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DEVELOPING DIGITAL COMPETENCES USING AN EDUCATIONAL SOFTWARE. A PEDAGOGICAL RESEARCH

Ioana Magdaş, Timea Bontea

Abstract: Many teachers and people in educational institutions consider it necessary prepare children for living in a computerized society. The Internet offers an incredible number of opportunities for teachers. The Web offer of e-learning open source platforms reached an impressive configuration. In this article, we present an educational software for developing digital skills conducted on the open source platform Moodle. The educational software has been developed for the grade's XII students of a technical profile. It covers the unit Databases, namely, the Access application. The contents are particularly adapted for the students of Technical Colleges. We will also present a pedagogical research that demonstrates effectiveness of such an approach. We conducted the research at Technical College "Iuliu Maniu", Carei, Satu-Mare County. The research hypothesis was: *Using a software to develop skills of using Microsoft Access application leads to much better results among students from technological high-schools*. Our research proves that the use of an educational software and computer assisted instruction in teaching and learning contributes to a significant increase of efficiency of education.

Key words: educational software, Moodle, Access, digital competences, pedagogical research

1. Introduction

Many teachers and people in educational institutions consider it necessary prepare children for living in a computerized society. For this purpose it is necessary to prepare first the teachers. The question is who should be the content of this computer training for teachers in primary and secondary schools. Addressing educational information for teachers varies widely: from technical issues in computer purchases, the study of computer science and literature. Existing computers in schools bring many new possibilities. Users (teachers and students) can use computer programs individually and they can influence others in this regard. It depends on each user that computing will only be passive (for photos, texts, movies or music) or if it is use in a constructive way for independent learning. A traditional model of professional education is not appropriate. Development of information technology, and particularly multimedia networks and virtual reality techniques, led to the establishment of new models of professional training. Students, teachers and trainers are increasingly concerned to learn how to use the full potential of ICT resources (information and communication technology) to accommodate new forms of education based on Internet technologies. Use of ICT in education will lead to shift emphasis from teacher-centered learning where the student-centered one, where teachers no longer the key source of information and transmission of knowledge, but employees of the pupils and students are not passive recipients of information, but is actively involved in their education. For an effective education, ICT should be combining with traditional technologies and so lead to improve the quality of teaching and learning. That means an easy access to knowledge and information, to obtain a high degree of flexibility to meet the education needs for society, to lower costs and improve education efficiency of education.

The Internet offers an incredible number of opportunities for teachers. Groups of students can communicate via the Internet with other groups of students from any location, thus the teacher can monitor and discuss various socio-cultural differences. In a time when school budget decreases, decreases the number of books in libraries and existing programs are crammed as much information, the Internet is a wonderful resource for communication and collaboration.

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E-learning is the interaction between teaching/learning and information technologies - ICT (Information and Communication Technology) covering a wide range of activities, from computer-assisted learning (a combination of practices traditional and online learning) to education conducted entirely online manner. The Web offer in e-learning platform open source reached an impressive configuration, many prestigious universities and institutions adopting such a solution for organizing online courses. Any school or training institution may offer web space every subject teachers to post or edit various teaching materials, topics for students, online testing, etc. and initiate communicating with students including forum discussions. An e-learning platform supports a system of educational organization exclusively through the Internet, with a very complex structure and function. This should include a public area, generally accessible, with informative, but also private sections for students, teachers and administrative staff. In the online publishing of teaching materials, e-learning platform gives teachers a series of software tools that they convey only the information content and the formatting is accomplish automatically. Development team in charge of designing the site is considering as many structures and models of educational materials, projecting them in line interface so users experience and skills and learning needs.

In this article, we present an educational software to develop digital skills conducted on an open source platform. We will also present a pedagogical research that demonstrates effectiveness of such an approach.

2. Software for developing the digital competences. General presentation

The purpose of the educational software developed is to prepare students for the baccalaureate examination, precisely for evaluating digital skills exam. This exam is compulsory for candidates from all pathways, profiles and specializations. The exam is held in school labs during the period specified in the baccalaureate exam schedule and assesses seven skills [3]:

1. Using the Computer and Managing Files
2. Text editors
3. Information and communication
4. Basis concepts of Information Technology (IT)
5. Spreadsheet editors
6. Databases
7. Presentations

The application is based on the sixth unit, "Database", containing materials for acquiring knowledge of the theory of databases, using Microsoft Office Access 2007 application [2], verification testing, demonstration videos, questions and issues that are included to develop the ability to application using Microsoft Office Access 2007. The software is built on the Moodle platform.

Moodle or Modular Object Oriented Dynamic Learning Environment - calls a dynamic learning platform developed under a multimodular object oriented environment. In other words, Moodle is a course management system (CMS), a software package designed to help teachers to make quality online courses and to coordinate the results of learners / students. Such systems are sometimes called Learning Management Systems (LMS), Virtual Learning Environments (VLE) and Learning Content Management Systems (LCMS). The platform is built in modules that provide different capabilities for collaboration, communication, E-learning and more. Moodle has to be installing on a server and it is accessible from any computer connected to the Internet. The main purpose of the platform is to provide a framework of interaction for teachers and their students. Moodle is designed by respecting the principles of constructivist learning direction so that the people could learn best through engagement and experiences.

Moodle allows the creation of different classes of users, each class having different access levels and permissions. For example, teachers can create and edit materials or they can provide sections of information while students are able to interact with this information. An administrator monitors each platform Moodle installed.

