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CROSS-CURRICULAR TEACHING OF SPREADSHEETS PRACTICE IN A WORKSHOP ON ENGLISH LANGUAGE OF THE COLLEGE STUDENTS

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***Summary:** The paper is a suggestion to conduct an English language workshop using the Spreadsheets knowledge of the college students from the Pedagogical College in Dobrich. On the one hand, attention is paid to the information which has already been given to the students in their mother tongue during the workshops on Spreadsheets and on the other, the language workshop is directed to the consolidation of terms already known as well as to operations connected to them. As a foreign language workshop it concerns language structures of the type of commands and gives opportunity to practice their usage. Most of all, the purpose is to consolidate the correct pronunciation of the words for there is a risk of being pronounced the way they are written.*

***Key words:** Spreadsheets, English language, pronunciation, imperatives.*

1. INTRODUCTION

As one comes across information about projects in Bulgaria that are connected with the cross-curricular teaching at primary school along with the language teaching requirements, it is obviously easy to conclude that it is relatively quite an old idea to integrate different subjects. For a long time there have been a lot of successful attempts to instill Information technology into different subjects. At first glance some of the subjects have nothing to do with the technology and more efforts are needed to find something in common.

According to Kuang-wu Lee in the area of language teaching, computers had their own place as early as 1960s and the following period of 40 years, he divided to three stages - Behaviorist computer-assisted language learning (CALL), Communicative CALL and Integrative CALL. The last stage, the purpose of which is to integrate different skills for learning a foreign language by means of technology, spreads more and more in foreign language teaching.

This paper aims at demonstrating the thing asserted above on the basis of Spreadsheet exercise in an English language workshop with the help of a computer. Our opinion is that the computer should not be the only and the constantly used means of realizing the

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teaching. Therefore, it is suggested that during the workshop one should do some exercises that do not require staring at the monitor all the time. The variegation of activities would lead to relaxation at the proper time which would lead to a dynamic effect of the tasks.

2. THE INTRODUCTORY PART OF THE WORKSHOP

The workshop in English requires a preliminary introduction to the course of Spreadsheets in order to review the terms and the teaching material once again but this time in English. Bearing in mind that a large quantity of the material is introduced in the 9th or 10th grade at the Secondary school, this exercise is rather a recollection of old knowledge and recall of the information necessary with a stress on the way it sounds in English.

There are a lot of specialized words that has entered the Bulgarian language without any translation. Therefore, the introduction of these words as new ones with a transcription and giving their meaning in the native language by the teacher would most probably make their understanding and remembering easier.

To review the teaching material in Spreadsheets as well as the terminology in English language, we suggest that the workshop begins with reading a text. It should be saved in advance on the computer of each student of the group. Fig 1 shows the text which is in fact an adapted version of an explanation from Wikipedia.

A spreadsheet is a computer application that simulates a paper worksheet. It displays multiple cells that together make up a grid consisting of rows and columns, each cell containing either alphanumeric text or numeric values. A spreadsheet cell may alternatively contain a formula that defines how the contents of that cell is to be calculated from the contents of any other cell (or combination of cells) each time any cell is updated. Spreadsheets are frequently used for financial information because of their ability to recalculate the entire sheet automatically after a change to a single cell is made.

Visicalc (Visible Calculator) is usually considered the first electronic spreadsheet.

The word „spreadsheet” came from „spread” in its sense of a newspaper or magazine item (text and/or graphics) that covers two facing pages, extending across the center fold and treating the two pages as one large one. The compound word „spread-sheet” came to mean the format used to present book-keeping ledgers—with columns for categories of expenditures across the top, invoices listed down the left margin, and the amount of each payment in the cell where its row and column intersect—which were, traditionally, a „spread” across facing pages of a bound ledger (book for keeping accounting records) or on oversized sheets of paper ruled into rows and columns in that format and approximately twice as wide as ordinary paper.

A „cell” can be thought of as a box for holding a datum. A single cell is usually referenced by its column and row. Its physical size can usually be tailored for its content by dragging its height or width at box intersections (or for entire columns or rows by dragging the column or rows headers).

An array of cells is called a „sheet” or „worksheet”. A cell may contain a value or a formula, or it may simply be left empty. By convention, formulas usually begin with = sign. A value can be entered from the computer keyboard by directly typing into the cell itself. Alternatively, a value can be based on a formula, which might perform a calculation, display the current date or time, or retrieve external data such as a stock quote or a database value.

Computer scientist Alan Kay used the term value rule to summarize a spreadsheet's operation: a cell's value relies solely on the formula the user has typed into the cell. The formula may rely on the value of other cells, but those cells are likewise restricted to user-entered data or formulas. There is no natural mechanism for permanently modifying the contents of a cell unless the user manually modifies the cell's contents.

