

Full Length Research Paper

# The comparison of two groups in perception of knowledge management in the environment of higher education

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Contrary to most studies in the field of KM (knowledge management) in education, and beginning with the indivisibility of organizational aspects of KM in educational institution and the application of KM in educational process, this study had a goal to investigate the attitude of students and professors (as users and creators of educational services) towards KM. The ground research of this study comprised a sample of academic institutions that teach management, and it has been conveyed during academic year 2007/2008 in Serbia (Vojvodina province). This study offers answers to the following questions: How do professors and students differ in recognizing KM systems (or its individual processes)? Do professors or students better recognize KM culture? Does gender of professors or students influence their perception of KM processes or KM culture? Do professors and students of private or state universities better assess processes and KM culture? The basic assumption was that there was statistically significant difference in perception of KM for two groups of respondents for at least one KM process namely KM culture; and this study has proved this assumption. This study not only offers scientific information about differences in perspective of KM of the two groups of respondents in higher education, but it is also helpful in determining sophisticated relations among characteristics of these groups and their perception of KM processes and culture in class. Therefore, scientific information offered by this study can be useful to the educational institutions' management and to the other organizations that are introducing KM system.

**Key words:** Knowledge management, education, university, student, professor, difference, perspective, process, culture.

## INTRODUCTION

Knowledge management is very propulsive science that has been for the last ten years, the subject of different research in developed parts of the world, even when we abstract intellectual capital that represents a distinct area and prompts research that is more extensive. Knowledge management is examined within its relation to organizational culture, shortages and obstacles of implementation, obstacles in reaching the effectiveness

of the system, motives for introduction, usability and efficiency of technologies. It is most commonly applied and examined in profit sector, in which consultative house KPMG is ahead in both continuity and complexity of research<sup>1</sup>. The application of KM in education is still being insufficiently examined. There is an institute in USA which deals specifically with this topic: ISKME (2003) (Institute for the Study of Knowledge Management in

<sup>1</sup> One of its world reports can be found at: <http://www.kmworld.com/Articles/News/KM-In-Practice/KPMG-releases-KM-report-9912.aspx>

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Education). OECD (Organization for Economic Co-operation and Development) (2002) from time to time also run projects on KM in profit sector and in educational one as well (it is organized by CERI – Centre for Educational Research and Innovation).

Ponzi (2002) argues that KM in education is establishing itself as an KM's part and is gradually capturing the attention of higher educational institutions (HEIs). KM in education has been more actively discussed about for the last few years. Rowley (2000) in his study raised the question of readiness of higher education institutions for KM. Petrides et al. (2003) in the Monograph on Knowledge Management in Education under the wing of ISKME published the results which show that there were barriers to effective usage of information in educational system.

In most recent research from the last two years, the following studies held a prominent place: "Knowledge Management and Higher Education: a UK Case Study" Cranfield and Taylor (2008), which investigated the practice and understanding of KM in higher education based on Stankosky's KM pillars (leadership, organization, technology and learning). The focus of this study was to evaluate the application of KM and the specificity of higher education for implementation of KM. Moss et al. (2007) investigated the influence of national cultures on KM processes in the 'study Knowledge Management in Higher Education: A Comparison of Individualistic and Collectivist Cultures' – Austrian and Slovenian, indicating the importance of team work for KM, and the level in which it is facilitated in a collectivist culture.

All of these studies indicate the inevitability of introducing KM in education despite its specificity and its difference from profit sector in which KM was originally set in. Education is founded on knowledge and it should prepare future generations for the work in the field of Economics which is more and more based on knowledge. Therefore, it is necessary for education to control all the available knowledge, and as a part of viable development, education should be the leader of the promotion of KM on both institutional and individual level. It is interesting that neither of these mentioned studies deals with the application of KM in educational process, but only in organizational aspects of KM in educational institutions.

This study begins with the indivisibility of the organizational aspects of KM in educational institution and the application of KM in educational process. Going further into the root of the problem, this study investigates the attitudes of students and professors towards KM in the institutions of higher education. With the emphasis on the differences in perception of KM between students and professors, this study compares two very important roles in the process of knowledge management in class: The creator and the user of education. The basic assumption of this study is that there is statistically significant difference in perception of KM between these two groups of respondents for at least one of KM processes or experimenting and learning culture (KM culture).

