

Meaningful Correlations Resulted from the Statistical Analyze of the Answers Obtained From the Students of the Engineering Faculty, Economic Engineering Specialization for the Second Semester - The University Year 2003/2004

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Abstract: On February 2005, at the Engineering Faculty was carried on the evaluation process of the disciplines and didactic personnel. We have used the Pearson chi-square tests, which test the hypothesis that the row and column variables are independent. While the chi-square test is useful for determining whether there is a relationship, it doesn't tell you the strength of the relationship. Symmetric measures attempt to quantify this. The actual value of the chi-square statistic test isn't very informative, so we used Cramer's test. Cramer's V is a measure of association based on chi-square test. Cramer's V maximum possible value is always 1. The significance value (Asymp. Sig.) has the information we're looking for. The lower the significance value is the less likely it is that the two variables are independent (unrelated). In this case, the significance value is so low that it is displayed as .000, which means that it would appear that the two variables are, indeed, related. We will present in this paper the main aspects that interfere in the evaluation that the students have made at the disciplines and the didactic personnel and every related question, which the students considered to have relevance with the grade that they have evaluated the lecturer and the discipline.

Key-words: Evaluation, statistical analysis, chi-square test, Cramer's V test, discipline grade, lecturer grade.

1 Introduction

An evaluation process of the disciplines and didactic personnel was carried out at the Engineering Faculty On February 2005. This evaluation process used the data collected with the help of the questionnaires distributed to the Economic Engineering students. After a first statistical analysis where we use means and modes to establish a classification (hierarchy), we made a more detailed analysis to see what aspects influence the students when they graded to the lecturer and to the discipline. We have used the Pearson chi-square tests. Pearson chi-square tests, which test the hypothesis that the row and column variables are independent [4]. The actual value of the statistic isn't very informative, so we used Cramer's test.. The significance value (Asymp. Sig.) has the information we were looking for. The lower the significance value is, the less likely it's that the two variables are independent

(unrelated). In this case, the significance value is so low that it is displayed as .000, which means that it would appear that the two variables are, indeed, related. Typically, a significance value less than 0.05 are considered "significant" [1].

2 Statistical analysis

We have obtained these values using SPSS software. To run a Crosstabs analysis you have to choose from the menus: Analyze then Descriptive Statistics and at the end Crosstabs. We have selected as row variable the grade that the students gave to the disciplines and to the lecturer. As the column variable, we selected the classification questions and the questions from all 3 objectives. These are the data that we obtained for each year of study.

Tabel 1 - Meaningful correlations for 1st year EE– University year 2003/04 – 2nd semester

Question number	Observation	Discipline test value	
		Chi square	Cramer's
1. My professional knowledge has been significantly	Medium	0,000	0,468

improved by this subject.			
4. The teaching method employed was a great help in understanding the subject.	Medium	0,000	0,397
6. The documentation that was distributed and/or the bibliography was up-to-date, useful and of good quality.	Weak	0,000	0,371
22. Student's attendance at the course	Weak	0,000	0,361
3. The theoretical part of the lecture was well doubled by the laboratory, seminar and project activity.	Weak	0,000	0,338
2. The volume of work was very high for this subject.	Weak	0,000	0,328
17. The lecturer's presence for the course	Weak	0,000	0,327
21. My last year's average grade was	Weak	0,000	0,325
15. Both the method of evaluation and the grading were correct.	Weak	0,000	0,322
19. My final grade was	Weak	0,001	0,309
5. The bibliography was easily procurable.	Weak	0,001	0,307
18. The seminar, laboratory and project teachers' presence was	Weak	0,000	0,306
20. Please evaluate your knowledge in this field	No	0,005	0,290

The Cramer's test give some sense of the strength of the association determined by chi-square test, they do not, in general, have an intuitive interpretation.

As we can see in table 1 the aspects that influence the student's grade for discipline are the answers at the questions 1, 4, 6 and 22. Questions 19, 5, 18 and 20 have a relationship not due to

chance but not very strong either. The questions 16, 9, 10, 12, 11, 13, 8 are complete independent. So a lecturer who wants to raise the grade to his/her discipline may considerer some work at the teaching method so that the students' knowledge can be significantly improved. The lecturer must also improved the documentations so that it can be useful and of good quality.