A formula identifies the calculation needed to place the result in the cell it is contained within. A cell containing a formula therefore has two display components; the formula itself and the resulting value. The formula is normally only shown when the cell is selected by „clicking” the mouse over a particular cell; otherwise it contains the result of the calculation.

A formula assigns values to a cell or range of cells, and typically has the format:

=expression

where the expression consists of:

- values, such as 2, 9.14 or 6.67E-11;
- references to other cells, such as, e.g., A1 for a single cell or B1:B3 for a range;
- arithmetic operators, such as +, -, *, /, and others;
- relational operators, such as >=, <, and others; and,
- functions, such as SUM(), TAN(), and many others.

When a cell contains a formula, it often contains references to other cells. Such a cell reference is a type of variable. Its value is the value of the referenced cell or some derivation of it. If that cell in turn references other cells, the value depends on the values of those. References can be relative (e.g., A1, or B1:B3), absolute (e.g., \$A\$1, or \$B\$1:\$B\$3) or mixed row-wise or column-wise absolute/relative (e.g., \$A1 is column-wise absolute and A\$1 is row-wise absolute).

A formula may contain a condition (or nested conditions) – with or without an actual calculation – and is sometimes used purely to identify and highlight errors.

A spreadsheet does not, in fact, have to contain any formulas at all, in which case it could be considered merely a collection of data arranged in rows and columns (a database) like a calendar, timetable or simple list.

Fig. 1 Text about spreadsheets

The meaning of the terms in the text is elicited from the students. In case of mispronunciation by the students during the reading task, the transcription should be written on the whiteboard. Some information concerning the knowledge of the students about the synonyms and antonyms as well as other words from the same semantic field is also elicited.

3. A PRONUNCIATION TASK

The next thing that the students are supposed to do is to underline these words in the text that embarrass them while reading and optionally to colour these words the pronunciation of which they feel not quite sure about. This way the old knowledge of Word processing is being reviewed and at the same time there is use for the language acquisition. At the end of the workshop the underlined text on the computer is send to the teacher by e-mail. And he/she summarizes the variants and pays attention to the information being gathered in order to prepare for the next workshop appropriately.

It is expected that each student has underlined and coloured different words from those by his/her student mate. Thus a pair work does a suitable job. Each student could try to read the

words marked by the one who sits next to him/her. If both of the students are sure that this is the correct pronunciation, the word could be unmarked and the final variant is sent to the teacher so that only the words that the students have real doubts about the pronunciation are left marked. This helps the teacher to get an overall idea about the situation.

In order to make the students more confident about the pronunciation still during the workshop, at the discretion of the teacher particular words from the text are prepared beforehand. The words could be as follows: **application, row, column, value, recalculate, item, approximately, physical, mechanism, assign, contain, reference, relative, implementation, arithmetic, variable, sum, function**. They appear on the screen of each computer in jumbled order and the task is that the student should pronounce the corresponding word. In case the student feels insecure in the execution of the task he/she can click on the word and see the transcription that would help him/her know if they had pronounced the word correctly or not. (Fig.2)



Fig. 2 A word chosen arbitrarily



Fig. 3 Transcription of the word that appears after clicking on the line under the word

4. A TEXT COMPOSING TASK

The next task is to choose a word and type a sentence using it. The sentence should be connected logically to the one typed by the student sitting on his/her left and the one who sits on his/her right should go on the same way. The desks in the room are ordered in a circle so it is not a problem to follow a clockwise order. The task could be easily done if the students are connected together to a local net . Each student should open a file in Word and save everything being done during the workshop. The text composed with the efforts of all of the students is possible to be fun. It could also be useful for making the things clearer even if some misconceptions come up to the surface. Thus things could be clarified no matter if the difficulty is a grammatical one or one connected with the subject of Spreadsheets. The student who types the last sentence is the one who reads the whole text. A number of skills are practiced. All the students listen and practice comprehension

listening, one of them reads and consolidates pronunciation.

Apparently, as the first text the students work on during the beginning of the workshop, the one composed by the students themselves would also be a narrative one using declarative sentences. In order to variegate the situation we could direct the attention of the students to another type of text or according to the last task – to another type of sentences, and namely the imperative ones. In our work with the computer we constantly come across different commands that pop up from menus, etc. These subjectless sentences are easy to be learned and used.

