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**A COMPUTER PROGRAM FOR INDIVIDUALISED
VOCABULARY LEARNING**

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ABSTRACT

Cet article décrit la première mouture d'un logiciel conçu dans le but de fournir un outil stimulant et individualisable pour l'acquisition de vocabulaire. Les apprenants effectuent, depuis le clavier, la saisie de leurs propres mots et traductions et, ensuite, les travaillent à partir d'un menu comprenant 8 jeux et une option test. Le vocabulaire saisi peut être conservé (et augmenté) pour des utilisations ultérieures. Il semblerait, d'après les observations effectuées pendant deux mois d'essais dans des ateliers de travail autonome en Anglais, que le logiciel est capable de motiver des étudiants autodirigés pour une tâche normalement perçue comme ingrate (et, par conséquent, négligée). Les taux d'acquisition de vocabulaire obtenus étaient quelque peu inférieurs à ceux obtenus dans des apprentissages d'Anglais dirigés par enseignant mais sont, croyons-nous, susceptibles d'amélioration.

A problem which we have frequently encountered when training French students of engineering and data processing to take over responsibility for their English learning (1) is this: they are rarely very keen on learning the lists of vocabulary they churn out in the course of their self-directed learning projects. In many cases little or no effort is made to do so, even when the students feel that learning words which have caused them trouble would make a substantial contribution to progress towards their objectives. This lack of motivation for necessary vocabulary learning is not just a matter of distaste for rote learning from lists. Few learners take advantage of the potentially more motivating techniques for vocabulary acquisition (2) which we offer them. The trouble seems to be that it is so much less bother -and more fun- to carry on consuming courses and authentic material or practicing speaking and writing than it is to buckle down to the job of doing something about the difficulties you encounter in doing so.

About three years ago, at a time when public enthusiasm for microcomputers was coming to the boil, it occurred to us that a computer could, perhaps, be used to overcome the effort/motivation barrier which we thought was keeping so many learners from making progress in passive or active vocabulary acquisition. First of all, it would attract learners by its novelty and topicality. Secondly, by putting a whole range of vocabulary learning techniques literally at fingertip reach, the computer would cut out the effort of scratching about to find interesting ones. Thirdly, it would -hopefully- retain learners' interest in working on vocabulary by being fun to use (games-style activities) relevant (input of personal vocabulary) and demonstrably efficient (provision of a test feature to monitor progress).

This paper will describe the computer program which the above idea eventually led to and assess to what extent it has fulfilled its purpose during its first few months of in-service trials.

THE PROGRAM :

This rejoices in the name of VOCMAN and has been written in BASIC for a Sinclair ZX81 with 64K RAM. As the program is too long to fit into the memory space available, it has been divided up into four parts which are used separately. Loading is from cassette. Individual learners (or small groups of learners) enter the vocabulary they wish to learn (plus translations) at the keyboard. The vocabulary entered is incorporated into the part of the program being used and is then available for presentation in its learning activities. Learners select the activities they wish to use from a menu. Program part and entered vocabulary can be saved onto a learner's personal cassette after use. Additional vocabulary can be incorporated into the program part at any time but if this is to be conserved for future use, rerecording of program part and words is necessary.

VOCMAN did not acquire its present shape and substance through the agency of some deeply pondered and rigorously executed master plan. It grew by accretion and reshuffling of vocabulary learning subprograms written as they were thought of and when time could be spared. Some of the subprograms aim at impressing spelling on the learner. Others are intended to focus on meaning or to act as springboards to speaking or writing activities. Few of them are original. One activity, indeed, is a home-made version of a program already described by Tim Johns (3). In the following paragraphs of this section we shall describe the structure and content of VOCMAN as it stands at the moment.

Each of the four parts of the program contain a number of standard features plus one or more vocabulary learning activities.

Features common to each of the four parts of the program :

Presentation Screen: This is an explanatory lead-in to the program for learners who have never used it before. They can take a look at the program menu and, if they wish, start to type in the words they want to learn.

Menu: This lists the facilities available to the learner and shows how they can be accessed.

Loader: This is used by the learner to enter the words s/he wishes to work on. On entry, the english word can be checked for spelling and corrected if necessary. The learner then has to supply one (only) L1 equivalent of the word entered. The latter will be used later on as a basis for correction in the activities where translation is called for.

Eraser: This serves to erase all the words entered should a clear-out be desired.

