

Large Student Groups Assessment During the Semester Term

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Abstract—Tertiary teaching is interactive process and by no means unilateral. Lecturers are increasingly interested in students' knowledge and understanding. Assessing students with the tests proposed provides the lecturers feedback on the students' accomplishments; not only on parts of teaching material did they acquire, but also the information on which parts do they understand better and which parts do they understand worse. Moreover, lecturers can discover if there is a problem with their teaching. In this paper, we provide the analysis of student's assessments by utilizing the above-mentioned principles, revealing some encouraging results.

Index Terms—analysis, assessment, evaluation, large groups, mistakes, students, testing

I. INTRODUCTION

Classes in the compliance with the Bologna process requires that students' work and from the lecturer to assess students continuously during the term. Assessment of small student group is relatively easy to perform. The problem arises with the large groups of students. With an aim to motivate the students for the continuous work, some innovations have been implemented in the Informatics course at the Faculty of Economics in Rijeka, and among them, two tests that have been used to assess the students' knowledge.

II. FIRST TEST

In this test the knowledge from the following fields was examined: information systems, hardware, software, lifeware and Internet. The test was conducted in the four groups each having different questions in order to minimize students copying from each other (Croatian students still have the bad habit of transcribing from their colleagues). Students were allowed to use the proposed literature. Learning how to appropriately utilize the literature can, from the authors' point of view, be very useful later in life for the students. In the addition to that, the attitude of the authors is that in the limited time allowed for test the literature cannot be advantageously utilized by the students if they are not already familiar with the material, and can only be useful if student looks up targeted confirmation of the familiar information. When speaking of prohibited transcribing, it is most often the one from the banned personal notes and the one between the students. There are two types of violators, the students that allow the transcribing from their papers and the students that are more likely to use someone else's answers instead of their own.

It is difficult, despite the explanations and sanctions, to eliminate this unwanted behaviour. This research will try to provide arguments against that transcribing itself can in some cases be a reason for bad results. Test was conducted in a following way: a single multiple-choice question at a time was displayed on the overhead projector screen and the students only had to write down the correct answers on the paper.

In such manner, if the question was:

1. Software that is essential for the connecting of all computer components is:

- a) Virtual memory
- b) Technological aging
- c) Minimal configuration
- d) Operating system

Students' answer in the form: 1. d or 1. D was expected.

Each group was given nine questions and to answer each question students were given 30 seconds.

A. Results of the first test

Every correct answer was rewarded with 1 point, making the maximum, as a result, 9 points. Calculated results distributed by groups are presented in the Table I.

TABLE I.
FIRST TEST: NUMBER OF STUDENTS AND THE AVERAGE SCORE PER GROUP

Group name	Number of students per group	Average score per group
G1	80	6,09
G2	83	5,47
G3	79	6,00
G4	123	6,73
TOTAL	365	6,07

Analysis of the individual answers was also conducted in order to discover whether some of the wrong answers were chosen randomly or there was some sort of regularity (common mistakes) between them. We could not present analysis for all of the answers in this paper but instead, we have chosen the best and the worst answered in every group to present here, Table II and III present the results for Group 1, Table IV and V present the results for Group 2, Table VI and VII present the results for Group 3, and Table VIII and IX present the results for Group 4.

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TABLE II.
BEST ANSWERED QUESTION BY THE GROUP 1 (G1)

5. What is the capacity of CD-ROM?	Answers
a) 700 GB	4
b) 700 KB	4
c) 700 MB	69
d) 700 bytes	3
The question was not answered	0
Percentage of correct answers: 86,25%	69/80

TABLE III.
WORST ANSWERED QUESTION BY THE GROUP 1 (G1)

8. How often is the compiler used?	Answers
a) With the every running of the program	18
b) Only when something is edited in the program	11
c) When the program is being developed and afterwards when something is edited in the program	39
d) How end-user decides	11
The question was not answered	1
Percentage of correct answers: 48,75%	39/80

TABLE IV.
BEST ANSWERED QUESTION BY THE GROUP 2 (G2)

5. What is the capacity of CD-ROM?	Answers
a) 700 GB	4
b) 700 KB	5
c) 700 MB	68
d) 700 bytes	4
The question was not answered	2
Percentage of correct answers: 81,93%	68/83

TABLE V.
WORST ANSWERED QUESTION BY THE GROUP 2 (G2)

9. What is OCR?	Answers
a) Operating system for graphical systems	31
b) Graphics cards integrated on the motherboard	11
c) Graphical User Interface	13
d) Program for character recognition	22
The question was not answered	6
Percentage of correct answers: 26,51%	22/83

TABLE VI.
BEST ANSWERED QUESTION BY THE GROUP 3 (G3)

5. What is the capacity of diskette?	Answers
a)1,44 GB	9
b)700 MB	3
c)1,44 MB	66
d)700 bytes	0
The question was not answered	1
Percentage of correct answers: 83,54%	66/79

TABLE VII.
WORST ANSWERED QUESTION BY THE GROUP 3 (G3)

