WHAT ONE HAS TO KNOW ABOUT METHODOLOGY IN COMPUTING

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ABSTRACT

In language learning we have to make sure that everything the teacher can do better than a computer program should be up to him or her. And we know that a lot of things in language learning and teaching can’t be done by a computer. But we assume that we know little or nothing about what the learners can do to improve their skill and competence, with the help of a learning program via the computer.

Teachers know a lot about teaching procedures, but learning procedure done individually seems to be a secret. Who can, for instance, answer the question sufficiently, how children learn words? The computer has its niches in language learning. We have to find out where they are and what we have to do to fill them.

This paper depicts such niches where the computer has its strength to assist a teacher and can do its utmost in the developing of individualized courseware.

INDIVIDUALIZED LEARNING

A computer can have a variety of functions in the learning of a foreign language: it can be used as a preparation for new material or as a reinforcement of work already done in the classroom.

It can also be used in various phases of language learning; in the presentation of new material, in working with the language and in applying it to new situations. However, it offers greater opportunities to the individual learner for individualized learning than in the normal classroom context. Furthermore, continual reinforcement of the learning
process, as well as specific checks on progress and the correction of errors, together with repetition and revision when necessary, can be built into the program. The program might even contain an element of evaluation, including assessment for the prevention or avoidance of mistakes.

The learners have instant and immediate access to the computer’s enormous memory. The computer is also infinitely patient and persistent and, although its dispassionate indifference may sometimes irritate, the learner remains totally in control. He can persevere, making use of every aid and assistance the computer has to offer, until he has achieved success or he can give up and switch the “damned thing” off.

In language learning we have to make sure that everything, the teacher can do better should be up to him. And we know that a lot of things in language learning and teaching can’t be done by a computer.

But we assume that we know little or nothing about what the learners can do to improve their skill and competence with the help of a learning program via the computer technique.

Teachers know a lot about teaching procedure, the learning procedure, done individually is a secret. Who can for instance answer the question sufficiently how children learn words?

The computer has its niches in language learning. We have to find out where they are and what we have to do to fill them.

The following depicts such a niche where the computer has its strength to replace a teacher and can do its utmost in the developing of intensive reading to extensive reading.

DEVELOPING THE INTENSIVE READING SKILL

Everybody needs to be able to understand more than he can express in the foreign language in order to be able to survive linguistically in everyday situations. The transmission of cultural knowledge takes place via receptive skills, in particular, through extensive reading, undirected silent reading. However, we cannot take it for granted that every pupil is capable of reading extensively nor can we assume that the ability to read and understand his mother tongue is necessarily a benefit to him in his
learning a foreign language. The ability to read extensively, even in one's mother
tongue, is not as highly developed in the majority of the population as it is sometimes
supposed. Furthermore, there are particular difficulties when it comes to developing
reading skills in a foreign language. One way of developing extensive reading skills is
by developing intensive reading. By intensive reading we mean a complete detailed and
complex comprehension of a foreign language text arrived at through directed silent
reading.

LEARNING SEQUENCE 1:
READING PERIOD WITH EXPLANATIONS

The learning program CHOPSTICKS consists of four learning sequences. A MENU
displays to the students the various options they could choose (Screen 1).

![Screen 1]

Note: Here, individual learning means that the learners must get all the information they need
to do their job. So they have to know e.g. (1) which keys they have to use, (2) where to find the
keys they have to press, (3) what aims they are supposed to reach, and (4) what content they will
be faced with. The line in bold print is blue colored on screen. If =>[ENTER] is being pressed,
this learning sequence becomes visible.
Screen 2 informs the learners about the name of the program, who it is produced for, the authors and the place where the program was generated, and some legal necessities.

**CHOPSTICKS**

A learning program for students after four years of English language study
by Reinhard Schulz with the assistance of Ying-Ju Peng and Connie Miller

Program generated with CALIS, Computer Assisted Language Instruction System,
(C) 1992 DUKE University, Durham 27706, Humanities Computing Facility

Press -> [ENTER] to go on.

Screen 2

On the next screen (Screen 3a) students have to read the information pertaining to the whole lesson along with hints. They will aid and guide the students through the program.

