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USE OF E-LEARNING COURSES IN AGRONOMIC

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Summary: *The article discusses the application of Electronic Learning in agronomic disciplines. The main tasks relate to the disclosure of the opportunities offered by information technology-related teaching and learning in the students. We apply the analysis of the possibilities of establishing a practical problem in two versions - Microsoft Office Word and Excel inspection and evaluation of agronomic knowledge objects. Development on a given topic is interesting and convenient for students because they are easy to acquire and apply knowledge and skills acquired during their training. Analysis of the results determined that the students acquire more effective subject content in agronomic disciplines using e-learning over traditional teaching methods. Students have acquired knowledge in the discipline, while looked at, adding experimented and learned new and interesting events and facts. In addition, evaluation and development of e makes "endings" of course more complete and less "scary". Thus, out of curiosity and interest in the new transformed into an entertaining and useful for their learning, which is confirmed by the final grade. Thus realized electrons offers students training to keep pace with technology and ubiquitous entrants themselves have innovative thinking. Last but not least teachers improve themselves as such and contribute more to the professional development of students. With e -learning desire to acquire new knowledge and its application in future development is much easier and rewarding for them.*

Key words: *spreadsheets, plant sciences, information technology, e-learning, knowledge.*

UPOTREBA E-LEARNING KURSEVA U AGRONOMIJI

Rezime: *U radu se razmatra primena Elektronskog Učenja (učenja na daljinu) u agronomskim disciplinama. Osnovni zadaci rada odnose se na otkrivanje mogućnosti koje studentima nudi nastava i učenje zasnovano na informacionim tehnologijama. Primenjena je analiza mogućnosti postavljanja praktičnog problema u dve verzije – nadgledanje i evaluacija agronomskih objekata znanja u Microsoft Office Word-u i Excel-u. Razvoj na zadatu temu je zanimljiv i pogodan za studente zato što mogu lako da prihvate i primene znanje i veštine stečene tokom obuke. Analizom rezultata došlo se do zaključka da studenti efikasnije usvajaju sadržaj u agronomskim disciplinama putem elektronskog učenja nego putem tradicionalnih nastavnih metoda. Studenti su usvojili znanja iz date oblasti, eksperimentisali i naučili nove i zanimljive pojave i činjenice. Pored toga, evaluacija i*

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razvoj interneta čini "rezultate" kursa potpunijim i manje zastrašujućim. Radoznalost i zainteresovanost za novo pretvorili su se u zabavno i korisno za učenje, što je potvrdila i konačna ocena studenata. Ovako ostvareni elektronski kursevi nude studentima mogućnost da nauče kako da održe korak sa tehnologijama, a takođe, polaznici kursa razvijaju inovativan način razmišljanja. Poslednje, ali ne i manje važno, nastavnici se usavršavaju i tako više doprinose profesionalnom razvoju studenata. Uz pomoć elektronskog učenja sticanje novih znanja i njihova primena u budućnosti je mnogo lakša i korisnija.

Ključne reči: *tabele, nauka o biljkama, informacione tehnologije, e-učenje*

1. INTRODUCTION

Regardless of the merits and possibilities of using information technology (IT) in our educational system, examples of this are too few [3, 4,] and on crop / biological / content, they are absent altogether. There are no studies on the methodological and didactic aspects of e-learning in general education in agriculture. Establish a defitsit theoretical sources to highlight the basic requirements for organizing, training and conducting exercises with the use of information technology and reporting student achievement - farmers in comparative term with the traditional way.

The purpose of this paper is to present some possibilities of e-learning in the absorption of new material in the exercises and the testing and evaluation of knowledge, skills and competencies of students by developing practical tasks in two versions - *Microsoft Office Word and Excel* training in agronomic disciplines.

2. USE OF INFORMATION TECHNOLOGIES TO ACQUIRING THE NEW MATERIAL

The new scale of development and incidence of information going beyond the traditional educational programs in general agriculture. The volume of information in the field of agricultural sciences is very large and is updated quickly and is virtually impossible to include everything in the curriculum. Many new areas of vegetation research impact of individual and cultural development of students. In this sea of information is important for students to learn to predict, organize and evaluate the limits and possibilities of agricultural sciences in an integrated biological and courtiers garden.

Accelerated development of technology and qualitative changes in the information media allows us to talk about a new kind of teaching strategy that is implemented using the capabilities of global information network. The Internet is a new learning environment. Using a global network of services and programs *Microsoft Office - Word and Excel*, the teacher is able to make the learning process in an attractive occupation, which are characteristic of reactions spontaneity, freedom of thought and creative response.

