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# TEACHING QUALITY, NEW LEARNING TECHNOLOGIES AND THE COMPETENCES DEMANDED ON THE JOB MARKET

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***Abstract**: The university is a field of professional and human training and development for all those involved in the process, and its quality is closely correlated with the new learning technologies. Initially regarded only as mere auxiliaries of the didactic process, as levers for streamlining the instructive-educational process from all perspectives, they have nowadays become responsible for a new type of learning and academic management as well as for the entire reconstruction of the relation with the labor market. In the knowledge society there is no longer the question of whether the new technologies should be used but how, where and for what activity should they be applied with maximum performance. It is important that higher education institutions should provide students with the possibility of developing a solid set of transversal key-competences (the digital competence being one of them). The study that we propose started from the finding that there is, compulsorily and logically, a close connection between the quality of academic teaching, the level of graduates' competences (implicitly meaning the contribution of the academic program to the forming of competences) and the level of competences required for graduates by the type of activity that they carry after graduation. If there is no doubt concerning these close correlations, our interest has been that of identifying to what extent these significant correlations between two or more of the 4 variables may exist.*

***Keywords:** teaching quality, learning technologies, competence, digital competence*

## I. WHAT PROBLEMS, NOTIONS AND INTERDEPENDENCIES ARE WE ANALYZING?

*Highly qualified* professional training is the responsibility of higher education. There has never been a greater preoccupation with ensuring the competences of graduates on a *qualitatively high level* and in *as good an agreement with the labor market as possible*, than there is today. Nevertheless, the necessity does not suffice for it to become reality. Usually, universities provide training for a dynamic and relatively unpredictable labor market. Basically, this means that the competences required by employers are not accurately prefigured and known in real time. The universities themselves often manifest an inevitable inertia both in terms of curricula and of some of the license degree programs, and also in terms of their relations with their own beneficiaries, the students. *The new learning technologies* may constitute *key points* in the academic university process at least in two ways: as means of learning, responsible with *forming the competence of learning throughout one's entire life*; from the perspective of the results of their exploitation, that is, ensuring the *digital competence*, one of those transversal competences that may be useful in the majority of activities from the labor market. Our study will investigate the correlations highlighted by the graduate's perception of the quality of teaching, some aspects of the new learning technologies and the competences required from graduates by the labor market.

Analyzing the real aspects that determine the performances of graduates we identify some that play a very significant role: *the quality of the didactic process* (as an expression of the teachers' human and professional quality) as it is in reality and as it is perceived by graduates; *the use of the learning technologies* (at the intersection of the human and material resources in the didactic process) as it occurs in reality and as it is perceived by graduates; *the competences required from graduates on the labor market* (as an expression of the professional value of their academic training when faced with the exigencies of the labor market).

The main notions that we shall attempt to conceptually delineate are:

*a. Teaching quality*: "The quality of education represents *a priority* for any educational institution" [2]. *The quality of teaching* is a constitutive and determining part of it, together with the quality of all resources and the quality of the results. The concept is difficult to bind in one definition and interpretable. In this context, we join the point of view expressed in the OECD Report [3] and we define the quality of teaching as aiming at the best level of achieving the process in relation to the finalities established under the given conditions. Ensuring it implies, as one of the essential premises, the "standards for teachers linked to standards for students" [1]. From this point of view, our study will aim at highlighting, based on the graduates' perception, precisely the existence of one or several correlations between the quality of teaching (as an expression of the quality of the teacher's training) and other indicators that shall be subsequently analyzed and expressed, from various perspectives, namely the quality of the graduates' acquisitions.

*b. Learning technologies* refers, in the most general and practically acceptable way, to "the broad range of communication, information and related technologies that can be used to support learning, teaching, and assessment" [4].

*c.* "Competences are defined as a combination of knowledge, skills and attitudes appropriate to the context." [5].

*d. Digital competence* is a special species of competences due to its transversal quality, fundamental for the acquiring and operationalization of other professional competences. Basically, it involves "the confident and critical use of Information Society Technology (IST) for work, leisure and communication. It is underpinned by basic skills in ICT: the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet" [5]. We believe that the ability to use the computer and to surf the Internet though not synonymous with the digital competence represents an essential part of its structure.

