WEIGHTING OF STUDENTS' PREFERENCES OF TEACHER'S COMPETENCIES

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Abstract

The aim of this article is to describe the proposed methodology of identification of the students' weights or preferences of teacher's managerial competencies at the Faculty of Economics, Czech University of Life Sciences in Prague (CULS). The goal of this article is not to evaluate the teacher's scientific ability but describe the evaluation of the teacher's managerial competencies weights from students' point of view.

For setting of weights there are many different methods that varied in the proportion of including the subjective and objective judgement. Commonly diffused method is the Analytic Hierarchy or Network Process by prof. Saaty (AHP or ANP). Because it is not possible to see or to evaluate teacher's competencies in complexity, we proposed the questionnaires for pairwise comparisons of various teacher's managerial characteristics and competencies. These answers are then analysed using the AHP method. The AHP is a method deriving global weights from partial weights received as result of pairwise comparisons.

Key Words

Teacher's managerial competencies, Analytic Hierarchy Process, competencies weights

Introduction

Teacher usually thinks that students are receiving and understanding information in the same way teacher does (Skarupská 2007). Mareš (1998) then asks, do we really need to change students' learning styles instead of personalizing the teachers? Because commonly more than 20 students are in the course, it is reasonable to personalize teacher to students, not the other way. Teacher then has to act as a professional, who has a wide scale of work tools and only he/she has to decide how to use them in different students groups (Skarupská, 2007).

But do the teachers know what students expect, which pedagogical methods they prefer, what they want not from scientific but from organizational point of view?

In this paper we focused not on the identification of the main teacher's managerial competencies and their analysis from educational process point of view. The aim of this article is to describe the methodology of how to identify the student's preferences or weights of teacher's managerial competencies at the Faculty of Economics, Czech University of Life Sciences in Prague (CULS). Used methodology is based on surveys of the students based on pairwise comparisons of selected teacher's managerial competencies and their analysis using the Analytic Hierarchy process.

Material and Methods

Because the students are not able to see or to evaluate managerial competencies of teachers in complexity, we excluded the technical competencies of teacher from observation. For the rest of managerial competencies of teachers were found the key characteristics from the student's point of view. The base for identification of teacher's managerial competencies had been the

Casselmann typology of teacher's roles, which was disintegrated to lower levels (Casselmann, 1967). These levels came from managerial competencies (Koontz and Weihrich, 1993) and were described according to Philip Morris competencies model (Hroník, 2006). The competencies observed in the study are in Table 1 (Brozova et al, 2011).

Competencies groups	Competencies	Characteristics/Anti-characteristics
L21 Content and form of teaching	L311 Amount of information L312 Complexity of reading L313 Content of reading L314 Form of reading L315 Depth of reading L316 Way of reading	L411 High/Low amount of information L412 High/Low complexity of reading L413 Oriented on the form of reading/Oriented on the content of reading L414 Oral/IT based presentation L415 Narrow specialization/Broad overview L416 Innovative/Classical education methods
L22 Organisation of lecture	L321 Focus on group or individual L322 Setting the rules L323 Solving problems L324 Evaluation process L325 Evaluation criteria L326 Plan of teaching L327 Flexibility L328 Monitoring	L421 Individual/Group focus L422 Consistent/Changeable decision making L423 First hand/Diplomatic manner L424 Quantitative/Qualitative evaluation methods L425 Consistent/Changeable criteria L426 Fixed/Framwork education plan L427 Impressible/Uninfluenced L428 Follow/Do not follow control or monitoring

L23 Personality of teacher	L331 Teacher's self-presentation L332 Communication skills L333 Focus on student L334 Support of student's independence L335 Ability to improvise L336 Teacher's outlook L337 Way of speaking	L431 Quiet/Energic way of speaking L432 Good/Poor communication skills L433 Students/Topic orientation L434 Directive/Democratic manner L435 React/Do not react to students L536 Casual/Informal look L437 Professional/Conversional language styl

Table 1: Competencies groups and their elements

In Table 1 the teacher's competencies are organised into three groups and it is possible to create the hierarchy of this competency system. And more, it is possible to suppose, that the students preferences differ according to the intensity of the competency characteristic.

