

**THE COMPUTER AS AN AID TO LEARNING
TO LEARN ENGLISH :
A PROJECT AND ONE FEASIBILITY STUDY**

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ABSTRACT

Il s'agit d'un projet d'aide automatique informatisée aux apprenants d'Anglais travaillant en autonomie sur n'importe quel projet personnel. Une étude des possibilités de réalisation de l'un des modules d'aide envisagés -un "dépanneur" capable de fournir informations et conseils concernant les principaux problèmes rencontrés lors d'un apprentissage autonome- a été faite. Cette étude était basée sur l'analyse des problèmes soumis à l'aide conseil par 36 étudiants d'informatique pendant les 42 heures de leur première expérience de travail autonome en Anglais. Les résultats sont encourageants.

I - THE PROJECT

During the 10 years or so during which we have experimented with learner-centred approaches to learning English (1) the number of learners we have dealt with has increased considerably. Thus, whereas in 1979 we had only one group of about a dozen trainees in self-directed learning per week to cater for, we now try to cope with 3 groups of 17 and 2 groups of 25 each week. This increased throughput has resulted in a reduction in learner training quality and has imposed a much heavier work-load on the teacher.

Learner training quality losses include :

- reduced freedom of individual students in planning and carrying out their own learning projects, consequent on the pair-work introduced to ensure that each learning project received sufficient counselling time
- reduced contact time with the teacher despite pairing (some pairs do not work out, split up and need individual counselling).

The increased work-load on the teacher is due principally to the fact that more learners means more material to prepare each week. We do not yet dispose of a resources room where learners can come and select and copy material for themselves. Consequently all this work has to be done by the teacher. This means in turn that the teacher has little or no time left over for preparing his interviews with the learners, creating material or doing research and development work on the learning system.

In principle, all the problems mentioned above might be solved by taking on one or more extra teachers. In practice, however, this is not a realistic solution. One teacher for 100 learners of English is already something of a luxury in a French University.

Obviously, the provision of a resources room would take all the material preparation work off the teacher's hands (and, at the same time, let learners get a better view of just what material is available and give them practice in selecting it themselves). This step is officially envisaged, but the date of realisation keeps on receding - mirage-like- to a 2 year horizon.

(1) See the bibliography for accounts of this work. Briefly stated, the present set-up is a "throw-them-in-at-the-deep-end" approach where groups of 18 learners (french students of computer applications in management) work in pairs on their own objectives using materials and techniques chosen by themselves. The work takes place at a weekly 2 hour workshop where the teacher is on hand to help at any time and discuss progress with each team every two weeks.

One might also consider the possibility of settling for a less learner-centred approach and gaining time by cutting down on learner choice. This is a "solution" the writer wishes to avoid as long as a majority of learners continue to prefer the present system to teacher-directed learning (2).

There may, though, be another partial solution which, working in conjunction with the long-awaited resources room might clear up the worst of the "operating with large numbers" problem. This partial solution would be to provide computer-dispensed counselling. If computer-counselling of learners who are learning to learn a language is possible, then it might also be possible to take enough counselling work off the teacher's hands to allow everyone who wished to work on an individual project to do so and still get adequate counselling.

This idea reoccurred to us about 4 years ago when the "large numbers" problem was beginning to make itself felt. It seemed worth investigating because, although the counselling work we were doing certainly did not lack variety, there was clearly quite a lot of repetition involved. From year to year the same types of language and language learning problems kept cropping up and were being treated in much the same way. It did not appear far-fetched to imagine that much of the routine advice being given could just as well be presented on one or more of our department's numerous computer screens, provided learners could readily access the advice they needed for their particular problems. In addition, the computer need not be limited to its function of "electronic counsellor". It could also be used in a browsing or consultation mode and as a source of training exercises for learners learning to learn or even for helpers learning to help. The outline specification below shows the sort of thing we have in mind.

The computer as an aid to learning to learn English : an outline specification

USER GUIDE : Describe facilities available and for whom and in what circumstances they may be useful. Allow browsing and trying out.

COMPUTER LEXICON : Explain meaning of words used by the computer which might cause difficulties for certain users.

LEARNER TRAINING MODULES : Offer practice activities and tests covering all sectors of language learning process.

(2) No longer possible ! This year - for the first time in 4 years of self-directed learning with french students of computer applications in management - there was only a minority (about a third) of learners in favour of "all-out" self-directed learning. The 86-87 intake would, in general prefer a mixture of teacher direction and self-direction with objective fixing and assessment handled by the teacher. The system will be modified along these lines for their second year.

LANGUAGE LEARNING PROJECT STARTER : Help learner who has an idea of what he wants/needs to work on to define his objectives, diagnose his major problems with respect to those objectives, set up a programme of work, choose material to be used and decide what working techniques to use or try out. Help learner who doesn't know what he wants/needs to do to explore possibilities via focussing questionnaires and diagnostic tests or via inspirational methods such as objectives lists, past learning project case studies, browsing through the language learning resources file or through files of the type "101 things to do with a (text/audio or video cassette/coursebook/another learner, etc.) to find interesting activities to try which might eventually generate a project. (This latter idea is due to Mike Rees).

LANGUAGE LEARNING KNOWLEDGE BASE : Operate in two modes : as consultable information bank or as feed-source for other components of electronic helper. Contain information on assessing language performance, needs analysis, definition of objectives, diagnosis of problems, setting up work programmes, choosing material, choosing working techniques and monitoring progress. Contain files of case studies and authentic learner problems.

LANGUAGE LEARNING RESOURCES FILE/LOCATOR : Contain information on all language learning resources available. Operate in consultation and feed-source modes. Consultation mode to include facility for multi-criteria searching for material.

LANGUAGE LEARNING SOFTWARE : Allow learner to use separate software *in situ* (e.g. commercial CALL programmes or learner-centred software such as the VOCMAN program for storage and games-menu revision of personal vocabulary-see Bibliography- a word processor for writing activities or keeping a learning diary, a data-base for storing language information etc.).

LEARNING PROJECT TROUBLE SHOOTER : Advise learner on all problems thrown up by his or her learning project and train him/her to deal with future problems him/herself.

