Application of the FUCOM-FUZZY MAIRCA Model in Human Resource Management

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Abstract: The paper presents the FUCOM-FMAIRCA MCDM model for application in human resource management. The proposed model allows the inclusion of all relevant stakeholders in the process of human resource selection, enhances the pool of scientific knowledge in the field of human resource management highlighting selection as a special activity, and uses modern quantitative (mathematical) decision-making methods. Based on the analysis of personality traits of teachers and literature related to this field, the necessary characteristics of teachers of the Military Academy are presented, on the basis of which the selection criteria are formed. The FUCOM method was used to define the weight coefficients of the defined criteria. In order to more precisely determine the qualitative properties and their quantification, triangular fuzzy numbers were implemented in the MAIRCA method, and by applying all the steps of this method, the ranking of alternatives was performed. Finally, in order to test the validity of the model, a sensitivity analysis was carried out.

Keywords: FUCOM; fuzzy; MAIRCA; teacher selection; HRM

1 Introduction

The development of any educational system is determined by numerous factors, and the human factor is certainly one of the most important. Even the most modern technical and technological solutions cannot replace the influence of the human factor in the process of educational work, where the teacher occupies a very responsible and important place and function, at all levels of education. Introducing young generations to what awaits them in life and training them to perform the

expected roles in society, has always been an activity of special interest to all humanity [1] [2] [3] and [4]. The teachers' competencies and personality is the subject of numerous studies that provided different scientific knowledge, depending on the time when they were conducted and the socio-cultural-political circumstances in which the research was conducted. Domas and Tiedeman [5] performed a comprehensive analysis of the literature related to teacher competencies that had been published up to that time. Medley [6] analyzes and synthesizes the results of research studies on the competencies and effectiveness of teachers, from the aspect of teacher behavior in classes. The author in [7] presented previous research in the field of teacher competencies in the United States and proposed measures to improve competencies. Cheong Cheng [8] proposes a holistic approach to improving teacher effectiveness, with an emphasis on improving teacher competencies and performance rather than teacher behavior. Selvi [9] explains the competencies of teachers through several dimensions "as field competencies, research competencies, curriculum competencies, lifelong learning competencies, social-cultural competencies, emotional competencies, communication competencies, information and communication technologies competencies (ICT) and environmental competencies". In their study [10], the authors investigate teachers' pedagogical aspects, professional beliefs, work motivation and self-regulation as aspects of their professional competence and their impact on student outcomes. Hakim [11] studies the impact of teacher competencies on learning performance, where he finds that competencies, such as pedagogical, personal, professional and social, are directly related to the achievement of teacher performance in the learning process. Sulaiman and Ismail [12] in the research entitled "Teacher Competence and 21st Century Skills in Transformation Schools 2025 (TS25)" list the following dimensions of teacher competence: Personal Characteristic, Curriculum, Planning, Evaluation & Reporting, Pedagogy, Professional, Information & Communication Technology and School Management & Development. The authors in [13] presented a multi-dimensional approach to teacher competencies in higher education which consists of six dimensions with their respective characteristics, which ensure quality during the selection of teachers and their professional development. Research in the area of teacher professionalism, presented in K, points to the fact that teacher's ideals, professionalism and practice have a direct influence on teacher competence [14]. In addition to previously researched competences, the scientific competences of teachers, described through the ability of teachers to apply modern technologies in the teaching process, are increasingly mentioned in recent researches [15]. As can be seen from previous research, there are different approaches to teacher competence. The first approach is directed towards the teacher's behavior during education, while the second is directed towards the characteristics of his personality. Answering the question of what is key to the success of a teacher is still a great challenge today, and therefore the selection of staff for future teachers, both in the civilian sector and in the military education sector. In the Republic of Serbia, the basic faculty that educates future military officers is the Military Academy.

The Military Academy, as a higher education unit within the University of Defence in Belgrade, integrated into the higher education system of the Republic of Serbia, provides its teaching staff mainly from officers serving in units and institutions of the Serbian Army and the Ministry of Defence. Great attention is paid to the selection of teachers who will educate and train future military officers. The basic conditions that officers who will perform the duties of a teacher must meet refer to the formal criteria defined by the law defining the field of higher education and internal regulations governing this field at the Military Academy, in which the characteristics of teacher as person are not considered. Numerous scientists around the world have researched this problem and come up with a large number of positive qualities that a teacher in higher education should possess. By analyzing the previously mentioned characteristics and literature related to this field, the necessary characteristics of the teachers of the Military Academy were presented, on the basis of which the selection criteria were formed.