Over 34 million users in over 200 countries use the platform in various education institutions - from schools and high schools to universities. Moodle is used on a smaller scale and in other public and

private institutions. Moodle is very easy to use. Being developed by IT engineers have pedagogical training, the platform was built on the principles of logic and simple to understand for both users and for those who manage. It is an open source program. Anyone is free to use, distribute and adapt the platform after the preferences or needs. Moodle is available in over 70 languages. Accessibility to a huge number of people around the world that led to today Moodle to have an active community of users who are eager to offer advice and assistance to newcomers.

Our software is created entirely using Moodle Romania. A partnership is created between this platform and Technical College "Iuliu Maniu", Carei, Satu Mare County. Administrator has created a virtual space for Technical College "Iuliu Maniu" on the platform www.edu.moodle.ro, and an administrator was assigned for this virtual space.

The software developed is a course called **BT Access Database**. A course can contain resources and activities. We used the option LABEL for additional information, and RESOURCE for Word documents and PowerPoint presentations. There I posted a video created with Adobe Captivate about creating databases. There are a number of modules for interactive learning activities that we can add the course. Communication and collaboration can be achieved using CHAT and the FORUM for conversational activities and CHOICE to have the feedback group. Adding tools for course is an excellent joint working approach to allow students / students on a project. This is possible by using the WIKI option. The work can be done by students and evaluate by teachers, using ASSIGNMENTS and WORKSHOPS options. The evaluation forms offer many options for automatic evaluation. Modules for activities, lessons and interoperable specifications SCORM offer content and presentation enable individualization depending on the options selected by the students. It is possible to add your own keywords, using GLOSSAR or you can give permission to students / pupils to do so. SURVEYS and DATABASES are also powerful tools that can be added to any course. During the course we used the TESTS application for testing, LESON for lessons and the option "Upload a single file" to check the activities they have performed in Access. For viewing the applications you have access the web page: *www.edu.moodle.ro* - Satu Mare - Technical College "Iuliu Maniu", Discipline, course: *Baze de date Access BT*

3. Experimental design

We conducted the educational research following the steps presented in paper [1]

3.1. The pedagogical research objectives are:

- Use appropriate methods and techniques to determine objectively the level of preparedness of students;

- Recording and comparing the results obtained from experimental and control group students throughout the research period;

- Analysis of the relationship between school performance and teaching - learning concepts for the use of specialized software applications database - Access through: qualitative and quantitative interpretation of test results of children proposed, analyzing educational environment, motivation and satisfaction in teaching;

- School performance optimization using software;

- Activation and optimization of intellectual and physical potential by using software;

3.2. The research hypothesis is: *Using a software to develop skills of using Microsoft Access application leads to much better results among students from Technological High-schools*.

The independent variable is the use of the educational software. The dependent variables are learning performances of students in Access databases.

3.3. Sample of subjects

We conducted the research at Technical College "Iuliu Maniu", Carei, Satu-Mare County. The experimental group was twelve grade C (XII C) with a specialization of *Technician in financial activities* and with a total of 22 students. The control group was the twelve grade D (XII D) with a

specialization of *CAD design technician* and with a total of 24 students. Initially we made an analysis of the structure of classes and teams and the general level of training specific experimental and control groups. We analyzed the area of origin, school performance, the percentage of students who have an Internet access home, etc. Following them, we found that the level of the experimental group is approximately equal to that of the control group.

a) Specialization that students attend (see Table 1 and Figure 2):

Table 1. *Number and percent of students for each specialization*

Specialization	Number of subjects	%
Tehnnician in financial activities (experimental group- EG)	22	47%
CAD design technician (control group- CG)	24	53%
Total	46	100%

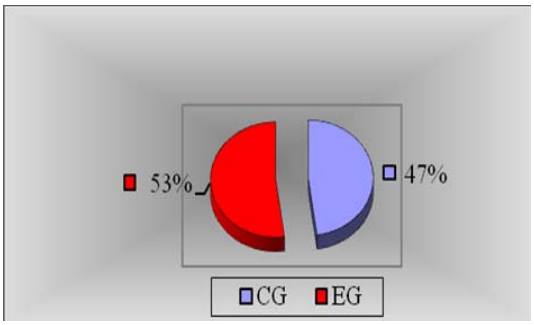

Figure 2. *Pie diagram for specialization that students attend*

b) Origin environment of students (see Table 3 and Figure 4):

Table 3. *Number and percent of students for each origin environment of students*

Environment	Number of subjects	%
Urban	20	43%
Rural	26	57%
Total	46	100%

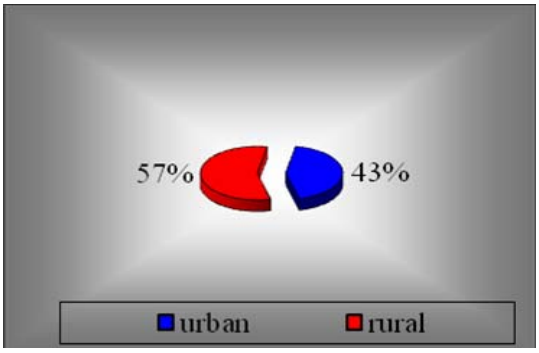

Figure 4. *Pie diagram for origin environment of students*

c) School performances (see Table 5 and Figure 6):