5. A TASK WITH PRACTISING INSTRUCTIONS

The next task presents instructions that the students follow as upgrade of other tasks done during a Spreadsheet workshop as in the following:

	A	B	C	D	E	F	G	H	I	J
1	N	X	K	$Y1=X^2-1$	$Y2=X^2+1$	$Y=k*(Y1/Y2)$		X0	Step	K
2	1	-2	10	3	5	6		-2	0,2	10
3	2	-1,8	10	2,24	4,24	5,283018868				
4	3	-1,6	10	1,56	3,56	4,382022472				
5	4	-1,4	10	0,96	2,96	3,243243243				
6	5	-1,2	10	0,44	2,44	1,803278689				
7	6	-1	10	0	2	0				
8	7	-0,8	10	-0,36	1,64	-2,195121951				
9	8	-0,6	10	-0,64	1,36	-4,705882353				
10	9	-0,4	10	-0,84	1,16	-7,24137931				
11	10	-0,2	10	-0,96	1,04	-9,230769231				
12	11	-0	10	-1	1	-10				
13	12	0,2	10	-0,96	1,04	-9,230769231				
14	13	0,4	10	-0,84	1,16	-7,24137931				
15	14	0,6	10	-0,64	1,36	-4,705882353				
16	15	0,8	10	-0,36	1,64	-2,195121951				
17	16	1	10	0	2	0				
18	17	1,2	10	0,44	2,44	1,803278689				
19	18	1,4	10	0,96	2,96	3,243243243				
20	19	1,6	10	1,56	3,56	4,382022472				
21	20	1,8	10	2,24	4,24	5,283018868				
22	21	2	10	3	5	6				

Fig. 4 Visual aid of the results from the execution of a Spreadsheet workshop task that serves as a basis for the following language task.

Fig. 5 shows the instructions that the students are supposed to follow:

- | |
|--|
| <p>A) Insert two empty rows to form the title</p> <ul style="list-style-type: none"> Put the cursor on the first row Use the command Insert/Row twice <p>B) Type the titles</p> <ul style="list-style-type: none"> In A1 cell Tables In A2 cell Main In H2 cell Auxiliary <p>C) Merge the cells A1:J1 and centre the title Tables</p> <ul style="list-style-type: none"> Mark the block A1:J1; |
|--|

- Press the Merge and Centre button which could be found in the tool panel called Formatting
- D) Centre the titles Main and Auxiliary the same way
- E) Use the Font, Size, Bold, Italic and Underline buttons to form the titles
 - Type the title in Arial, size -14, italic, Font color -crimson
 - Type Main and Auxiliary using Times New Roman, size -12, Font color – dark blue
 - Type the titles of the tables in Times New Roman, height -11, Italic, Font color –blue
- F) Change the width of the columns in order to be able to see the whole text in the cells
- G) Align the titles to the centre
 - Use the familiar buttons from the tool panel Formatting or the command Format/Cells/Alignment or do it by double clicking of the right hand button of the mouse and open Alignment
- H) Put the columns and the titles of the main and the auxiliary tables into frames; Outline – single, thick, and red; Inside – between the columns – single, thin, and black, between the title and the rest of the rows – double and red.
To make a frame you can use Formatting Borders.
- I) Fill the table with a colour for a background; inside the table- pale yellow, the cells with the title - orange, for the cells with the values of Y from the last column of the main table – pale yellow background and crimson letters.

Fig. 5 Task with instructions

In the end of the workshop, each student sends his/her table to the teacher and this is an assertion of how well everyone has understood the text.

To make sure that there is no problem with the usage of imperative, the last task is designed as typing short instructions that each student should send to the one sitting next to him/her and the latter is supposed to follow the instructions.

After processing of the results from the workshop, the teacher will be aware if the workshop is a successful one and exactly to what extent. And the result will help for the preparation and will name subject of the next workshop.

6. CONCLUSION

The suggested workshop is not tested in a real environment but nevertheless it is easy to list several obvious values of it:

- There is a collaboration between the teachers of different subjects during the preparation of the workshop and this helps for a more effective teaching and thence learning;
- The correct pronunciation of the terms is consolidated and there is a possibility to clear up some obscure points in terms of the words meaning;
- The work of each student is to be sent by e-mail to the teacher at the end of the workshop and this gives a clear final picture of the level of acquisition to which each of the students has come during the workshop no matter if the student has been an active one or the other way round, a passive one, during the workshop;

- ❑ It gives a chance for direct impressions of the work of all the students due to the connection to the local computer net and this helps for the fast and adequate reaction by the teacher;
- ❑ It gives the students a good idea about a structure of the English language, and namely the imperative one, the use of which is a characteristic feature in the work with computers and gives opportunity for consolidation of knowledge connected with the way it should be used.

7. LITERATURA

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