The paper presents a model for the selection of candidates for teachers of the Military Academy, which would include all the necessary criteria. The model is based on respect for all modern scientific knowledge in the field of human resource management, with special emphasis on selection, as a special activity, and the application of modern decision-making methods. The model represents a synthesis of the FUCOM method, which defines the weight coefficients of the criteria, and the Fuzzy MAIRCA method, which ranks alternatives and chooses the optimal solution. Also, the analysis of the sensitivity of the model to the change of the weight coefficients of the criteria was performed, as well as the determination of the Spearman's coefficient of rank correlation, on the basis of which conclusions were drawn about the stability of the used methodology.

2 Materials and Methods

Although a relatively young scientific discipline, human resource management is the most important factor in the successful functioning of any organization, and the abilities of employees in the organization are an important factor in success [16]. As one of the important activities in the process of human resources management, is a selection. The goal of selection is to correctly predict the candidate's behavior, which will positively affect the achievement of the organization's goals. The selection process generally includes: determination of the required characteristics for the effective and efficient performance of the duties in question and evaluation of the candidate in terms of how well he fulfills the required characteristics of the specified job. In the selection process, the necessary information about the candidate is obtained using certain methods and techniques, the basic characteristics of which are: objectivity, sensitivity, reliability and validity, confirming to us which of the registered candidates is the most competent for the position for which we are making the selection. Candidates differ from each other in many ways in terms of abilities, character traits, competences, etc.

According to Lojic [17], one of the most acceptable determinations of the basic phases in the selection process are: analysis of received applications and supporting documents, preliminary interview, testing, diagnostic interview, reference check, job offer and medical examination. Also, an indispensable part of the final stage of the selection, which represents the verification of a well-executed selection, is the monitoring and analysis of the results of the received candidates, which lasts several months [17]. The teaching staff in military schools consists of teachers with appropriate teaching titles, who teach and can perform other duties at the same time. The teaching base of the Military Academy is formed, in most cases, by officers who are in the defence system, ie in units and institutions of the Serbian Army and the Ministry of Defence, while a smaller number of them have the status of civilians.

The model of selection of officers for teachers of the Military Academy implies that this process takes place according to a clearly defined procedure, in which the superior officers of the candidate who apply for teaching duties would take part, and the implementation of the selection and making the final decision would be realized by the commission of the Military Academy, composed of four teachers from the educational-scientific field for which a teacher and one psychologist are elected, based on the model of multi-criteria decision making and interviews with candidates, respecting the basic stages in the selection process (Figure 1):

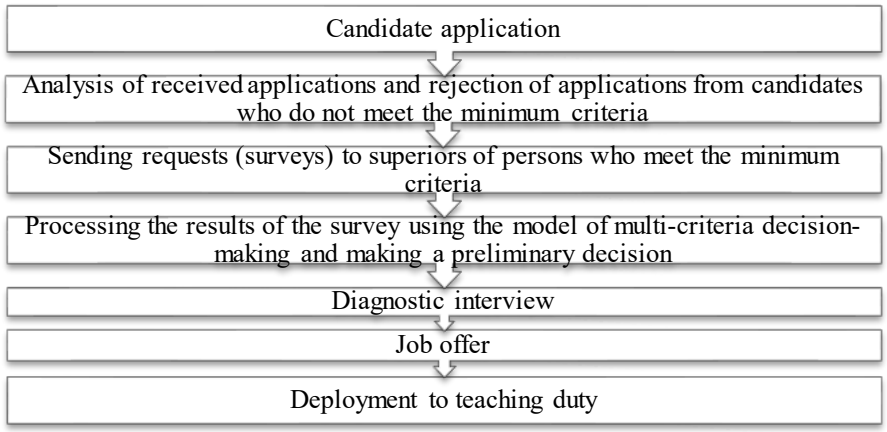

Figure 1

Phases in the selection process (adapted from [17])

In order to integrate knowledge and experience into one whole, a model of multi-criteria decision making for the selection of teaching staff of the Military Academy was developed, presented in Figure 2.