On one hand, professors are the ones who (should) implement and lead the process of knowledge management at faculties and create experimenting and learning culture in class. On the other hand, students in educational process do not have participative function in the process of implementation of knowledge management in class practice (as professors have); but it is characterized by the role of user. Students yet can influence the culture in class as well as the improvement of certain processes or activities and the general success of KM processes. This study presents the results of the part of research on KM in class which was based on the questionnaires filled out by both groups of respondents, whose answers were compared afterwards.

This study not only offers scientific information about differences in perspective from the standpoint of KM of the two participative groups in higher education, but it is helpful in determining sophisticated relations among characteristics of these groups and their perception of KM processes and culture that are created in class. In other words, this study seeks for answers to the following questions:

1. Do professors or students better recognize experimenting and learning culture in class?
2. Does gender of professors and students influence their perception of KM processes or experimenting and learning culture?
3. Do professors and students of private or state universities better assess processes and knowledge management culture?

Scientific information offered by this study can be useful not only to the management of the educational institutions, but also to all the organizations that are introducing or are about to introduce KM system. This study therefore, offers clear contribution in the field of management, organization studies, and education, being at the same time attractive to academic audience as well as a wider audience in practice.

## THE RESEARCH - MATERIALS AND METHODS

The research has been conducted during 2008 in Serbia. The sample consists of seven faculties that study management in Serbian province of Vojvodina. It has gathered 90 lecturers and 369 students, which made a whole of 459 respondents, and which was enough for statistical evaluation of data by multi-variant analysis.

Within knowledge management research, the starting point was the given sample, for faculties as educational institutions stand on the pillars of knowledge and should prepare the forthcoming generations for work in the field of Economics, which is extensively based on knowledge, that is, the reason why it is necessary to manage all the available knowledge. On the other hand, the research started with Faculties of management, for their central topic on research is managing. This is why this research presents the greatest challenge and relevant scientific information.

With the aim of examining as much objective as possible, KM system in class is examined from two different standpoints – the standpoint of professors and the standpoint of students and with

special questionnaires. In order to avoid the examination being based on bias in favour of a certain standpoint, both standpoints were equally taken into account during the evaluation of the occurrence of this process within educational process on the questioned sample. This kind of examination set the place for analysing the differences (and similarities) between these standpoints that are being discussed in this study.

Examining individual processes based on the theory of KM processes; Clarke (2004) – ‘gaining and creating, sharing and allocation, storage and organization and usage of new knowledge’, the analysis of difference in point of view between professors and students was based on the comparison of professors’ scores with those of students for the same dimensions. Besides that, the difference in perspectives between professors and students was characterized by discriminative analysis in which the criteria variables were gender of respondents and faculty governance structure, which respondents either attend or work for. Detailed information about design and the instruments of investigation were published in the study by Arsenijevic et al. (2009) “Correlation of Experimenting Culture and Process of Knowledge Management in the University Environment”.

By statistical evaluation of the results of this research (by calculating Cronbach’s Alpha coefficient and factor analysis) it has been determined that the reliability of the questionnaire is very high. During statistical evaluation of the results of this research, the following were used: T-tests for independent samples for asserting the existence of differences between groups of respondents and the comparison of average scores on subdimensions of questionnaires, as well as of discriminative analyses for the purpose of asserting the existence of differences in structure and expressiveness of experimenting and learning culture and KM processes; and in relation to socio-demographic characteristics of respondents. During the analysis done for professors and students, random variables were gender and faculty governance structure. The sum of predictor variables (quantitative ones) consisted of summative scores on the subdimensions of questionnaire and factor scores in Promax factors, extracted in measurement’s place of the same questionnaire.

## RESULTS

The difference in evaluation between students and professors depending on culture and other KM processes in class

### *T-tests for independent samples*

The extent of knowledge management in class is investigated according to the answers of professors and students in parallel and by taking into accounts all of the answers equally. In that manner, the evaluation of KM in class is reached. For that reason, these leaves place for analysing the comparison of scores between professors and students for the same dimensions.

