DOCUMENT RESUME

ED 285 427 FL 016 907

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TITLE Data-Based Courseware: One Thousand Lessons on One Disk.
PUB DATE Apr 87
NOTE 9p.; Paper presented at the Annual Meeting of the International Association of Teachers of English as a Foreign Language (21st, Westende, Belgium, April 12-14, 1987).
PUB TYPE Reports - Evaluative/Feasibility (142) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Computer Assisted Instruction; *Course Content; *Courseware; *Databases; English (Second Language); Foreign Countries; French; Individualized Instruction; *Information Storage; Learning Activities; Second Language Instruction; Second Language Learning; *Student Needs
IDENTIFIERS Belgium

ABSTRACT

A common problem in second language instruction is the lack of correlation between the content of courseware and the specific learning situation of the student. Students using the available programs encounter unfamiliar words and structures, deviant methodologies, or inappropriate levels of difficulty. This causes unnecessary errors and remediation. Since it is also generally not feasible for teachers to produce their own courseware, one solution is the development of courseware with its own database. The learning content is stored on the disk with the program, and the menu allows the teacher or student to select the elements to be studied and practiced according to the specific learning situation. The selected elements are then automatically placed in the instructional framework of the courseware and manipulated for different kinds of practice. Several such programs exist, and the method has been found to be versatile, easy to use, and easily adapted to various difficulty levels. The technique is seen as especially suitable for content that has clearly-defined elements that are expanded constantly over a long period of time, but useful even for a limited range of contextualized items placed in databases that operate on the same principles. (An extensive description is provided of Verbapuces, a computer program to train and test the mastery of the French conjugation systems.) (MSE)

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Data-based courseware

One thousand lessons on one disk

IATEFL

Westende, Belgium, 12-14 April 1987

1. A traditional problem: the lack of correlation between the content of courseware and the specific learning situation.

We approach computer-assisted instruction in the strict sense of assistance in regular school-settings. The teacher refers his students to courseware, either for remedial explanations and practice, or for more broadening learning experiences. In many cases the teacher will use for these purposes commercially available courseware, which has not been developed specifically for a certain situation or tied to a specific method or handbook. The consequence is an often serious lack of correlation between the content of the courseware and the specific learning situation. Students using these programs will face unfamiliar words and structures and deviant methodologies, or they will have to work with items that are not challenging according to the level they have already reached.

Especially in the early phases of foreign language learning, this lack of correlation is quite disturbing, because unsystematic and problemsome approaches to language cause more language errors which require unnecessary correction time and remedial practice. It also gives more uncertainty to the learner, leading to discouragement.

A teacher would thus need a large array of courseware, matching the learner's development at each stage, adapted to the needs of the best and the weakest learners, plus courseware summarizing material seen up to a certain point, different courseware for training, remedial teaching and tests. It is obvious that such diversity would require a major effort in production. Very often, the courseware available represents only a very limited portion of the normal content of a complete course.

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2. Making your own courseware through traditional means:
not to be expected from the average teacher

Some say the teacher himself should make the courseware needed for each specific situation where he teaches. Because programming through a general programming language is such an arduous and specialized task to reach a certain level, the market offers a number of easier instruments to produce courseware, namely authoring systems and authoring languages. Although these have an undeniable value, there are some weaknesses:

- Most authoring systems and languages are not geared toward the specific needs of CALL: CALL needs its own didactic strategies, a particular error analysis, a strong progression pace, usually not offered in the commercially available systems and languages.

- The better systems and languages, offering a wider variety of possibilities, also become more complex to use. Some are as complex as general programming languages, hampering easy introduction.

- It still takes a lot of time to program a small courseware-unit with limited effect. If one wants to come to a complete set of versatile units covering a whole language course, the work involved is quite challenging.

Therefore, one must not expect the average teacher to make the effort to produce courseware through these languages and systems. It is unrealistic to think that CALL will ever become very popular, if each teacher must spend many hours in producing limited courseware-units for his particular classes and individual students.

3. Selection-system for maximal versatility:
the databased organization of content

In courseware production, one of the most crucial capabilities of the computer is often neglected: the power of immediate selection and combination from databases. For a large part of linguistic material, the computer is able to select and to combine at will and in a matter of seconds precise elements from a wider corpus, so that this selection matches precisely the initial situation of particular students.

If the databases on the disk are well organized, using high quality procedures and index sequential organization, the same floppy for a simple PC can contain thousands of different units, matching the most varied lessons. The breadth of the choices must be so large that the

same disk can be used by a pupil in elementary school as well as by a student in graduate school. Moreover, if such courseware is sold at a minimal price with permission to copy within the school, the price for a courseware-unit becomes extremely cheap.