Table 5. *Number and percent of students for each level of school performance*

Level of school performance	Number of subjects	%
High	8	17%
Medium	29	63%
Low	9	20%
Total	46	100%

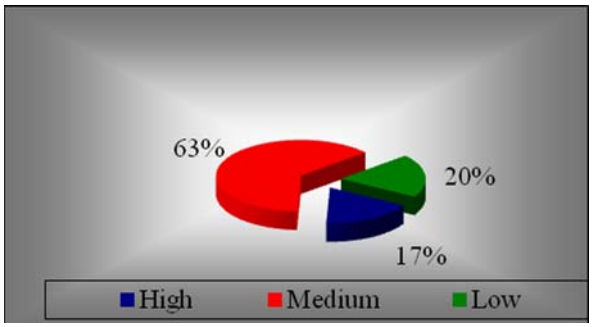

Figure 6. *Pie diagram for school performance of students*

d) Internet access at home only for the Experimental group (see Table 7 and Figure 8):

Table 7. *Number and percent of students with Internet access at home*

Internet access at home	Number of subjects	%
Yes	15	68%
No	7	32%
Total	22	100%

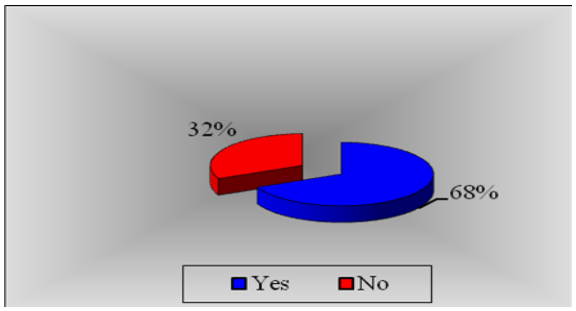

Figure 8. *Internet access at home of EG group students*

3.4. The sample content

Educational software has been developed for the grade's XII students of a technical profile. It covers the unit, Databases, namely the Access application.

3.5. Methodological system

Taking into account the specific requirements of scientific research and our thematic which is the use of educational software for teaching Access, we used the research methods listed below:
- **Systematic observation method** which consists of knowing the results in each step throughout the research. Observation was used in the run and during the experiment. We also observed how students with varying degrees of training (very good, good, mediocre, and weak) accept alternative methods and we used in each lesson observation protocols.

- **Tests.** We used tests to measure how accurately the volume and quality of knowledge, skills and abilities students are before and after the experiment.

3.6. Organizing and developing research

Preexperimental stage aims to establish the existing level at the start of the pedagogical experiment both to the experimental group and to control group. Initially we made a careful analysis of the structure of classes and teams and the general level of training specific experimental and control group. To collect these data we used the following ways: making data from systematic observation of student activity and behavior (current observation), such as students' educational needs, aptitudes, interests, their motivation for study, learning styles, pace of work, etc., of the results obtained from applying the same evaluation tests for experimental and control sample. In this stage we applied an initial test, the same experimental sample and control sample.

Experimental stage is developed during teaching the chapter by using specialized software applications database - Access to class we used software developed experimental and control class without introducing the platform where the software. We also tried to use the most appropriate depending on the specific applications. The profile services: call for proposals, bid, management reports, the summary of economic activity, the technical profile: use applications for projects that consider the technical knowledge base acquired by students in specialized disciplines. The worksheets were used during teaching and are composed of complex tasks. Each task has a working time affected by task difficulty and scoring. We used Worksheet 1 when students have sufficient theoretical knowledge of Access application, containing practical exercises on her operations with tables in a database. Worksheet 2 contains requirements about creating some queries of different difficulty. This sheet was used to deepen the knowledge to create queries in Access. Worksheets are presented in Annexes.

Experimental stage was followed by **final testing** phase. The final test role is to determine the extent after using educational software student achievement in the experimental group were improved. It will also make a comparison of students' results at post-test for the two groups to see if this difference is significant or not.

The r**etest** phase is applied to determine the strength and the durability acquisitions of students within three weeks after completion of experimental activities. The post-test was intended to establish long-term degree of assimilation of knowledge.

3.7. The analysis and interpretation of results

The control and experimental groups are roughly equal numbers: group A / Experimental - 22 students and Group B / control, 24 students. At the beginning of the research students don't have been initiated in using specialized software for learning.

Pretest

The pretest (Initial test) serves to establish the existing level at the start of psycho-pedagogical experiment. Ascertaining the essential condition during the experiment is to ensure equivalence between experimental and control samples, to levels approximately equal, so that they can initially be considered comparable in all respects. To find exactly the groups and to see how students react to the tasks, such as those involved in experimental work, we applied the initial test.
The results are centralized in Table 9, Figures 10, 11, 12, and 13:

Table 9. Centralization of Initial Test grades for EG and CG students

Grades for Initial test	EG		CG	
	Number of subjects	%	Number of subjects	%
9-10	2	9%	2	8%
7-8,99	9	41%	10	42%
5-6,99	7	32%	8	33%
under 5	4	18%	4	17%