Table 2- Meaningful correlations for 1st year EE- University year 2003/04 – 2nd semester

Question number	Observation	Lecturer test value	
		Chi square	Cramer's
9. The lecture was delivered in a clear and well-structured manner.	Strong	0,000	0,551
10. The lecturer stimulated the students' interest for the discipline.	Strong	0,000	0,532
12. The time allotted to this discipline was efficiently used by the lecturer.	Strong	0,000	0,524
15. Both the method of evaluation and the grading were correct.	Medium	0,000	0,461
11. The lecturer readily agreed to discuss problems regarding the discipline.	Medium	0,000	0,455
13. I would like to attend another of this professor's lectures.	Medium	0,000	0,434
8. The lecturer proved an excellent grasp of the discipline they taught.	Medium	0,000	0,420
16. The exam was promoted only by professional criteria	Medium	0,000	0,407
17. The lecturer's presence for the course was:	Weak	0,000	0,338
18. The seminar, laboratory and project teachers' presence was:	Weak	0,000	0,324
20. Please evaluate your knowledge in this field	Weak	0,001	0,314

In table 2 we wanted to search the aspects that have most influence student's grade for the lecturer. Questions 12,11,9 and 8 have the strongest influence when they evaluate a lecturer. So the students appreciate a lecturer who use the

time allocated to that discipline efficiently, he wants to discuss the problems regarding the discipline. A good lecturer master the discipline that he taught and he delivered it in a clear and well-structured manner.

The questions 17, 18 and 20 have a relationship not due to chance but not very strong also. Questions 19, 22, 21, 1, 4, 6, 3, 2 and 5 are

complete independent. As we can see the students were not influence by the grade that they have received at the exam.

Table 3 - Meaningful correlations for 2nd year EE – University year 2003/04 – 2nd semester

Question number	Observation	Discipline test value	
		Chi square	Cramer's
18. The seminar, laboratory and project teachers' presence was:	Strong	0,000	0,671
1. My professional knowledge has been significantly improved by this subject.	Strong	0,000	0,549
9. The lecture was delivered in a clear and well-structured manner.	Strong	0,000	0,511
12. The time allotted to this discipline was efficiently used by the lecturer.	Strong	0,000	0,504
8. The lecturer proved an excellent grasp of the discipline they taught.	Strong	0,000	0,491
4. The teaching method employed was a great help in understanding the subject.	Medium	0,000	0,474
6. The documentation that was distributed and/or the bibliography was up-to-date, useful and of good quality.	Medium	0,000	0,458
11. The lecturer readily agreed to discuss problems regarding the discipline.	Medium	0,000	0,446
3. The theoretical part of the lecture was well doubled by the laboratory, seminar and project activity.	Medium	0,000	0,445
10. The lecturer stimulated the students' interest for the discipline.	Medium	0,000	0,393
5. The bibliography was easily procurable.	Weak	0,000	0,389
19. My final grade was	Weak	0,000	0,378
2. The volume of work was very high for this subject.	Weak	0,000	0,366
17. The lecturer's presence for the course was:	Weak	0,000	0,359
21. My last year's average grade was	Weak	0,000	0,336
20. Please evaluate your knowledge in this field	Weak	0,000	0,332
13. I would like to attend another of this professor's lectures.	Weak	0,001	0,315
22. Student's attendance at the course	Weak	0,000	0,301

As we can see in table 3 and 4 the 2nd year students didn't make a very clear difference between the teacher and the subject evaluated. This affirmation is sustained by the fact the question 9 and 12 appear to have a very strong

influence on both evaluations. We also observed that the seminar teachers' presence influence their grade given to the subject. As the first year students, the 2nd year students evaluated the lecturer influence by the question 12, 11, 9 and 8

Table 4 - Meaningful correlations for 2nd year EE – University year 2003/04 – 2nd semester

