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STUDENTS' PREFERENCE OF E-LEARNING IN PHYSICAL SUBJECTS AT MENDEL UNIVERSITY IN BRNO

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Abstract

KUMBÁR VOJTĚCH, FILÍPEK JOSEF. 2015. Students' Preference of E-learning in Physical Subjects at Mendel University in Brno. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis,* 63(3): 775–780.

In this article there is observed e-learing study support in subjects focused on physics, mainly in praktikum of these subjects. Teaching e-learning software made by collective of physics teachers at Mendel university in Brno is possible to use as a electronic exercise book, homework aid for solving of laboratory homework, dataprojector presentation in teaching and also as a examination of students by means of didactic tests. It is necessary to be mindful that programme is valid, simplify studying and also to raise deeper interest in physics. The goal of teaching aid is to simplify studying process and create possibility for teachers to devote all students to a higher extent. Important fact is of course contribution such a support for students themselves. E-learning support can be very valuable, highly developed and contributive but if it is not accepted by all students, all devoted lessons for its creation would be useless. That is why it is very important to monitor regular feedback of students who have a chance to use these supports, afterwords to adapt them according to actual both teachers requests and mainly students requests. It is also very suitable if students have a chance to make a choice among several study supports because not all students are same.

Keywords: e-learning, study support, laboratory measuring, student

INTRODUCTION

Contemporary trend in education is using of electronics teaching supports. For these supports the term e-learning support has been established. The process is called e-learning. According to worldwide open encyclopedia is e-learing defined as a educational process, using information and communitacion technology to create course, allocation of study content, communication between students and teachers and to run studying. There are other publications exists where the term is defined. For example:

- E-learning is a teaching wiht use of information technology and internet.
- E-learning is basically any use of electronic and didactic material to reach effective educational goal by realization mainly through information network.
- E-learning is a educational process, using information and communication technology to create courses, to allocate study content, to communicate between students and teachers and to run studying.
- E-learning is a form of education using multimedial factors – presentation and texts with links, animated sequences, video photos, shared worked surfaces, communication with teacher and classmates, tests, electronical process models etc. in system for study running.
- The point is that this kind of study, during knowledge are gained and used is allocated and simplyfied by means of electronical devices.
- E-learning includes both theory and research, and any educational process (with different intentionality degree),which is in a harmony with ethical standards used for information and

communication technology working with data in electronical wording. The way of using ICT means and their accessibility of teaching material are depended mainly on educational goals and content, character of educational environment, needs and possibilities of all participants of educational process.

E-learning is used mainly for teaching of students at general universities both in attendance and combined form of study, which is described in publication. Very important fact is the asset of such a support for students themselves. E-learning support can be fine, sophisticated and contributive but if it is not accepted by students all hours devoted to its creation would be useless. That is why it is very important to observe feedback from students who have a chance to use this support. There is also very useful if students have a chance to have a choice among several study supports. In this article there is the observation of study support use in subjects focused on general physics.

MATERIAL AND METHODOLOGY

Study Supports

Study supports have a functions which are part of subject Physics. Laboratory seminars take place in Physics lecture room where students work two lessons in sequence in pair on chosen physical task. In described research there were used three student supports which can be used by students:

- classical printed college textbooks which can be borrowed or bought at University library,
- same college textbooks in electronical form (pdf) which students receive for free on the first lecture,
- e-learning support (software) created in programme Adobe Flash which students receive for free on the first lecture.

Students

Questionnaire research was done in subjects of general physics with students in the first year of their present form bachelor study. Branch of study, faculties and student numbers are detailed stated in Tab. I.

Questionnaire

Questionnaire was given to students to fill in in last week of teaching in term in which the subject was taught. It consisted of three questions. At every question students have four options. They could also expressed in percentage study support during study preparation within seminar and during creation of report. Questionnaire ordering (answers and questions) was as follows:

What kind of study support **during preparation** on laboratory exercise do you prefer?

- Classical printed college textbooks ..... %
- Electronic textbooks ..... %
- E-learning software ..... %
- Others ..... %

What kind of study support **during measurement** in laboratory exercise do you prefer?

- Classical printed college textbooks ..... %
- Electronic textbooks ..... %
- E-learning software ..... %
- Others ..... %

What kind of study support **during report creation** for laboratory exercise do you prefer?