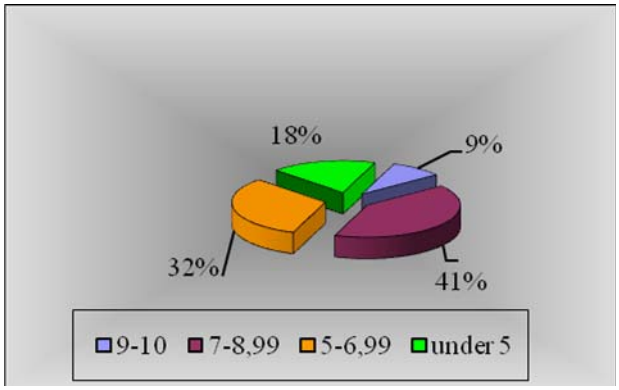

Figure 10. *Pie diagram for Initial Test grades of EG students*

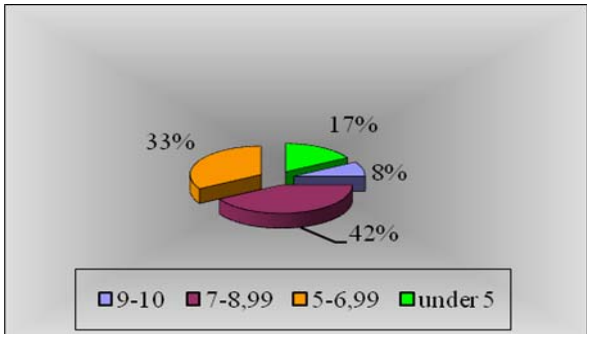

Figure 11. *Pie diagram for Initial Test grades of CG students*

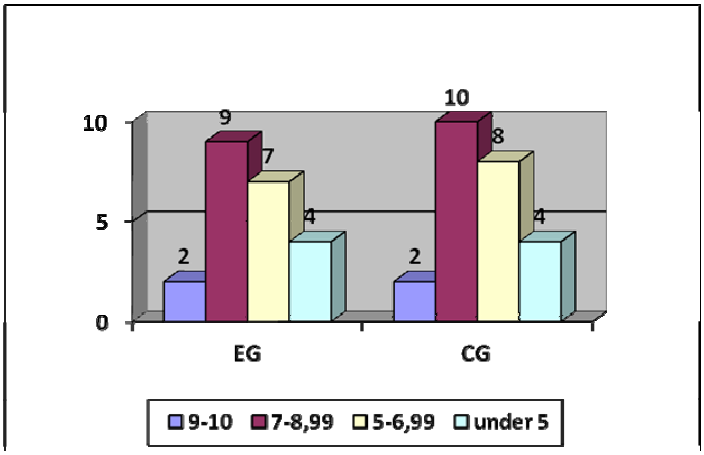

Figure 12. *Histograms for Initial Test grades of EG and CG students*

A statistic interpretation of the results below it is been made in Tables 13 and 14:

Table 13. *Statistic indicators for Initial test grades of EG and CG students*

Experimental class		Control class	
Mean	6,681818	Mean	6,583333
Standard Error	0,433382	Standard Error	0,380297
Median	7	Median	7
Mode	8	Mode	8
Standard Deviation	2,032741	Standard Deviation	1,863066
Sample Variance	4,132035	Sample Variance	3,471014
Kurtosis	-0,46588	Kurtosis	0,251802
Skewness	-0,60781	Skewness	-0,6049
Range	7	Range	8
Minimum	3	Minimum	2
Maximum	10	Maximum	10
Sum	147	Sum	158
Count	22	Count	24

Table 14. *t-Test for Initial test grades of EG and CG students*

Hypothesized Mean Difference	0
df	43
t Stat	0,170808
P(T<=t) one-tail	0,432588
t Critical one-tail	1,681071
P(T<=t) two-tail	0,865176
t Critical two-tail	2,016692

We can see that the difference results from the two samples do not differ significantly, so the choice of research groups meets the requirements for teaching.

Worksheet 1

After applying Worksheet 1 we obtained the following results (see Table 15, Figures 16 and 17):

Table 15. *Centralization of Worksheet 1 grades for EG and CG students*

Grades for Worksheet 1	EG		CG	
	Number of subjects	%	Number of subjects	%
9-10	4	18%	2	8%
7-8,99	10	46%	11	45%
5-6,99	6	27%	8	33%
Under 5	2	9%	3	13%