## II. HOW DID WE INVESTIGATE?

### 2.1. Aim, hypothesis and objectives of the research

*Aim:* identifying the existence of a significant correlation among the following four indicators: 1. the quality of teaching; 2. the level of computer operating and Internet surfing skills (at the end of the studies program); 3. the contribution brought by the studies program graduated to the development of the computer operating and Internet surfing skill; 4. evaluating the required level of the skill in using a computer and in surfing the Internet for the type of activity conducted at present.

*Hypothesis*: is there any significant correlation between two or more of the four targeted indicators?

*Objectives:*

a. identifying the graduates' perception of the four targeted indicators;
b. presenting, analyzing and interpreting the collected data;
c. identifying, highlighting and analyzing the correlations.

### 2.2. The research methodology

The present study is a partial result generated by the institutional frame of the project "*Graduates and the labor market*", a national study for monitoring the insertion on the labor market of the graduates of higher education. This was implemented in the period may 2010-October 2011 by UEFISCSU-CNFIS, in partnership with the international Center for Research in Higher Education

(INCHER), the University from Kassel, Germany. Many public and private higher education institutions from Romania were invited to join in the project and 49 of them answered favorably. From the ensemble of the data collected we have selected and we shall present only those that are related to the announced theme.

*a. The method of research*: the online questionnaire. After constituting the data bases with the faculties' graduates, they were contacted via electronic mail and invited to take part in the study. The platform automatically generated and randomly allotted a code that ensured the respondent's uniqueness and anonymity.

*b. Sample*: *622* graduates of promotion 2009, "Vasile Alecsandri" University of Bacău. From the total of the graduates invited to participate in the study, *448* participated effectively. The structure of the sample by faculties is the following:

**Table 1. The distribution of the questioned graduates by faculties**

| Faculty | Number of respondents | Percent-age |
|---|---|---|
| Faculty of Engineering | 197 | 43,9% |
| Faculty of Letters | 25 | 5,6% |
| Faculty of Sciences of Movement, Sports and Health | 51 | 11,4% |
| Faculty of Sciences | 32 | 7,1% |
| Faculty of Economic Sciences | 114 | 25,4% |
| Department for Teaching Staff Training | 29 | 6,5% |
| Total | 448 | 100% |

*c. Stages of the research*:

*1. the preliminary stage*, *July - October 2010*, providing all the organizational, material and human resources required for contacting and involving the graduates into the research;

2. *the stage of applying the questionnaire, November 2010 - March 2011*, the online filling in of the questionnaires. This was done by electronic transmission in four successive rounds (November 23, December 14, 2010, January 25, March 1, 2011) of the personalized letters of invitation for accessing the questionnaire online (by means of the mail merge procedure);

3. *the final stage, April - October 2011,* collecting, analyzing and interpreting the data. Processing the data was ensured by the program Statistical Package for the Social Sciences (SPSS 17).

## III. WHAT RESULTS DID WE OBTAIN?

### 3.1. Presenting and analyzing the results obtained for indicator 1

*Variable 1 "The quality of academic teaching"* is represented by a series of three items arranged on a scale from 1 to 5 (1 being *very poor* and 5 being *very good*). For item 1 "*The quality of teaching-didactics* (method, technical means, teaching style)" the frequency of answers is distributed thus: Faculty of Engineering-164; Faculty of Letters-18; Faculty of Sciences of Movement, Sports and Health -38; Faculty of Sciences -27; Faculty of Economic Sciences -89; Department for Teaching Staff Training -21.

**Table 2. Statistical data obtained for the indicator 1 in item 1**

| **"Quality of teaching-didactics (method, technical means, teaching style"** | **Mean** | **Standard deviation** |
|---|---|---|
| Faculty of Engineering | 3,90 | ,897 |
| Faculty of Letters | 3,67 | 1,029 |
| Faculty of Sciences of Movement, Sports and Health | **4,34** | ,582 |

| | | |
|---|---|---|
| Faculty of Sciences | 3,78 | ,892 |
| Faculty of Economic Sciences | 3,85 | ,972 |
| Department for Teaching Staff Training | **4,52** | ,680 |
| Total | 3,95 | ,904 |

The data reveal the placing of the means for four of the faculties of the university in positions of statistical normality and also the mean of appreciations towards very good given by the graduates of the Faculty of Sciences of Movement, Sports and Health (4,34) and of the Department for Teaching Staff Training (4,52).

