

access they should have in the educational system in the country, ranging from pre-school onwards.

Based on this situation to ascertain, the Roma minority in the country is still necessary to make improvements in the Albanian legislation, in terms of meeting the criteria to benefit from the opportunities offered by central and local government on issues such as education and employment, simplify the application procedures for the Roma community near government offices, for a wider access and ease in completing documentation.

Finally we can conclude that the most important elements in resolving the issues facing Albanian society, including Roma minority issues remain constructive dialogue and continuous, and intercultural cooperation between, state institutions, civil society and citizens, that addressing the issues and the process of analyzing and solving them to be more inclusive and accepting of all. Fulfilling the obligations of Albania in the framework of respecting the rights of minorities, especially against Roma, in order for this community to live by the standards of the rest of the population in our country requires interagency coordination, which is essential for the effective protection his rights.

Reference

- Cashmore, E. (2002) Behind the window dressing: Ethnic Minority perspectives on cultural diversity policy. *Journal of Ethnic and Migration Studies*, 28(2), 327- 341.
- Decade of Roma Inclusion. (2010-2015). National Action Plan. (2011)
- Gedeshi, I., Jorgoni, E. (2011). Hartzimi i fëmijëve në Shqipëri, Qendra për studime ekonomike dhe sociale. Raporti për UNICEF -in.
- Heijes, C. (2007). Officers at work in a multicultural police force. *Policing: An International Journal of Police Strategies & Management*, 30 (4), 555-556.
- INSTAT, (2011) Census
- Ivanova, A., O' Higgins. (2006) Education and Employment Opportunities for Roma. 6-19, 48
- Marcel Courthiade. (2003) Origin Roma.
- National Strategy for Improvement of Roma Living Conditions Decade of Roma Inclusion. (2003). The National Action Plan. (2010-2015)
- PNUD. (2006). Vulnerabiliteti social i romëve në Shqipëri, 45.
- UNDP (2012). Assessing the needs of Roma and Egyptian communities in Albania.

An alternative method to evaluate the teaching's standards

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Abstract

The article applied the DOE approach to evaluate the teaching's standards. Design of Experiments (DOE) is the statistical method to assess the quality related to products and services. Meanwhile the one's aspect of DOE's using focused to the evaluation according to the public services. DOE used to evaluate the teaching's quality in the master courses at European University of Tirana (EUT). The article demonstrates shortly the content of DOE model referring to the required practical construction of orthogonal matrix to obtain information by using the standard matrix L_2^8 Taguchi. The questionnaire focused to the students of master's courses of Faculty of Economics and Information Technology, I Year (2015-2016). The analysis of results using the Taguchi method through ANOVA's highlighted the significance and impact of the inclusive factors which affected the teaching's standards. The results confirmed the significance of ability to explain and to communicate and the teacher's experience related to the teaching's standards.

Key words: DOE, Taguchi, teaching's standard

1. Introduction

The evaluation of teaching process comprises the one's core issues according to the comprehensive development into universities actually. Institutional accreditations, legal requirements, internal or external evaluation, the various rankings of colleges, etc., are the most important elements of the overall framework related to the

development of higher education. This aspect is linked with various "bid" in the market naturally, meanwhile the "product" of higher education, the student with his knowledge; it can only be tested in the end of study's cycle due to the required time at least into three year period in the best case. Taking into consideration this "product" is not random, but it has the crucial substance related to the professional development of each individual, because the consequence of permanent evaluation of the teaching's standards in colleges is primary.

Generally the evaluation of the teaching process, without considering the evaluation that the labor market makes to different schools (which it is the most important), can be divided into the two main forms: through the processes of institutional evaluation and also through the evaluation of interviews or direct surveys. The institutional evaluation in the overall view realize through the checking of diverse legal criteria, study's programs, (academic evaluation), the academic staff's qualification, student's admission criteria, material base (eg. libraries, internet, etc.). Meanwhile the evaluation relying on the interviewing and surveying provides the "feedback" from direct subjects who they related directly to the high school product: the students, businesses, and the academic staff of course. This article is focused exactly on the second types according to the evaluating of teaching's standards.