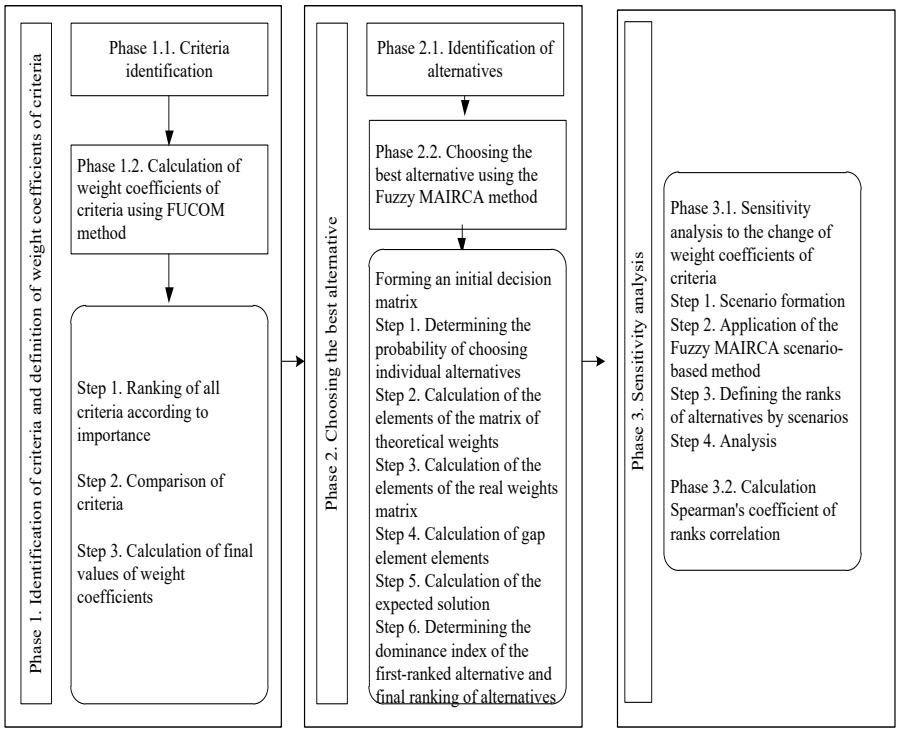

Figure 3
Multi-criteria decision making model for teacher selection

2.1 Defining Selection Criteria

Teachers at the Military Academy, as well as at other faculties and schools in the country and abroad, have two basic roles: educational and upbringing. Not only professional and working abilities, but also human values of teachers come to the fore in educational work. With the advent of pedeutology, as independent scientific disciplines of pedagogy, in the twenties and thirties of the last century, more and more importance were given to the study of teacher characteristics, as a factor in the success of the teaching process [18]. Suzic [18] comes up with 97 characteristics and recognizes six basic criteria for the classification of teacher characteristics: the teacher as a personality; relationship - performance towards the listener and teaching; style and way of working in teaching; values and value orientation; social role and status of teachers; physical qualities and physical appearance. According to [19], the result of long discussions was the final list of personal competencies of a university teacher, based on personality traits, moral and ethical characteristics. As the basic positive and desirable qualities of teachers, expressed by students, in the research conducted in [20], [21] desirable qualities of teachers were listed, among others, ambition, responsibility, communicativeness, expertise,

professionalism, etc. Investigating the factors of professional success of teachers of the Military Academy, the author in [21] recognizes the following dimensions and characteristics of teachers (only those significant for the research problem are highlighted): professional competence; didactic-methodical competence; character and other qualities of the teacher; the adragogic-psychological dimension of the participants. Given that one of the basic desirable qualities of an officer is leadership, that leadership according to Lojic [22] represents "the ability of one person to influence other people, so that they cooperate with each other in work and make efforts to achieve the goals of the organization", and that the teacher in his work must influence the students in order to achieve the goal of educational work, it can be concluded that this is one of the necessary characteristics of the teacher of the Military Academy. Also, as the most important factors of leadership, the author in [22] recognizes: personal characteristics of the individual, characteristics of subordinates and characteristics of the environment, while Greenberg and Baron [23], as characteristics of successful leaders, state the following: energy; honesty and integrity; leadership motivation; self-confidence; ability to perceive; job knowledge; creativity; flexibility. Although the previously mentioned authors listed a large number of desirable qualities of teachers, there is still no single generally accepted position on this problem, especially in the field of upbringing and education of future military officers. The analysis of available literature, in which previous research on this problem is presented, as well as the specifics of higher military education, leads to the criteria for selection of candidates for teachers in higher military education (Table 1):

Table 1
Description of the criteria

Criterion	Description of the criterion
Criterion 1	Professional qualities of teachers.
Criterion 11	Safety and breadth of expertise and general knowledge.
Criterion 12	Striving to acquire knowledge and develop interests.
Criterion 13	Developed communication skills.
Criterion 14	Professional attitude towards work.
Criterion 2	Character and other characteristics of teachers.
Criterion 21	Clearly defined relationships with subordinates and consistency in equirements.
Criterion 22	Respect for the personality of the subordinate.
Criterion 23	Optimism, motivation and enthusiasm in work.
Criterion 24	Creating a pleasant working atmosphere.
Criterion 25	Charismatic appearance and behavior.
Criterion 26	Critically thinking person.
Criterion 27	Willingness to cooperate.
Criterion 28	Leadership ability.