E-learning has the advantage that it can combine many different types of information and present it in its best form (graphic, photo, table, etc..) To provide easier understanding of the material. The possibilities for using computer in teaching general agriculture are large. It can be presented, and systematic data compiled for the benefit of agribusiness.

Using Word and Excel programs support the creation of texts, tables and graphs needed for designing and managing an agricultural business plan of a farm or ranch in the field of biological or traditional plant breeding. With reference to special education / plant / network sites students receive basic knowledge about the determinants of crop yields, and

their interaction methods for the rational use and regulation, the most effective use and maintenance of soil fertility and modern methods and means for weed control, and the latest achievements of science in agriculture. These features are used to increase general knowledge of students and assist their training on specific topics on the syllabus.

Electrons training does not replace the old ways and new opportunities for their realization.

3. ESTABLISHMENT AND DEVELOPMENT OF PRACTICAL TASK TOTAL AGRICULTURE WITH SPREADSHEETS

The structure of workbooks spreadsheet of *Microsoft Office - Excel* and *Microsoft Office - Word* are very convenient for collecting and testing of a normative didactic text. Each razrobotena practical problem with the proposed requirements for it to have a separate worksheet in the workbook.

We studied the results of comparative analysis in sastavyaneto practical tasks 'General Agriculture', two versions of *Microsoft Excel* or *compile Microsoft Word*, conducted with students from first and second year of the majors 'agricultural technology', 'Business Management', Agribusiness Management and rural areas' and 'Agricultural Economics'. The modules provide a calculation of the practical difficulty of the task and is inappropriate in drawing erroneous methods (distraktori). So after trying to assess whether the task / project is effective on the base of the analysis results to improve for the next tests. Practical tasks are subject to establish a crop rotation in workbooks in *Microsoft Excel* and *Microsoft Word* with certain requirements and guidelines. (Figure.1)

Task 1. Post Polish rotation in time and place of 1000 hectares irrigated area, comply with the shape and size of fields and crop rotation on the structure of the workbook spreadsheet of Microsoft Office – Word

NOTE TO PRACTICAL PROBLEM

1. Fields page:
 - * Top, bottom, left and right 1.5 cm;
 - * Gutter position (channel binding): 0 cm
2. Title:
 - * Font: Tahoma;
 - * Align: center;
 - * Style: Bold and italic;
 - * Size: 12 pt;
 - * Spacing between characters: 6 pt;
 - * Highlight the entire paragraph with a double bottom line;
3. Paragraphs 2 and 3:
 - * Alignment: bilaterally;
 - * Style: italic;
 - * Indent the first line: 1.25 cm;
 - * Two column text;
 - * Line between them;
 - * Distance between columns 1 cm)
4. Paragraph 4 and 5:
 - * Font: Arial;
 - * Align: center;
 - * Style: italic, bold and underlined;
 - * Before paragraph indentation: 6 pt;
 - * Indented paragraph after: 12 pt.
 - * Size: 12;
5. Paragraph 6:
 - * Font: Times New Roman;
 - * Align: center;
 - * Before paragraph indentation: 6 pt;
 - * Indented paragraph after: 6 pt;
 - * Frame around the entire paragraph.
6. Format the way evidence lists.
7. The last paragraph:
 - * Font: Times New Roman;
 - * Alignment: bilaterally;
 - * Style: bold;
8. Graphic object Silwvqk.jpg
 - * Rip it job and insert it into the document;
 - * Size Height: 2 cm;
 - * Alignment: Right;
9. Insert a footer with page number and your name and surname (aligned right).
10. Name the file with your name and surname and send the e-mail -

Task 2. Create a vegetable crop rotation in time and place of 500 acres of irrigated area to suburban area, to comply with the shape and size of fields and crop rotation on the structure of the workbook spreadsheet of Microsoft Office – Excel

NOTE TO PRACTICAL PROBLEM

1. Make 2, 3 and 4 column text document in a table in Excel.
 - * Add the line below in the table and calculate the total area with function field
 - * Add the last column "Number fields" and calculate the formula:
 - * Block / Common area. Format numbers as targets.
 - * Add the first column in the table, merge cells in it, enter text and orient its direction, as shown in the list
 - * Add last row "TOTAL" and to calculate the number of function fields and a total area of the field
 - * Add the line below - "Choice of Vegetable Crops" merge the first 3 cell and type the text as shown in the list. Calculate the rotation function with the total area / rotation of vegetable crops.
 - * Add another line below it - "Method of watering" merge the first 3 cell and type the text as shown in the list. Find a function of irrigation.
 - * Add another line below it - "Suburban area" merge the first 3 cell and type the text as shown in the list. Find a function type area.
 - * Add another line below it - "Difference in the type of irrigation and choice of vegetable culture" and calculate a formula difference in the type of crop irrigation.
 - * Format characters (vertical and horizontal, etc.), as shown in the list
 - * Format the context and background, as shown in the list
2. Create a strip chart in the shape and size of fields, as shown in the list:
 - * Belt diagram lines for time and place.
 - * Title, as shown in the list. The legend underneath. Tags with values
3. Save the resulting file named C on Coral.xls: record Pd** - where Pd is the type of rotation, and the place of the two stars with a unique code for the type of irrigation area.