LEARNING PROJECT PROGRESS CHECK UP : Help learner to assess progress, to diagnose causes of unsatisfactory progress and to find better ways of working. Help learner to acquire habit and means of monitoring progress and adjusting process alone.

HUMAN HELPER TRAINING MODULES : Make use of preceding modules to familiarise trainee helpers with language learning knowledge and resources, problems involved in learning a language alone (by doing it) and in learner training and counselling (by generating practice exercises from the authentic learner problem file for instance).

USER FEEDBACK (COMPLAINTS/SUGGESTIONS BOX) : Help to expand and refine computer functions.

USAGE PATTERNS RECORDER : Provide additional data for assessment/improvement of computer functioning and for research on learner autonomisation.

The TROUBLE SHOOTER and CHECK UP modules would be of most immediate interest to us since they are the ones via which we would hope to reproduce electronically the two principal functions we exercise when face to face with learners. Most of our discussions with learners start with a trouble shooting phase and then move on to a second phase where we check up on whether the learner knows and is satisfied with his or her progress or not and give what we hope is appropriate advice if there is doubt or dissatisfaction. See Figure 1 below for a more detailed picture of events in this situation.

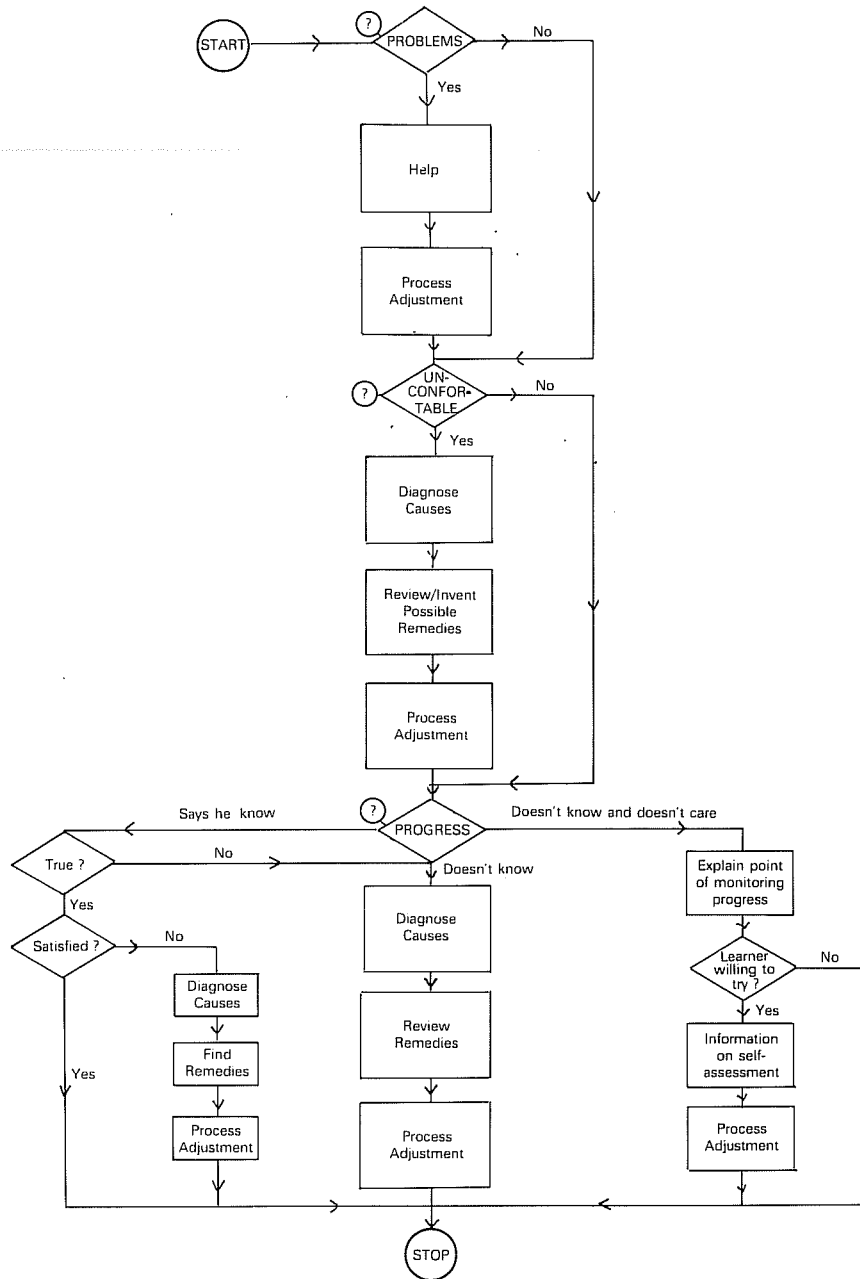


FIGURE 1 : FLOW CHART SHOWING TYPICAL TEACHER/TRAINEE-SELF-DIRECTED-LEARNER INTERVIEW

Is the above procedure satisfactory enough to warrant all the effort of partially embodying it in computerized form? Frankly, we are not sure. Are we not then putting the cart before the horse? Should we not assure ourselves that we have no more progress to make in helping learners become self-directed before attempting to make electronic helpers in our own image? Well, the answer to that could well be "yes" so we will try to justify our wish to persist with the project:

- 1 : We cannot cope alone. Any help is better than none.
- 2 : Trying to make an electronic helper may make us ask ourselves more questions about becoming a better human helper anyway.
- 3 : We are already working on assessment of the results of our attempts to help learners become self-directed and intend to pursue this project alongside the electronic helper one.

We decided (quite arbitrarily) to make the TROUBLE-SHOOTER the subject of our first feasibility study. The results of this work will make up the subject matter of the best part of the remainder of this paper.

II - FEASIBILITY STUDY FOR A TRAINEE SELF-DIRECTED LEARNER'S TROUBLE SHOOTER

OBJECTIVES

The questions we set out to answer were the following :

- 1 - What sorts of problems are encountered by our "self-directed" learners of English?
- 2 - How many of these problems are serious? Which are the serious problems?
- 3 - What form might computer treatment of learner problems take?
- 4 - Which problems might be amenable to treatment by computer and to what extent?
- 5 - How much help could computer treatment be?