- Classical printed textbooks ..... %
- Electronic textbooks ..... %
- E-learning software ..... %
- Others ..... %

RESULTS AND DISCUSSION

After gathering filled questionnaires the data were processed. Results were counted as per relation for each possibility:

$$P = \frac{1}{n}\sum_{i=1}^{n} A\,, \tag{1}$$

where
P .... average study support percentage,
n .... number of students,
A ... proportional study support ratio.

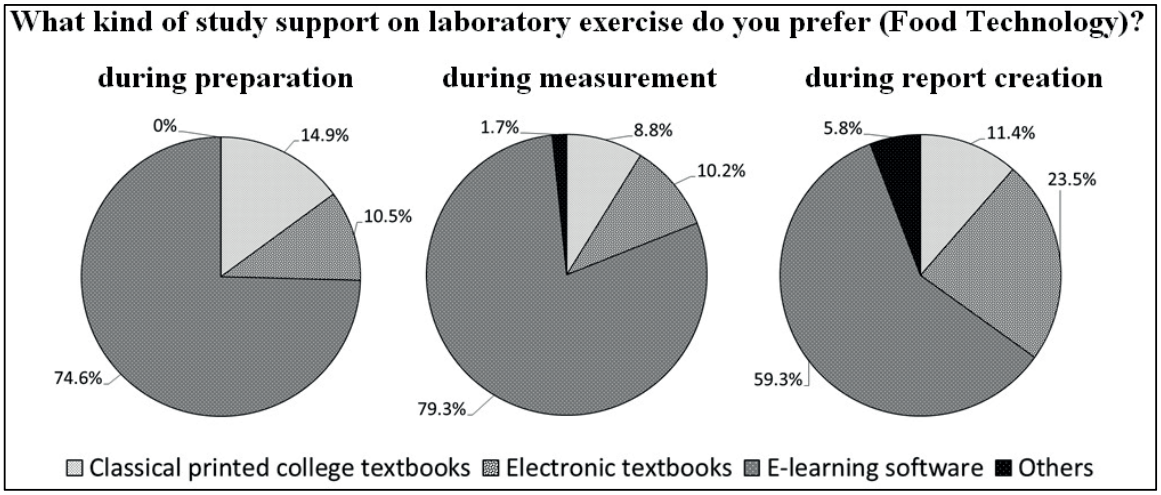
If one option was chosen, there was a proportional study support ratio A = 100%. At remaining three options at the same question A = 0%. Grand total A at one question must be equal 100%.

The results study support use are graphically processed on the Figs. 1–3. Total results of study support use in individual phases are processed on the Fig. 4. Total results of study support use at individual branches of study are processed on the Fig. 5. In the Fig. 6 there are processed total results of preferences of study supports at all three branches of study (116 students in total).

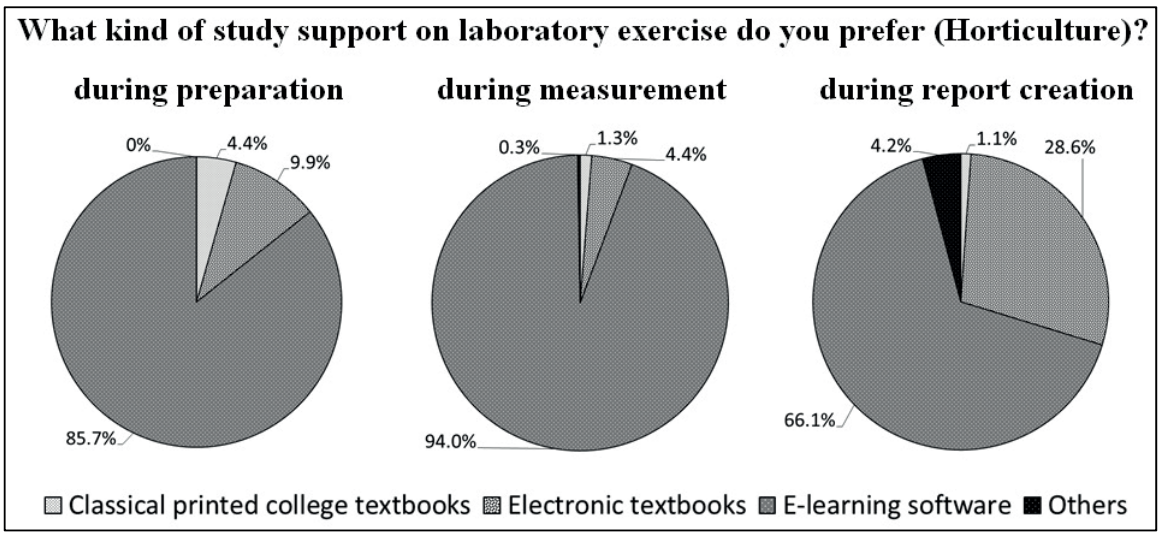
After assessment of filled questionnaires there was found that results differ depending on studied branch.

