

COMPUTER ASSISTED LEARNING READING AND LANGUAGE SOFTWARE

Paraskevi Mentzelou

Alexander Technological Educational Institute (A.T.E.I.) of Thessaloniki
P.O BOX 141, Thessaloniki, 574 00-Greece
E-mail: hellenic@the.forthnet.gr

Abstract

The question that occupies the educational community of the elementary school is based on how to use computers in order to assist during early stages of reading the "weak students" or the students who don't have the school language (Greek) as their first language. Teacher may use the computer either for teaching or for testing the students or for both of them. The student may use the computer either as an information source or as communication mean or as learning tool. The support for students who are having language reading difficulties is a necessity and every mean that can offer it to them must be hired towards to this direction. Computers are the one of the most appropriate mean due to their abilities can offer to children a medium for learning and practice in places and time chosen by them. But can be achieved only when the appropriate software according to their needs is operated.

This study deals with the development of educational software which aims to assist the "weak students" during their initial reading stages. It is an integrated language learning system [ISL]. It follows the curriculum sections, supports learning theories and its evaluation takes place in this framework. This software application has the main program and two auxiliary programs, the student program and picture-word update program. The main program contains six distinct parts: tutorial, words reading, grammar, syntax and glossary and the child chooses which part of the program wants to work with.

1. Introduction

Studies and researches based on learning with computers have already given strong indications that computers can improve the education outlook dramatically, as they can influence children's education and development. Carefully designed software can show to students how to learn more efficiently.

The level, up to which Computer Assisting Learning can influence learning through its effect on motivation and attitude to work, is its of great importance. While many would agree that technology is changing the way we live, the classroom remains one place, in which we are still struggling to take full advantage of technology's power.

Indications concerning children's benefits based on the difficulties that they are facing during the reading process are presented in a study that has been taken in Israel during 2000. In this study 46 aged 5-6 years old children took part where all of them had reading difficulties and the influence of computer-assisted instruction – (CAI) for word reading, letter naming and letters has been studied. Students' performance has been measure prior and after the use of educational software and the results indicated that these children have achieved a considerable progress in the reading sector [1].

Integrating learning systems falls in the category of educational software which manages curriculum delivery. Its differentiation from the other curriculum educational software is that it includes a record system [2]. In such a system the curricula is being delivered to students so students are having personal work programs for certain period of time which can be between weeks or months. An ILS constitutes of three basic parts:

- the content of the class curricula and this consists of a tutorial part, the drill and practice part and the evaluation part,
- a student record system which keeps information for each student and writes down its performance,
- a management system which binds and controls the data flow and it could achieve the following operations:

- interpretation of students responses in the current activity,
- update of students records,
- selection of the curricula path,
- delivery of the proper learning parts.

The current work deals with the development of educational software which target is to assist the students that they present reading difficulties during the beginning of their reading. It is widely accepted that and if a child cannot make even a modest start in reading by the age of seven, then this child is at educational risk [3]. Effective educational software for reading has to combines a number of individual activities in a harmonic prototype which:

- satisfies curricula parts,
- supports learning theories
- its assessment falls in this infrastructure [4], [5].

2. Basic Principals of Educational Software

There are five basic principals that have to be followed during the creation of computer reading instructions [6]. During the creation of reading software the instructions that constitute followed the rules:

- concentration to the meaning with emphasis to content understanding,
- active participation and critical thinking
- support and expansion of the reading content
- use of a wide range of subjects,
- linkage between reading and writing.

In general, reading software has to offer to students texts that are meaningful ones. In cases where word learning is taking place students have to work with software words have to be presented through a combination of picture and sound or through any other meaningful manner and also to analyse its structure. In accord students should have the chance through software to apply the skills that have been taught. The software has to be according to their intellectual level of development, interests, previous experiences and finally the software aim has to understandable to them. Finally the use of software in classroom does not have to operate as an independent learning mean but as a mean of the whole student's learning process.