METHOD

The method we used to seek answers to these questions was to analyse tape recordings of all the discussions that we had with our first year learners during the self-directed learning workshops which took place during the academic year 1984-1985.

The recordings were made (pocket cassette recorder) with the knowledge and consent of the 36 or so learners (intermediate to advanced level) involved in the 14 weekly 3 hour workshops. The majority of the learners were working in pairs and had had no previous experience of self-directed learning. The recordings total about 45 hours (3) and consist mainly of conversations where the teacher descended without invitation on learners, interspersed with occasional episodes where learners sought out the teacher because a pressing problem had arisen.

The recordings were analysed without previous transcription (i.e. simply by listening to them). Parts of recordings judged to be relevant were transcribed directly into a computer data base file (DBASE II) together with analysis-generated data. This latter procedure facilitated and accelerated subsequent manipulation of the information obtained.

The analysis was carried out as follows :

- 1a - *Identification of learner problems* : In addition to all unambiguous and spontaneous requests for help (e.g. "what does this mean?") we treated and filed as symptomatic of a problem all utterances where a learner expressed dissatisfaction (e.g. "Trouble is, we think in French and then translate"). We also treated as problems all utterances where a learner spoke of difficulty or impossibility (e.g. "You *can't* measure global comprehension.") even if the topic had been raised by the teacher because he felt the learner was neglecting something important.
- 1b - *Classification of learner problems by type* : The classification scheme was elaborated gradually as we advanced through the recordings. This meant that, in the earlier stages at least, frequent revision

(3) 84 hours of workshops yielded only 45 hours of recordings. This may sound as though the teacher spent half his time in idleness. Although the writer has a clear conscience on this point, he was rather startled by the number of hours he did not spend on counselling. A check on recordings made the following year revealed an identical "shortfall" in counselling time. It seems likely that much of the remaining time is spent shuttling between workshop and non self-access resources centre dealing with problems of unsuitable or ailing material. In order to investigate this point a record is being kept this year of everything the teacher does during the workshops.

of previous classifications had to be undertaken in order to bring everything into line with the latest adjustment to the classificatory grid. Considerable fiddling about also took place once all the problems identified had been classified and computer listing by category rendered apparent previously unnoticed inconsistencies. The final classification scheme divided problems into 4 main types :

Problem type 1 - "point" problems with language

Problem type 2 - problems with learning

Problem type 3 - requests for correction of work

Problem type 4 - queries about institutional constraints

2 - *Classification of learner problems in terms of seriousness* : Again, the classification system emerged as more and more problems were identified. Eventually, three sizes of problem were distinguished.

Problem size 1 : Apparently small problems such as queries about word meanings, points of pronunciation, socio-cultural allusions, how many workshops remained etc.

Problem 2 : Medium-sized problems. Recurring problems like having trouble with irregular verbs or long dictionary entries. Short term problems such as cassette recorder misbehaving.

Problem size 3 : Serious problems such as dissatisfaction with language performance or progress made. Dissatisfaction with way objective being worked on. Requests for urgently needed new material. Etc. Etc.

3 - *Implementation of computer treatment of learner problems* : Here, we noted in outline

a - the sort of interrogation sequences the computer might follow in order to determine as precisely as possible the nature of a learner's problem and

b - the information and/or advice which would be given

- 4 - *Possibility of treatment of learner problems by computer* : Where provision of computerized aid seemed feasible, the kind of help envisaged was classified in terms of depth of treatment. Three levels of treatment were distinguished :

Treatment level 0 : Problems which cannot be treated by computer.

Treatment level 1 : Problems for which only general advice can be given.

Treatment level 2 : Problems for which fairly comprehensive information or advice can be given.

- 5 - *Evaluation of potential usefulness of computer treatment of learner problems* : This was examined from the points of view of

a - what area and depth of coverage of serious and less serious problems might be expected from the computer

b - how much of the teacher's counselling time might be saved

c - how much time might be gained by learners through not having to wait for help from the teacher.

RESULTS AND DISCUSSION

1 - What sorts of problems are encountered by our "self-directed" learners ?

First of all, a few examples of these (as they were submitted, but translated into English) may serve to clarify the nature of the four types of problem we distinguished.

Problem type 1 : "Point" problems with language. Examples :

- "What does 'yuppy' mean ? It isn't in the dictionary."
- "What does 'unfarmlike' mean ?"
- "What does 'c/o' stand for ?"
- "What is a 'nuts and bolts politician'"
- "There are a few words in this song that we can't get."
- "How do you pronounce this word ?"
- "How do you say 'mettre en cause' ?"
- "How do you sign off a letter in English ?"

Problem type 2 : Problems with learning. Examples :

- "We can't agree on how often to stop the videotape."
- "What film should we choose?"
- "I have to look so many words up that I lose the thread of the story."
- "I rarely guess correctly the sense of words I don't know."
- "I have trouble turning the sounds I hear into words."
- "I'm finding it difficult to get used to the Scottish accent."
- "I grope for my words when I speak."
- "When should I start working on my second objective?"
- "There's a lot of background noise on this cassette."
- "What I need is a cassette intermediate in difficulty between the last one and the one before."
- "Have you got any *real* lectures on computing?"
- "I don't feel I've found an effective way of improving my reading comprehension."
- "We haven't got a method for working on video."
- "I seem to spend ages looking in the dictionary."
- "O.K. I'll finish the book maybe, but how shall I know what progress I've made?"
- "I'm not going to see much progress in 6 weeks."
- "How can we assess progress when the difficulty of our material changes every week?"