2. Interviews and their problematic

Referring to above the recognized method to evaluate the teaching's standards is also the interviewing of students about what they think according to the development of various courses, respective programs or their lecturers. At first sight this approach seems simple, but it is so complex, similar to put up questionnaires as well as the content of reflective. Subjective nature in the questionnaire's completion is known, but it becomes more problematic related to the assessment due to the other concerned factors are not directly associated to the directed questions. It is no usual during the evaluation of lecturer, if the student may be influenced by his taken assessment of course, and did not concentrate to evaluate the preparation or the ability of lecturer. Otherwise, we should investigate if there were any probability that a student evaluated "very good" in his course, but his lecturer evaluated "not very good". Referring to this aspect of questionnaires' results, despite of their structure and completion might have the wholly positive principles, regularly they have concluded into the contradictious and inexplicable output. In some cases, it noticed the trend that the most exacting lecturers were evaluated "less" compare to the less exacting ones, the effective internal lecturers compare to non- effective lectures, etc. Due to this problematic, another used form at The European University of Tirana (EUT) is the assessment through open interviews according to "focus groups". But it is not the best solution due to

it does not remove the bias, also the additional question requires how focus groups should be selected to give further assessment.

However, all interviews carried out above, simultaneously general survey of students and focus groups do not provide the level of overall assessment for teaching. They can serve to diverse lecturers, but they cannot provide the comprehensive assessment of teaching's level at universities (even if the student perspective). On the other hand the processing of their results, particularly when interviews are open, it is quite difficult. They often remain into the descriptive presentation of estimations related to specific criteria, without providing a comparative result among evaluation of criteria.

Emphasizing the problematic according to evaluating of teaching process through interviews, we do not mean to reject their significance. These forms should not be neglected, but rather, should be developed and improved in advance. However that's neither the issue of article. We analyzed the above problematic due to the requisite of any alternative method to evaluate the comprehensive teaching's standards relying on the incorporated appearance according to the determinants of this process. The question related to make possibly the analysis in depth and demonstrated where we should be more considerable. Another specific question linked to the proper comprehensive evaluation on teaching standards into the course or department and it was not just related to subjects or individual professors. The partial solution of these circumstances relied on the Design of Experiments (DOE).

3. DOE and modeling of teaching's evaluation

About DOE technique

Design of Experiments (DOE) is a statistical technique studied and presented for the first time by the Englishman R. A. Fisher in the '20s. In many statistical techniques to study the impact of a factor on the dependent variable, they assume that other factors remain fixed, which it is not practically the real assumption. Meanwhile taking into consideration the simultaneous change of all factors generates several complexities mainly due to their combination is almost the considerable number. Referring to this feature, Fisher tried to demonstrate the dependence's analysis of factors' set on the given output realizing the necessary minimum number of experiments. Precisely this comprises the DOE's core: the dependence's revision of cause – consequence by determining the minimum crucial number of required experiments. According to this focus Fisher attempted to analyze the dependence of agricultural cultures efficiency by determinants' efficiency like irrigation, temperature, utilize of fertilizers, etc. Relying on the realization of certain number of experiments, he managed to

argue the optimal combinations of these factors for a maximum result according to agricultural cultures.

The Japan's Taguchi efforts for many years during '40 years has contributed in subsequent searches of DOE who's his contribution focused particularly to the standardization of alternatives and making the technology more "user friendly". The using of the Taguchi DOE was mainly in the engineering field, which constituted the core of its application in improving the quality of products and services. An important part of the achievements in the field of automobile industry in Japan was evaluated to be exactly the DOE's contribution of Taguchi's technique.

DOE and application in education

DOE relates mainly to the study of increasing the quality of products and services to determine the optimum combination of determined factors. However, its use has been extended to the field of public services, where it intended to assess the diverse factors to a certain level of offered public services. Furthermore, the use of DOE can apply to evaluate the teaching's standards in schools starting from the assessment of particular factors affecting them.

To give a general idea of this view, we take into the simple example. Assume that we discuss to create the teaching program, which it includes a group of subjects, amongst them deciding about two subjects, for instance A and B. Each of them can be developed in two levels, for example level 1 and level 2 more advanced, then we will have A_1 or A_2 and B_1 or B_2 . The possible combinations can be A_1B_1, A_1B_2, A_2B_1 and A_2B_2 . The question related to which of these can be selected. To answer to this question we can make an interview of a group of experts in the field, each of them gives his alternative. Interview's results according to experts' preferences are set in Table 1.

TABLE 1 The combinations of DOE's results

| | B_1 | B_2 | Means of B_1B_2 by A_1 or A_2 | Difference of means B_1B_2 |
|-------------------------------------|-------|-------|-------------------------------------|------------------------------|
| A_1 | 10 | 50 | 30 | 5.0 |
| A_2 | 40 | 30 | 35 | |
| Means of A_1A_2 by B_1 or B_2 | 25 | 40 | 37.5 | |
| Difference of means A_1A_2 | 15 | | | |

Source: Authors' evaluation referring to DOE

The table demonstrates the possible combinations respectively 10, 50, 40 and 30 ratings. For the B_1 level of the case B, the average A_1 and A_2 is 25, on average 25 experts are on the level of B to B_1 , regardless of level A. Similarly to level B in B_2 is approximately 40 experts. While the level of A to A_1 or A_2 are respectively an average of 30 and 35 experts. The indicator of average by group A or B, regardless of the level of another subject (A or B) is also important. These changes represent reality which of passage has more significant impact on the teaching's level.