The whole competency system is really complicated and comprehensive and preference information can have many different forms; therefore its transformation into numerical expression is necessary for mathematical models calculation. So students' weights of these teacher's competencies are estimated as preferences received using Saaty pairwise comparisons methods and subsequently synthesized using the AHP method. The AHP method using quantitative pairwise comparisons is the suitable tool for this analysis, because it enables above described evaluation by sequential comparisons of all possible pairs of items. The AHP is a method deriving global preferences from partial preferences that represent relative measurements of the hierarchical dependences of decision elements (Saaty,

1980, 1999). Fundamental characteristics of both methods are following.
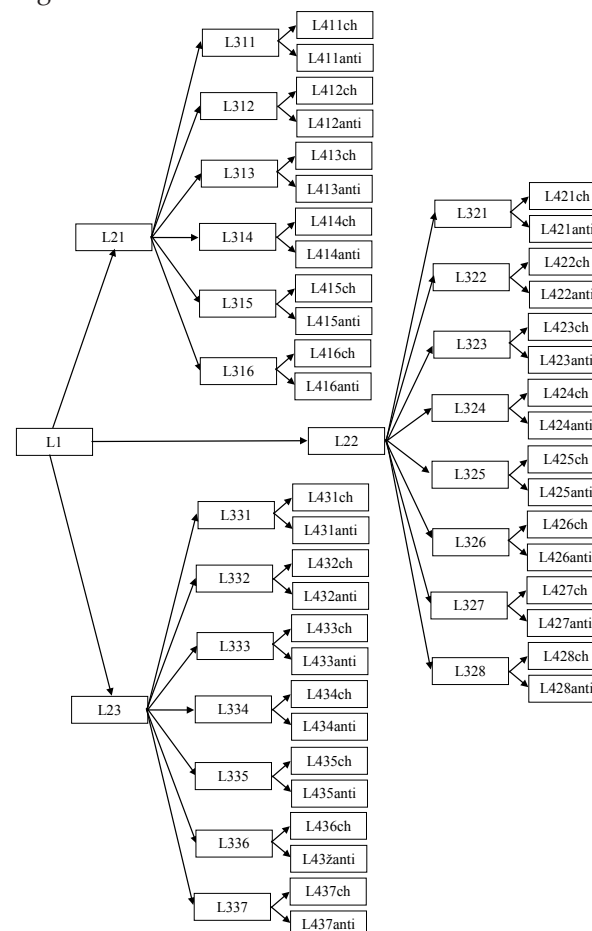

Figure 1: Hierarchy of teacher's competency system

Saaty's pairwise comparison method

Pairwise comparison is the process of comparing pairs of items to judge which of each pair is preferred, or has a greater amount of some quantitative property. One broadly used method is Saaty's pairwise comparison method (Saaty, 1980). It is based on the expert evaluation of this preference and then uses mathematical calculations (for instance the geometrical mean) to convert these judgements to priorities for each of the criteria.
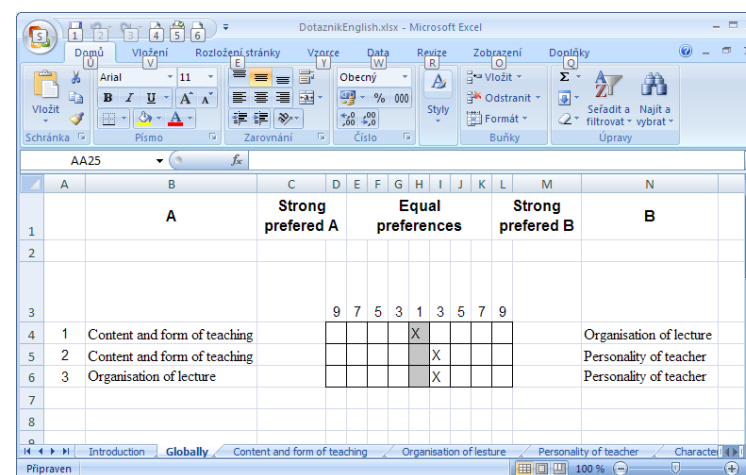
Analytical Hierarchical Process (AHP)

The AHP (Saaty (1980, 1999) is based on mathematics and psychology. The procedure for using the AHP consists of the following steps:

1. Creation of the problem hierarchy containing the decision goal, the variants for reaching it, and the criteria for evaluating the variants.
2. Calculation of the priorities among the elements of the hierarchy by making a series of judgements based on pairwise comparison of the elements.
3. Checking the consistency of the judgements.
4. Synthesis of these judgements to yield a set of overall priorities for the hierarchy.
5. Selection of the best variant based on the highest overall priority.

The AHP model for setting of weights has four levels (Figure 1): the first one L1 with the goal – the preference setting, the second L2x with the group of competences, the third L3xx with the weighting of competencies or the competencies and the fourth L4xx with qualitative characteristics describing the competencies.

To receive the necessary data for this analysis, the student's survey was made. The students filled the questionnaire in MS Excel (Figure 2) and then the answers were synthesized by the AHP for every questionnaire. Because no student can be preferred more than other one which studies the same specialization, the average weights were calculated and analysed at the end.