The results of statistical evaluation of t-tests presented in Table 1 show that there is a statistically significant difference between professors and students in the evaluation of the occurrence of culture, the process of sharing and allocation, gaining and creating and usage of new knowledge in class. The difference is on behalf of professors in a sense that professors rather than students evaluate that these processes more frequently

occur.

### **Differences in the assessment depending on the socio-demographic factors**

#### ***Differences in the structure and the prominence of the culture and the KM process depending on the lecturers’ socio-demographic characteristics***

(1) Canonical discriminative analysis of the lecturers in relation to governance structure: In the canonical discriminative analysis, the criterion variable is the faculty at which the lecturer is teaching; the subjects of the analysis are divided into two groups, depending on whether they teach at the state or private faculty. The set of the predictor variables consisted of the sum of the scores on the subdimensions of the poll, and the scores of factors on the Promax factors extracted in the measurement of the same poll.

The extracted discriminative function was not statistically significant which means that the existence of the difference between the subjects was not confirmed (Table 2 and 3). The governance structure of the faculty at which the subjects are taught did not influence the assessment of the interviewed lecturers about the knowledge management.

(2) Canonical discriminative analysis of the lecturers in relation to their gender: In the canonical discriminative analysis, the variable of the criterion was the gender of the lecturer. The set of the predictor variables consisted of the sum of the scores on the subdimensions of the poll, and the scores of factors on the Promax factors extracted in the measurement of the same poll.

The extracted discriminative function was not statistically significant (Table 4 and 5) which means that the existence of the difference between the subjects was not confirmed. The gender of the lecturer was not connected with the attitudes related to the knowledge management.

#### ***Differences in the structure and the prominence of the culture and the KM process depending on the students’ socio-demographic characteristics***

(1) Canonical discriminative analysis of the students in relation to faculty governance structure: In the canonical discriminative analysis, the variable of the criterion is the faculty at which students study; the subjects of the analysis are divided into two groups, depending on whether they go to the state or private faculty. The set of the predictor variables consisted of the sum of the scores at the subdimensions of the poll, and the scores of factors on the Promax factors extracted in the measurement of the same poll.

The extracted discriminative function (Table 6) was statistically significant, at the significance level of 0.01

**Table 1.** T-tests for independent samples.

	T	Df	p
Experimenting and learning culture	9.735	457	0.000
	12.986	221.959	0.000
Knowledge sharing and allocation	9.257	457	0.000
	9.119	133.382	0.000
Knowledge gaining and creation	9.411	457	0.000
	9.856	143.898	0.000
Knowledge storage and organization	-.688	456	0.492
	-.671	132.048	0.503
New knowledge utilization	9.225	457	0.000
	10.145	154.177	0.000

Legend: T – T test; Df – degree of freedom; p – evaluation of the importance of function.

**Table 2.** Characteristic root, percentage of variance and canonical correlation.

Function	Characteristic root	Percentage of variance	Cumulative percentage	Canonical correlation
1	0.559244	100	100	0.598885

**Table 3.** The assessment of the significance of the discriminative function.

Fuction	Wilks@Lambda	<sup>2</sup>	Number of the degree of freedom	P
1 through 2	0.641336	22.21005	14	0.0744

**Table 4.** Characteristic root, percentage of variance and canonical correlation.

Function	Characteristic root	Percentage of variance	Cumulative percentage	Canonical correlation
1	0.458095	100	100	0.560512

**Table 5.** The assessment of the significance of the discriminative function.

Function	Wilks@Lambda	<sup>2</sup>	Number of the degree of freedom	p
1 through 2	0.685826	18.85654	14	0.170504

with the quotient of the canonic correlation of 0.442, which means that the existence of the difference between the groups of subjects was confirmed, and that difference was of moderate intensity (Table 7).