**Some remarks to the monolingual approach**

The program "chopsticks" is monolingual in so far as all instructions and assistance are given in the foreign language. All assistance, however, from the meaning of a single word to the full and complete translation of all instructions into the mother tongue can be obtained merely by pressing the appropriate key or typing the appropriate characters. Therefore, should the information concerning the program itself, the instructions for the exercises or the tests prove too complicated, or should the vocabulary explanation prove insufficient, the learner can always call up a full translation (Screen 3b).
Information

This program about 'chopsticks' was generated to make you familiar with the English register of using chopsticks. You will be asked to read a text and to do some keyboarding and pressing keys to get the explanations. Afterwards you'll get some tasks having to do with the new words and phrases. A test will show your language competence.

IF you can't remember how to edit a text, press [Alt], hold it down and press ➔[F1], and you'll get the EDIT HELP. Try it!

IF you need the entire word explanations, then press [Alt][F2].

IF you can't remember how to get help, look at the bottom line.

FINISHED? Type ➔ y and press ➔[ENTER].

Screen 3a

Information


Falls Sie sich nicht an den Text erinnern können, drücken Sie [Alt], halten Sie gedrückt und drücken auf ➔[F1]. Sie erhalten dann die Editierhilfe.

Falls Sie die Worterklärungen benötigen, drücken Sie [Alt][F2].

Falls Sie sich nicht an Hilfen erinnern können, schauen Sie auf die unterste Leiste.

FINISHED? Type ➔ y and press ➔[ENTER].

Screen 3b
Some remarks to the monitor display

Experience has shown that there is an optimum layout on the monitor screen for enhancing comprehension and readability:
- to facilitate comprehension, the text should be presented in sections of not more than 15 - 17 lines in length;
- each line should contain about 50 characters so that the learner only needs to cast his eyes to the right 1 1/2 times during reading and can easily proceed to the following line;
- to prevent irritation, the student must be told what to do to follow the instructions to the program in an easy way, so:
  (1) messages to the students,
  (2) responses to students’ answers appear in reverse video, both in monochrome display and in color display,
  (3) student responses appear in monochrome highlighted, in color in light yellow,
  (4) if students give up, the response appears underlined in monochrome, light green in color display,
  (5) there is only one message on screen to be followed as far as the routine of the program is concerned,
  (6) the number of messages the learning program uses is limited to three.

When students have typed = > y and pressed = >[ENTER], they will begin their reading sequence by entering the marked word or words (e.g. /cuisine/) and getting the contextual explanations pertaining to the word or words. In the learning sequence, the words set between slashes appear in bold print on monochrome display, and light yellow on color display (Screen 4a).

If students type in a marked word or words (e.g. = >Chinese cuisine), the explanation appears in the line of the text just below the marked word or words.

Once finished, students leave the reading sequence by typing = >y and pressing = > [ENTER], and then go back to the MENU to choose Sequence 2, Inferencing (Screen 4b).
If you do not know the meaning of a marked word or word group (e.g. \textit{\textless cuisine\textgreater}), just type it into the computer. Give it a try now and type \textit{\textless cuisine\textgreater}.

/Chinese cuisine/ is /famous/ the world over. So is its ever present /adjunct/, the /chopsticks/. They are a /familiar sight/, everywhere Chinese food is eaten. Chopsticks let you /prod food/, /stir it/, /pick it/ up, /squeeze it/ and /haul it/ out of the pot /with ease/. What's more, they're all you ever need at the /dinner table/. The /Western counterparts/ are the /knife/, /fork/ and /spoon/. They often need each other and /require both hands/ to /come into play/. In fact, the use of chopsticks is not just a /dining-skill/, it's also a window into /Chinese culture/.

Type in word or word group: \textit{\textless cuisine\textgreater}.

If finished, type \textit{\textless y\textgreater} and press \textit{\textless [ENTER]\textgreater}.

Screen 4a

If you do not know the meaning of a marked word or word group (e.g. \textit{\textless cuisine\textgreater}), just type it into the computer. Give it a try now and type \textit{\textless cuisine\textgreater}.

\textbf{Chinese /cuisine/ is /famous/ the world over.}

\textbf{Chinese cuisine: a style of cooking in China}

Chopsticks let you /prod food/, /stir it/, /pick it/ up, /squeeze it/ and /haul it/ out of the pot /with ease/.