Figure 2: The part of questionnaire

These data then are worked up using MS Excel tools – functions and also macros. Saaty's matrices were recalculated automatically using sheets functions, consistency index was calculated using Goal seeking and results were completed using special macros made for this purpose. The next Figure 3 shows sheet organisation for Saaty's matrix calculation and consistency index checking for competencies and competency groups. When value of consistency index is very bad, corresponding answers are removed from the final elaboration. Weights of

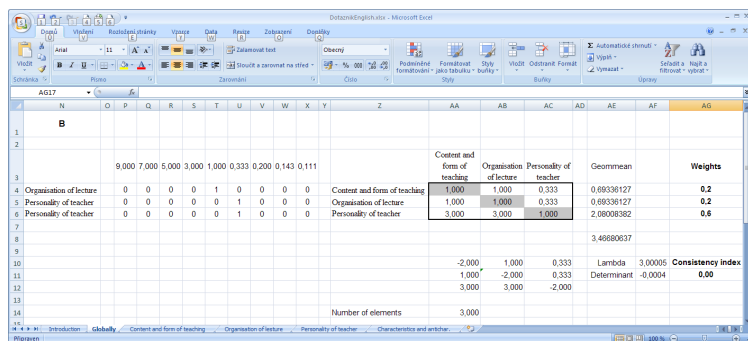characteristics and anticharacteristics are calculated as shown in Figure 4.

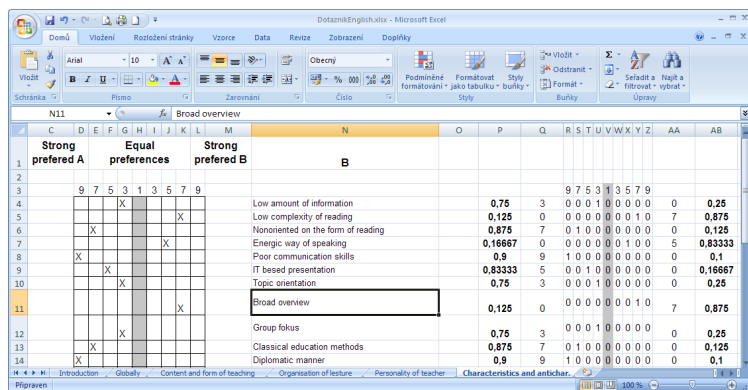**Figure 3: Saaty's matrix calculation and consistency index checking**

Figure 4: Weights calculation for characteristics and anticharacteristic

Results and Discussion

Suggested methodology was tested on small group of four students. This number of students is really small but also in this test we can show the first results and mainly, this test on a small group of students shows the reasonability of this approach (Brozova et al, 2011).

The analysis of the second level of hierarchy

Preferences of competency groups show, that for students organisation of lectures is not very important (Figure 5). It can be explained by student's ability to accept changes. The most important is the personality of teachers, students often choose the subjects not only according to their contents (the second preference) but also according to the teacher.

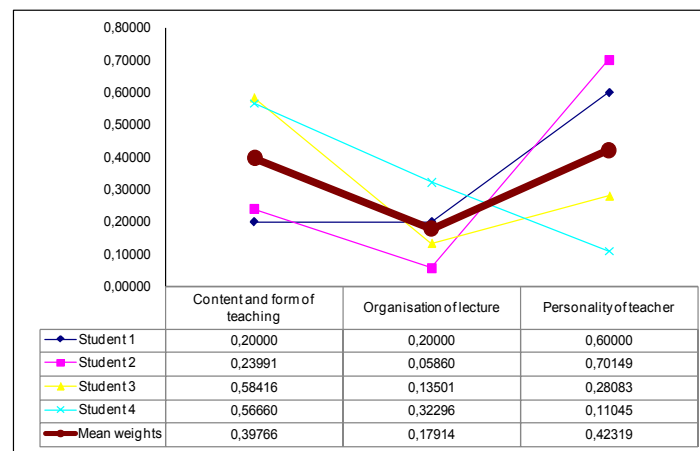|	Content and form of teaching	Organisation of lecture	Personality of teacher
Student 1	0,20000	0,20000	0,60000
Student 2	0,23991	0,05860	0,70149
Student 3	0,58416	0,13501	0,28083
Student 4	0,56660	0,32296	0,11045
Mean weights	0,39766	0,17914	0,42319