Problem type 3 : Requests for correction of work. Examples :

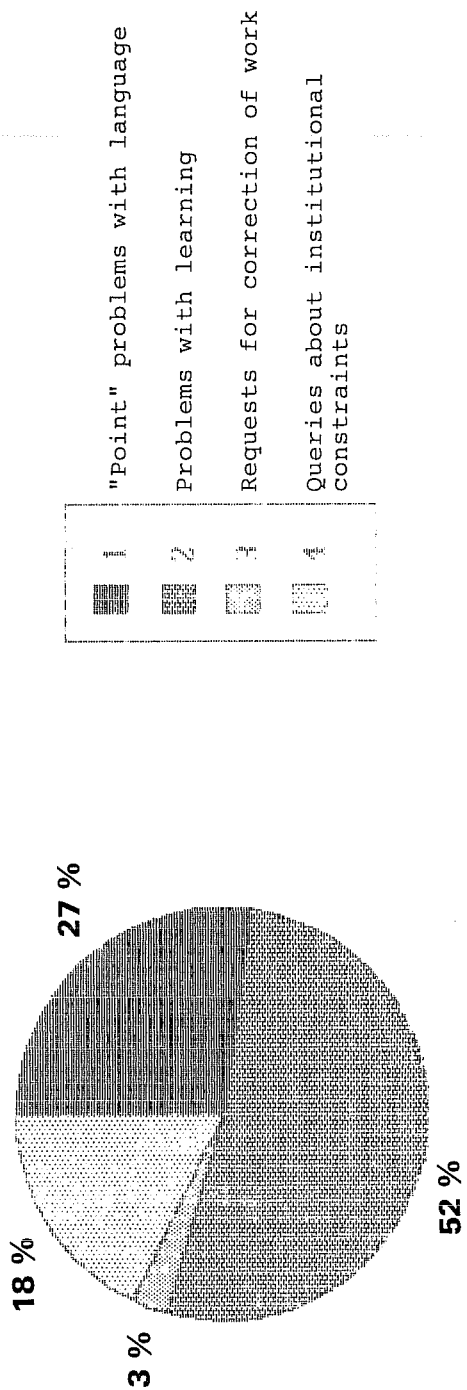
- "I can't see what's wrong with this bit you've underlined."
- "Could you check whether I've transcribed this passage correctly, please?"

Problem type 4 : Queries about institutional constraints. Examples :

- "Have I filled this worksheet in O.K.?"
- "Can I take the book home with me?"
- "Can I use my own reading material?"
- "I've spent more time on my first objective than on my second. Does it matter?"
- "When do we have to hand the report in?"
- "How long does the report have to be?"

The list of problem types is not necessarily complete since there may have been - for example - discreetly formulated problems which we were not perceptive enough to detect or which learners were unwilling to talk about. Other workers in the field of self-directed language learning have written of the psychological problems inherent in transfer from teacher to self-direction. As a rule, our learners rarely, if ever, emit (to us) indubitable distress signals but some of them do - at the end of the course - say they felt more or less nervous or disorientated at the start. So the electronic trouble shooter should also include conspicuous provision for learners who might benefit from comfort at this time.

The frequency of occurrence (percentage of total number of problems distinguished) of the four main types of problem is shown in the pie chart below.



THE FOUR MAIN TYPES OF PROBLEM ENCOUNTERED BY OUR "SELF-DIRECTED" LEARNERS.

The four main types of problem were broken down into sub-problems. These are listed below together with their frequencies of occurrence.

"POINT" PROBLEMS WITH LANGUAGE 27,35 %

Reading comprehension :

Vocabulary	7,73 %
Abbreviations	0,55 %
Grammar	0,28 %
Expressions	5,53 %
Socio-cultural allusions	1,10 %
Words in sentence understood but not sense	0,28 %
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	15,47 %

Listening comprehension :

Vocabulary	0,55 %
Small chunks not understood	1,94 %
Imagery in songs	0,55 %
Socio-cultural allusions	0,28 %
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	3,32 %

Oral expression :

Pronunciation	1,38 %
Vocabulary	0,28 %
Grammar	0,55 %
Expressions	0,28 %
Language Functions	1,93 %
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	4,42 %

Writing :

Spelling	0,28 %
Vocabulary	0,55 %
Grammar	0,55 %
Expressions	0,83 %
Language Functions	1,38 %
Text structure	0,55 %
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	4,14 %

PROBLEMS WITH LEARNING 52,76 %

Difficulty working with other people 0,83 %
 Choice of Objectives 0,55 %
 What to do about recurrent language problems. 18,78 %

(No predominant problems. See Note 4 for details)

What to do when 0,55 %
 Material. 17,96 %

(Questions about material available. 12,16 %)
 Hardware malfunctions. 2,76 %)
 (Miscellaneous. 3,04 %)

(Mostly dictionary use)

Noise interfering with concentration 0,55 %
 Difficulty assessing level 1,38 %
 Difficulty assessing progress. 6,63 %
 Dissatisfaction with progress 0,55 %

REQUESTS FOR CORRECTION OF WORK 2,76 %

QUERIES ABOUT INSTITUTIONAL CONSTRAINTS 17,40 %

Use of material. 7,18 %
 Assessment by teacher 8,01 %
 Miscellaneous. 2,21 %

(4) READING COMPREHENSION : Words not understood 1,10 %, Inability to guess meaning of words 0,28 %, Puzzling constructions 0,55 %, Unrecognized allusions 0,55 %, Words in sentence known but sentence not understood 0,28 %, Whole sentences often not understood 0,28 %, Jokes not understood 0,28 %, Comprehension questions too difficult 0,28 %, Difficulty perceiving author's attitude 0,55 %, Dissatisfied with reading speed 0,55 %, Difficulty picking up threads after a week away from novel 0,28 %.

LISTENING COMPREHENSION : Segmentation problems 0,83 %, Words heard but not understood 0,28 %, Inability to look up words in dictionary because spelling unknown 0,28 %, "Poor articulation" hindering comprehension 1,10 %, Problems with accents 0,55 % Imagery not understood 0,55 %, Complex sentence structure 0,28 %, Need to break speech down into manageable small portions 0,28 %, Speed 1,66 %, Note-taking 0,28 %.

ORAL EXPRESSION : Vocabulary 1,66 %, Grammar 1,38 %, Unfinished sentences 0,28 %, Fluency 1,38 %, "Uncolloquialness" 0,55 %, "Frenchness" 1,10 %.