Test: This offers a translation test (English to L1 ou L1 to English) with automatic scoring, correction and a terminal list of words which were not known. Subsequent learning activities can, if the learner desires, be based only on the words which caused a problem.

Word list : This presents on screen, for revision purposes, all the words (with their translations) which have been entered.

Vocabulary learning activities offered :

In the first part of the program :

Find the word : One of the words in the learner's stock is hidden in a block of randomly selected letters. The learner has to locate it and check his solution either by asking for the word to be highlighted on screen or by typing it in for verification by the computer. Afterwards, translation of the word can be attempted if desired. The translation routine includes a correction phase. The computer will continue to select different words at random from the learner's stock until the learner chooses to move on to another activity. When all the words have been used up, random selection of different words restarts automatically.

Spot the word : After a randomly variable delay of the order of seconds, one of the words in the learner's stock appears briefly on screen in a randomly selected position. The learner has to type in the word s/he has seen. The computer tells the learner whether the answer given is right or wrong and, in the latter case, offers him or her unlimited additional attempts at getting the spelling right. If the learner has the wrong answer and gives up straightaway, s/he can ask to see the right answer. When the right answer has been established, the learner can move into a translation/correction routine if desired. Random selection of words continues (see activity above) until the learner chooses to change activities.

Anagram : One of the learner's words is presented on screen with its letters in a different order. The learner has to unscramble the anagram. Correction, retry and translation routines are available as in the preceding two activities.

In the second part of the program :

Whirlyword : One of the learner's words appears on screen with its letters rapidly changing position (the last letter goes to the front of the word, the new last letter does the same and so on...). The learner is invited to try to freeze the word (by pressing a key) when it appears with all its letters in normal sequence. Again, a translation/correction routine is available.

Hangman : Too well known to require description. The mystery words which have to be guessed letter by letter in a limited number of "go"s are chosen - as usual - at random from the learner's stock.

In the third part of the program :

Storyteller : The computer randomly selects 5 words from the learner's collection of words and invites him/her (or them) to make up a story containing all 5. Translations of the words are furnished on request. A different selection of 5 words

can be called for whenever inspiration fails. The activity can lead to discussion in English, to a told or written story and to correction and follow-up activities.

Fruit machine : A crude representation of a fruit machine appears on screen. The usual fruits, however, are replaced by words. On the left hand side "band" are the words fed into the computer by the learner. On the centre and right hand side "bands" are words from the computer's own stock of words. The learner is confronted by ever varying word triplets each containing one of his/her words. S/he is invited to block the machine whenever s/he sees an interesting word combination and to make up a sentence containing the three words. Learners working in pairs or in small groups can add spice to the activity by imposing time limits and requiring justification of implausible sounding sentences.

In the fourth part of the program :

Ludo : This is simulated board game of the "Ludo" type for two players or two teams of players. Each player or team of players take(s) turns translating words selected at random from their stock. A player giving a correct answer is awarded from 1 to 6 points (random selection again) and his counter moved forward the appropriate number of points on the board. A translation is provided when a wrong answer is given. The winner is the first player to arrive exactly on the last square of the board.

DID THE PROGRAM DO WHAT IT WAS SUPPOSED TO DO ?

The program was intended to do two things. Firstly, to motivate more work on vocabulary amongst self-directed learners with problems in this field. Secondly, to ensure that work done with the program did lead to worthwhile acquisition of vocabulary. The way in which VOCMAN was tested on these two points and the results obtained will now be described. Section headings will be :

- the learners involved
- the learning approach involved
- the "experimental method" used to assess whether VOCMAN did, in fact, lead to more work of an effective sort on vocabulary.
- results and discussion

The Learners :

French students in their first year of a two year course (M.I.A.G.E.) on the use of computers in management. All of them had, until their arrival at the Nancy M.I.A.G.E., followed fairly traditional courses in English at school and in higher educational establishments.

The Learning Approach :

Strongly self-directed. The students (3 groups of 16 to 18 members) set up their own objectives and learning programmes and worked on them -individually or in pairs- during twelve three hour workshops using materials, techniques and assessment

methods of their own choice. The only constraints upon the learners were the obligation to carry out the bulk of their work during the workshop slots, to fill in a worksheet at the end of each 3-hour session and to submit a report (accompanied by all written and recorded work) for evaluation. The teacher functioned as a learning counsellor.