Figure 5: Preferences of groups of competencies

The analysis of the third level of hierarchy

Surprisingly these results show, that for students the way and form of reading is much more important than the content of subject, its difficulty, complexity and so on (Figure 6).
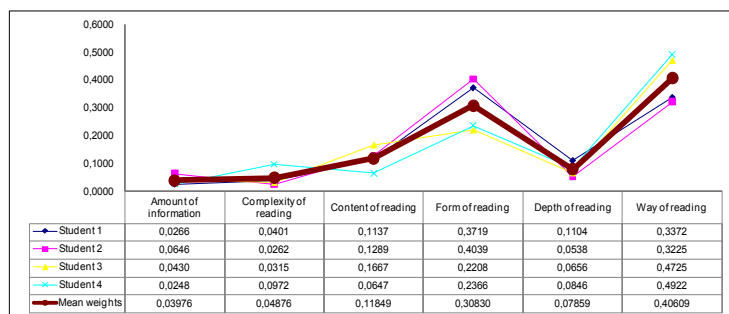

	Amount of information	Complexity of reading	Content of reading	Form of reading	Depth of reading	Way of reading
Student 1	0,0266	0,0401	0,1137	0,3719	0,1104	0,3372
Student 2	0,0646	0,0262	0,1289	0,4039	0,0538	0,3225
Student 3	0,0430	0,0315	0,1667	0,2208	0,0656	0,4725
Student 4	0,0248	0,0972	0,0647	0,2366	0,0846	0,4922
Mean weights	0,03976	0,04876	0,11849	0,30830	0,07859	0,40609

Figure 6: Preferences of competencies in content and form of teaching

Organisation of lectures is not really important for student (Figure 7). In this group of competencies only the way of monitoring and flexibility can be mentioned, but their weights are not high.
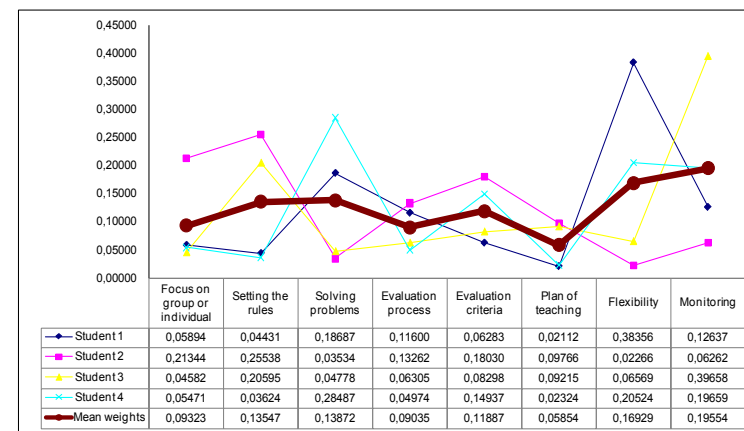

	Focus on group or individual	Setting the rules	Solving problems	Evaluation process	Evaluation criteria	Plan of teaching	Flexibility	Monitoring
Student 1	0,05894	0,04431	0,18687	0,11600	0,06283	0,02112	0,38356	0,12637
Student 2	0,21344	0,25538	0,03534	0,13262	0,18030	0,09766	0,02266	0,06262
Student 3	0,04582	0,20595	0,04778	0,06305	0,08298	0,09215	0,06569	0,39658
Student 4	0,05471	0,03624	0,28487	0,04974	0,14937	0,02324	0,20524	0,19659
Mean weights	0,09323	0,13547	0,13872	0,09035	0,11887	0,05854	0,16929	0,19554

Figure 7: Preferences of competencies in organisation of lecture

In the last group of competencies the way of speaking has the highest preference (Figure 8). It seems that students are really excited and disturbed if the teacher has some inappropriate speech habits.
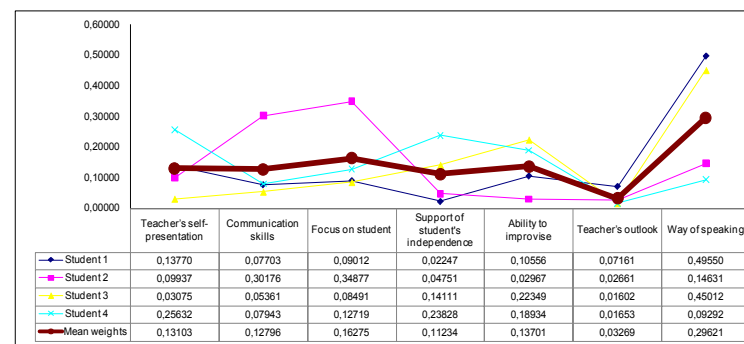

