# LEARNING TECHNOLOGIES

Real time Tuition with Interactive Discussion

DISTANCE LEARNING

Although audio-visual techniques have overcome many of the problems associated with distance learning, there is no substitute for live tuition and the interchange of ideas.

This is what STARNET and Electronic Writing Systems have made possible for a wide range of students and trainees in locations many miles away from the source of tuition.
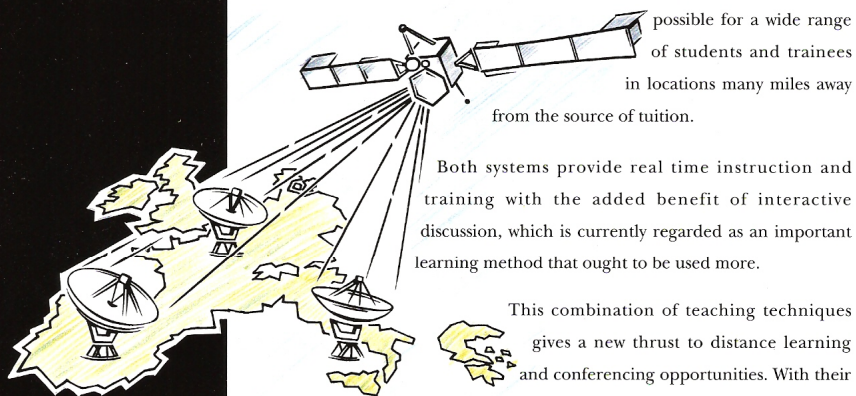
Both systems provide real time instruction and training with the added benefit of interactive discussion, which is currently regarded as an important learning method that ought to be used more.

This combination of teaching techniques gives a new thrust to distance learning and conferencing opportunities. With their help, training managers and educational establishments can provide a quality and style of communication that is appropriate to the needs of the 1990s.

Starnet

Education and Training Programmes by Satellite

This is one of the most exciting education and training developments of the decade. Using time allocated on the Olympus satellite, STARNET was developed to broadcast interactive programmes across Western Europe via the production expertise of Polytechnic South West and the training experience of the Employment Department.

During 1990/1, STARNET broadcast 52 programmes, split mainly across two series: "It's Your Business" for people starting up on their own; and "The Competitive Edge" for engineers engaged in advanced manufacturing technology. Each series was repeated in expanded form after the first evaluation had suggested modifications. There were also some one-off programmes on specialist topics.

The final evaluation report, prepared by four independent consultants and published in October 1991, gave a positive response, indicating that the system works best for corporate training, professional updating and international conferencing. Within these areas, it is clear from the trial programmes that the interactive component of STARNET is of major importance, promoting learning through discussion not only with those in the studio but also with other students on the network via telephone links - the 'audio bridge'.

Although as a pilot project it had to overcome teething problems, many of the participants showed an unswerving loyalty to the system and an expectation that it could be a valuable teaching and training medium.

"Providing reasonably swift and easy access to updating ... potentially valuable for communication and training within large companies of professional organisations." STARNET Evaluation Report

Key Criteria in Assessing Starnet

Interaction

Learning through discussion is currently regarded as an important method of education and training that should be more widely used and it is this aspect of STARNET which has found such favour. Instead of the one-way flow of information inherent in most audio/video training methods, STARNET allows for questioning and discussion between tutor and students and between students themselves via the 'audio bridge'.

Such interactivity is not confined to the programmes. Post-transmission discussions and arguments of 20-40 minutes between participating students extend the value of the tuition by bringing in people and ideas beyond the time constraints and formality of the programmes themselves. Periodic phone-in facilities are also available to an even wider audience.

Educational Outcomes

- There is evidence that trainees and students do learn from the discussion sections of the programme, especially by relating theory to practice and by improving understanding through reference to experience.
- The medium is more likely to show advantages over other methods when it is used to meet an educational need that is not already being met, as in the series on Advanced Mechanical Technology.
- Most participants retained an unshakeable belief in the potential of the medium.

Cost-Effectiveness

The STARNET project met all its operational objectives and achieved its production of 52 programmes within budget.

The cost to trainers, assuming they bear no production costs, was around £117 (at 1991 prices) per session per site. Staff costs accounted for 47% of this - a considerably lower figure than for normal academic activities. Fixed costs include the satellite dish, tuner/decoder and programme support materials.