In the above case, the number of discussed alternatives is 4 (A_1B_1, A_1B_2, A_2B_1 and A_2B_2), so relatively small. But in the general case, this number would be relatively significant, for example in the case of discussing for seven factors that affecting to teaching, where each of them can be seen on three levels, the number of alternatives would be $2.187 (3^7)^1$. This would make it hard to compare various alternatives. This aspect consist the contribution of Taguchi, who managed to standardize the analysis of alternatives reducing significantly their number. Starting from the number of factors and their levels, Taguchi put up the sample tables that are used today to assess precisely the measure of the impact of these factors. For instance, if we analyze the effect of seven factors, where each of them takes two levels (eg. 1 and 2), the standard table Taguchi would be the L_8 ⁸ (Table 2) and the analysis of results would be sufficient to evaluating of accessible alternatives in this table:

TABLE 2 The combination of factors

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| 3 | 1 | 2 | 2 | 1 | 1 | 2 | 2 |
| 4 | 1 | 2 | 2 | 2 | 2 | 1 | 1 |
| 5 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| 6 | 2 | 1 | 2 | 2 | 1 | 2 | 1 |
| 7 | 2 | 2 | 1 | 1 | 2 | 2 | 1 |
| 8 | 2 | 2 | 1 | 2 | 1 | 1 | 2 |

Source: Taguchi method

So in this case, instead of evaluating options 128 (2^7), we can realize the analysis of assessment according to the eight above options.

¹ The calculating of the number of alternatives in the general case will be n^f , where f -is the number of influencing factors and n - the number of level that can take each factor.

4. DOE's application and Taguchi method in UET

The construction of the questionnaire and matrix

The applied aspect in this article relies on the implementation of DOE and Taguchi method according to the evaluation of influential factors into the teaching process in Master cycle, the Faculty of Economics and IT, European University of Tirana, the I year (2015- 2016).

The assessment was made for the following five factors that are considered to be significantly in teaching:

1. The ability in explanation.
2. The ability in communication
3. The use of contemporary literature
4. The use of innovative methods
5. The experience of the lecturer

Based on the Taguchi method firstly was built the following matrix (matrix 1), which it will be evaluated by the students:

MATRIX 1 The factor's combinations in questionnaire

| Variants | Ability to explain | Ability to communicate | Use of contemporary literature | Use of innovative methods | Teacher experience | Quality rating (1 to 6) |
|----------|--------------------|------------------------|--------------------------------|---------------------------|--------------------|-------------------------|
| 1 | bad | bad | bad | bad | bad | |
| 2 | bad | bad | good | good | good | |
| 3 | bad | good | bad | bad | good | |
| 4 | bad | good | good | good | bad | |
| 5 | good | bad | bad | good | good | |
| 6 | good | bad | good | bad | bad | |
| 7 | good | good | bad | good | bad | |
| 8 | good | good | good | bad | good | |

Source: Authors' evaluation

For each variant (1 to 8), the Master Cycle students, I year, should give their assessment 1-6 (1 low level, and 6 the highest level). Particularly this assessment

meant to the respective variant, they assess the impact on teaching from 0% to 100%:

| | |
|---|------|
| 1 | 0% |
| 2 | 20% |
| 3 | 40% |
| 4 | 60% |
| 5 | 80% |
| 6 | 100% |

Source: Authors' evaluation

The total participation in testing was 87 students, where 53 were students in Science's Master cycle and 34 in the Professional Master; 71 students of the total number were women and 16 men.

Results by variations to the average form in percentage are presented in Table 3:

TABLE 3 The average rating (%) according to factor's combinations

| Variants | Ability to explain | Ability to communicate | Use of contemporary literature | Use of innovative methods | Teacher experience | Average rating (%) |
|----------|--------------------|------------------------|--------------------------------|---------------------------|--------------------|--------------------|
| 1 | bad | bad | bad | bad | bad | 8.5 |
| 2 | bad | bad | good | good | good | 24.4 |
| 3 | bad | good | bad | bad | good | 21.5 |
| 4 | bad | good | good | good | bad | 28.7 |
| 5 | good | bad | bad | good | good | 38.1 |
| 6 | good | bad | good | bad | bad | 27.8 |
| 7 | good | good | bad | good | bad | 40.5 |
| 8 | good | good | good | bad | good | 26.2 |

Source: Authors' evaluation

Referring to these results, we confirm that from 435 reviews (87 students x 5 factors), variant VII received the highest rating (40.5%), where "bad" are estimated the using of contemporary literature and the experience the lecturer, while "good" the other three factors. Meanwhile the combination with the less "assessment" has been the first (8.5%), which it evaluates "bad" all the factors.