For *item 2 "Availability of (access to) technical equipment (computers, measuring instruments, etc)"*, here is the frequency of answers: Faculty of Engineering-162; Faculty of Letters-18; Faculty of Sciences of Movement, Sports and Health-35; Faculty of Sciences-27; Faculty of economic Sciences-88; Department for Teaching Staff Training -20.

**Table 3. Statistical data obtained for indicator 1 in item 2**

| **"Availability of (access to) technical equipment (computers, measuring instruments, etc)"** | **Mean** | **Standard deviation** |
|---|---|---|
| Faculty of Engineering | **3,66** | 1,041 |
| Faculty of Letters | 3,22 | ,943 |
| Faculty of Sciences of Movement, Sports and Health | 3,54 | 1,067 |
| Faculty of Sciences | 3,44 | 1,050 |
| Faculty of Economic Sciences | **3,38** | 1,216 |
| Department for Teaching Staff Training | 3,45 | 1,234 |
| Total | 3,53 | 1,099 |

The data presented above reveal the mean of the graduates' appreciations in relation to the availability of the technical means, these being placed between a minimum of 3,38 given by the graduates of the Faculty of Economic Sciences and a maximum of 3,66 given by the graduates of the Faculty of Engineering. It is worth mentioning the difference between the mean of appreciations for this item and the preceding item (0,88 for the graduates of the Faculty of Sciences of Movement, Sports and Health and 1,07 for those of the Department for Teaching Staff Training).

The frequency of the answers for *item 3 "Quality of equipment and instruments for laboratory/tutorial practice"* is distributed as follows: Faculty of Engineering-163; Faculty of Letters-17; Faculty of Sciences of Movement, Sports and Health-35; Faculty of Sciences-27; Faculty of Economic Sciences-84; Department for Teaching Staff Training -19.

**Table 4. Statistical data obtained for indicator 1 in item 3**

| **"Quality of equipment and instruments for laboratory/tutorial practice"** | **Mean** | **Standard deviation** |
|---|---|---|
| Faculty of Engineering | 3,39 | 1,107 |
| Faculty of Letters | 3,24 | ,903 |
| Faculty of Sciences of Movement, Sports and Health | **3,63** | ,910 |
| Faculty of Sciences | 3,59 | 1,118 |
| Faculty of Economic Sciences | **3,21** | 1,243 |
| Department for Teaching Staff Training | **3,63** | 1,300 |
| Total | 3,39 | 1,129 |

The statistical data obtained for this item are comparable to those from item 2, the maximum of the mean being situated at the Faculty of Sciences of Movement, Sports and Health and at the

Department for Teaching Staff Training (3,63), and the minimum at the Faculty of Economic Sciences (3,21).

### 3.2. Presentation and analysis of the results obtained for indicator 2

Regarding the evaluation of the graduates' level of competences when graduating the studies program we have selected as a basic component of the digital competence, respectively *"Computer operating and Internet surfing skills",* on a scale from 1 to 5 (1 being *very low* and 5 being *very high*). The frequency of the answers is distributed thus: Faculty of Engineering-104; Faculty of Letters-12; Faculty of Sciences of Movement, Sports and Health-25; Faculty of Sciences-17; Faculty of Economic Sciences -61; Department for Teaching Staff training -20.

**Table 5. Statistical data obtained for indicator 2 in item 1**

| **"Computer operating and Internet surfing skills"** | **Mean** | **Standard deviation** |
|---|---|---|
| Faculty of Engineering | 4,32 | ,927 |
| Faculty of Letters | **4,75** | ,452 |
| Faculty of Sciences of Movement, Sports and Health | **3,48** | 1,388 |
| Faculty of Sciences | 4,24 | ,831 |
| Faculty of Economic Sciences | 4,36 | ,931 |
| Department for Teaching Staff Training | 4,65 | ,587 |
| Total | 4,28 | ,976 |

The graduates of the Faculty of Letters believe that the studies program attended by them forms, to a very large extent (mean 4,75), computer operating and Internet surfing skills whereas the graduates of the Faculty of Sciences of Movement, Sports and Education situate it within normal standards (3,48). Also, one may see that the graduates from five of the academic structures mentioned have the mean of appreciation above 4,00.