Immediate feedback is the strongest advantage that the computer has over traditional teaching methods because the child gets an immediate correction and a chance for retention of the correct information. With a computer, the child is in charge of representation and can exercise options at his discretion. There are four types of computer feedback:

- *Judgmental*: when it just shows to a child that his response is correct and in many cases these computer programs do not explain why a response is incorrect.
- *Corrective*: when it indicates errors and it uses error correction procedures. Usually these procedures are asking repetition of the current exercise or responses to similar ones.
- *Congratulatory*: when there is an addition of motivational graphics, sounds and verbal encouragement and in this last case where it is possible to include corrective graphics or voices then the child may deliberately give incorrect responses.
- *Intrinsic or judgmental*.

Furthermore, when all of the above characteristics are included in educational software then this type of software provides an effective feedback and it also keeps the child's interest. Finally, a child is able to connect feedback with his response only when it is well structured. [6].

Nowadays, software development in programming, languages, techniques and tools help to solve new classes of problems. Consequently, software design and implementation fills the gap between the machine and the end user and, prior to its design and implementation process, there is a need for the comprehension of the user application needs or the user environment. [7].

The role of teachers is important during the educational software design and evaluation process because they have the classroom's experience; they can assist to advance the curriculum and the teaching and learning strategies [2]. Accordingly, computers can enhance and support the learning process only when:

- programmers and teachers are working together for the design and evaluation of the educational software,
- teachers know how the technology operates and what the technology can offer to them and they are using them as educational tools.

The educational software differs in instructional methods, degree of students involvement and mode of delivery and it can be formed in six modes of delivery: drill-and-practice, tutorial, educational games, demonstrations, simulations and problem solving [8].

3. Description of the Software

In this educational software emphasis was put to elements such as interactivity, functionality, learner control and cognitive load. These are central considerations in designing an interface because interface design creates and embodies the form, the functions and the processes of learning as it acts as a link between the learner and the learning material [9], [10]. The proposed learning reading model is a serial one [11].

*Learn material A → Recall A and learn related material B →
 Recall AB and learn related information C → Recall ABC and learn D (and so on).*

The Application's Context Diagram and criterion of success are in figures 1 and the criterion of success is presented in Table 2.

10 correct responses	→	big reward (animation)
9 correct responses	→	small reward (static)
8 correct responses	→	no reward
3 consequently errors	→	repetition of the current stage
4 overall errors	→	repetition of the previous stage
3 repetition of the process	→	next time

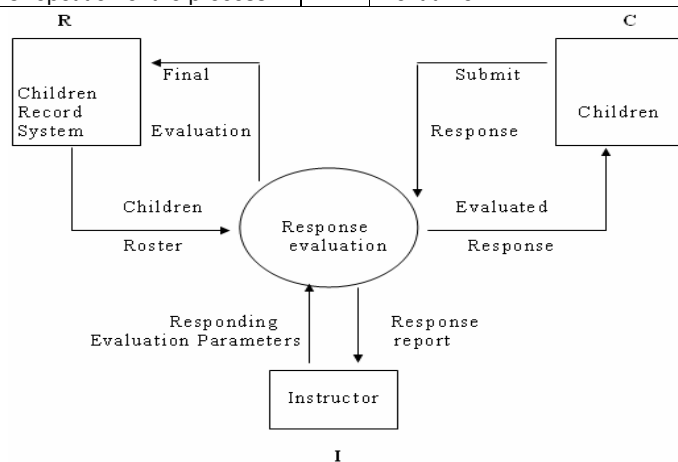


Figure 1. The Application's Context Diagram

Table 1. Criterion of success

3.1 Program description.

This software application consists of *the main program* and two other ones, the *student database* and the *update program*.

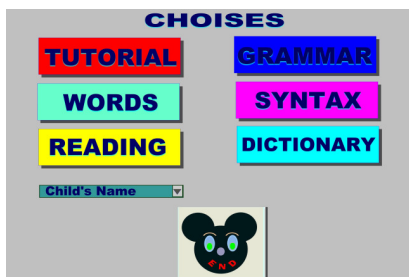
- *Main Program.* The parts of the main program are six: Tutorial, Words, Reading, Grammar, Syntax, and Dictionary and prior to the program operation the child has to be enrolled to the program.
- *Tutorial:* familiarizes the child with the use of the mouse and with the program's operation.
- *Word:* introduces the child to the word identification process (whole-word-method).
- *Reading:* introduces the child to the reading process.
- *Grammar:* introduces the child to its language's grammar. There is a separate section for each grammar part.
- *Syntax:* introduces the children to the structure of the simple and complex sentences. There is a separate section for each syntax level.
- *Dictionary:* contains the program's words. The child accesses them by picking with the mouse the word's letters and the corresponding picture appears on the screen (Figure 2).