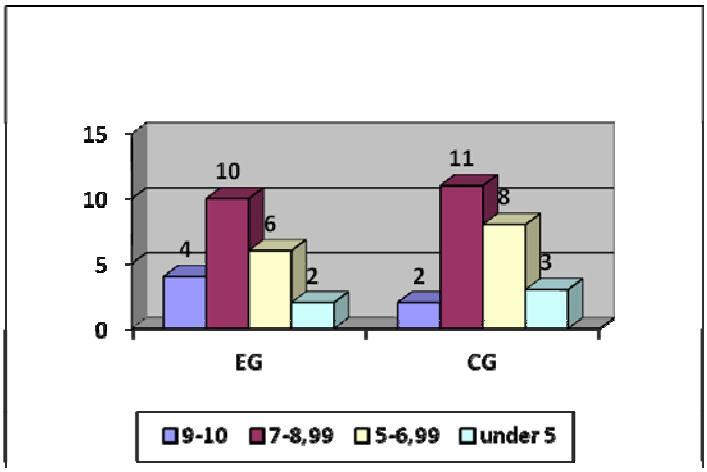

Figure 16. *Histograms of Worksheet 1 grades for EG and CG students*

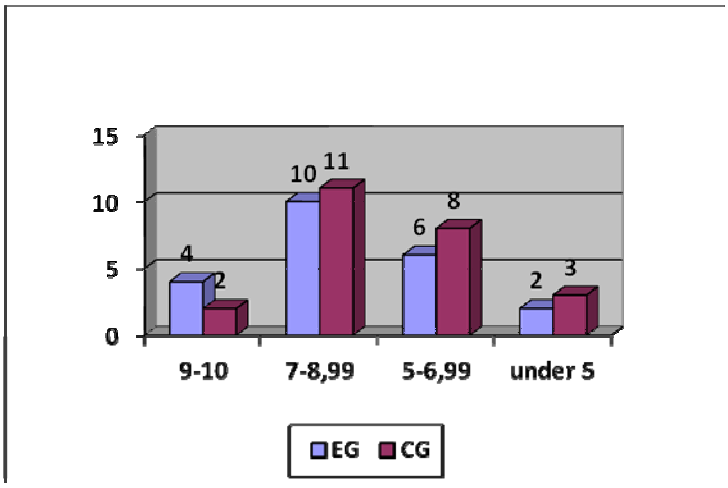

Figure 17. Comparative *Histogram of Worksheet 1 grades for EG and CG students*

Use of educational software for teaching and learning of Access has led to better grades for the experimental group.

Worksheet 2

After applying Worksheet 2 we obtained the following results (see Table 18, Figures 19 and 20):

Table 18. *Centralization of Worksheet 2 grades for EG and CG students*

Grades for Worksheet 2	EG		CG	
	Number of subjects	%	Number of subjects	%
9-10	5	23%	2	8%
7-8,99	11	50%	11	46%
5-6,99	5	23%	9	38%
under 5	1	4%	2	8%

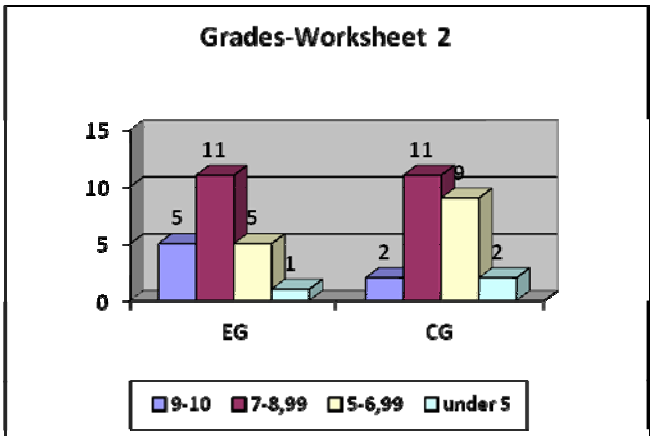

Figure 19. *Histograms of Worksheet 2 grades for EG and CG students*

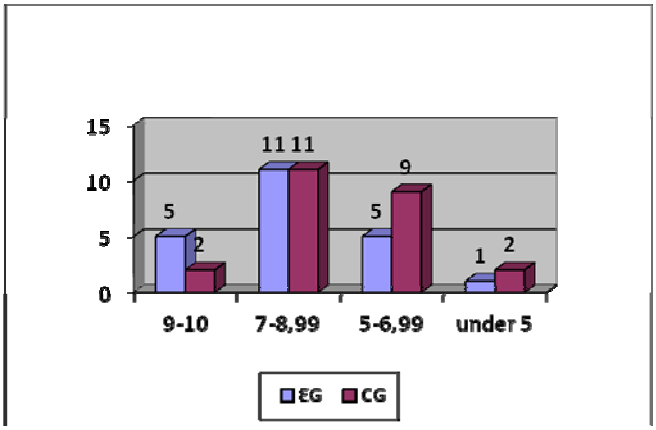

Figure 20. Comparative *Histogram of Worksheet 2 grades for EG and CG students*

We can note that experimental class shows continue to grow and control class remains largely the same.

Post-test

Post-test (Final test) was designed to ascertain whether the use of educational software, contribute to skill development using Access application. The test was common in the experimental group and control group and sought to put students in front of a complex task. To solve the task, students need to enhance the knowledge, skills, abilities, skills, abilities and behaviors they have learned and practiced during the experimental work.

The results of Final test are centralized in Table 21, Figures 22, 23, 24, and 25:

Table 21. *Centralization of Final test grades for EG and CG students*

Grades for Final test	EG		CG	
	Number of subjects	%	Number of subjects	%
9-10	8	36%	2	8%
7-8,99	11	50%	11	46%
5-6,99	3	14%	10	42%
sub 5	0	0%	1	4%