	Teacher's self-presentation	Communication skills	Focus on student	Support of student's independence	Ability to improvise	Teacher's outlook	Way of speaking
Student 1	0,13770	0,07703	0,09012	0,02247	0,10556	0,07161	0,49550
Student 2	0,09937	0,30176	0,34877	0,04751	0,02967	0,02661	0,14631
Student 3	0,03075	0,05361	0,08491	0,14111	0,22349	0,01602	0,45012
Student 4	0,25632	0,07943	0,12719	0,23828	0,18934	0,01653	0,09292
Mean weights	0,13103	0,12796	0,16275	0,11234	0,13701	0,03269	0,29621

Figure 8: Preferences of competencies in personality of teacher

The analysis of the synthesised information on the fourth level of hierarchy

Synthesised weights on the fourth level show the preferences of teacher's characteristic from the quantitative point of view (Figure 9, Table 2).

The innovative educational methods (not classical), oral based presentation (not IT based), and energic way of speaking (not quiet) are most preferred by students. The students want to enjoy their study. In the same time students preferred teachers which are democratic (not directive) and which react to their needs and problems.
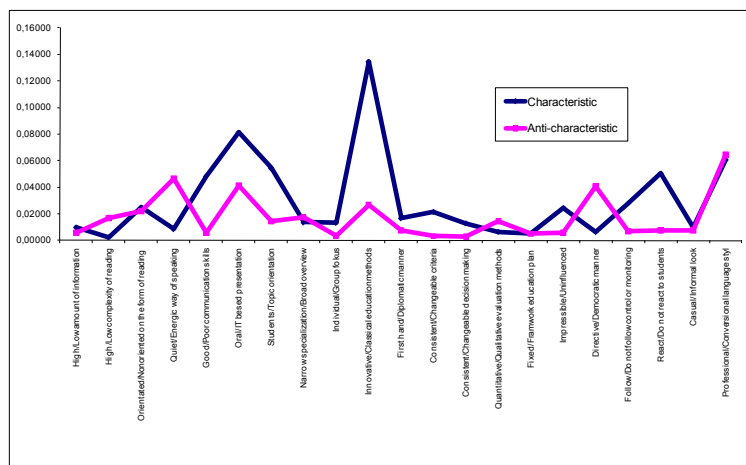
Figure 9: Graph of preferences of competencies in personality of teacher

Characteristics/Anticharacteristics	Weights of characteristics	Weights of anticharacteristics
High/Low amount of information	0,010045421	0,005763766
High/Low complexity of reading	0,002504769	0,016886991
Orientated/Nonoriented on the form of reading	0,025033042	0,022087979
Quiet/Energic way of speaking	0,008664485	0,046788218
Good/Poor communication skills	0,048396954	0,005753484
Oral/IT besed presentation	0,081222744	0,041377624
Students/Topic orientation	0,054524695	0,014348604
Narrow specialization/Broad overview	0,013673804	0,017580605
Individual/Group fokus	0,013395532	0,003305391
Innovative/Classical education methods	0,134573171	0,026914634
First hand/Diplomatic manner	0,016836214	0,007432203
Consistent/Changeable criteria	0,021640211	0,003209792
Consistent/Changeable decision making	0,013083621	0,003102302
Quantitative/Qualitative evaluation methods	0,006654517	0,014639937
Fixed/Framwork education plan	0,005505841	0,004981475
Impressible/Uninfluenced	0,024640205	0,005686201
Directive/Democratic manner	0,00663618	0,040906599
Follow/Do not follow control or monitoring	0,02809629	0,006932851
React/Do not react to students	0,050493447	0,007489459
Casual/Informal look	0,009655985	0,007638316
Professional/Conversional language styl	0,060588396	0,064766906

Table 2: Preferences of competencies in personality of teacher

Globally the way of reading, form of reading, and way of speaking, and democratic approach are more important characteristics of teacher, which influence the success and overall impact of reading and of subjects generally.

Conclusion

This article describes the new methodology for evaluation of students' weights or preferences of teacher's managerial competencies. The AHP model was worked up and the questionnaire for competencies evaluation was prepared. The test on a small group of students provides interesting results and their analysis was made. In conclusion it is possible to say, that

- The small test showed that this methodology is useful.
- Questionnaire for students takes not more than 10 minutes of their time, so students are willing to fill them.

- The form and content of results are adequate for the research of students' weights of teacher's managerial competencies.

- The small test results show, the innovative way of reading, classical form of reading, and energic way of speaking, and democratic behaviour of teacher are more important characteristics of teacher.

These results show the reasonability of proposed methods for weighting of student's preferences of teachers' managerial competencies. Of course, in this contribution we analysed only results of small study, but the results are realistic.

The next work will be focused on the analysis of results received from interviewing all students from study groups in the whole course.

Acknowledgements

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