Student Database.

The *Student Database* contains the records of each child (name, date, part of the program that has been involved, repetitions, time spend on the task and the number of right or wrong responses. Statistical analysis may give indications to parents or educators to identify if there are language problems to a particular child and to assist this child. (Figure 2).

Update Program.

The *Update Program* is a database connected with each section of the main program except the tutorial. All the parts of the main program maybe updated according to the child's needs (Figure 3).

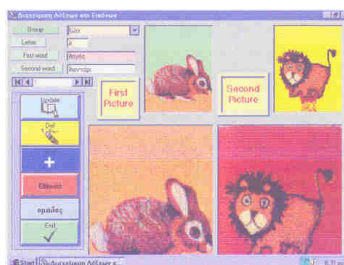


The Programs main screen

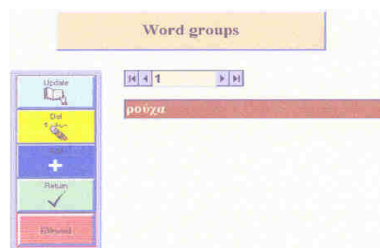


Children's database

Figure 2. The main screen and the student database



Word's management screen



Word groups management screen

Figure 3. The Update program screens.

3.2 Main Program Parts

Tutorial Part. The child learns the program operation (Figure 4).

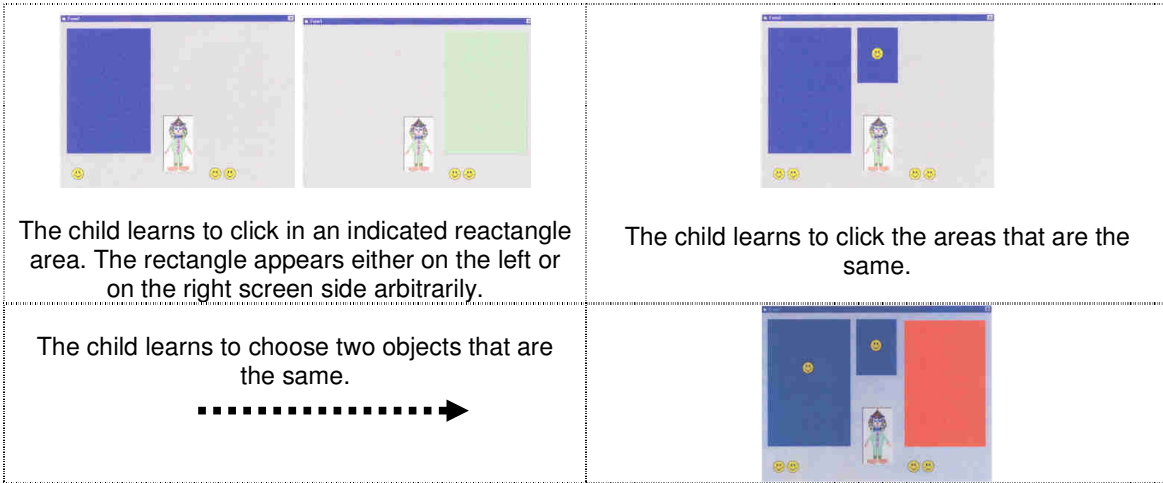


Figure 4. The Tutorial part screens

Word Part.

- *Learning:* Introduction first a picture and then the corresponding word and vice versa.
- *Consolidation:* Word identification and connection with its corresponding picture and vice versa. In this way contiguity, familiarity and imagery appear. Consequently, the child is able to recognize the subject automatically and to connect it with its corresponding meaning (Figure 5).
- *Testing* (Figure 6).