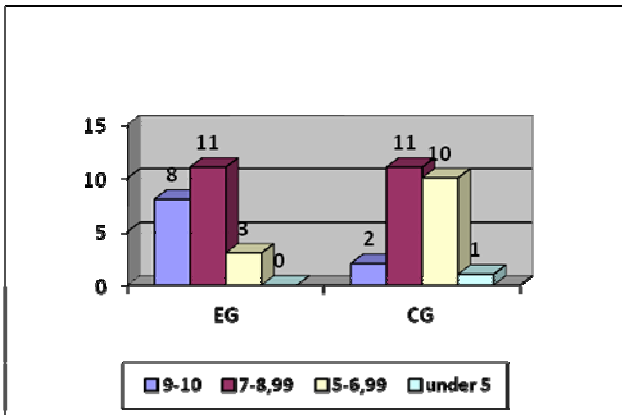

Figure 22. *Histograms for Final Test grades of EG and CG students*

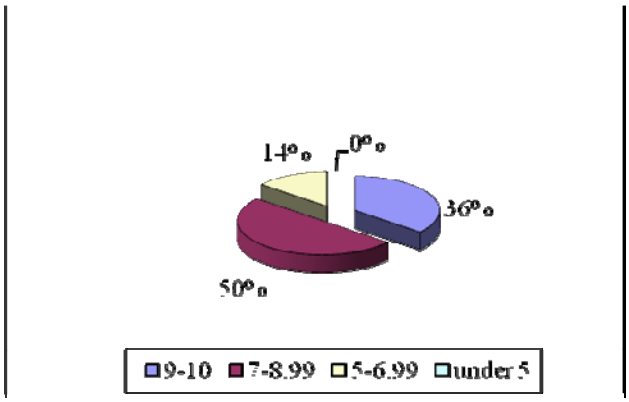

Figure 23. *Pie diagram for Final test grades of EG students*

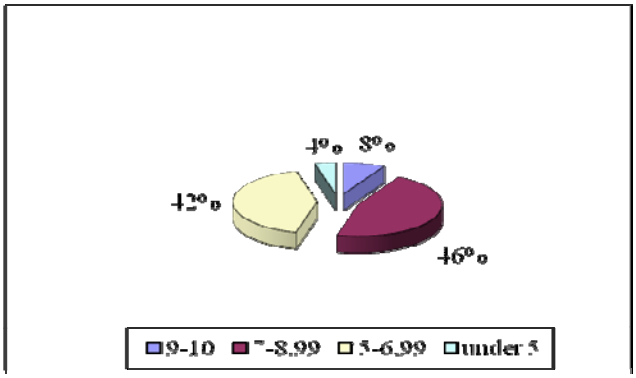

Figure 24. *Pie diagram for Final test grades of EG students*

A statistic interpretation of the results below it is been made in Table 25. For comparing the averages obtained by the two groups at final testing we used student t-test. In Table 26 we present the t-test results. We observe that the value of t Stat calculated is greater than the value of t corresponding to P = 0.05 significance threshold even higher than P = 0.027928. From this we conclude that the difference between the two areas is statistically significant at P = 0.03 significance threshold. Also from diagrams, we can see that the experimental class got much better results than the control group. Into the class where we applied the software, most students have obtained very good and good results. The control graders perform more poorly, most placing between well and enough.

Table 25. *Statistic indicators for Final test grades of EG and CG students*

Experimental Class		Control Class	
Mean	7,909091	Mean	6,958333
Standard Error	0,293575	Standard Error	0,297813
Median	8	Median	7
Mode	7	Mode	6
Standard Deviation	1,376991	Standard Deviation	1,45898
Sample Variance	1,896104	Sample Variance	2,128623
Kurtosis	-0,54139	Kurtosis	-0,42747
Skewness	-0,18305	Skewness	0,078219
Range	5	Range	6
Minimum	5	Minimum	4
Maximum	10	Maximum	10
Sum	174	Sum	167
Count	22	Count	24

Table 26. *t-Test for Final test grades of EG and CG students*

Hypothesized Mean Difference	0
df	44
t Stat	2,27353
P(T<=t) one-tail	0,013964
t Critical one-tail	0,013964
P(T<=t) two-tail	0,027928
t Critical two-tail	2,015368

Retest

To determine the strength and durability acquisitions students at an interval of three weeks a retest was applied. The retest administered was identical to experimental and control groups. We aimed to establish the degree of assimilation in the long run, strengthening and operationalization of purchases. To the retest following results were obtained (see Table 27 and Figure 28):

Table 27. *Centralization of Retest grades for EG and CG students*

Grades for Retest	EG		CG	
	Number of subjects	%	Number of subjects	%
9-10	8	36%	2	8%
7-8,99	9	41%	10	42%
5-6,99	5	23%	11	46%
sub 5	0	0%	1	4%

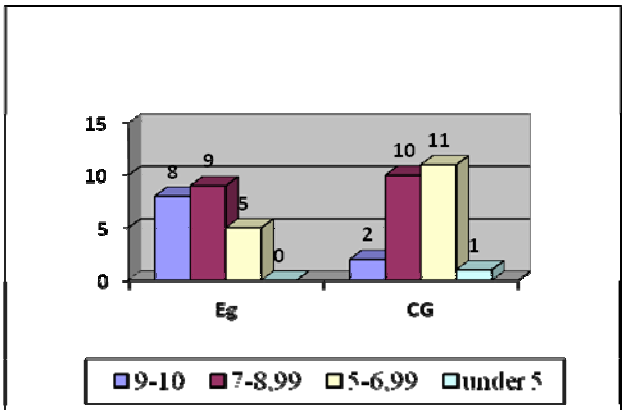

Figure 28. *Histograms for Retest grades of EG and CG students*

By applying the retest we wanted to check if there is a proportionality relationship between the investment of time and energy and the results, and to confirm additional research hypothesis. Both the experimental sample and control is observed to the very slight decrease in the retest students who have achieved good grade. This decrease is due to the time elapsed between the posttest and retest. However, we want to mention that students who have Internet access at home in the experimental class, did not decrease after application of retest ratings.