In the Table 8 was presented the structure of the discriminative function. Values show that with discriminative function, in positive direction, subdimension

‘experimenting and learning culture in classes’ and the KM processes: ‘the process of usage of new knowledge, the process of gaining and creating the knowledge and the process of sharing and allocation of the knowledge at classes’ correlated in a statistically significant way. The process of ‘knowledge storage and organization in class’ was the only one at the negative end of the discriminative

**Table 6.** Characteristic root, percentage of variance and canonical correlation.

Function	Characteristic root	Percentage of variance	Cumulative percentage	Canonical corelation
1	0.242659	100	100	0.441898526

**Table 7.** The assessment of the significance of the discriminative function.

Function	Wilks@Lambda	<sup>2</sup>	Number of the degree of freedom	p
1 through 2	0.804726	78.42863	10	0.0000

**Table 8.** The structure of the discriminative function.

	Function 1
The process of storage and organization of knowledge in class	-0.2984
The process of gaining and creating knowledge in class	0.351236
The process of usage of new knowledge in class	0.364841
The experimenting and learning culture in class	0.567987
The process of sharing and allocation of knowledge in class	0.303862

**Table 9.** Centroids of the groups.

Gender	Function 1
Men	0,267433
Women	-0,16611

function scale. In other words, 'all' the processes of knowledge management and the experimenting and learning culture, that is, 'all' the elements of the knowledge management model correlated in a statistically significant way with the discriminative function.

According to values and the direction of the centroids of the groups presented in Table 9, it can be said that private faculty students achieved higher, and the state faculty students lower scores at the discriminative function. Private faculty students recognized the processes of sharing and allocation, the process of gaining and creating the new knowledge at classes as well as the experimenting and learning culture, while the state faculty students recognized only the process of storage and organization of the knowledge in class.

(2) Canonical discriminative analysis of the students in relation to their gender: In the canonical discriminative analysis, the variable of the criterion was gender of the students. The set of the predictor variables consisted of the sum of the scores at the subdimensions of the poll, and the scores of factors on the Promax factors extracted in the measurement of the same poll.

Extracted discriminative function was statistically significant on the level of significance of 0.05 and with the

canonical correlation quotient of 0.206 (Table 10), which confirms that there is a difference between the groups of examinees, but this difference is of a very low intensity, showed in Table 11.

Within the discriminative function, very important processes, such as the process of knowledge storage and organization in class at the positive pole and the process of gaining and producing knowledge in class took place (Table 12). On the basis of this, discriminative function can be defined as the developed process of knowledge organization in class and decreased process of knowledge gaining and creation due to the lack of experimenting and learning culture.

Taking into account the values and the directions of centroids of the groups (Table 13), it can be said that men achieve high and women low discriminative function scores.

## DISCUSSION

In concordance with the main goal of this research, the analysis of t-tests was presented mainly to state whether there is a difference in students' and professors' evaluations of the knowledge management processes and experimenting and learning culture. It was pointed that there is a statistically significant difference between professors and students in the evaluation of presence of culture, as well as in all the knowledge management processes except the knowledge storage and organization in class, thus the essential assumption of this work has been confirmed. It was also stated that this difference was in favor of professors, that is, the professors

**Table 10.** Characteristic root, percentage of variance and canonical correlation.

Function	Characteristic root	Percentage of variance	Cumulative percentatge	Canonical correlation
1	0.044667	100	100	0.206778467

**Table 11.** Significance of the discriminative function evaluation.

Function	Wilks@Lambda	<sup>2</sup>	Number of the degree of freedom	p
1 through 2	0.957243	15.8188	8	0.04504825

Legend: p – significance of the function evaluation.

**Table 12.** The structure of discriminative function.

	Function 1
The process of knowledge storage and organization in class	0.585886
The process of gaining and producing knowledge	-0.2034
The process of knowledge usage in class	0.163107
The experimenting and learning culture in class	-0.14826
The process of sharing and allocation of knowledge in class	-0.0923

**Table 13.** Centroids of the groups.

Gender	Function 1
Men	0.267433
Women	-0.16611

Source: Field Study (2008).

evaluated these processes to be more present than students did. The only process, for which the statistically significant difference had not been indicated, was the process of 'knowledge storage and organization', which is explicable by the fact that the both groups of respondents agreed about the non-existence of this process (scores for both groups of respondents were low). This process is actually the only one which is not directly dependent on the engagement of students, or on the professor's work, but on "the existence of the management initiative to store and organize knowledge (in order to assure them and use them more easily)" (Arsenijevic, 2009) at all levels at the faculty, as well as the level of teaching – which was not the case in the surveyed sample. This fact also further indicates that both of the groups of respondents could be objective when they were not directly involved, that is, they separate their role from the process of KM.