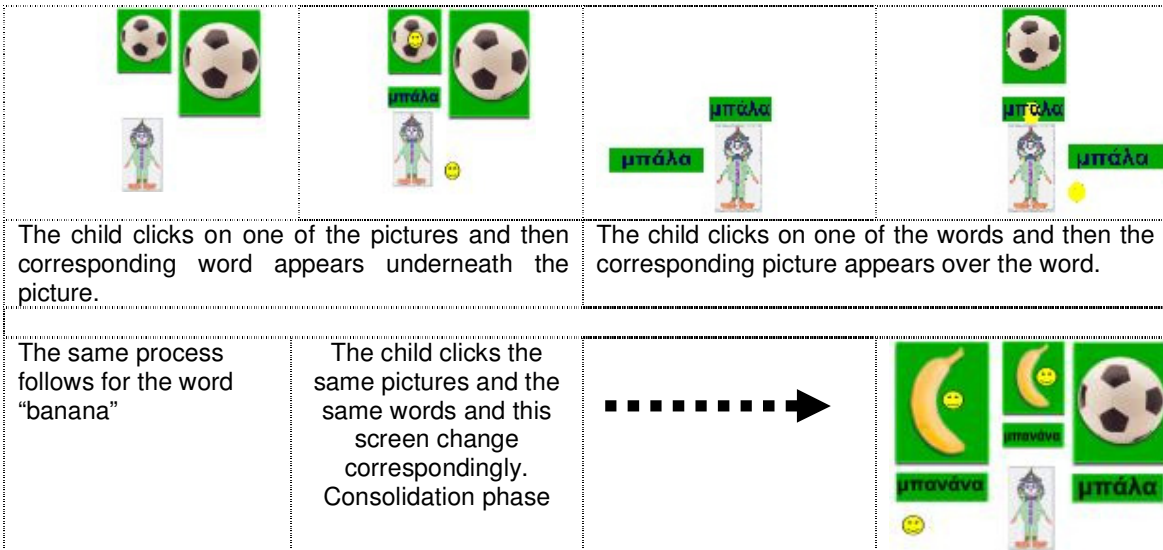


Figure 5. Word learning process



Figure 6. Word testing process

Reading Part

Next movement is to split the known words into their syllables and then to integrate these syllables to form the corresponding words. Always the words are with their corresponding pictures, and in the case

of a noun, by its corresponding article. The articles are with a picture, which declares the gender of the noun. Next comes the splitting of the words into their corresponding letters. First the word will be split into its corresponding syllable and then into its corresponding letters. Then the letters integrated into their syllables and then the syllables integrated to form the word. Similar processes are taking place for learning rest of the Greek language features.

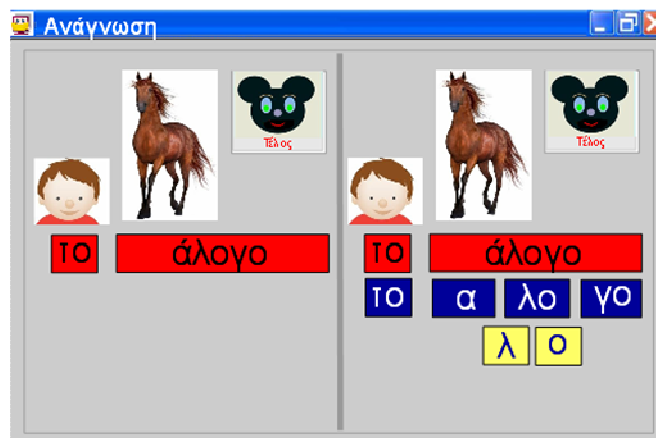


Figure 7. Screen of the reading part

Program Evaluation and conclusions

The program tested with twenty children (aged 4-5 years old) where ten of them were "poor readers" difficulties and ten of them were "good" readers children all of them were kindergarten students and none of them knew to read. The operation lasted seven months. The design of the research was trying to be as close as possible to true experimental method. Statistical analysis of the collected data showed that the differences between "poor" and "good" readers have been eliminated during time spending on process and also there was a clear correlation between the amount of time spending on the task. This suggests that the system will have a considerable positive effect if the "poor" readers can use it either prior of their entrance in the first class or during the first class of the elementary school.

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