The results of the Experimental Group (EG) obtained during experimental research are presented in the Figure 29:

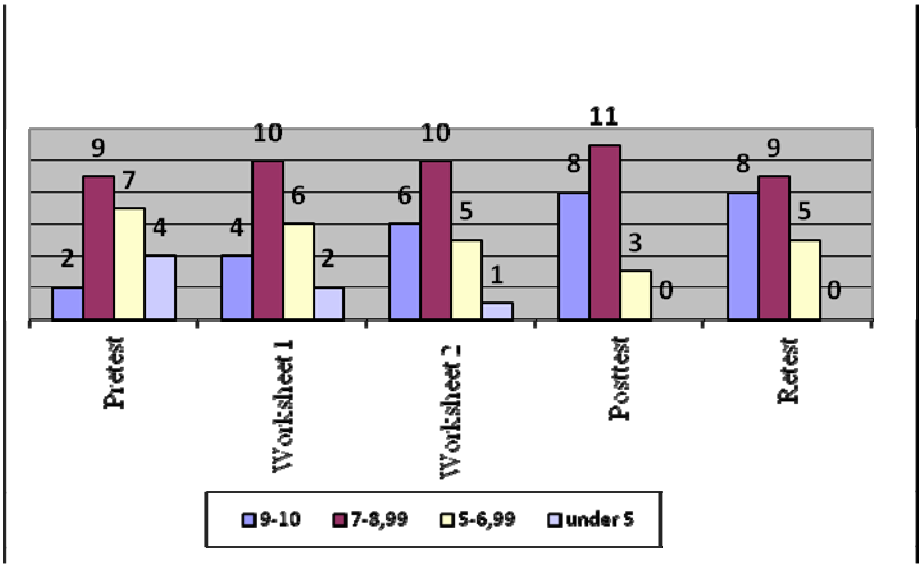

Figure 29. *Comparative Histograms of EG students' grades at tests provided*

The results of the Control Group (CG) obtained during experimental research are presented in the Figure 30:

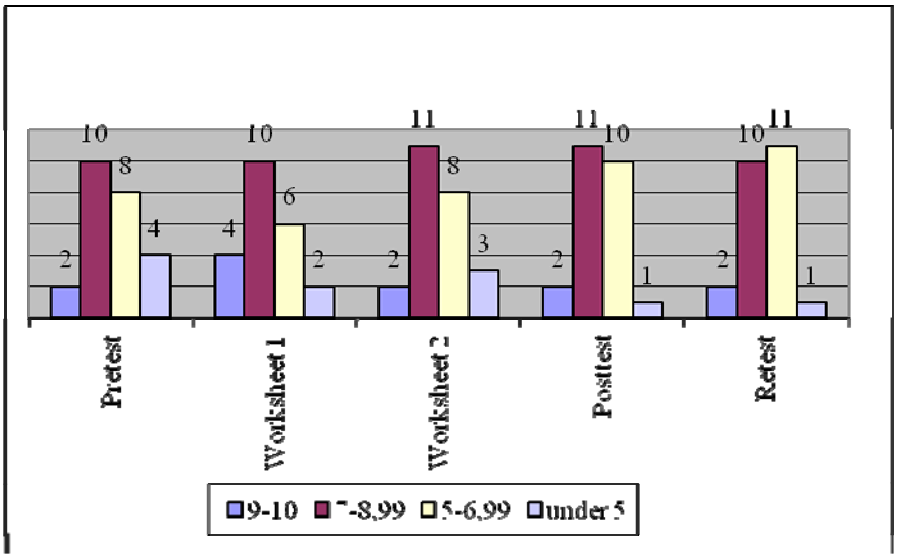

Figure 30. *Comparative Histograms of CG students' grades at tests provided*

4. Conclusions

As a first conclusion we can say that the use of educational software in teaching and learning exerted a strong positive influence on the pace of learning, soundness and durability of the acquisitions for the experimental class students. The educational interventions in developing digital skills that we have analyzed during the research show the need for increasing the use of educational software in schools.

The use of educational software increases the efficiency of the teaching - learning through multiple formative valences, of which we mention the following:

- Educational software can be used as auxiliary in the educational process at all school subjects.
- Enable a better insight of the phenomenon studied based on a full understanding.
- Provides interactivity. The learning based on educational software is accompanied by tone and color and is pleasant, attractive and fun breaks.
- By using the educational software in the process of learning of concepts and their applications the accent is on formative activity, anticipatory, participatory and practice.
- The learning errors of the learner are solved by himself with help provided by the software through comments and explanations necessary to continue the lesson.
- The dialogue between software and student must be as close to the dialogue between teacher and pupil, although this performance is difficult to be achieved.
- By working and learning with educational software allow students a permanent form self-education, they learn to appreciate the quality and duration of his training.
- Allows new forms of lessons' presentation.

Our experiment proved that educational software could improve students' digital skills. Students worked with pleasure and they proved that can apply general terms about the databases in different contexts, so they have transferred abilities. During the experiment we observed that students who are not among computer enthusiasts have been drawn into these activities, managing to understand and assimilate the knowledge transmitted to an average level and above average. As a corollary of the conclusions, occurs naturally the idea that a judicious combination of traditional teaching methods with educational offer a greater efficiency in the study of information technology. Therefore, we consider that the research has confirmed the hypothesis fully.

Based on the research conducted and presented in this paper, it is clear that the use of educational software and computer assisted instruction in teaching and learning contributes to a significant increase of efficiency of education.

