THE MICROCOMPUTER AS A TEACHING AID

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Inexpensive microcomputing systems have recently reached the U.K. market.
The Tandy TRS-80 (costing under £500) has about 3.5K useable memory and can be
readily programmed in level I BASIC.   In spite of this limited memory facility
it is possible to modify some existing large programs with surprising success,
as shown in exhibit A.   Exhibit B gives an example where an additional 12K
memory (cost £229) is advantageous.

In the education of undergraduates the microcomputer has great potential as a
teaching aid and at Chelsea College we have just begun to explore the possibil-
ities of its application to practical and theoretical problems.

Exhibit   A   Computer-assisted teaching aid for the identification of
               powdered vegetable drugs

The identification of powdered vegetable drugs requires considerable
expertise and a wide experience unless there is a severe limitation in the
number of drugs for identity.   It was, therefore, pertinent to utilise the
microcomputer to aid both the student and teacher in this difficult task.
The program DRUGID (Jolliffe & Jolliffe, 1976) was developed as an aid for
analysts in the identification of powdered vegetable drugs.   The teaching
program POWDERS exhibited is a modification and simplification of DRUGID
in which the data bank has been reduced from 174 to 32 drugs.   The additional
12K memory would enable the whole data bank to be included but for under-
graduate teaching this is not thought necessary.

In the program, the 11 main (30 specific) characters for the 32 selected drugs
are suitably coded in the DATA statements.   The program calls for suitable
input data in 6 blocks of 5 digits, the figure 1 representing an absent
character and 2 an observed character.   The input and stored data are com-
pared using a suitable scoring system and any drug having characters identical
with the input data is printed out together with the instruction to compare
with an authentic sample.   One of the limitations of level I BASIC is that
alphanumeric arrays are not possible, therefore, the drug is represented as a
reference number.   Where there is no agreement no drug is indicated.   In
either case, however, a list of characters which may need to be checked is
given.   This list comprises the characters which do not agree with the input
data for those drugs with fewest points of disagreement.

Exhibit   B   M.C.Q. self-assessment test

The program exhibited has 100 multiple choice questions based on the knowledge
a student should have gained during the first year course in pharmacognosy at
Chelsea College.   The student is asked how many questions he is prepared to
answer (maximum 20) and the questions appear in random order so that there is
little chance that the same set of questions will appear more than once.
Without the extended memory one is limited to only 10 - 12 questions.

Obviously the application of microcomputing systems is limited only by one's
imagination: these two examples have been selected to show the wide divergence
of programs which can be written to meet different requirements.

Jolliffe, Georgina H. and Jolliffe, G. O. (1976), Analyst,101, 622-633.