\textbf{......}

Type in word or word group: \textit{\textless Chinese cuisine\textgreater}.

If finished, type \textit{\textless y\textgreater} and press \textit{\textless [ENTER]\textgreater}.

Screen 4b
Some remarks to the vocabulary

Thus, when the learner calls for assistance with the vocabulary, he sees the word in its usual collocation and/or in the context in which it is to be found in the reading passage. There follows an explanation in English which defines the word in relation to its context, where necessary, with its denotations and/or connotations. Therefore, the learner will see, for instance, not only the word "cuisine" or the word "Chinese," but "Chinese cuisine."

Learners are reassured by the fact that they are able to get such lexical and semantic assistance even during the exercises or tests i.e. there must always be a key reserved especially for lexical assistance even during structural exercises.

If, after calling up a word and having read through the explanation and definition in English, the learner wishes to have a translation of the word or an explanation in his mother tongue, he has merely to press the key indicated in the display on the monitor screen. Even cultural and literary background information can be stored in the same way. This requires, of course, a permanent up-dating of the information.

Searching for such information in reference books or looking up such an enormous number of words in a dictionary would take up very much more time than merely pressing a key or two on the computer keyboard.

Furthermore, the explanatory word definitions given by the computer program, whereby the word is explained in its context, are of much more value to the learner than all the definitions contained in the dictionary. An explanation which is relevant to the passage being read and within the language capability of the learner can be more easily understood and assimilated than any complex dictionary definition.

Experience has shown, too, that young people have an aversion to dictionaries and, in looking for the meaning of a word among the variety of definitions, tend to seize upon the easiest explanation or the one that has the most familiar ring to it, regardless of the original context.

Never before has there been such an opportunity to widen one's vocabulary through contextually and situationally based words. A variety of vocabulary exercises can be undertaken based on "sensible guessing" and inferencing which allow the learner to derive the meaning of words from their context. Since the learner always has access to the computer's "word memory," less account has to be taken of the learner's own "word
memory" when devising exercises. Thus the exercises themselves can be of higher linguistic level. Here the traditional reading patterns are brought together with the most up-to-date technological aid in such an efficient and meaningful way that even the greatest sceptic amongst the teachers will have to recognize the superiority of the computer in this area of language learning.

It is, of course, impossible to anticipate accurately the vocabulary needed by an individual learner in order for him to be able to understand immediately what he reads in a foreign language.

Therefore, the precipitated number of words to be explained and translated has to be as wide as possible. The extent of the then anticipated vocabulary cannot in any way be determined in proportion to the length of the text but must simply contain all the content words, except those in daily use in the lessons, and even those structural words not in daily use such as though, although, nevertheless, obviously, meanwhile, etc.

LEARNING SEQUENCE II: SPEED READING AND SPELLING

The second learning sequence has to do with speed reading and spelling. The aim of this sequence is to strengthen the students' reading and spelling skills. As a starter, the students are informed what to expect and what to do (Screen 5).

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**SPEED READING AND PROPER SPELLING**

You’ll read a text of which some words will start blinking and will disappear after some seconds. Your job is to retype the exact words in the blanks.

Don’t forget to use ↑ when you will have to rewrite something.

If you can’t remember some words, press ➤[Alt][F5].

Press ➤[ENTER] to go on.

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*Screen 5*
Then the students are asked to retype the blinking and then missing word or words. (e.g. = >/cuisine/ was the first word to be retyped. Now the missing word = famous has to be rewritten (Screen 6).

Note: At any time students may get help by pressing the appropriate keys shown at the bottom of the screen and/or in the margins.

Once students have completed the sequence, they are taken back to the MENU and guided to the third sequence which provides some tasks in inferencing.

![Screen 6]

To achieve complete comprehension

After the initial reading phase, it is necessary to establish comprehension of the passage, both in general and in detail, since, in every language learning process, comprehending plays a vital role. In order to achieve complete comprehension, one either has to know the words already or to be able to derive their meaning from their form, their word fancily or their context; in order to recognize speech intentions, one has to be familiar with the speech registers appropriate to the situation.

Cultural and historical background and a knowledge of important persons as well as topical current affairs are often necessary for grasping and comprehending the language used in any particular situation.