The Experimental Method :

From the fifth workshop onwards, the attention of the learners was drawn to the existence of VOCMAN by posting a notice on the blackboard. This notice contained a succinct description of the purpose and functioning of the program and concluded with an invitation to try it out during workshop time. The program itself was not visible because the computer could not be conveniently installed in the workshop and hence had to remain "across the road" at the C.R.A.P.E.L. The notice was the sole form of "recruiting" employed.

Learners who came forward expressing interest were introduced to VOCMAN via a short demonstration by the teacher and thereafter, if interested, booked one hour work sessions with it. Questionnaires and a notice requesting learners to fill in a questionnaire each time they used VOCMAN were placed close to the computer. The questionnaires were intended to provide a record of who used VOCMAN when and how and to collect information on learning and learner reaction to the learning tool provided.

The effectiveness of VOCMAN in promoting work on vocabulary acquisition was gauged by assessing the proportion of learners with non-negligible vocabulary problems who were stimulated into regular work on them by VOCMAN. For comparison, the proportion of learners with non-negligible vocabulary problems who worked on them regularly using other techniques was also assessed. This meant that the following quantities had to be evaluated :

- 1 - The number of learners with non-negligible vocabulary problems
- 2 - The proportion of learners with non-negligible vocabulary problems who made some regular attempt to deal with them (i.e. over and above simply making word lists) using methods other than VOCMAN
- 3 - The proportion of learners with non negligible vocabulary problems who were attracted to working on them regularly by VOCMAN.

Quantity 1 was evaluated by examining all the written work furnished by the learners and counting up for each learner the number of words listed during the twelve workshops. Learners with less than 20 words listed were considered to have negligible vocabulary problems (negligible in the sense that if they did have vocabulary problems, they did not consider these to be important enough to warrant the making of lists for learning). Learners with more than 20 words listed were considered to have shown that they felt their deficiencies in vocabulary to be cause for some concern.

Quantity 2 was evaluated via inspection of all information available (learners' worksheets, teacher's logbook and recollections) on the learners with non negligible

vocabulary problems. The number of these learners who had not used VOCMAN and who had definitely done more about their vocabulary problems than merely make word-lists were counted and their percentage calculated.

Quantity 3 was evaluated by referring to the information sources mentioned just above, to the teacher's records of who used VOCMAN when and for how long and to the (almost invariably) completed questionnaires. The number of learners who had used VOCMAN more than 3 times during the 8 or 9 workshops for which it had been available (and who had done no previous work on vocabulary) was counted and their percentage calculated.

The effectiveness of VOCMAN as a worthwhile learning tool was investigated by observing the long term retention of vocabulary learned with its aid and the rate (words/hour) at which the retained vocabulary was learned.

The first quantity was obtained by asking regular users of VOCMAN to take -one month after the last workshop and without revision- a written test of their knowledge of the words they had worked on.

The second quantity was obtained by dividing the number of words correctly translated in the test by the time spent working with VOCMAN (available from the teacher's records and the questionnaires completed when learners used VOCMAN).

Results and discussion :

The figures yielded by the investigation of whether VOCMAN lead to more work amongst learners with vocabulary problems are given below :

Regular work on vocabulary with and without VOCMAN

Total number of learners	50
Number of learners with non-negligible vocabulary problems	46
Proportion of learners with non-negligible vocabulary problems who worked regularly on them by study other than with VOCMAN	8/46 (17,4 %)
Proportion of learners with non-negligible vocabulary problems who worked regularly on them using VOCMAN	8/46 (17,4 %)
Proportion of learners with non-negligible vocabulary problems who would have worked regularly on them using VOCMAN if they had discovered it earlier or if it had been implemented on less unreliable and more easily manipulable hardware	5/46 (10,9 %)
	TOTAL 21/46 (45,7 %)

It can be seen that, in the space of 8 workshop sessions, VOCMAN attracted another 17,4 % of the 85-86 students with vocabulary problems into doing regular work on them. Given more time and better hardware an extra 28,3 % (17,4 % + 10,9 %) of this class of learner would have been regularly attending to their word problems with VOCMAN. That they did not do so was due (in 2 cases) to deciding to use it only three sessions before the end of the course and to (in the 3 remaining cases) exasperation with the inadequacies of the ZX81 (slow loading, frequent failure to load, awkward keyboard, frequent loss of program and words through RAMpack wobble) outweighing enthusiasm for the software. It is not surprising that more learners did not avail themselves of VOCMAN when one considers that :

a - reports of the appalling performances of VOCMANIS supporting hardware were circulated by its victims (at least one learner is known to have changed her mind about giving VOCMAN a try for this reason)

b - some learners were repelled by the very idea of using a computer for language learning, feeling that there were quite enough computers in their life already

c - other learners were chiefly interested in doing as little work as possible

d - a few learners may not have heard of VOCMAN - as late as the tenth week of the course one learner professed amazement on learning of its existence