Figure 1: Terms and guidance on making practical task: 1) Microsoft Word and 2) Microsoft Excel

Students should consider and identify the "most appropriate" method of composing an e seitoobrashtenie given in workbooks

Practical problems made themselves comfortable for students and professionals in the field of agribusiness, as have the opportunity to test their knowledge of specific subject area. The proposed workbook practical assignment students may enter in other (software) environments, to consult them, they need to compile a specific crop rotation or management of their agribusiness. Each version of parkticheskata task is located on a separate worksheet in the workbook. The right choice of culture and method of preparation according to the learner is shown by the relevant requirements specified in the colored box. Using the mouse to select the next sheet - method or approach from the register of worksheets. The number of fields within the rotation is optional tests, depending on the size of the field. If necessary in the practical assignment sheet can be integrated graphical object (picture, diagram, picture, etc.).

The choice of *Microsoft Excel* or *Microsoft Word* for approbation of the practical task / project is not driven by the rich possibilities of the medium and the fact that classes are taught in the informatics and information technology in secondary and tertiary school, and that it has developed modules of Visual Basic for Application (VBA) for a posteriori analysis of teaching tasks. The modules provide the calculation of the difficulty and discriminatory power of practical tasks and finding the wrong wrong methods (distraktori). Logic modules is established [1, pp. 174-185].

Table 1: Difficulty and discriminatory power to the test

indication	Strong					Weak					Difficulty (P)	Number of correct	Discriminatory effect (DP)	Strong-Weak
	1	2	3	4	5	1	2	3	4	5				
Z01	0	<u>1</u>	2	7	0	1	<u>6</u>	1	2	0	35,00%	7	-0,50	-5
Z02	0	0	<u>9</u>	0	1	0	3	<u>5</u>	0	2	70,00%	14	0,40	4
Z03	0	<u>10</u>	0	0	0	0	<u>10</u>	0	0	0	100,00%	20	0,00	0
Z04	0	1	0	0	<u>9</u>	4	0	3	0	<u>3</u>	60,00%	12	0,60	6
Z05	0	0	<u>10</u>	0	0	0	0	<u>9</u>	0	1	95,00%	19	0,10	1
Z06	<u>9</u>	1	0	0	0	<u>5</u>	3	0	1	1	70,00%	14	0,40	4
Z07	2	0	<u>8</u>	0	0	2	2	<u>1</u>	3	2	45,00%	9	0,70	7
Z08	0	0	<u>9</u>	0	1	0	0	<u>9</u>	0	1	90,00%	18	0,00	0
Z09	0	0	1	<u>9</u>	0	3	0	1	<u>6</u>	0	75,00%	15	0,30	3
Z10	0	0	0	<u>10</u>	0	0	3	0	<u>7</u>	0	85,00%	17	0,30	3
Z11	<u>10</u>	0	0	0	0	<u>8</u>	2	0	0	0	90,00%	18	0,20	2
Z12	1	2	<u>6</u>	1	0	0	2	<u>6</u>	1	1	60,00%	12	0,00	0
Z13	0	0	0	1	<u>9</u>	0	0	0	3	<u>7</u>	80,00%	16	0,20	2
Z14	0	<u>3</u>	7	0	0	0	<u>3</u>	7	0	0	30,00%	6	0,00	0
Z15	0	<u>10</u>	0	0	0	1	<u>7</u>	2	0	0	85,00%	17	0,30	3
Z16	<u>10</u>	0	0	0	0	<u>3</u>	2	0	3	2	65,00%	13	0,70	7
Z17	0	<u>10</u>	0	0	0	0	<u>6</u>	4	0	0	80,00%	16	0,40	4
Z18	<u>3</u>	0	3	1	3	<u>4</u>	0	2	1	3	35,00%	7	-0,10	-1
Z19	<u>9</u>	0	0	0	1	<u>5</u>	2	1	0	2	70,00%	14	0,40	4
Z20	<u>10</u>	0	0	0	0	<u>4</u>	3	2	0	1	70,00%	14	0,60	6