The process of knowledge storage and organization in class is specific in the sense that it is the only one for which professors scored worse than students. This data can be explained by the fact that professors are probably more aware of what information systems for knowledge storage and organization are, therefore they could give an answer that is more correct. On the basis of additional

answers of students, it is concluded in research that the majority of students did not make any difference between the faculty initiative for constitution of such systems and other organization's initiatives, which they quoted, and possibly, because of which they scored this issue better (Arsenijevic, 2008).

Discrepancy between the students' and professors' answers about the KM processes in class, which are given in this research, represents both of these groups biased to a certain degree, which further suggests that both groups consider their own role to be particularly important or in the very center of the educational system. Nevertheless, in another research related to a recognition of intellectual capital, statistical significant difference was also observed in usage of human capital and KM between top management (first group of subjects) and their subordinates (second group of subjects) (Tot, 2007).

Because of that, the ground which is presented by the fact that there is significant difference between these two groups in perception of KM is further built by the more detailed analysis of these differences, depending on demographic factors.

In the analysis of the structure and representation of the experimenting and learning culture and knowledge management processes, depending on socio-demographic characteristics of professors, it was concluded that there is no statistically significant difference in professors' answers, neither concerning governance structure of the faculty they work at, nor their gender.

As opposed to professors, among students there is a statistically significant difference for the both variables: governance structure of the faculty they study at and their gender; in other words: depending on the governance

structure of the faculty they study at and their gender, students perceived KM processes and experimenting and learning culture in a different way.

According to the students' answers, faculty governance structure indicates statistically significant differences of moderate intensity for 'all' the KM processes, as well as the experimenting and learning culture. Private faculty students are better in recognizing the three KM processes: 'sharing and allocation, gaining and creation and usage of new knowledge' in class, while the state faculty students do not recognize these processes, nor the 'experimenting and learning culture', but only the processes of 'knowledge storage and organization' in class (even better than the private faculty students). Private faculty students also score better in 'experimenting and learning culture in class' subdimension. This means that the experimenting and learning culture is better represented at private faculties.

It is important to note that the process of knowledge storage and organization is not represented by the whole sample, that is, it is not practiced neither at the group of private nor the group of state faculties which is implied by the negative sign in front of the discriminative analysis function (which is identified as a deficiency of this process). Better perception of this process by state faculty students implies that "this process is more important to them, what is connected is the fact that this process was better evaluated by state faculty students than by the students of private faculties" (Arsenijevic, 2008). A part of the knowledge organization does not refer only to virtual grounds, that is, the solutions supported by IT, but also to the traditional bases of knowledge, which consist of the traditional libraries that are richer at the state faculties in the environment researched.

In any case, according to the students as users of the services provided by the faculties, there is an evident difference between state and private faculties in the usage of KM process and the practice of experimenting and studying, which is better at the private faculties. Government structure of faculties thus becomes a very important factor in the indication of the presence of KM in them, which is reasonable considering the fact that the private faculties (as not financed by the state budget) are more focused on profit. On the education market, as well as on any other, the profit is dependent upon a good quality of services and goods and the intensive focus at a consumer. As the knowledge management in the educational institution improves the quality of its work which is reflected in all the processes, including the educational one, it is clear why the research did show that the KM in the educational process is more represented at the private faculties than at the state faculties.

In fact, most of the works on knowledge management in education emphasize a compatibility of the market orientation of the educational institutions with a KM

system, that is, the necessity of the application of knowledge management to the educational institutions in order to satisfy the changeable market requirements and challenges more precisely and accurately. On the other hand, the results of the same research, published in a study in 2009 (Arsenijevic et al. 2009) show that there is an evident relation between the culture and organization and KM processes for the subjects in educational process – professors, and the users of these services – students. Therefore, it is not surprising that the perception of the experimentation and learning culture and the majority of KM processes is greater among the private faculty students.