The standard of Matrix Taguchi is the L_2^8 form, which means taking into consideration seven factors (not five as is in the concrete case). Due to this reason the analysis may include two other factors considering that some of factors taken

into study interact to each other. This assumption by Taguchi can be applied if you think that the factor's impact interacts with another factor. In our case it can be assumed that the two pairs of factors interact with each other are “the ability in explanation” with “the ability in communication “ and “the ability in communication “with “the contemporary literature”. Including these two new couples of factors, L_2^8 matrix can be presented (matrix 2):

THE MATRIX Taguchi 2

| Factors | Ability to explain | Ability to communicate | Interaction AB | Use of contemporary literature | Use of innovative methods | Interaction BC | Teacher experience |
|---------|--------------------|------------------------|----------------|--------------------------------|---------------------------|----------------|--------------------|
| | A | B | C | D | E | F | G |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| 3 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 4 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| 5 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 6 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| 7 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 8 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

The analysis of the results and ANOVA

The matrix 2 above demonstrates the estimates “bad” and “good” replacing respectively to “1” and “2”. It represents the standard Taguchi matrix L_2^8 (Table 2). By setting the (average) results according to variations (1-8), the matrix will show (matrix 3)

THE MATRIX Taguchi 3 according to average rating (%)

| Factors | Ability to explain | Ability to communicate | Interaction AB | Use of contemporary literature | Use of innovative methods | Interaction BC | Teacher experience | Average rating (%) |
|---------|--------------------|------------------------|----------------|--------------------------------|---------------------------|----------------|--------------------|--------------------|
| | A | B | C | D | E | F | G | |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 26 |
| 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 24.4 |
| 3 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 21.6 |
| 4 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 26.7 |
| 5 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 26.1 |
| 6 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 27.8 |
| 7 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 40.5 |
| 8 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 26.2 |

Source: Authors' evaluation

The descriptive analysis of factors by level

The first step of analysis related to these results is the evaluation of average according to the factors referring to their level (1 or 2). The data processing with MINITAB provides the following results (Table 4 and Graphic 1):

TABLE 4 Results of Taguchi analysis

Taguchi Analysis: Rating versus Ability to e, Ability to c, Interaction , ...
Main Effects Plot for Means

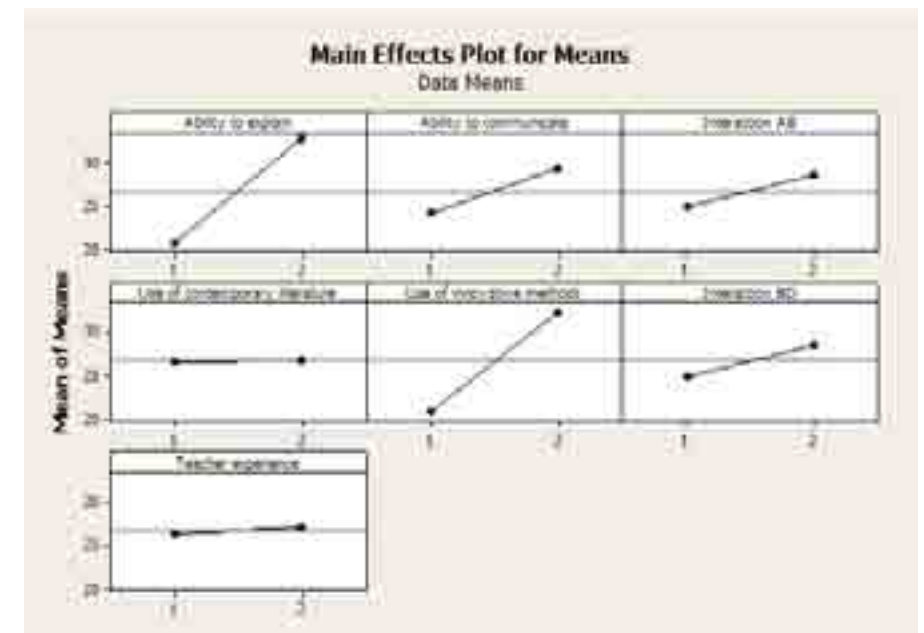
Response Table for Means

| | Ability to explain | Ability to communicate | Interaction AB | Use of contemporary literature | Use of innovative methods | Interaction BC |
|---------|--------------------|------------------------|----------------|--------------------------------|---------------------------|----------------|
| Level 1 | 20.77 | 24.20 | 24.90 | 26.65 | 21.00 | 24.88 |
| Level 2 | 32.65 | 29.23 | 28.53 | 26.77 | 32.42 | 28.55 |
| Delta | 11.88 | 5.03 | 3.63 | 0.13 | 11.42 | 3.67 |
| Rank | 1 | 3 | 5 | 7 | 2 | 4 |