NOT YET CLASSIFIED 1,91 %

Examination of the distribution of "point" problems with language across the 4 language skills shows that reading comprehension gets the lion's share. This is probably just a reflection of the fact that a fair proportion of the learners involved were working on reading. More interesting from a point of view of what components might profitably be tackled first if an electronic trouble shooter were to be constructed is the high incidence of problems involving passive or active knowledge or use of vocabulary and expressions and language functions (over 2/3 of the problems). Modules attempting to deal with these problems should be given priority in this problem area.

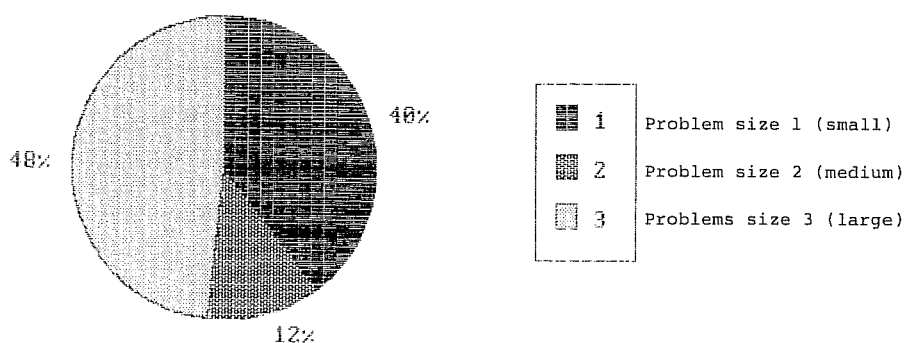
Taken at face value, the distribution of problems with learning across the various sectors of the learning process gives a somewhat distorted image of what the real difficulties of our learners are in this area. While ignorance of how to tackle particular language problems *is* a frequent problem (18,8 % of all learning problems), the high proportion of problems with material (17,7 %) is mostly accounted for (11,9 %) by questions about what material is available. This part of the material problem would be absent if our learners had access to the resources centre or to its filing system. Again, there were a number of enquiries about assessing level and progress, but the majority of these were probably provoked by the imminence of the date at which a written report on progress had to be commenced rather than by innate interest in monitoring (only 2 of all the 362 problems were classed as indubitable cases of genuine dissatisfaction with progress). The relatively modest proportion (5,0 %) of cases of dissatisfaction with working technique is probably a result of the tardiness of many learners' attempts to measure progress. As long as they do not know what progress they have made they will not question their methods (grossly unsuitable ones excepted). Priorities for the trouble-shooter will, then, be a compendium of techniques for working on various language problems plus a "materials available" file which, ideally, would be capable of carrying out multi-criteria searches. Information on self-assessment will also be needed but will have to be accompanied by means of getting more learners interested in it sooner.

Requests for correction of work are not very numerous and come entirely from the relatively few learners who indulge in free oral or written expression.

The presence of 8 % of enquiries about teacher assessment mode amongst the queries about institutional constraints is not surprising in a set-up such as ours where student marks have to be supplied at the end of each year.

2 - How many of our "self-directed" learners problems are serious ?

As the pie chart below shows, just under half of the problems raised (48 %) are serious (size 3). The proportion of moderate problems (size 2) is limited (12 %). The remaining 40 % of problems are small ones (size 1).



SERIOUSNESS OF PROBLEMS ENCOUNTERED BY OUR "SELF-DIRECTED" LEARNERS.

Which are the serious problems ?

The table below provides the answer to this question.

PROBLEM TYPE	PROBLEM SIZE		
	1 small	2 medium	3 large
"Point" language problems	24,6 %	0 %	2,4 %
Learning problems	4,2 %	10,9 %	36,9 %
Requests for correction of work	1,8 %	1,2 %	0 %
Queries about institutional constraints	9,0 %	0,4 %	8,6 %

DISTRIBUTION OF PROBLEM SIZE OVER ALL MAIN PROBLEM TYPES

The problem type which contributes the most - and by far - to both the serious and moderate problem categories (sizes 3 and 2 respectively) is learning. This is natural enough when one considers the potential long term importance of decisions concerning the learning process. Provision of help in this field should be a first priority for a future trouble shooter module. There is also a moderate contribution to the serious problem category from queries about institutional constraints (mostly concerning how to write the required project report and fill in worksheets, but also concerning freedom with respect to learning process decisions). The contribution of other problem types to the serious and moderately serious categories is negligible. This is because requests for correction of work are not a frequent problem (over half are of the non-urgent sort anyway) and because over half of the queries about institutional constraints are of a trivial nature. As for the remaining problem type - "point" language problems - these are marginal difficulties by definition (although possibly symptoms of a larger problem). The 2,4 % of large problems produced by the "point" language problem category are requests for fairly large slices of information (present perfect vs. simple past, how to express surprise and joy etc) which really merited a category to themselves.