Analysis of discriminatory power of each task - the formula $DP = (\text{number of persons from the strong group decided true task} - \text{number of persons from disadvantaged groups decided true task}) / (0.5 * \text{total number of persons of 2 - these extreme groups})$. Table 1 presents the results of the analysis of the difficulty and discriminatory power. The table shows that, given practical tasks only 2, 4, 6, 7, 9, 10, 11, 13, 15, 16, 17, 19 and 20 are acceptable coefficient of discriminatory power $\leq DP \leq (0,4 \text{ } 0,6$ and $DP \leq 0,2 < 0,4$), and all other podusloviya 7 (1, 3, 5, 8, 12, 14 and 18) must be replaced ($DP < 0,2$ or $DP > 0,8$). These are the students misunderstood or incorrectly made by the examiner.

4. INFORMATION TECHNOLOGY APPLICATION IN COMPARISON WITH THE TRADITIONAL METHOD OF TEACHING.

In Fig. 2 presents the average grade of students studied subjects in two different academic years (two different courses).

In the first year, the average success rate is two points lower than average success rate of the second, that during the learning process is applied e-learning implementation of new teaching material and exercises (computer presentations by the teacher, self-seeking Internet information on a given topic or task).

This proves the benefits of electronic training on achievement and learning curriculum of the students.

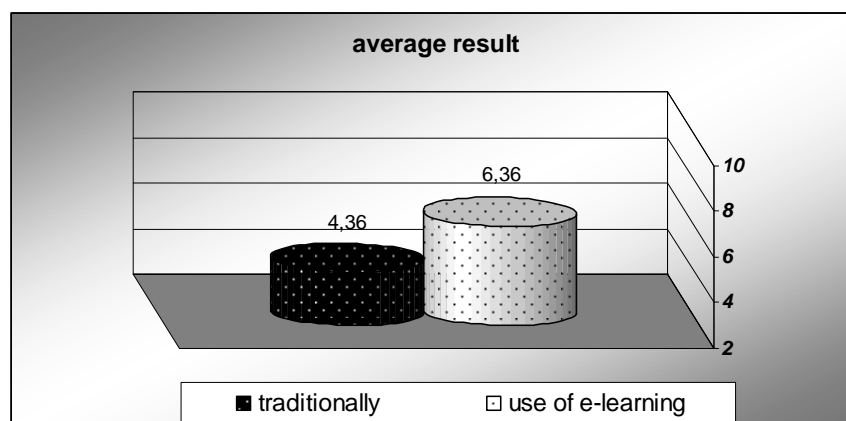


Figure 2: Comparison of the success of students

5. CONCLUSION

E-learning in general agriculture is a way that students are more satisfied with their knowledge and skills to recognize, nurture and protect the plant world. Students acquire knowledge on the subject while browsing, adding, experiment and learn new and interesting events and facts that the blackboard could not find such a space. Thus, out of curiosity and interest in the new transformed into an entertaining and useful for their learning, which is confirmed by the final grade. Thus, the realized training provides students with the opportunity to keep pace with technology and ubiquitous entrants themselves have innovative thinking. Last but not least teachers improve themselves as such and contribute more to the professional development of students.

6. REFERENCES

- [1] Бижков, Г.: *Теория и методика на дидактическите тестове*. С., Просвета, 1992.
- [2] Василева, С.: *Электронные таблицы для апостериорного анализа дидактических тестов*, Тезисы докладов Международной научно-образовательной конференции „Наука в Вузах: Математика, Физика, Информатика”, Россия, Москва, Российский университет дружбы народов, 2009., str. 862-863
- [3] Глушкова, Г.: *Електронен кълъстер „ECL-School” на системата DeLC*. Научно – практическа конференция „Новите технологии в образованието и професионалното обучение”, 2003, София.
- [4] Стоянов, С.: *Виртуален университет помощно средство за обучение на студенти*. Национална научна конференция „Информатика в научното познание”, 2002, Варна.
- [5] Vasileva, S.: *Spreadheets and a posteriori analysis of normative didactic test*, Beograd – Novi Sad, Tehnologija, informatika, obrazovanie 2, 2003., str. 264-269.
- [6] Николова, Е., Василева С.: *Приложение на информационните технологии в обучението по агрономическите дисциплини*, НАУЧНИ ТРУДОВЕ на Русенски университет "Ангел Кънчев" - 2008, т.47, с.5.1, str.: 41-45.
- [7] Николова, Е., Василева С.: *Приложение на информационните технологии по Хербология*, НАУЧНИ ТРУДОВЕ на Русенски университет „Ангел Кънчев” – 2011, т.50, с.7.1, str.: 46-52.