It is important to notice that the students have their clear opinions based on the various prejudices that are attached to both private and state faculties, especially taking into account the fact that private faculty students often have to defend their choice, which is often a subject of various critics in the surveyed environment which is in the process of decentralization and market oriented education. The same analysis have not shown any important difference in statistics, when professors are in question. Professors shared similar attitudes disregarding a faculty governance structure. It is important to emphasize that the research has been carried out at the faculties of management or the faculties which have the department for management in Serbian province of Vojvodina. In the moment, the research was carried out and there was a deficit of management professors, so the majority of them were respondents who worked at several faculties at the same time. Even those respondents who did not work at several faculties have various similar characteristics, such as education, age, etc. Therefore, it is logical that they share the similar attitudes disregarding the faculty governance structure.

Furthermore, the gender of the students provides differences in their perceptions of knowledge storage and organization, and the gaining and creation of knowledge in class. In the structure of students, men score better in recognizing the processes of 'knowledge storage and organization in class', but lower in recognizing the processes of 'gaining and producing knowledge in class'. Male students thus recognize the process of 'knowledge storage and organization in class' (practical and technical in nature) better and to them it is more important than other subdimensions, which are rather cultural in nature. On the other hand, women score better in the dimension of 'acquiring and generating knowledge in class', and lower in the knowledge 'storage and organization'.

Female students show that they are more sensitive to the dimensions that are cultural in nature, that is, they perceive them better than the process of 'knowledge storage and organization', as a technical process.

## **Conclusion**

Statistically significant differences on behalf of professors

suggest that the professors are biased, because they realize that the processes of KM in class are in their purview, so they evaluate it in a better way, looking at it through their own prism.

On the other hand, although students can influence the culture in class and the success of other KM processes by themselves, they evaluate these dimensions more critically than professors, what is also an indicator of a certain degree of subjectivity, that is, the lack of broader perspective. Therefore, the gap between the answers of the students and those of professors about the KM in class processes suggests that both groups are biased, that is, the fact that all of them consider their role to be very important – in the very centre of the educational process.

On the basis of the deeper, discriminative analysis, the surveyed professors had shown consistency in their attitudes toward and perception of KM process in relation to socio-demographic criteria according to which they were grouped. According to the sample, gender and governance structure of the faculty they work at, do not affect their attitudes and the practice of knowledge management.

Students, on the other hand, had shown a great discrepancy in relation to the criteria according to which they were grouped for the perception of KM processes and the experimenting and learning culture. As opposed to professors, students' perception of KM is affected by both gender and faculty governance structure.

Insensitivity of professors to the differences in gender or faculty governance structure (especially taking into account students' sensitivity to these criteria) could be explained by following arguments. The research has been carried out during the period of increased mobility of professors, due to the deficit of faculty personnel, which created the condition for most of the professors to work at private and state faculties at the same time. Therefore, it is logical that the governance structure does not generate differences in professors' attitudes. On the other hand, the fact that there are no differences between genders based on the gender of the professors points to the conclusion that their objectivity is based on education, which, as an opposing force, later eliminates the hues that could be affected by gender. As opposed to professors, among students there is a clear difference between those who study at private faculties and those who study at state faculties, reinforced by various prejudices that exist in Serbian society related to either private or state faculties. The gender influences in such a way that female students are more sensible to cultural dimensions and male students are prone to perceiving technical dimensions more; and it has a greater influence due to the fact that the students surveyed had (still) not achieved the level of education as of the professors', which would have provided them with the unbiased, scientific objectivity.

The most significant data that was gotten from this research is, however, the fact that students, as users of

services provided by the surveyed faculties, realize the important difference in the presence of KM processes in relation to the faculty governance structure, where this presence is better at private faculties. As knowledge primarily increases the quality of the work of educational institution, which is reflected in all processes including educational one, it is clearly shown by the research why KM is more dominant in the educational process of private faculties than in the state faculties. 'The governance structure of the educational institutions thus becomes an important factor in the indication of KM presence in the institutions'.

The data implied by the students surveyed is of a great significance, because it is only students who are competent to be in the position to judge the educational process. Therefore, their evaluation is much more important than professors' one whose attitudes toward this issue are indifferent.

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