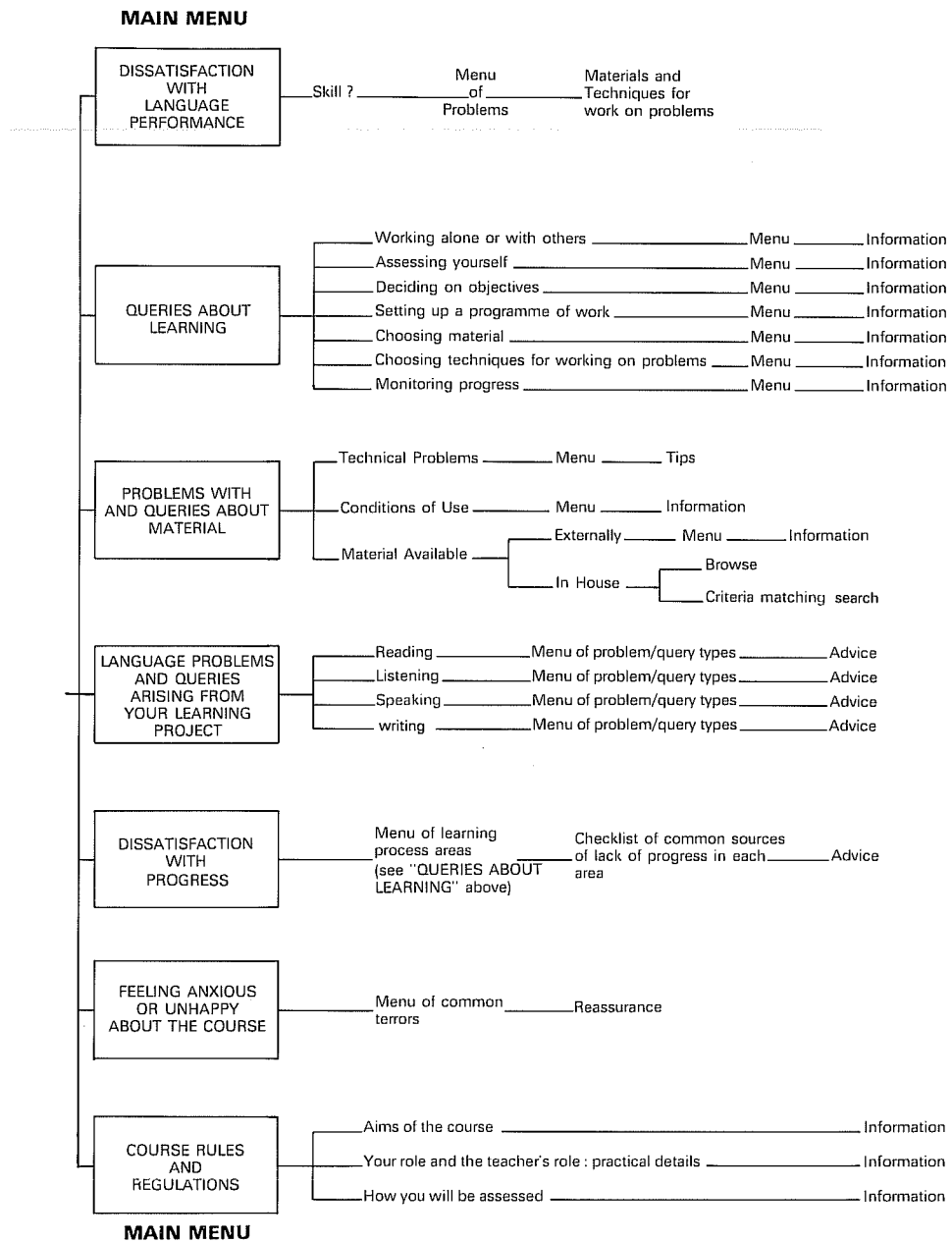
3 - What form might computer treatment take ?

Broadly speaking, the kind of help needed falls into two categories : giving information and providing guidance and training. For some problems (e.g. enquiries about what material or techniques are available for working on a given recurring and annoying language problem, queries about institutional constraints etc.) simply dispensing the required information is sufficient. For other problems (e.g. point problems with language, decisions concerning the design or redesign of the language learning process) we need to do more than just give information. We also need to try and ensure that the learner will, after consulting the trouble-shooter about a given problem, be more likely to deal with the same sort of (or new) problem unaided the next time s/he encounters it. In other words, we would like the trouble-shooter to offer learners the means of becoming more self-directed rather than merely spoonfeeding them.

For the latter class of problems, the computer would have - ideally - to be capable, first of all, of eliciting and understanding learner information about what s/he was trying to do and about what decisions had been implemented to this end (and why). It would then have to be capable of assessing what had been decided or done and of pinpointing and signalling to the learner possible mismatches between intention and means of realisation. Finally, the computer would have to be able to offer remedial information, guide the learner towards a better decision (preferably by building on the learner's own concepts and soliciting his or her suggestions as often as possible rather than handing over pre-packaged solutions straight away) and offer training exercises if the learner desired them. All this would seem to call for a well-stocked and sophisticated self-improving expert system and possibly for a special or natural language interface for some of the user-computer communication.

Work along these lines has already been considered in other learning contexts (BISSERET, 1985) and indeed is already under way in the (presumably more limited and better understood) field of training learners to use the PROLOG computer language (COOMBS and ALTY, 1984). Our own knowledge of self-directed language learning and of artificial intelligence being somewhat sketchy, we prefer - for the moment - to aim at fulfilling the trouble-shooter specifications in the last but one paragraph in a much less ambitious but easier way and to consider implementing an expert system approach (possibly via an expert system shell) if the pilot realisation shows promise.

What we plan to do is, first of all, to provide access to help via successions of menus leading the learner from a general specification of his or her problem to more and more particular ones (see Figure 2).



ACCESS FIGURE 2 : FLOW CHART SHOWING HOW LEARNERS WOULD ACCESS TROUBLE SHOOTING INFORMATION

In the case of problems of the "request for information" type, help will then be provided in the form of information drawn from an appropriate file.

For example :

Problem : "Have you got any *real* lectures on computing ?'

Trouble shooter menu sequence : Problems with and queries about MATERIAL → Technical problems/Conditions of use/Material available → Material available → Externally/In-house → In house → Browse/Criteria Matching Search → Criteria matching search (Criteria : Recording, Computing, Authentic → INFORMATION (list of material compatible with choice criteria) Details of each item on request.

Problem : "How do you sign off a letter in English ?"

Trouble shooter menu sequence : Language problems → Reading/Listening/Speaking/Writing → Writing → Letters/Reports/Abstracts/C.V. etc → Letters → List of material on letter-writing → Details of points treated by each item on request → INFORMATION : Courses and handouts dealing with opening and closing formulae in letters.

Problem : "How can I improve my pronunciation ?'

Trouble shooter menu sequence : Dissatisfaction with language performance → Reading/Listening/Speaking /Writing → Speaking → Know what problem is ?/Don't know → Know what problem is → Vocabulary, Repair Strategies, Grammar, Pronunciation, Idiomatic Expressions, Language Functions, Clarity, Organisation, Speed → Pronunciation → INFORMATION : Techniques for diagnosing improvement required, techniques and material for working on pronunciation.

Problem : "How can we assess progress when the difficulty of our material changes every week ?"

Trouble shooter menu sequence : Queries about learning → Monitoring progress → Why measure progress ?/ When to measure progress/Criteria of progress/Ways of applying progress criteria/Choosing progress criteria/ Looking for progress : problems and tips/What to do with your measure of progress → INFORMATION : Looking for progress : problems and tips.