Deductive understanding can only be achieved when the preconditions for drawing conclusions are granted and critical understanding is achieved when one's own previous and current experience of life is brought into play in comparing and contrasting.
The computer can be of enormous help in the comprehension of a foreign language text because it can store not only grammatical, lexical and syntactical explanations but also topical and historical facts and constantly up-dated information of all kinds which is immediately accessible.

Further assistance is offered by a wide variety of multiple-choice answers which provide an opportunity not only for a superficial, situationally based understanding but also for deductive and critical leading to the drawing of conclusions and the expression of personal opinions.

The teacher who compiles the program must be constantly aware that there must be some kind of dialogue or interaction between himself and the user of the learning program if the program is to be accepted by the learner.

Therefore the instructions, tasks, and exercises must be clear and unambiguous. A simple RIGHT/WRONG or TRUE/FALSE response to the learner's attempted answer to a question should be used only rarely and then only for particular true/false type question. A variety of different answers with varying nuances can be given, ranging from: "Well done," through "I'm afraid that's not close enough." to "Good heavens! You'd better read the text again. There's a better solution." In other words, feedback and reinforcement are not to be seen as a deterrent but as a polite and friendly encouragement to go on or to try again. An occasional humorous remark or solution can stimulate the learning process.

After the initial text passage has been read, one or more times as required, and the text reception phase has been completed, there follow a number of tasks and exercises designed to check on the learner's understanding of the content. This can be done by means of multiple-choice questions to ascertain both gist and detailed comprehension. But there are a variety of other types of tasks and exercises for checking comprehension such as scanning (answers to questions having to do with the persons and event of the text), c-exercises and c-tests, cloze-exercises and cloze-tests, gap filling, reconstruction exercises, and multiple-choice exercises.

Then comes the most difficult part of the learning program which uses this reading comprehension as a basis for the drawing of conclusions, and the forming of attitudes and opinions and which attempts to impart techniques required for the interpretation and appreciation of literature. In order to achieve this, the program must contain a section in which the learner is led towards an interpretation of events and to conclusions about the characters appearing in the passage.
There can, of course, be no inter-communication between the learner and the computer but a kind of interaction between the author of the program and the learner is possible in so far as a number of different interpretations and opinions about the passage can be presented which allow the learner to draw his own conclusion or to reconsider his own point of view. This can be done by means of an elaborated multiple-choice task.

In such an individualized learning process, it is necessary to use the closed or half-open type of task and exercise, since open-ended questions require discussion and argument — and for this the computer is not the appropriate partner.

**LEARNING SEQUENCE III: INFERENCING (SENSIBLE GUESSES)**

After students have chosen the sequence, they will be shown directions for content and routine work. Students have to find a word or words from the text corresponding to a given definition and type it/them in (Screen 7).

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And now for some inferencing

An inference is a conclusion that you make about something by using the information that you already have.

Now you have to make a sensible guess as you are given a definition from which you have to find the corresponding word/s in a text. You cannot skip a task.

=>[ENTER] to go on.
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If students type in the appropriate answer, they’ll get a reinforcement and can then continue their job (Screen 8a).

If students type in = >cuisine, which is only part of the solution because the definition was "style of cooking in China," they’ll get the response seen in Screen 8b.
Chinese cuisine is famous the world over. So is its ever present adjunct, the chopsticks. They are a familiar sight everywhere Chinese food is eaten. Chopsticks let you prod food, stir it, pick it up, squeeze it and haul it out of the pot with ease. ...... etc

**Good, Chinese cuisine.**

#1 Find the two words corresponding to the definition below.

**Definition:** style of cooking in China

Type in the corresponding words → Chinese cuisine

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Chinese cuisine is famous the world over. So is its ever present adjunct, the chopsticks. They are a familiar sight everywhere Chinese food is eaten. ...... etc

**It was asked for the style of cooking in China. One word is missing. So you have to try again.**

**Definition:** style of cooking in China

Type in the corresponding words → cuisine*

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Screen 8b: cuisine* = > only half of the solution
Spell checker as a means of corrections

A spell checker helps the students to find the source of their error. When something, such as *famos*", is wrongly spelt, the answer appearing above the wrongly typed word is seen in Screen 8c (*famos = famous*).