The principle of a selection-system is simple: the learning content is stored in a database within the program. A simple menu allows the teacher (or the student if so desired) to select precisely the elements that are to be studied and practised according to a specific learning situation. Any elements that are not to appear in this situation can thus be discarded. The selected elements are automatically placed in the didactic frame of the courseware, which itself can be manipulated in various ways: display mode, drill and practice, help functions, testing, scoring, selective randomization, etc.

The menus are easy to use so that the user need not program nor type any words. Only the keys with the arrows and the "enter"-key are necessary.

4. Example: Verbapuces, IBM-studycontract, developed at the University of Antwerp (UIA)

Verbapuces is a program to train and test the mastery of the French conjugation systems. It was first developed in the United States, at Computer Teaching Services of Brigham Young University, then further refined under an IBM-Studycontract at the University of Antwerp. Its database contains 1300 verbs which can be conjugated at all possible tenses, moods and forms, generating more than one million verbal constructions. It contains all the verbal types of the French system.

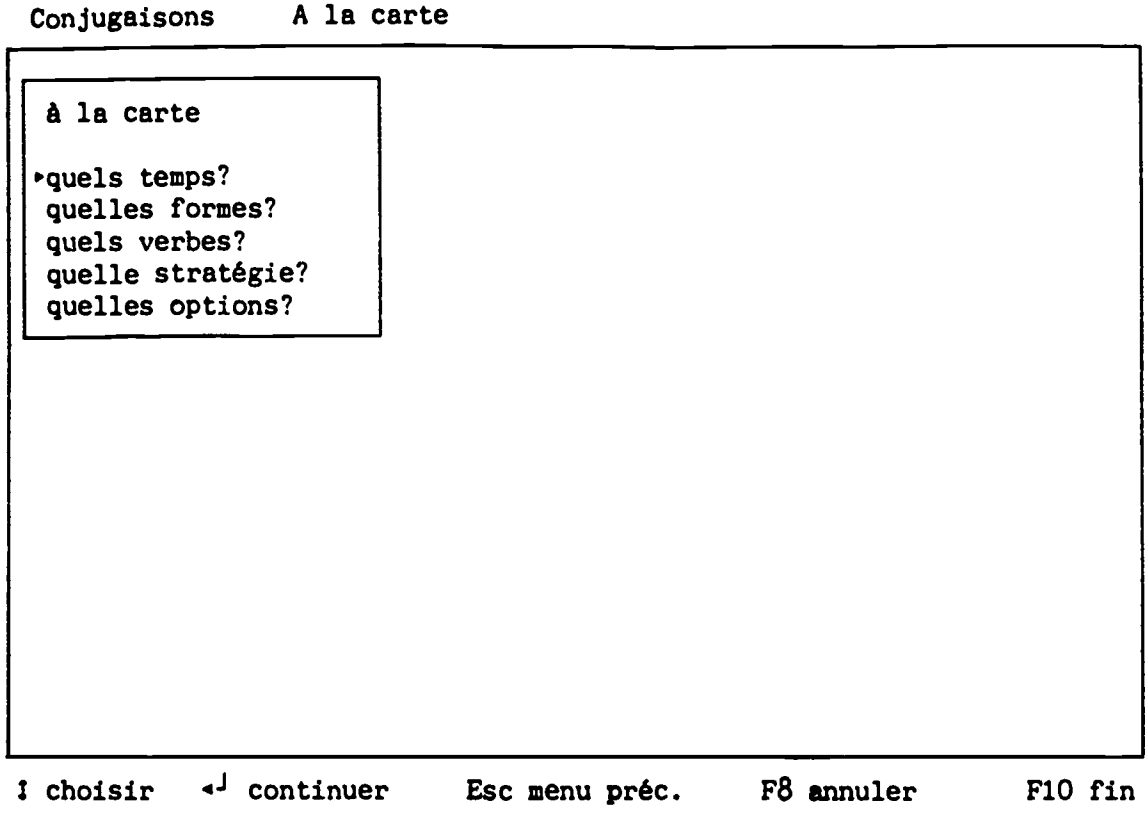
4.1. Basic menu

The disk loads itself and the first menu gives the following choice:

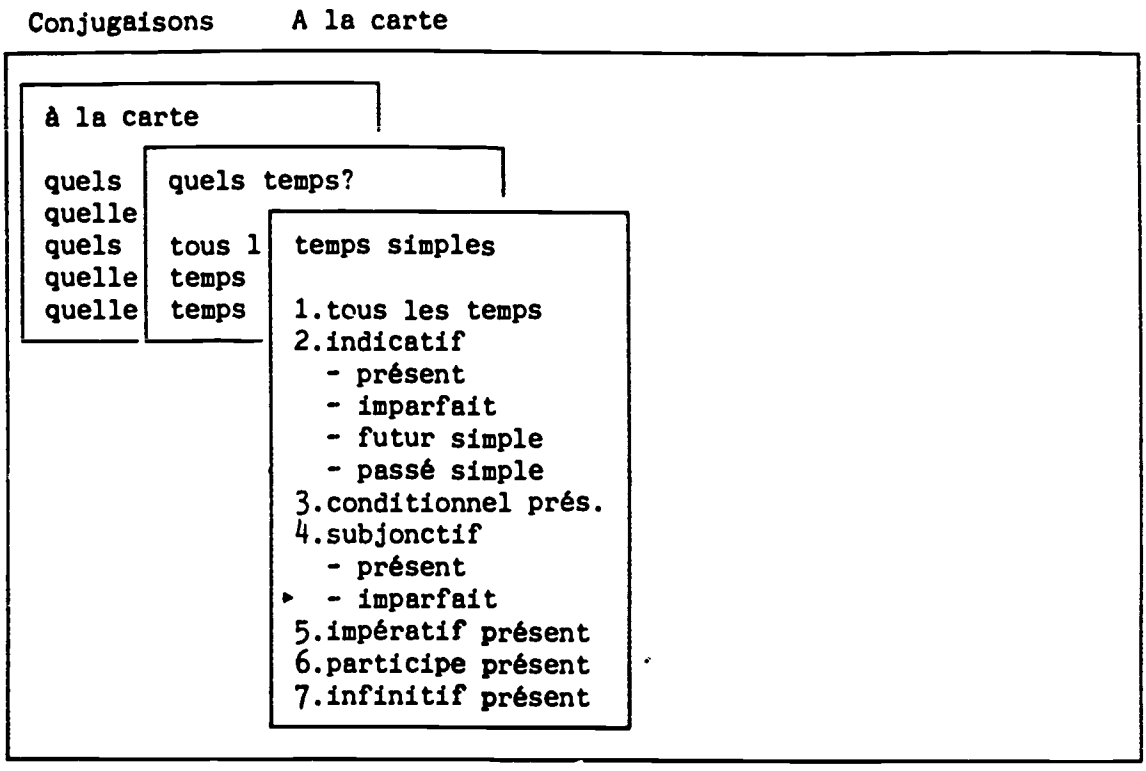
A la carte
Plat du jour
Buffet

In "à la carte" the user can make all the selections himself. This is appropriate for advanced students who want to work on particular areas or on a general review of the conjugations, which they define themselves at the onset. Any combination is possible. The selection-system allows to define any precise didactic unit, whether certain verbal types, specific verbs, particular tenses, etc. It is alo possible to enter only certain verbs through a selection called "votre liste".

The first "à la carte" menu presents the following choices:



A simple touch of the arrow-keys allows to open each possibility. Secondary menus superpose each other logically, allowing quick further selections:



"Plat du jour" avoids that the student must make these selections. Indeed, in most cases students will have to work on conjugations in direct relation to the material covered in their actual courses. The student will simply select "Plat du jour" and he will receive an overview of the lessons available, organized according to the teachers using the program, according to the various classes of each teacher, and according to the specific lessons planned for each class.

As soon as the student has selected his unit, this unit is composed from the database in a fraction of a second, exactly as the teacher has predefined it through using the easy "à la carte"-selections in a separate teacher's entry (cf. 4.3).

Finally, "buffet" allows to view any verb in all its forms: it functions like a grammatical manual that can be consulted.

4.2. Didactic strategies

The principle of versatility also allows to select various strategies at will: the display of the selection, the display of the conjugations selected, oral and written exercises, tests.

The display of the selected verbs still allows to discard unwanted verbs or to add other ones desired.

The display of the conjugations allows to run through the verbal system at will, using only the keys with the arrows and the enter-key.

Exercises are generated automatically according to randomization criteria. The user can define how many items he wants to do. "Help" is available in exercises: the conjugation-type of the verb requested is shown in an overlay-window.