I: *Specification of students*

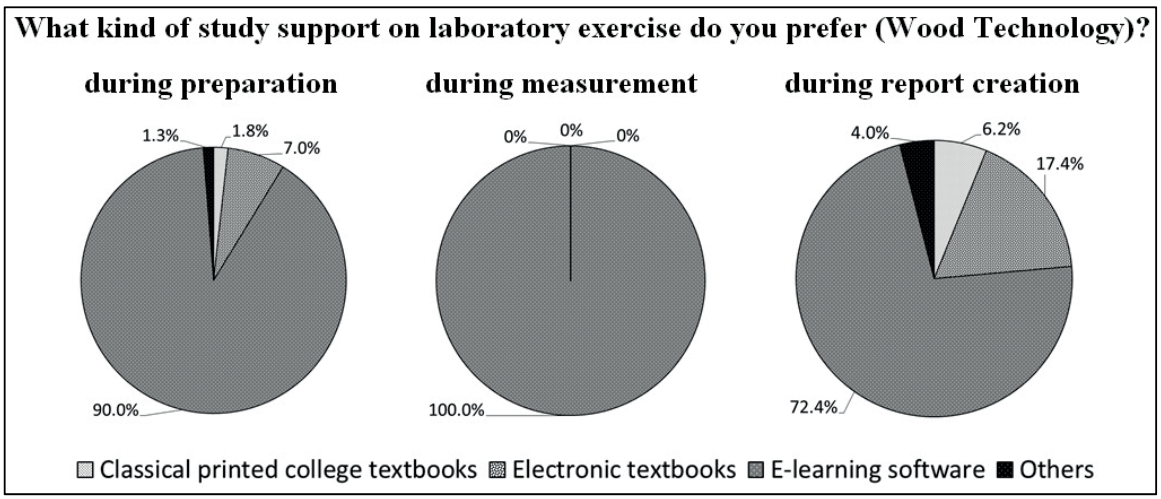
Faculty	Field of Study	Number of Students
Faculty of Agronomy	Food Technology	60
Faculty of Horticulture	Horticulture	36
Faculty of Forestry and Wood Technology	Wood Technology	20



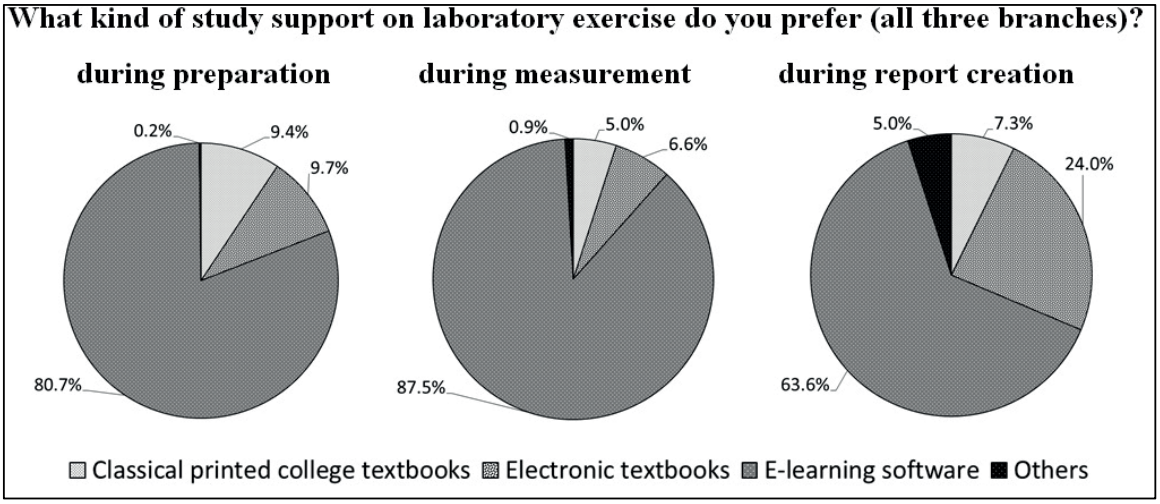
1: *Questionnaire results of students of technology of foodstuffs – individual phases*