Annexes

Initial Test

1. The memory inscribed by the manufacturer is:
- a) internal memory;
- b) external memory;
- c) RAM memory;
- d) ROM memory;

2. The acronym CPU means:
- a) Processor Control Unit;
- b) Control and Processing Unit;
- c) Central Processing Unit;
- d) Central Processor Unit;

3. A Software is:
- a) all computer programs that assure the computer functionality
- b) all physical components of a computer
- c) all the data in ROM and RAM memories

4. Geographically widespread network is a network:
- a) MAN
- b) WAN
- c) LAN

5. Associate each element in column A from column B corresponding meaning:

A	B
a) copyright	1) free software
b) licence	2) right to publish or sell a program
c) freeware	3) buying the right to use a program

6. Associate each element in column A from column B corresponding meaning:

A	B
a) processor	1) peripheral input
b) Keyboard	2) data storage device
c) floppy	3) component that supports the execution of orders

7. Which of the following functions to add cells from B1 to B5 are wrong:
- a) =Sum(B1:B5)
- b) =Sum(B1,B2,B3,B4,B5)
- c) =Sum(B1;B5)

8. Microsoft PowerPoint is:
- a) file management utility
- b) tool for presentations
- c) advanced graphical utility

9. Choose the possible operations to perform on a text within a slide from a PowerPoint presentation:
- a) You may add an entrance effect
- b) You can add an exit effect
- c) You can choose text color and size
- d) You can choose the text font type

10. www service access protocol is:
- a) TCP/IP
- b) HTML
- c) SMTP

d) http

Grading Scale: for each correct answer one point was given, otherwise zero points

Worksheet 1

Open the STUDENTS table in the SCHOOL database

1. Populate this table
2. Select the third registration
3. Sort table ascending by class
4. Delete the second entry
5. Select the commuter students
6. Select the students who have more than 10 unexcused absences from class XC
7. Select the students with an average more than 9
8. Select the students who do not commute
9. Select the students who commute and do not have an average over 7
10. Check if we have students named Muresan
11. Index Class field from STUDENTS table with duplicates
12. Index Class field from CLASSES table without duplicates
13. Create another table named SUBJECTS (subject code, class name, teacher code) in the SCHOOL database
14. Populate the remaining three tables: CLASSES, TEACHERS, SUBJECTS

Grading Scale:
- For items 5 -13 was given 0.8 points for a correct answer
- For the items 1-4 was given 0,3 points for a correct answer
- For the last item 14 was given 0.6 points for the correct answer

Worksheet 2

Open database LIBRARY
Design queries to answers the following questions:
1. Which are the existing books (author, title, no-copies) from publishing Corinth?
2. What books were out of stock after 1999?
3. Wich publishers printed textbooks?
4. Which books from M. Eminescu have the price between 20 and 30 RON?
5. Which books or textbooks where printed in 2000?
6. Who are the students enrolled in the library?
7. Which are the books from the publisher Corinth? In descending order by release date.
8. Which are the books by author X?
9. Which are the books borrowed by reader X?
10. How many books are in the library? Order the books by the publisher.

Grading Scale: for each correct answer one point was given, otherwise zero points

Final Test

1. Create a database named SCHOOL, containing the following tables:
   STUDENTS (code-student, class, name, average, date of birth, unexcused and motivated absences)

CLASSES (code-class, teacher, profile)
OBJECTS (object code, class names, code-teacher)
TEACHERS (teachers code-name, object)

2. Populate the tables with at least 10 entries.
3. Create the following relationships between tables:
   CLASS 1 – n STUDENTS
   TEACHERS 1 – n OBJECTS
   CLASS 1 – n OBJECTS
4. Design a form for browsing and editing for the tables in TEACHERS
5. Create queries for the following questions**:**
   a) Select the students from XC class
   b) Select the student from XIIA class which have an average between 8 and 10
   c) Select the students from XC or XD class
   d) Select the student from XIIA class which have an average of 10
   e) Select the number of students in each class
   f) Select the mean of unexcused absences in each class
6. Make a list of absences of students per class, each student is listed with name, number of unexcused / motivated absences. At the end of each class calculate the total number of unexcused and motivated absences.

Grading Scale:
- Each question except the 5th question has a value of 1.20 points
- In case of question 5th each correctly solved query is 0.5 points.

Retest

1. Create database STORE containing tables STORAGE.DBF and MATERIALS.DBF with structures: CODE, QUANTITY, PRICE, DATA_IN, DATA_OUT, respectively CODE, NAME.
2. Populate at least ten records tables
3. Create the following relationship between the tables: MATERIALS n - 1 STORAGE
4. Design a form for browsing and editing table MATERIALS.
5. Create queries to the following questions:
   a. Which are the materials with prices higher than 30 Ron?
   b. Which are the materials with prices between 5 and 10 Ron?
   c. Which are the materials that came yesterday or today?
   d. Which are the materials with today as an output, or the amount is less than 5?
   e. Which is the average value of the materials?
6. Make a list (report) of the materials ordered by price descending.

Grading Scale:
- Each question except the 5th question has a value of 1.20 points
- In case of question 5th each correctly solved query is 0.6 points.

References

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Online resources:

www.moodle.ro

Authors

Magdaş Ioana, Babes-Bolyai University, Cluj-Napoca, Romania, e-mail: magdas_ioana@yahoo.com

Bontea Timea, "Iuliu Maniu" National College, Carei, Satu-Mare County, bontimea@yahoo.com