8. How often is the interpreter used?	Answers
a) With the every running of the program	31
b) Only when something is edited in the program	9
c) When the program is being developed and afterwards when something is edited in the program	22
d) How end-user decides	13
The question was not answered	4
Percentage of correct answers: 39,24%	31/79

TABLE VIII.
BEST ANSWERED QUESTION BY THE GROUP 4 (G4)

5. What is HTML?	Answers
a) Operation system	2
b) Language for the creation of the programs	9
c) Management's tool for the decision support	2
b) Language for the creation of the Internet pages	104
The question was not answered	6
Percentage of correct answers: 84,55%	104/123

TABLE IX.
WORST ANSWERED QUESTION BY THE GROUP 4 (G4)

7. Which of the statements is correct?	Answers
a) 1 byte consists of 256 bits	15
b) In 1 byte it is possible type to 8 letters (at the same time)	17
c) Bit is the part of the byte	75
d) 1 byte can have only 2 different states; 0 or 1	13
The question was not answered	3
Percentage of correct answers: 60,98%	75/123

Correct answers for the projected questions were as follows in the Table X.

TABLE X.
FIRST TEST: PERCENTAGE OF THE CORRECT ANSWERS FOR THE PROJECTED QUESTIONS

Question regarding subject	Percentage
SPEC	58%
Motherboard	72%
CPU manufacturers	63%
Differences between optical and magnetic media	66%
CD-ROM capacity	84%
Virtual memory	73%
Bit and byte	65%
Compilers and interpreters	41%
GUI	84%
CPU performances	64%
RAM memory	76%
OCR software	27%
Minimal configuration	62%
RISC	76%
Operating systems	72%
Development software	74%

B. Analysis of the first test results

The first test has shown that the student population is unfortunately still insufficiently educated in the terms of information technology. Part of the material that is general knowledge was answered better, but there still students who are confused by and are mismatching the elementary terms such as: bit and byte, compiler and interpreter, optical and magnetic media, etc.

Most of the students answered correctly the question on the capacities of CD-ROMs, but still 18% of them provided the wrong answer. This is the elementary knowledge they should have acquired earlier in their education.

Question on OCR software was correctly answered by as little as 26% of students. It is even more significant that 31% of students consider OCR to be the nonexistent “operating system for graphical systems”.

Only 15% of the students answered incorrectly on the question considering HTML which is not bad. On the other hand, 40% of the incorrect answers on the question considering bit and byte are far above the satisfactory level, as the students must have heard it during their education for the at least several times.

III. SECOND TEST

The second test was used to examine the students’ knowledge from the fields of database creation design. Test was, again, conducted in the four groups and the questions were mostly differentiated, while the rules remained the same; multiple-choice questions projected on the canvas screen. Students were providing answers only, 30 seconds were available for each answer, 9 questions were set for each group. During the second test a slightly less unwanted transcribing was noted because students perceived that the transcribing can be retrospectively detected on the basis of their answers.

A. Results of the second test

The scoring methodology remained the same like on the first test: every correct answer was rewarded with 1 point and therefore the maximum score is 9 points. Calculated results for the second test are distributed by groups and presented in the Table XI.

TABLE XI.
SECOND TEST: NUMBER OF STUDENTS AND THE AVERAGE SCORE PER GROUP

Group name	Number of students per group	Average score per group
G1	102	4,56
G2	108	3,74
G3	42	3,64
G4	81	4,77
TOTAL	333	4,18

TABLE XII.
SECOND TEST: PERCENTAGE OF THE CORRECT ANSWERS FOR THE PROJECTED QUESTIONS

Question regarding subject	Percentage
Entity relationship diagram (elements)	93%
Entities	65%
Relationships	45 %
Queries (types)	19%
QBE	25%
SQL	50%
Creation of the relationships	55%
Queries (basis for creating)	40%
Primary key	41%
Calculations	48%
Normalization (exercise)	29%
Attributes	54%

B. Analysis of the second test results

There was significantly less unwanted transcribing during the second test. Results were worse than in the first test, partially because of the more individual work and partially because of the fact that it was new material that most of the students only acquired during current semester term. The results proved that the biggest problems arise when presented matter had to be applied on the problem solving. To understand extent of this problem additional tests and analysis should be undertaken

IV. FINAL CONSIDERATIONS

Lecturers are accustomed to the test the students and often the only purpose of tests is to grade the students. Tests, on the contrary can provide the professors with the much more precious data. On the basis of test lecturers can understand which parts of teaching material they should explain more adequately [1] and what are the most common students’ misunderstandings [2]. Test analysis [3] also indicates which questions are not defined clearly enough and what are the elements that confuse the students.

V. CONCLUSION

Tests during the term are useful to both:

- students as they motivate them for the continuous learning process
- lecturers as they provide feedback information on their students' level of knowledge, indicate teaching material that causes most problems for the students and what part of teaching material students understand more easily.

According to the guidelines of Bologna process the results of tests, like the ones described in this paper, will have to be public. On the basis of those tests, not only students will have to be evaluated, but also the professors.

To conclude, authors intend to proceed with the practice of testing their students and analyzing their results with intention of identifying shortcomings in teaching, students' knowledge and also improving testing and analysis of results.

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