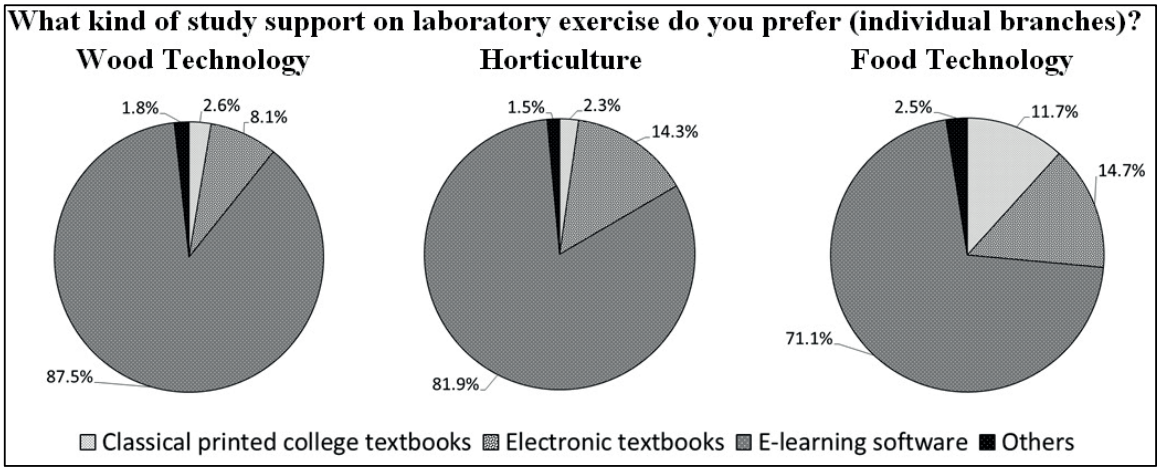
2: *Questionnaire results of students of horticulture – individual phases*



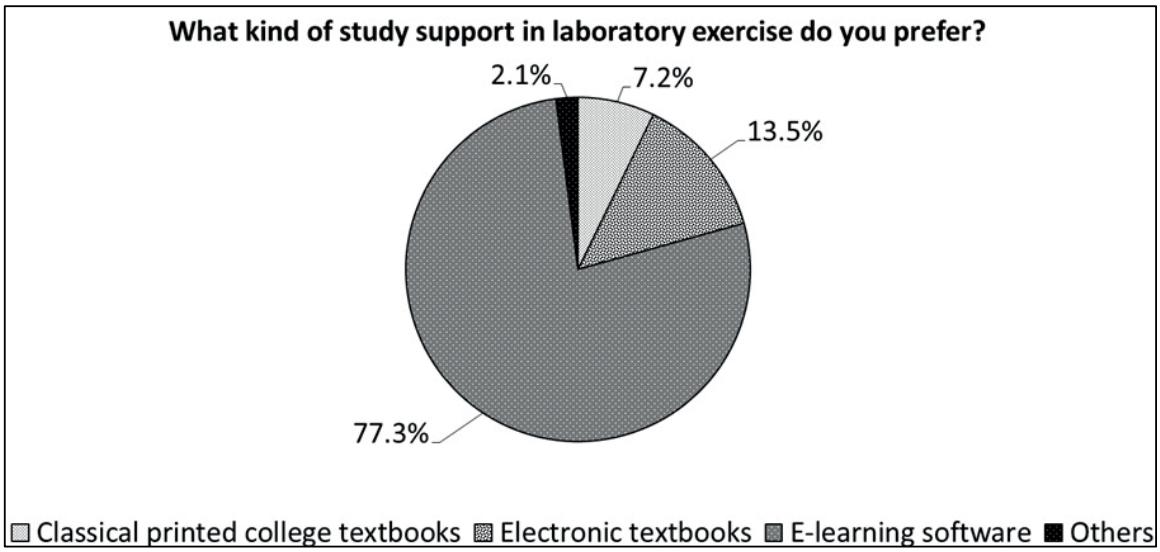
3: *Questionnaire results of students of wood technology – individual phases*