A student can enter the testing from the beginning, after having made the initial selections. He can also interrupt the exercises at any moment, and enter testing. This allows the student to switch to testing, as soon as he feels confident enough. No "help" is available in testing and no reaction is provided when a wrong answer is entered. At the end of the test, the result is provided, together with an overview of items missed: the correct answers, plus the possibility to ask for a comparison with the error.

An immediate error analysis in written exercises and in testing allows to automatically generate specific remedial material, geared at the problems of the student. This is presented in "digestif", which appears in the main menu.

4.3. Teacher's entry

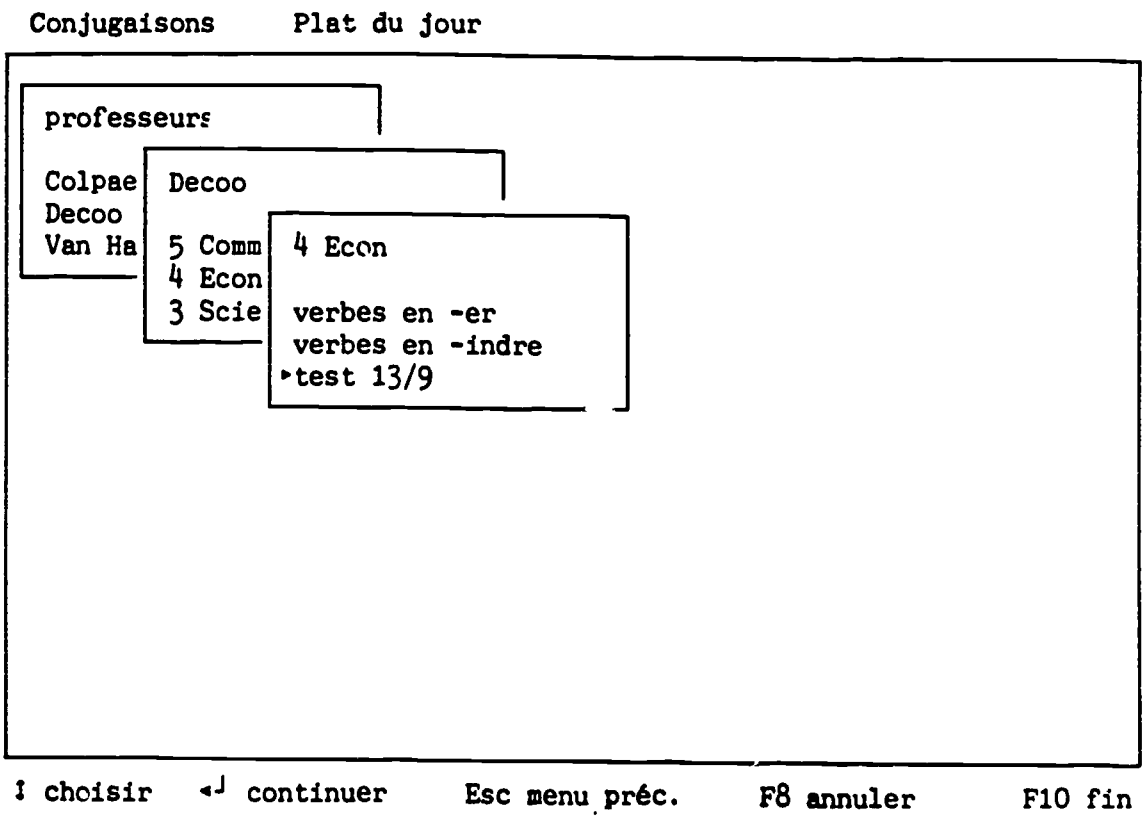
The teacher's entry is meant to quickly define the exact content for a particular class or student. It is the way to define the "plats du jour".

The teacher will first identify the unit by giving it a code, for example his name, the identification of his class and the week in the schoolyear or the chapter in the book. This code is the only thing the student will have to know in order to enter into the defined unit.

The same menu's as in "à la carte" allow to define the unit. The units thus defined can be changed, expanded or erased whenever the teacher wants to.

There is the possibility to automatically accumulate the pre-defined units for a particular class. It means that the teacher only has to identify, for a particular class, the new items that were studied in a particular week or chapter, and the program adds these to the items already seen.