Question number	Observation	Lecturer test value	
		Chi square	Cramer's
12. The time allotted to this discipline was efficiently used by the lecturer.	Strong	0,000	0,545
11. The lecturer readily agreed to discuss problems regarding the discipline.	Strong	0,000	0,544
9. The lecture was delivered in a clear and well-structured manner.	Strong	0,000	0,542
8. The lecturer proved an excellent grasp of the discipline they taught.	Strong	0,000	0,534
10. The lecturer stimulated the students' interest for the	Medium	0,000	0,456

discipline.			
13. I would like to attend another of this professor's lectures.	Medium	0,000	0,452
6. The documentation that was distributed and/or the bibliography was up-to-date, useful and of good quality.	Medium	0,000	0,446
4. The teaching method employed was a great help in understanding the subject.	Medium	0,000	0,438
18. The seminar, laboratory and project teachers' presence was:	Medium	0,000	0,438
3. The theoretical part of the lecture was well doubled by the laboratory, seminar and project activity.	Medium	0,000	0,433
1. My professional knowledge has been significantly improved by this subject.	Medium	0,000	0,395
19. My final grade was	Weak	0,000	0,370
15. Both the method of evaluation and the grading were correct.	Weak	0,000	0,359
5. The bibliography was easily procurable.	Weak	0,000	0,340
17. The lecturer's presence for the course was:	Weak	0,000	0,330
16. The exam was promoted only by professional criteria.	Weak	0,000	0,312
21. My last year's average grade was	Weak	0,000	0,308
20. Please evaluate your knowledge in this field	Weak	0,000	0,297

3rd year students (table 5) starts to place the importance of a subject on the way in which the theoretical aspects of the lecture are reinforced by the laboratory activities. We also notice that the grade received at the exams starts to have a medium / weak influence on their evaluation. Only question number 2 is completely

independent. We notice that the students start to have a more complex image when they evaluate a discipline. They want a lecturer who agrees to discuss problems related to the discipline and who knows how to manage time and tries to improve their knowledge on the subject (table 6).

Table 5 - Meaningful correlations for 3rd year EE – University year 2003/04 – 2nd semester

Question number	Observation	Discipline test value	
		Chi square	Cramer's
1. My professional knowledge has been significantly improved by this subject.	Strong	0,000	0,594
5. The bibliography was easily procurable.	Strong	0,000	0,538
3. The theoretical part of the lecture was well doubled by the laboratory, seminar and project activity.	Strong	0,000	0,524
11. The lecturer readily agreed to discuss problems regarding the discipline.	Strong	0,000	0,510
4. The teaching method employed was a great help in understanding the subject.	Medium	0,000	0,486
10. The lecturer stimulated the students' interest for the discipline.	Medium	0,000	0,438
16. The exam was promoted only by professional criteria	Medium	0,000	0,427
6. The documentation that was distributed and/or the bibliography was up-to-date, useful and of good quality.	Medium	0,000	0,422
17. The lecturer's presence for the course was:	Medium	0,000	0,399
19. My final grade was	Medium	0,000	0,394
13. I would like to attend another of this professor's lectures.	Weak	0,000	0,385
20. Please evaluate your knowledge in this field	Weak	0,000	0,380
18. The seminar, laboratory and project teachers' presence was:	Weak	0,000	0,373
8. The lecturer proved an excellent grasp of the discipline they taught.	Weak	0,000	0,366
12. The time allotted to this discipline was efficiently used	Weak	0,000	0,361

by the lecturer.			
22. Student's attendance at the course	Weak	0,012	0,350
9. The lecture was delivered in a clear and well-structured manner.	Weak	0,000	0,337
15. Both the method of evaluation and the grading were correct.	Weak	0,000	0,325
21. My last year's average grade was	No	0,000	0,257

Table 6 - Meaningful correlations for 3rd year EE – University year 2003/04 – 2nd semester