![Screen 8c](image)

Reinforcement, Evaluation and Correction

It is, of course, necessary to establish that learning has taken place, to check on the results and to correct errors. This is especially important in the individualized learning process since this can only be done via the program itself. Every exercise task and test has a confirmation stage e.g. in gap-filling exercises by the insertion of the correct answer or by the right/wrong solution appearing on screen. With multiple-choice questions a number of responses are possible, ranging from a simple "right" or "wrong" on statements of facts, to explanations and references back to the text on the more complex questions.

The learner is able to correct his work by typing in or by selecting another answer. If the learner is unable to find the correct answer, he can, as will be indicated on screen, call up the solution by pressing a key; the problem of spelling is also dealt with since the correct spelling of a word can be obtained by pressing a special key. While doing these tasks, the learner has unlimited access to these solutions. However either or both keys may be blocked during specially designed tests. The results of such tests can be obtained through a special assessment routine built into the program.

If the teacher has access to the "author program," he will be able to devise his own tests and exams according to his own teaching plan.
LEARNING SEQUENCE IV: CHECKING, A CLOZE TEST

Sequence III finished, the students will be taken to the last and final one by checking their language competence (Screen 9a).

In this learning sequence students will have to enter missing words taken from a fist and reconstruct a text. A surprising addition, a play on words follows, in which students have to find words which do not match the corresponding text in Screen 9b.

Note: Because it is a test, no language help is given.
But the student is provided with some content help. At any time this help can be accessed by pressing \(=>1\) and \(=>\text{ENTER}\) (Screen 10).

The cloze procedure and the surprising addition above are more than just filling gaps-exercises or picking and correcting mistakes. The contextual, monolingual, and situational approach, and the ever present adjunct, the content and language help (i.e. spell checker, the students can receive by just pressing an appropriate key,) encourage the students to develop their competence in the foreign language.

**THE END: A CUMULATIVE SUMMARY**

A cumulative summary appears at the end of the learning program. The students learn how many attempts they have made, how often they have given up and whether they have completed their lesson successfully or not (Screen 11).
EXTENSION

After the program has been correctly worked through, the learner should be able to express his opinion on the events and characters portrayed in the reading passage and to be able to write down his views and opinions and to justify them. A word-processing program will be of value to the learner here, enabling him to write a precis, a summary of the contents, character sketches, an outline of the plot and even criticism of the text. This work could be printed out for the purposes of classroom discussion, thus stimulating both written and oral expression in the foreign language.

How much time should be devoted to the reading program?

There are no hard and fast rules about how much time should be devoted to the use of the learning program. It is intended for one or two learners working on their own and the extent of its use in school is entirely in the hands of the teacher. In the group referred to in this paper, the seven programs were spread over a period of two school years in which the group had one extra lesson per week.
The instruction began with a period of "getting to know the computer" in which various vocabulary and test programs were used, all dealing with particular and discrete aspects of language, during which, however, the keyboard skills for the computer and the user skills for learning programs were acquired. Then gradually, in terms of the length and quality of the content, the more complex intensive reading programs were introduced.

The time devoted to a learning program in the language teaching curriculum will vary according to the function it is to serve within any particular teaching unit. As a rule, this should not exceed one third of the total time allowed for a particular unit, excluding, of course, the time spent by the individual learner working with the program at home or in free periods at school. Free periods are especially useful in providing equal opportunity for practice to those pupils who do not have access to a computer at home.

**AUTHOR'S BIODATA**

Reinhard Schulz is a retired Principal of a Secondary School. He also used to be a Supervisor at a Language Teachers' Seminar and a Lecturer of Methodology in ESL (English as a Second Language) at Dortmund University. He is still Member of the Board of Bilingual Teaching and Learning at the Kultusministerium in Düsseldorf, North-Rhine Westphalia. He was a Charles E. Culpeper Visiting Scholar in Modern Language Computing at Duke University in 1992 where he contributed strategy, methodology and content to a Summer Seminar for students from a variety of countries in addition to the U.S.

Reinhard Schulz wrote a series of textbooks and accompanying listening and watching exercises. Of these he adorned four textbooks with full electronic datasets written on the TextCALIS platform. His current interests include composing listening exercises based on TextCALIS/WinCALIS Language and Soundblaster.

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