| | Teacher experience |
|---------|--------------------|
| Level 1 | 26.38 |
| Level 2 | 27.05 |
| Delta | 0.68 |
| Rank | 6 |

Source: Authors' evaluation

GRAPH 1 Means' effects



Source: Authors' evaluation

Referring to the table, for instance the value 20.77 shows the average of assessment according to the level 1 (“bad”) related to the factor “the ability in explanation”, so the percentage of 0-100% of “bad” assessment for this indicator has been an average of 20.77. “Delta” in table 4 shows the difference between two averages of two levels for each factor. As the greater difference is, as the greater impact of factors is considering into the results’ study. So in the last row, “rank” shows from 1 to 7 the extent of factor’s impact in teaching process. It shows that the greatest influence in this process has been “the ability in explanation” furthers “the innovative methods”. The results are clearly demonstrated in Graphic 1.

Referring to DOE model theoretically, the analyzed factors are considered as “signal”, so like factors that affects the study’s output. In addition to this output can also affect other factors that are not considered in the analysis due to they cannot be controlled and influenced by us. Such factors are considered as “noise” in the DOE. In this aspect DOE requires the calculation of another index, known as the S/N ratio which characterizes the relation between signal factors (S) and those noises (N). This indicator intended to receive as great value as in the experiment. Table 4 confirms the calculation of S/N in MINITAB, as well as the ranking of factors by this index.

TABLE 5 Results of Taguchi analysis

Taguchi Analysis: Rating versus Ability to e, Ability to c, Interaction , ...

Linear Model Analysis: SN ratios versus Ability to e, Ability to c, ...
Main Effects Plot for SN ratios

Response Table for Signal to Noise Ratios
Larger is better

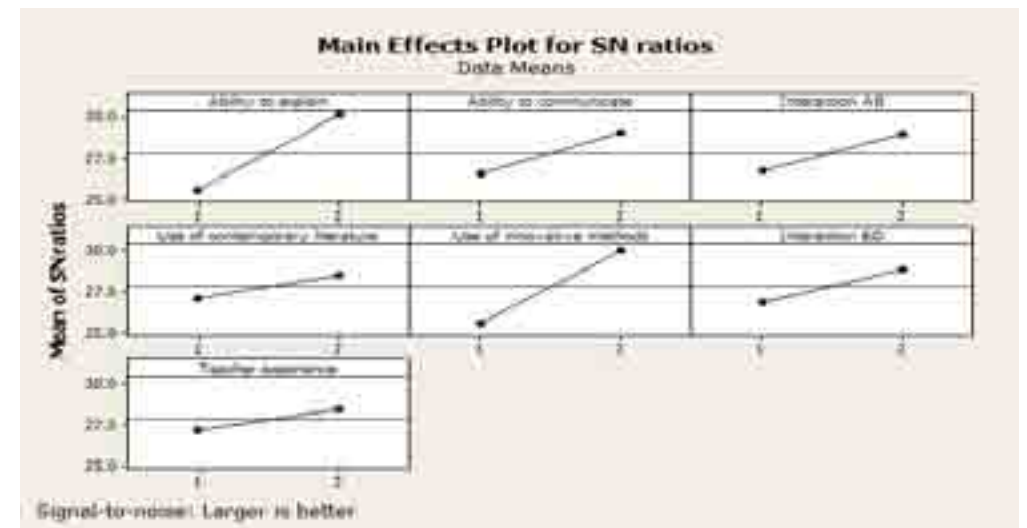
| | Ability to explain | Ability to communicate | Interaction AB | Use of contemporary literature | Use of innovative methods | Interaction BD |
|---------|--------------------|------------------------|----------------|--------------------------------|---------------------------|----------------|
| Level 1 | 25.54 | 26.59 | 26.71 | 27.13 | 25.62 | 26.82 |
| Level 2 | 30.14 | 29.08 | 28.96 | 28.54 | 30.05 | 28.86 |
| Delta | 4.60 | 2.49 | 2.25 | 1.40 | 4.43 | 2.04 |
| Rank | 1 | 3 | 4 | 6 | 2 | 5 |

| | Teacher experience |
|---------|--------------------|
| Level 1 | 27.19 |
| Level 2 | 28.48 |
| Delta | 1.28 |
| Rank | 7 |

Source: Authors’ evaluation

However we demonstrate that “the ability in explaining” and “the use of innovative methods” are more acceptable. While graphically S/N is presented in Graph 2.