Question number	Observation	Lecturer test value	
		Chi square	Cramer's
11. The lecturer readily agreed to discuss problems regarding the discipline.	Strong	0,000	0,543
1. My professional knowledge has been significantly improved by this subject.	Strong	0,000	0,517
12. The time allotted to this discipline was efficiently used by the lecturer.	Strong	0,000	0,516
10. The lecturer stimulated the students' interest for the discipline.	Strong	0,000	0,496
3. The theoretical part of the lecture was well doubled by the laboratory, seminar and project activity.	Medium	0,000	0,481
13. I would like to attend another of this professor's lectures.	Medium	0,000	0,465
8. The lecturer proved an excellent grasp of the discipline they taught.	Medium	0,000	0,447
4. The teaching method employed was a great help in understanding the subject.	Medium	0,000	0,436
17. The lecturer's presence for the course was:	Medium	0,000	0,416
9. The lecture was delivered in a clear and well-structured manner.	Medium	0,000	0,407
18. The seminar, laboratory and project teachers' presence was:	Medium	0,000	0,403
16. The exam was promoted only by professional criteria	Medium	0,000	0,391
5. The bibliography was easily procurable.	Weak	0,000	0,386
15. Both the method of evaluation and the grading were correct.	Weak	0,000	0,374
6. The documentation that was distributed and/or the bibliography was up-to-date, useful and of good quality.	Weak	0,000	0,369
20. Please evaluate your knowledge in this field	Weak	0,000	0,346
19. My final grade was	Weak	0,000	0,319
22. Student's attendance at the course	Weak	0,000	0,311

4th year students (table 7, 8) are more reserved when they evaluate a discipline and strong opinions about the lecturers evaluated. Questions 4, 1, 3 and 6 have a medium influence to the subject evaluation and the students' attendance at the course and final grade at the exams are complete independent aspects. Questions 9, 12

and 11 have a strong influence on student's evaluation for the lecturer. The final grade exams and lecturer presence have a weak influence and questions 22, 20, 18, 21 are completely independents regarding the aspects of the student's grading of the lecturer.

Table 7 - Meaningful correlations for 4th year EE – University year 2003/04 – 2nd semester

Question number	Observation	Discipline test value	
		Chi square	Cramer's
4. The teaching method employed was a great help in understanding the subject.	Medium	0,000	0,444

1. My professional knowledge has been significantly improved by this subject.	Medium	0,000	0,443
3. The theoretical part of the lecture was well doubled by the laboratory, seminar and project activity.	Medium	0,000	0,436
6. The documentation that was distributed and/or the bibliography was up-to-date, useful and of good quality.	Medium	0,000	0,422
5. The bibliography was easily procurable.	Weak	0,000	0,381
15. Both the method of evaluation and the grading were correct.	Weak	0,000	0,344
16. The exam was promoted only by professional criteria	Weak	0,000	0,329
17. The lecturer's presence for the course was:	Weak	0,000	0,322
20. Please evaluate your knowledge in this field	Weak	0,000	0,316
18. The seminar, laboratory and project teachers' presence was:	Weak	0,000	0,312
2. The volume of work was very high for this subject.	Weak	0,000	0,304
21. My last year's average grade was	Weak	0,000	0,301

Table 8 - Meaningful correlations for 4th year EE – University year 2003/04 – 2nd semester

Question number	Observation	Lecturer test value	
		Chi square	Cramer's
9. The lecture was delivered in a clear and well-structured manner.	Strong	0,000	0,556
12. The time allotted to this discipline was efficiently used by the lecturer.	Strong	0,000	0,525
11. The lecturer readily agreed to discuss problems regarding the discipline.	Strong	0,000	0,513
13. I would like to attend another of this professor's lectures.	Medium	0,000	0,472
8. The lecturer proved an excellent grasp of the discipline they taught.	Medium	0,000	0,466
10. The lecturer stimulated the students' interest for the discipline.	Medium	0,000	0,451
16. The exam was promoted only by professional criteria	Medium	0,000	0,414
15. Both the method of evaluation and the grading were correct.	Medium	0,000	0,399
19. My final grade was	Weak	0,000	0,375
17. The lecturer's presence for the course was:	Weak	0,000	0,365

3 Conclusions

As we can notice, all the students have evaluated the discipline regarding the aspects of the knowledge improved by the subject (question 1). The final year students consider that an important aspect is the way in which the theoretical aspects are reinforced by laboratory activities. When they evaluated the lecturer all the students agreed that the lecturer must be a good time manager, he / she must agree to discuss problems related to the discipline and present the lecture in a clear and well-structured manner.

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