"Initial indications are that this is both a more flexible and more effective means of distance learning than those without the benefit of 'live' tuition." STARNET Evaluation Report

The STARNET Project, developed over the last few years, has proved it can deliver an effective system of distance learning with the advantages of immediacy, interaction and cost-

effectiveness. Although suitable for many kinds of education and training, it appears to be particularly influential in corporate training, professional updating and international conferencing.

Electronic Writing Systems

Bridging Educational Gaps

Where populations are thin on the ground and widely spread, special needs in education often get left behind. The cost of bringing in specialist teachers to service remote and scattered communities can be prohibitively expensive.

Electronic Writing Systems combine the advantages of real time, tutor-led instruction with the interaction provided by audio-video technology via a telephone line. They bridge the gap created by distance and the absence of on-the-spot tuition.

How Electronic Writing Systems Work

A central teaching establishment, such as a technical college, is linked to a number of out-stations where pupils regularly assemble for tuition. The college has an audio and data electronic 'bridge', which is linked to modems serving up to five telephone lines. Audio/video connections at both ends of the system ensure continuous interaction.

Two-way Communication

The medium of written and graphic communication is either an electronic writing board or white board. The writing board is used where the teacher is instructing students in out-stations only. Using a special pad with an electronically activated stylus, he or she writes or draws information which is shown on the screen for students to respond to by using identical equipment at their end.

The white board is for lessons where the tutor is addressing not just pupils at their out-stations, but also a group at a college. Students on the Systems see the message on a TV monitor, while those in college see it on a normal white board.

The method allows for verbal input from pupils and for discussion with others and the tutor. Electronic Writing Systems are therefore fully interactive, reproducing at a distance a class or lecture room situation. They are a big step forward in distance learning in areas of educational deprivation.

People and Places

The Systems Help

Pioneering work, led by Gwynedd Technology Centre, North Wales has transferred easily to the Highlands and Islands of Scotland. Here are typical areas of educational shortfall, where small and scattered populations in remote places cannot justify the cost of bringing in specialist teachers on a regular basis but Electronic Writing Systems have begun to bridge the gap between educational and vocational needs and available expert tuition.

Thurso, Caithness - at the mainland's northern tip. Peter Smith is one of its college enthusiasts

using the Systems to reduce the drop-out rate in distance learning: *"Students 100 miles or so from college feel very much on their own. When they require tutoring help, they want it here and now and not have to wait for the answer to a letter. We're offering real time support."*

Kinlochbervie, Sutherland - a thriving fishing port towards Cape Wrath. **Irene Macleod** works for the Community Service and has helped to set up its local advisory group in the management of the Systems' resources: *"We heard that Orkney College was starting up a Coastal Navigation course and thought it would be a useful thing for us to link into."* **William Thomson** is an auctioneer at the harbour fish market, but every Wednesday afternoon he studies a Small Business Course in Accounting, using an Electronic Writing Board for tutorial help. **Alison Massey** studies at home for an Aberdeen University Access Course in Scottish Literature. She chats over the phone with other students, comparing notes: *"Once a week I drive to the local centre for a tutorial from Aberdeen. I can talk to my tutor by phone and take part in audio-conferences with other students both from the mainland and from Orkney."*

Dornoch, county town of Sutherland. Here the Systems are housed at Dornoch Academy, where they benefit both children and adults. **Margaret Sutherland** is Head Teacher: *"We find Electronic Writing Boards are of value to the community as a whole. We use them in adult education for helping with SCOTVEC Modules - in computer studies, for example - and for those on Aberdeen University Access Courses. During the day, our secondary school pupils use them on an electronics course, which we arranged with Thurso College when our specialist teacher left."*

Westray Island, Orkney. Head Teacher, **Ally Sangster** is glad of the Navigation Course: *"Our Electronic Writing Boards give us a direct link with the expert in Stromness and allow us to present a course here that wouldn't otherwise be possible."*

The Systems can also provide a forum for teachers' meetings without their leaving the island. It enables important issues to be discussed quickly and cost effectively. Quite simply, the future of Electronic Writing Systems is only as limited as the imagination of their users.

STARNET and Electronic Writing Systems are leading the way into the technology-led future of distance learning.

In their different ways, both systems combine the advantages of real time tuition and interactive discussion.

They offer, at an economic cost, the opportunity to reach out to students and trainees over a wide area simultaneously.