaching. *TESOL Quarterly* 34.
- Warschauer, M. & Meskill, C. (2000). Technology and second language learning. In J. Rosenthal (ed.), *Handbook of undergraduate second language education*. Mahwah, NJ.
- Warschauer, M. (2002). A developmental perspective on technology in language education. *TESOL Quarterly*, 36 (3).
- Weyers, J. (1999). The effects of authentic video on Communicative Competence. *The Modern Language Journal* 83 (3).
- Zhao, Y. (1997). The effects of listeners's control of speech rate on second language comprehension. *Applied Linguistics*, 18 (1).
- Zhao, Y. (2002). Uses and Effectiveness of Technologies in Language Education. *ELLS Technology Work Group.*

Books

- Chapelle, C. (2001). Computer applications in second language acquisition: Foundations for teaching, testing and research. CUP.

- Chapelle, C. (2003). English Language Learning and Technology: Lectures on applied linguistics in the age of information technology. John Benjamins Publishing.
- Crystal, D. (2001). Language and the Internet. CUP.
- Kaplan, R. ed. (2002). Handbook of Applied Linguistics. OUP.
- Kern, R. ed. (2000). Network-based Language Teaching: Concepts and Practice. CUP.
- Markee, N. (1997). Managing curricular innovation. CUP.
- Sperling, D. (1997). The Internet Guide for English Language Teachers. Prentice Hall Regents.
- Warschauer, M. & Kern, R. (2000). Network-based Language Teaching. CUP.
- Warschauer, M. (2003). Technology and Social Inclusion: Rethinking the Digital Divide. CUP.
- White, C. (2003). Language Teaching in distance Education. CUP.
- Willis, D. (2003). Rules, Patterns and Words. CUP

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