### 3.3. Presentation and analysis of the results obtained for indicator 3

Appreciating the contribution of the studies program in developing one's level of competences in relation to the skill of using the computer was expressed through the item "Computer operating and Internet surfing skills (as a constituent part of the contribution of the studies program to the development of one's level of competences)". The graduates appreciated the forming of this skill on a scale from 1 to 5 (1 being *very low* and 5 being *very high*). The answers' frequency is the following: Faculty of Engineering-153; Faculty of Letters-18; Faculty of Sciences of Movement, Sports and Health -37; Faculty of Sciences-25; Faculty of Economic Sciences -85; Department for Teaching Staff Training -22.

**Table 6. Statistical data obtained for indicator 3 in item 1**

| **"Computer operating and Internet surfing skills (as a constituent part of the studies program's contribution to the development of one's level of competences)"** | **Mean** | **Standard deviation** |
|---|---|---|
| Faculty of Engineering | **4,05** | 1,081 |
| Faculty of Letters | 4,11 | ,900 |
| Faculty of Sciences of Movements, Sports and Health | **4,05** | 1,079 |
| Faculty of Sciences | **4,32** | 1,802 |
| Faculty of Economic Sciences | 4,14 | 1,025 |
| Department for Teaching Staff Training | 4,18 | 1,006 |
| Total | 4,11 | 1,031 |

The graduates of the Faculty of Sciences believe that the studies program attended forms, to a very large extent, (4,32), the skills in operating a computer and surfing the Internet. The lowest level of appreciation for this item is that of the graduates of the Faculty of Engineering and of those of the Faculty of Sciences of Movement, Sports and Health (4,05). Also, one may notice that the graduates of all the faculties have the mean of appreciation above 4,00.

### 3.4. Presentation and analysis of the results obtained for indicator 4

Evaluating the level of competences required by the type of activity conducted at present was placed in relation with the computer operating and Internet surfing skills. The graduates appreciated this skill on a scale from 1 to 5 (1 being *very low* and 5 being *very high*). The answers' frequency is the following: Faculty of Engineering -104; Faculty of Letters -12; Faculty of Sciences of Movement, Sports and Health-25; Faculty of Sciences-17; Faculty of Economic Sciences-61; Department for Teaching Staff Training-20.

**Table 7. Statistical data obtained for indicator 4 in item 1**

| **"Computer operating and Internet surfing skills (as a constituent part of the type of activity conducted at present)"** | **Mean** | **Standard deviation** |
|---|---|---|
| Faculty of Engineering | 4,32 | 0,927 |
| Faculty of Letters | **4,75** | ,452 |
| Faculty of Sciences of Movement, Sports and Health | **3,48** | 1,388 |
| Faculty of Sciences | 4,24 | ,831 |
| Faculty of Economic Sciences | 4,36 | ,913 |
| Department for Teaching Staff Training | 4,65 | ,587 |
| Total | 4,28 | ,976 |

The graduates of the Faculty of Sciences of Movement, Sports and Health appreciate as least important the skills in operating a computer in the professional activity conducted at present (3,48) whereas the graduates of the Faculty of Letters regard it as extremely necessary (4,75).

## IV. CONCLUSIONS

Analyzing the data obtained by faculties, we found major differences between the means of the appreciations of the graduates of the Faculty of Letters in terms of the quality of academic teaching (3,67) and the digital competences acquired or required by the job (4,75). The closest correlation highlighted by the statistical data between the quality of the teaching act and the digital competences is that found at the graduates of the Department for Teaching Staff Training (4,52 respectively 4,65).

On the level of the sample, one may see that the correlations established among the four indicators are *positive*. The absolute value of the Pearson correlation coefficients (that indicate the strength of the connections among the variables) reveals the fact that between the quality of academic teaching and the ability to operate with a computer and surf the Internet there is a *weak positive connection* (for the correlation with the indicator 2 it is 0,142 and for the correlation with the indicator 3 it is 0,255). An *average connection* exists between the computer operating and Internet surfing skills, as part of the studies program's contribution (0,321), on the one hand; also, between the computer operating and Internet surfing skills, at the time of graduation and at the job (0,337), on the other hand. Regarding the threshold of relevance, we found that there are five *relevant* correlations, except that between the quality of teaching and the skills in operating a computer and surfing the Internet required by the job (0,183).

The aim of the study was reached. The hypothesis was confirmed in terms of the existence of relevant correlations among three of the four variables, as we have previously shown.

For any university, such a study provides valid data concerning the measures that are required with a view to improving the quality of teaching and of the graduates' competences for a better agreement with the labor market.

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