GRAPH 2 SN ratios effects



Source: Authors’ evaluation

The standard deviation is another indicator which it used to assess the variation in Taguchi model. This indicator provides to assess the variation of the factor in the result due to the noise factors. Results of our model illustrates in table 6 and graphic 3.

TABLE 6 Results of Taguchi analysis

Taguchi Analysis: Rating versus Ability to e, Ability to c, ...

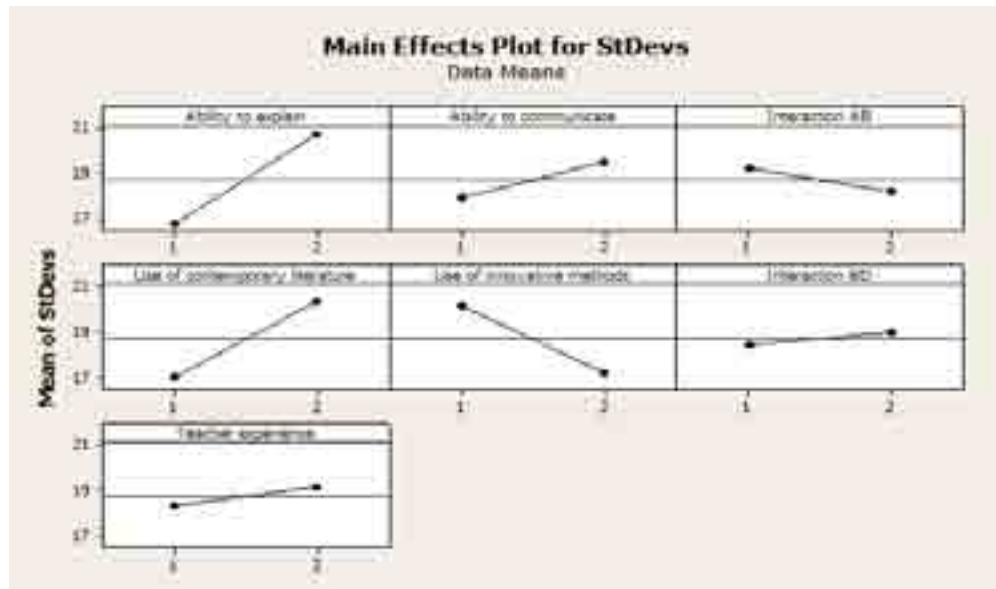
Main Effects Plot for StDevs
Response Table for Standard Deviations

| | Ability to explain | Ability to communicate | Interaction AB | Use of contemporary literature | Use of innovative methods | Interaction BD |
|---------|--------------------|------------------------|----------------|--------------------------------|---------------------------|----------------|
| Level 1 | 16.71 | 17.94 | 19.23 | 17.02 | 20.10 | 18.44 |
| Level 2 | 20.70 | 19.48 | 18.19 | 20.40 | 17.23 | 18.98 |
| Delta | 3.99 | 1.54 | 1.04 | 3.38 | 2.95 | 0.54 |
| Rank | 1 | 4 | 5 | 2 | 3 | 7 |

| | Teacher experience |
|---------|--------------------|
| Level 1 | 18.31 |
| Level 2 | 19.11 |
| Delta | 0.80 |
| Rank | 6 |

Source: Authors’ evaluation

GRAPH 3 The effects of standard deviation



Source: Authors' evaluation

The order of the estimated factors by the standard deviation is shown in the last row of table 6.

The analysis of the variance, ANOVA

The analysis of variance by ANOVA represents the certain procedure which initially involves the calculation of some indicators. The estimated values of these indicators are presented in Table 7²:

TABLE 7 ANOVA results

| Factors | I | S | V | F | P |
|-----------------------------------|---|---|-------|-------|--------|
| 1. Ability to explain | A | 1 | 282.0 | 282.0 | 43.53% |
| 2. Ability to communicate | B | 1 | 50.5 | 50.5 | 7.80% |
| 3. Interaction AB | C | 1 | 28.0 | 28.0 | 4.08% |
| 4. Use of contemporary literature | D | 1 | 0.0 | 0.0 | 0.00% |

² The calculations are made with MINITAB and by the standard analysis given in "A PRIMER on the Taguchi Method" - Ranjit K. Roy, (Second Edition, SME -2010).