Problem : "How long does the report have to be ?"

Trouble shooter menu sequence : Course rules and regulations → Aims of the course/Your role and the teacher's role : practical details/How you will be assessed → How you will be assessed → Interviews/worksheets/report → report → INFORMATION : How to write your report.

Where a problem calls for examination and criticism of what a learner has been getting up to and encouraging him or her to think again and possibly do some training activities in learning to learn, all we are going to do for the moment is to offer (for "point" problems with language) lists of strategies/techniques/material relevant to the problem in hand and (for learning problems) check-lists of common problems/tips/remedies in learning process design. It will then be up to the learner to put the various suggestions to the test.

For example :

Problem : "What does yuppy mean ?"

Trouble shooter menu sequence : Language problems → Reading/Listening/Speaking/Writing → Reading → Unknown vocabulary/Abbreviations/Grammar... etc. → Unknown vocabulary → Are you using the right dictionary ? (list of available dictionaries and what they are useful for) + Are you using the dictionary correctly ? (hints on rapid and successful searching for word meaning) + Can you guess what the word means ? (compendium of strategies) + Do you really need to know what the word means ? + If you've found out what the word means, do you want to learn to understand it the next time you meet it ? (file of techniques for dealing with language problems : learning words for reading)

Problem : Dissatisfaction with progress

Trouble shooter menu sequence : Dissatisfaction with progress → Check-list of possible sources of trouble in each area of learning progress, e.g. Choice of material : Does it match your objective (situation/subject), type of language used (written/spoken, interactive/non-interactive, formal/informal, spontaneous/non spontaneous, R.P./accent) ? (See "Deciding on objectives" if you are not sure). Does it give you practice in the areas where you are weak ? (See "Setting up a programme of work", if you are not sure). Does it suit YOU ? (is it too easy or too difficult ? Is it boring ? Do you need more variety in you mate-

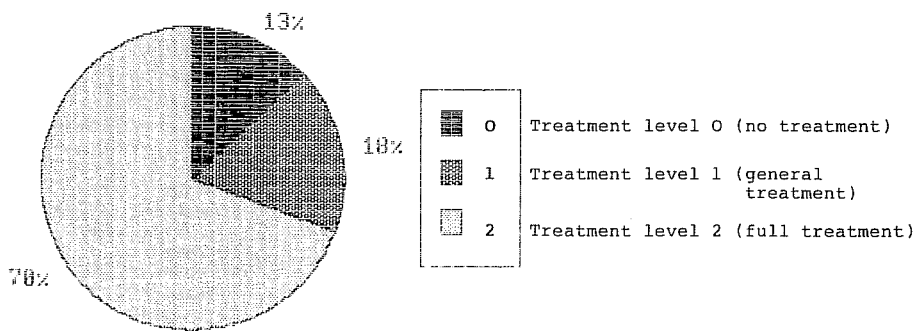
rial ? Do you need more authentic material/more course book material ? Have you fully exploited the resources available ? (See ' Choosing material (exploiting resources properly)' if you are not sure).

We shall also include features designed to encourage learners to work on the learning to learn dimension. These will include :

- Offers of practice activities and materials for the problem raised (possibly reinforced by a system which would remind a learner how many times he had already consulted on this kind of problem and suggest that more training might be beneficial)
- Reminders to monitor results of changes made as a result of consultation (referral to files on monitoring)
- Offers of dated print-outs of consultation sequences and files consulted that learners would be encouraged to reread for learning and to use as evidence of progress in unaided trouble shooting (in conjunction with a record showing problems solved with teacher or computer help)

4 - Which problems are amenable to treatment by computer and to what extent ?

The answer here is "most of them would seem to be", as the pie chart below shows. Only 13 % of problems cannot be treated by computer and of the 88 % which would appear to be suitable for computer treatment, 70 % should be treatable at level 2 (i.e. fairly comprehensively).



SUSCEPTIBILITY OF PROBLEMS TO TREATMENT BY COMPUTER

The table below shows which of the main problem types might be suited to treatment by computer and which might not.

PROBLEM TYPE	TREATMENT LEVEL		
	0 no treatment	1 general treatment	2 full treatment
"Point" language problems	14 %	65 %	21 %
Learning problems	11 %	2 %	87 %
Requests for correction of work	100 %	0 %	0 %
Queries about institutional constraints	5 %	0 %	95 %

DISTRIBUTION OF TREATMENT LEVEL OVER EACH MAIN PROBLEM TYPE

It can be seen that the majority of two of the main problem types - problems with learning (87 %) and queries about institutional constraints (95 %) - look as though they can be dealt with fairly comprehensively (treatment level two). This is because, in both cases, the range of information required to be covered is reasonably limited and fairly comprehensive help not too difficult to provide. Thus, for learning problems, the learning process can be divided into 7 or so sectors (see Fig. 3) in each of which we can usually provide a number of suggestions for dealing with common problems (e.g. in the sector "Techniques for working on language problems" we can offer a choice of compensation strategies for learners lacking active vocabulary for speaking).

"Point" language problems cover a huge area but - on the basis of our sample at least - look as if they can be dealt with quite well (21 % at level 2 and 65 % at level 1). Level 2 treatment (fairly comprehensive) should be feasible for point queries about matters such as grammar and language functions (e.g. use of a given modal, how to sign off a letter) where learners can be guided - with good chances of success - towards finding answers for themselves in courses or reference works via the materials data base. Where point queries are such that made-to-measure answers between the covers of books are less surely accessible or even non-existent (exotic vocabulary for example), we can still offer general advice (level 1 treatment) which, while not guaranteeing that learners will find answers to their questions should at least give them a fighting chance of doing so. We can, for example, check that they are using available sources of information correctly, point them towards sources of information they may not have consulted or suggest strategies for guessing things they don't know.

The problem of correction of free oral/written expression is a different matter. Here, a vast spectrum of reactions to an infinitely varied input is required. Sophisticated computer treatment of this kind would appear - especially in the oral domain - to be a long way off in the future.