4: *Total questionnaire results of students of all three branches – individual phases*



5: *Total questionnaire results at individual branches*



6: *Total questionnaire results at all branches*

From results it is obvious that students use the most e-learning study support during measurement in laboratory exercise (87.5%) which shows a possibility to have an own laptop in teaching in laboratory exercise. During preparation for study students use e-learning study support in 80.7% and during report creation to laboratory exercise in 63.6%. On the average students of wood technology use the most e-learning study support. Expressed in percentage ratio of e-learning support was 87.5%, electronic textbooks 8.1%, classical printed college textbooks 2.6% and other supports 1.8%. With students of horticulture expressed in percentage ratio of e-learning support was 81.9%, electronic textbooks 14.3%, classical printed college textbooks 2.3% and other supports 1.5%. With students of technology of foodstuffs expressed in percentage ratio of e-learning support was 71.1%, electronic textbooks 14.7%, classical printed college textbooks 11.7% and other supports 2.5%.

Total questionnaire result (Fig. 6) points to a fact that students (116 students in total) prefers in 77.3% e-learning support, 13.5% electronic textbooks, 7.2% classical printed college textbooks and only 2.1% other study supports.

In response of „other study supports" students stated internet or other monographs.

CONCLUSION

E-learning teaching software is prepared for exercises/seminars from physics. It contains great amount of tasks, is regularly innovated, extended and it can be used not only as an electrical exercise book but it can also have other functions. In comparison to printed college textbooks it brings many other advantages. Besides text it contains substantial amount of graphical attachments, animation, sounds and video records. For illustration purpose there is a ojbect movement, fluent size change, shape, colour, transparency, use of mask, dynamical text and text input. Proper interactivity is reached mainly by means of textbook language ActionScript. By using slight adjustment the programme can be used for students examination using generated didactic tests with several options of setting score. Students can use electronic teaching programme both at home during preparation for laboratory measurement and under surveillance of experienced teacher where the schoolwork can be practised in various connection and students can develope their creative thinking.

It is necessary to observe students feedback. The best way is using questionnaire research. This questionnaire and its assesment was the goal of this article.

From the results it is obvious that students use the most e-learning support directly during laboratory measurement (87.5%). That is connected to opportunity to carry own laptop directly to teaching of laboratory measurement. For teaching preparation students use e-learning support at 80.7% and during report creation for laboratory exercise at 63.6%. During process of the reports procedures and formulas have to be used for calculation of bad measurement when some students still prefer electronic or printed college textbooks. On the average e-learning support is used most by students of wood technology – average percentage ratio of e-learning support was 87.5%, electronic textbooks 8.1%, classical printed college textbooks 2.6% and other supports 1.8%. Students of this branch have lots of subjects in the first year of their studies where computer technology is used (for example data analysis, CAD, CAE). Average percentage ratio of e-learning support with students of horticulture was 81.9%, electronic textbooks 14.3%, classical printed college textbooks 2.3% andother supports 1.5%. Percentage ratio of e-learning support with students of technology of foodstuff was 71.1%, electronic textbooks 14.7%, classical printed college textbooks 11.7% and other supports 2.5%. These students do not have many computer technology subjects in the first year of their studies (they do have in next years) which can give a reason for high interest in classical printed college textbooks.

Total questionnaire result (Fig. 6) points to fact that students (116 students in total) prefer at 77.3% e-learning support, at 13.5% electronic textbooks, at 7.2% classical printed college textbooks and only at 2.1% other supports. In answer „other supports" the most used was internet or other monographies. Used questionnaires are suitable for repetitive research when the individual questions can be changed. These study supports gained from fine processed results can be adjusted for needs of teachers but mainly for students themselves.

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