| | | | | | |
|------------------------------|---|---|-------|-------|---------|
| 6. Use of innovative methods | E | 1 | 261.1 | 261.1 | 40.30% |
| 6. Interaction BD | F | 1 | 27.0 | 27.0 | 4.17% |
| 7. Teacher experience | G | 1 | 1.0 | 1.0 | 0.14% |
| Other / Error | e | 0 | 0 | 0 | |
| Total | | 7 | 847.8 | | 100.00% |

Source: Authors' evaluation

Referring to this table:

- f - Degree of freedom-DOF
- S - Sum of squares
- V - Variance - mean of square
- P - Percentage of contributions in the estimated output.
- F - Factor ratio (an indicator used for assessing the statistical significance of factor)

According to the estimation of variation, the indicators S_e , V_e , F are important and relate to the alleged error in the model as well as in the assessing of statistical significance to each factor. These indicators result zero referring to Table 7 which it does not allow further evaluation. Due to this reason, factors that have a small percentage of impact on the study's results are eliminated. According to our case such factors are demonstrating as "literature" (C) and "experience" (E). The recalculated coefficients like S_e , V_e and F will obtain a different value from zero. Recalculations demonstrate in Table 8.

The evaluation of factor's significance is the most important after these calculations. According to Taguchi method, it is analyzed by comparing the F value (ratio factor) of each factor with the estimated values in standard tables related to the certain level of confidence. The statistically significant factor will be considered if the value of F factor in the experiment will be greater than the tabular value³.

TABLE 8 ANOVA results

| Factors | I | S | V | F | P |
|---------------------------|---|---|-------|-------|--------|
| 1. Ability to explain | A | 1 | 281.7 | 281.7 | 43.48% |
| 2. Ability to communicate | B | 1 | 50.0 | 50.0 | 7.72% |

³ The tabular values are determined by the level of confidence, as well as the DOF factor and the DOF of the error term.

| | | | | | | |
|------------------------------|---|---|-------|-------|-------|--------|
| 3. Interaction AB | C | 1 | 26.1 | 26.1 | 58.1 | 3.98% |
| 4. Use of innovative methods | E | 1 | 260.2 | 260.2 | 581.0 | 40.23% |
| 5. Interaction BD | F | 1 | 26.1 | 26.1 | 59.1 | 4.10% |
| Other / Error | e | 2 | 0 | 0.0 | | 0.51% |
| Total | | 7 | 845.0 | | | 43.48% |

Source: Authors' evaluation

Referring to the significance level in our case 99%, DOF of factor =1 and DOF of error term = 2, the estimated value of F is 98 503. Referring to Table 6 is demonstrating that “the ability in explanation” is above this value (628.7), “the ability in communication” (112.3) and “the use of innovative methods” (581.0). Meanwhile the other two factors according to significance level 99% are considered not significant statistically, so they should be eliminated and recalculated. If we obtain the significance level 97.5%, so lower, then the tabular value of F will be 38.506, however related to this significance level all factors of table 8 would be considered statistically significant.

The last column of Table 8 shows the impact on the teaching's quality of particular factors. It demonstrates that the larger impact provides “the ability in explanation” (43.5%) and “the use of innovative methods” (40.2%).

The calculations with MINITAB related to ANOVA provide the results of table 9. The influence of three factors in the analysis, as well as their interaction is statistically significant (P <0.05). Also R-Sq is high (99.86%), which shows that these factors explain almost completely (100%) the teaching's level.

TABLE 9 Results of linear model

General Linear Model: Rating versus Ability to e., Ability to c., ...

| Factor | Type | Levels | Values |
|---------------------------|-------|--------|--------|
| Ability to explain | fixed | 3 | 1, 2 |
| Ability to communicate | fixed | 2 | 1, 2 |
| Interaction AB | fixed | 2 | 1, 2 |
| Use of innovative methods | fixed | 2 | 1, 2 |
| Interaction BD | fixed | 2 | 1, 2 |

Analysis of Variance for Rating, Using Adjusted SS for Tests

| Source | DF | Seq SS | Adj SS | Adj MS | F | P |
|---------------------------|----|--------|--------|--------|--------|-------|
| Ability to explain | 1 | 282.03 | 282.03 | 282.03 | 398.47 | 0.002 |
| Ability to communicate | 1 | 50.50 | 50.50 | 50.50 | 107.14 | 0.009 |
| Interaction AB | 1 | 26.28 | 26.28 | 26.28 | 55.77 | 0.017 |
| Use of innovative methods | 1 | 261.06 | 261.06 | 261.06 | 553.98 | 0.002 |
| Interaction BD | 1 | 27.01 | 27.01 | 27.01 | 57.32 | 0.017 |
| Error | 2 | 0.94 | 0.94 | 0.47 | | |
| Total | 7 | 647.83 | | | | |