Amongst other problems which would not appear to be susceptible to computer treatment (of our own devising) we find :

- Unusual "one-off" problems, e.g. "We need a map of London" (as a source of street/place references needed for a play that was being written) or "Where do I write to subscribe to *Jane's Defence Weekly* ?"
- Questions to which only the teacher can provide an answer, e.g. "My co-learners are more advanced than me. I think it would be better if I worked on my own". The teacher alone can judge whether compliance with the request will be too much for him.
- Problems with sociocultural allusions in written or spoken discourse.
- Problems identifying author's attitude to his subject.
- Problems with imagery in poetry and song lyrics.
- Vaguely formulated problems which need analysing, e.g. "I don't understand this sentence." or "There are weird constructions that I can't understand."
- Unknown words or expressions beyond the reach of reference works or guessing strategies, e.g. recently coined words used in a context which gives no clue to their meaning.

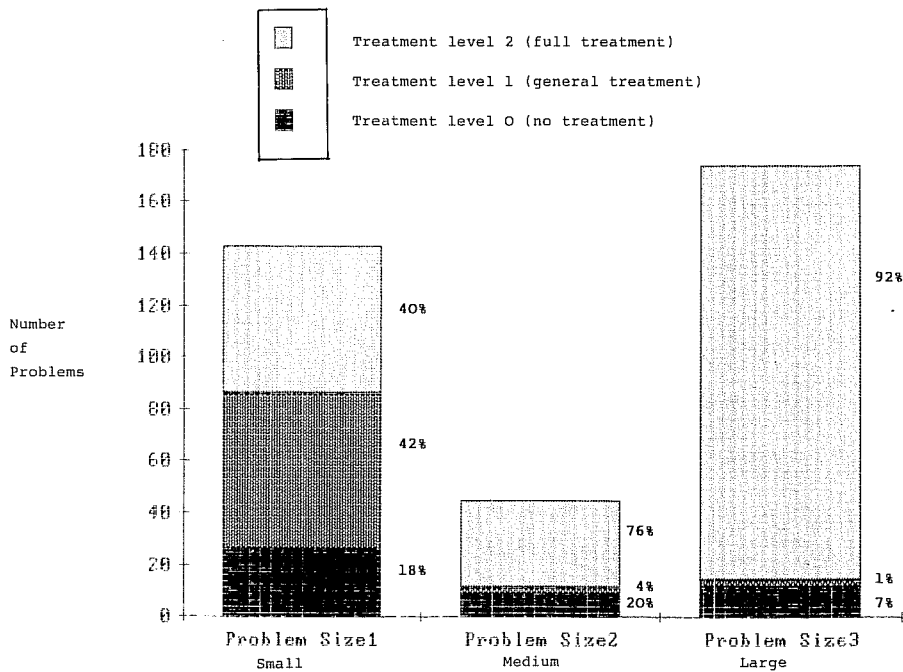
5 - How much help could computer treatment be ?

- a - Area and depth of coverage of serious and less serious problems.

The histogram below shows the coverage we would expect to get on the problems which occurred in our sample.

It can be seen that 92 % of serious problems (Pb size 3) should be treatable at treatment level 2 (fairly comprehensive) and that 75 % of moderately serious problems (Pb size 2) should also be treatable at this level. This looks encouraging. Only 40 % of small problems (Pb size 1) look like being susceptible to treatment at the fairly comprehensive level, but this is not too serious in the case of small problems (for which an additional 42 % should be treatable at the

general advice level anyway). If our analysis can be supposed to have thrown up a fair proportion of all the problems which future learners will encounter (or a representative sample of them at least) then the chances of successful computer treatment of them would seem to be good. In principle, treatment for problems which have not been foreseen should gradually be made available as users report omissions via the complaints/suggestions box.



HISTOGRAM SHOWING TREATMENT LEVEL DISTRIBUTIONS FOR EACH PROBLEM SIZE

b - How much counselling time might be saved ?

An idea of this was obtained by choosing, at random, 54 of the 220 odd conversations analysed and timing how many minutes of each the teacher spent dealing with problems raised by the learners he was talking to. A statistical procedure was then used to estimate the proportion of learner-teacher conversation which was devoted to dealing with learner problems. This turned out to be 41 % plus or minus 13 % (95 % confidence interval). So with a trouble shooter capable of dealing with something like 88 % of future learners' problems, we might expect to save ourselves something less than a quarter to a

half of the time we spend counselling if the computer took over this job completely. In actual fact we might save a bit more time than this because the materials-search facility built into the trouble-shooter would spare us the trouble of identifying material to match the more urgent learner specifications handed in during workshops (the learners would do this for themselves via the computer).

c - How much time might be gained by learners ?

The gains here ought to be considerably higher since they would apply, potentially, to a hundred learners instead of to just one teacher. They would, theoretically, be of two types. Firstly, there should be psychological advantage in not keeping learners waiting for help (i.e. in sparing them frustration and discouragement). Secondly, we would avoid the considerable setbacks (nearly half the problems raised are serious) that some learners suffer when they "lose" two, or even three, usefully employed work-sessions (out of a total of between 12 and 18) through being stuck on a wrong track from which timely advice might have diverted them.

FUTURE WORK

We hope to be able to begin construction of the TROUBLE-SHOOTER section of the proposed ELECTRONIC HELPER in the near future. The pilot version will probably be very incomplete, concentrating on those areas which throw up serious problems the most often and offering a materials file containing information on frequently used material only. The language envisaged is DBASE III + The program will be implemented either on a PC or a PC compatible and will eventually need to be accommodated on a hard disc. With luck, we may be in a position to test the pilot version during the academic year 1988-1989. Concurrently, we hope to investigate the feasibility of writing a CHECK-UP module to complement the TROUBLE-SHOOTER.

In doing so we may be making a small contribution to possible future software which might enable language learners who so desired to carry out their own learning projects in their own way in (or outside of) their own homes ; possibly feeding them the material they required electronically (onto printer, tape or disc) from local or national resources centres and tele-linking them when necessary to flesh and blood fellow learners, native speakers and language learning counsellors.

We wish to thank JEREMY FOX of the University of East Anglia for encouragement and for drawing our attention to (and supplying us with photocopies of) the papers of COOMBS and ALTY.

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