So, all things considered, VOCMAN seems to have been reasonably successful as far as stimulating work on vocabulary is concerned. What were the reasons for this ? Its regular users were unanimous in cursing list-learning as deadening and ineffective. They justified their adherence to VOCMAN in terms of its fun aspect and its usefulness (as perceived in the results of regular runs of the test option).

This brings us to the second point of our enquiry. Did the extra vocabulary work generated by VOCMAN do any good ? What vocabulary was learned and at what expense of effort ? The table below presents the answers we obtained to these questions :

Vocabulary learning with VOCMAN

Learner	Number of words studied	Long term retention	Time spent with VOCMAN *	Words learned per hour
B	39	90%	6h.	5.9
Co	39	79%	6h.	5.1
Ca	39	59%	2h.	11.5
L	39	62%	2h.	12.1
D	68	66%	4h.	11.2
W	68	72%	4h.	12.2
H	81	77%	4h.	15.6
Dj	81	81%	4h.	16.4

*Excluding sessions where hardware failure prevented work on vocabulary.

The table shows that VOCMAN was more than just a plaything. It produced respectable long-term retention of vocabulary studied. The average retention rate (73 %, s.d. 10.5) is comparable with those of (74 %, s.d. 8.18) and (80 %, s.d. 9.24) reported by CROW and QUIGLEY (4) for (teacher-directed) traditional and semantic field approaches to vocabulary learning by (mostly) middle and far Eastern students. The rate at which words were learned using VOCMAN, however, is lower than that achieved by CROW and QUIGLEY's learners. The latter were (according to our calculations based on CROW and QUIGLEY's data) learning about 20 words per hour under teacher-led instruction, whereas our self-directed learners were chalking up between 11 and 16 per hour. (We have ignored the scores of the first two learners in the table above because they gave up adding new words to their computerized stock in the mistaken belief that the computer would take no more). A possible explanation of our learner's lower scores is that the variety of games provided by VOCMAN led to overkill, with the learners spending more time exploring the activities than was necessary for acquisition. Nevertheless, there were more learners working effectively on vocabulary than there would have been without VOCMAN and it may be that the suspected overkill phenomenon would have disappeared if the learners had had the time to try all the activities. Continuing use of VOCMAN should show whether this hypothesis is correct and will also enable us to see whether what would seem to be a promising start was a flash in the pan or not.

FUTURE WORK :

The first thing to be done will be to implement the program on a more reliable and sophisticated computer equipped with a disc operating system. This will eliminate much wasted time and temper, permit rapid access to all the activities and allow storage of vocabulary on a large scale. While transferring the program to a better machine (the in-house GOUPIL or MINI-6 for instance) a number of user-suggested modifications will be made :

- provide for entry of several translations of a given English word
- provide for entry of long words and expressions
- provide for storage of contextual information
- provide for fine grained manipulation of the vocabulary held in stock (editing, suppression and selection of words or blocks of words for incorporation into activities).

At a later stage, the existing activities will be supplemented with new ones. While the majority of activities provoked very different reactions from different learners, the "Ludo" game was a universal favourite - presumably because of its competitive dimension. Accordingly, more options of this sort will be added and competitive versions of present and future activities provided when appropriate.

NOTES

(1) See MOULDEN. H., *Mélanges pédagogiques* 1978, 1979, 1980, 1983, 1984, C.R.A.P.E.L, Université de Nancy II

(2) Some of those suggested in *Learning English Words* (Pilgrims Language Publications), for example.

(3) "Wordspin. Six games and activities for language learning on the ZX81". Paper presented at a conference on computers in foreign language teaching organized by the British Council and the Goethe Institute, Paris 16-18 December 1982.

(4) CROW and QUINGLEY (1985), "A semantic field approach to passive vocabulary acquisition for reading comprehension". *TESOL Quarterly*, Vol. 19, No. 3, September 1985.