Finally, the student will only see the following to enter "test 13/9" in class "4 Econ" by teacher "Decoo":

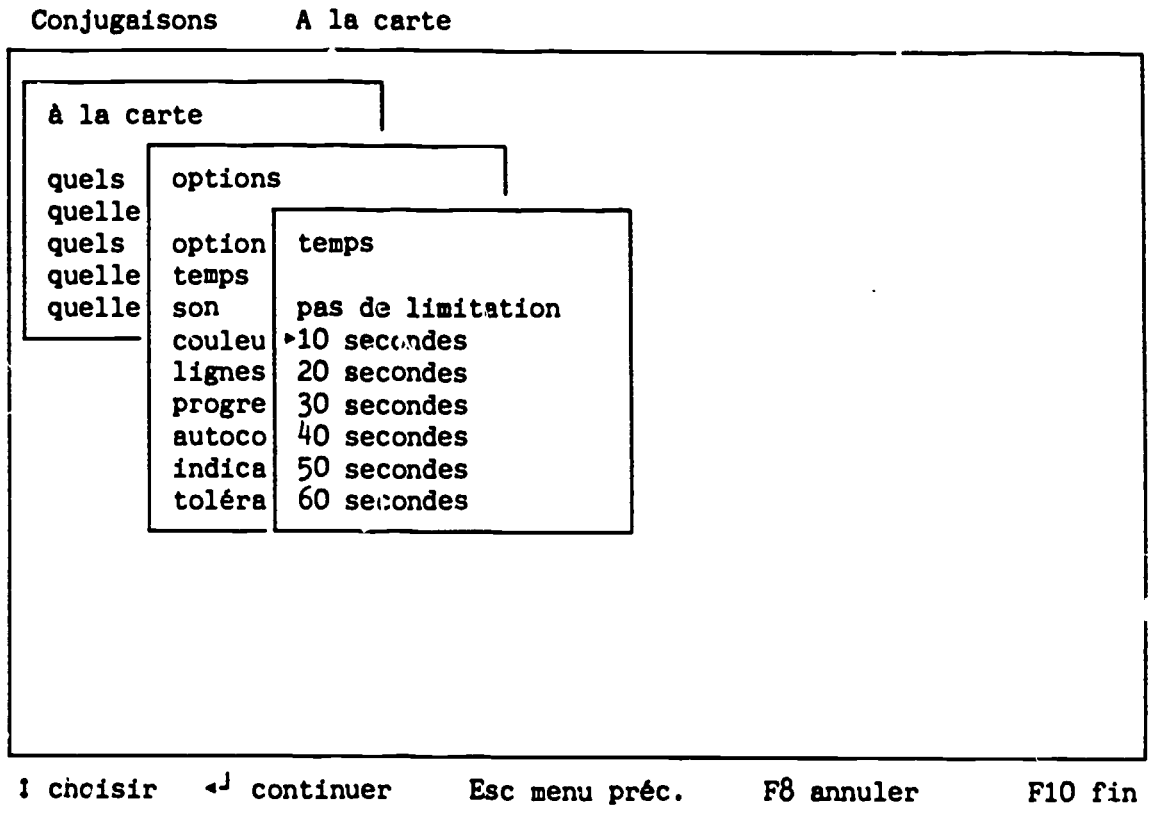


4.4. Supplementary options

The user can change a number of standard options, also by a simple menu-system:

- error latitude for one letter and automatic correction
- acceptance or not of orthographic tolerances
- timer in testing
- sound
- number of lines per screen
- indication or not of score

For example, the menus to select time-limitation in exercises or tests give the following:



4.5. Some other characteristics

- Ergonomy of user-interface
  - menu-system with overlay-windows
  - lay-out with reserves zones for indication of situation, dialogue-boxes, messages, function-keys
  - functional management of the screen
  - constant input-control

- simple starting and ending procedures
- availability of help
- supplementary options to change the format

- Programming efficiency

  - Pascal with combinations to Prolog and Modula 2
  - index sequential organization of databases
  - recursive procedures
  - comprimation procedures

- Didactic efficiency

  - emphasis on easy, correct and intense lingual experience
  - versatility in didactic formatting
  - application of efficiency criteria for integration
  - help to develop problem-solving procedures and auto-correction reflex

5. Conclusion

The selection-system is especially suitable for any learning content that works with clearly defined elements and expands these elements constantly over a long period of time. Vocabulary, conjugations, declensions, the use of prepositions are examples of excellent material that can be built into external versatility.

But even contextualized items can be placed in databases working with the same principles. Our Vocapuces is a program working with 4 500 contextual items and presenting and practising the complete "français fondamental" and Niveau-Seuil.

It is more difficult to apply when the material becomes broadly contextual, such as practising reading and writing skills in full texts. But even here, it is possible to generate practice forms based on databanks identifying the nature of content. Our Textapuces, developed within the Netherlands NIVO-project by OMO in Tilburg, is a typical example of the broader applications of a selection-system.

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