S = 0.686477 R-Sq = 99.85% R-Sq(Adj) = 99.49%

| Term | Coef. | SE Coef. | T | P |
|---------------------------|---------|----------|--------|-------|
| Constant | 26.7125 | 0.2427 | 110.06 | 0.000 |
| Ability to explain | -5.9375 | 0.2427 | -24.46 | 0.002 |
| Ability to communicate | -2.5125 | 0.2427 | -10.35 | 0.009 |
| Interaction AB | -1.8125 | 0.2427 | -7.47 | 0.017 |
| Use of innovative methods | -5.7125 | 0.2427 | -23.54 | 0.002 |
| Interaction BD | -1.8375 | 0.2427 | -7.57 | 0.017 |

According to coefficients, ANOVA shows their value to the level “1” (“bad”) of factors, referring to the dependence of Y output (the teaching's level) related to the factors taken into analysis may be presented with the following equation.

$$Y = 26,7215 + (-5,9375 + 5,9375)A + (-2,5125 + 2,5125)B + (-1,8125 + 1,8125)C + (-5,7125 + 5,7125)E + (-1,8375 + 1,8375)F + (+1,8125 - 1,8125)C + (-5,7125 + 5,7125)E + (+1,8375 - 1,8375)F$$

The equation demonstrates the largest impact on the teaching's standards referring to “the ability in explanation” (A) and “the using of innovative methods” (D).

5. Concluding remarks

DOE is an alternative method which can be recommended related to the analysis of impact according to various factors on the teaching's standards. In spite of divergence among results of the simple interviews and the descriptive analysis, the proposed approach enables the more complete statistical analysis between various factors and the outcome of study.

The current model demonstrates through the relatively large number of proposed “experiments” relying on the Taguchi method, can be studied the impact of diverse factors in the teaching's standards. The analysis of article concentrates to explain which of the factors are more influential on teaching's standards and which of them are considering not more influential.

Referring to DOE's approach confirm the statistical significance and largest impact on the teaching's standards related to “the ability in explanation” and “the using of innovative methods”. Meanwhile we should be considered the influential interactions of factors according to the teaching's standards.

We propose to apply this approach like the standard statistical method due to it can be applied to other aspects when it required to analyzing the quality's level to diverse services related to the influential factors.

References

- Jean-Marie Boussier, Estrailier, P.; Sarramia, D. and M. Augeraud (2006), "Approach to Design Behavioural Models for Traffic Network Users" Design & Decision Support System, pg 151-166.
- Popescu, C.; Cucu, T.; Ion-Boussier L and Jean-Marie Boussier and A. Mitu (2009), "Methodology to evaluate the Quality of Public Services", The Amfiteatru Economic Journal, 2009, vol. 11, 26 Edition, pg 260-270.
- Ranjit K. Roy (2010), "A Primer on the Taguchi Method", (Second Edition, SME - 2010).
- Ranjit K. Roy (2001), "Design of Experiments Using the Taguchi Approach: 16 Steps to Product and Process" Bk&Cd-Rom edition (January 2001) John Wiley & Sons; ISBN: 0471361011.
- Taguchi, G. (1986), "Introduction to Quality Engineering - Designing Quality into Products and Processes", Asian Productivity Organization, Tokyo, (1986).
- DOE Demystified:
A1A2

A theoretical model of mandatory use of e-government system adoption: factors affecting digital notarial system

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Abstract

Even though all government around the world are investing a lot of a lot of efforts and money in E-government initiatives, the adoption factors of such systems doesn't seem to be studied enough from the researchers. Without a good adoption by users, the E-government investment is jeopardized. Through studying the Digital Notarial system in Albania, we build a new model for user adoption of E-government technologies. Technology adoption is one of the most mature area in Information Systems (IS) research. Since voluntary use is the main context of these researches, they are focus in predicting system Use and Behavior Intention as the direct predictor of usage. Because the use of Digital Notary is not voluntary, but instead is mandatory, we argue that the Behavior Intention and system use are not the appropriate variables to be measured as the success of adoption. Instead User Satisfaction is an appropriate measure in the mandatory use. Using previous research work, this article will identify the determinants' constructs and their relationship to the adoption of Digital Notarial system in Albania. Finally, a theoretical framework for private professionals' adoption model of mandatory E-government Information Systems will be proposed.

Keywords: *E-government, Technology adoption, Notarial System, Albania, Mandatory use.*