Criterion 29	Flexibility.
Criterion 3	Didactic methodological qualities of teachers.
Criterion 31	Emphasis on the essence of the work.
Criterion 32	Developing creativity in work.

The criteria are arranged in two levels of hierarchy.

2.2 Description of Used Methods

The selection model is based on the FUCOM method and the fuzzy MAIRCA method, due to the simplicity of their mathematical apparatus and good output results.

2.2.1 FUCOM Method

The FUCOM (Full Consistency Method) method is used to determine the weight coefficients of the evaluation criteria. The method was first presented in 2018 [24] and has since been applied in a large number of papers to solve various problems, such as: to determine the most popular airlines in Indonesia with MABAC method [25], in an integrated RFUCOM-RTOPSIS FMEA model for risk assessment [26], select the best site for a floating offshore wind farm in Norway in hybrid decision making model with a combined compromised solution (CoCoSo) [27], assessment of critical success factors for continuous academic quality assurance and accreditation, with the fuzzy AHP method [28], for selecting a location for a brigade command post during combat operations in MCDM model with Z-numbers and MABAC method [29], selection of the best solution for business balance of the passenger railway operator, together with the fuzzy AHP method [30], selection of the group of construction machines for enabling mobility in model with D numbers and fuzzy RAFSI method [31], construction of a single-span Bailey bridge, with the fuzzy MABAC method [32], etc. Fuzzified version of FUCOM method was used to solve the following problems: selection of reach stacker in a container terminal with fuzzy MARCOS method and Fuzzy Bonferroni Mean (BM) operator [33], prioritization of express packaging recycling patterns with fuzzy GRC-DANP and fuzzy EDAS method [34], selection of renewable electricity suppliers [35], to manage transport requirements in the urban mobility system in Istanbul, in model with Dombi-Bonferroni mean operators [36] etc. The FUCOM method consists of three steps [24], [31]. The steps of the method are presented in Figure 3.

2.2.1 Fuzzy MAIRCA Method

The MAIRCA (MultiAttributive Ideal-Real Comparative Analysis) method the method was first presented in 2014 [37]. The FuzzyMAIRCA method has found application in many areas: for determination of constructive elements of weapons [38], to rank failure modes according to risk level [39], to assess occupational risks from a human health and environmental perspective [40], for select a camp space

[41], to locate a logistics platform in a sustainability perspective [42], for the selection of places for crossing tanks under water [43], for the selection of intermediaries-agents in the field on B2B markets [44], and others. Mathematical formulation of the fuzzyMAIRCA method, consists of 6 steps [37], [46]. The steps of the method are presented in Figure 3. Fuzzification was performed using triangular fuzzy numbers and using the degree of confidence of the decision maker in the statements he made [45].

3 Results and Discussion

Based on the phases of the formed model of multi-criteria decision making (Fig. 3), we first approach the identification and calculation of weight coefficients of criteria. Criteria K_1-K_3 represent the first level of the hierarchy, while their sub-criteria are the second level, and the calculation of criterion weight coefficients is based on global and local values of criteria and sub-criteria [42], [46]. Ranking and determining the significance of the criteria, by levels, was performed by 10 experts.

Step 1. In the first step, the criteria were ranked from the most important to the least important, according to the levels of hierarchy:

First level:

$$C_1 > C_2 > C_3$$

Second level:

$$C_{11} > C_{12} > C_{13} > C_{14};\ C_{21} > C_{22} > C_{23} > C_{24} > C_{25} > C_{26} > C_{27} > C_{28} > C_{29};\ C_{31} > C_{32}$$

Step 2. Comparison of the first ranked with other criteria, by levels.

The significance of the comparison of the first ranked in relation to other criteria, by levels, for expert E1, is given in Table 2.

Table 2

Significance of the comparison of the first ranked in relation to other criteria

Expert	$C_1 > C_2 > C_3$ $\varpi_{C_{j(k)}}$	$C_{11} > C_{12} > C_{13} > C_{14}$ $\varpi_{C_{j(k)}}$	$C_{21} > C_{22} > C_{23} > C_{24} > C_{25} > C_{26} > C_{27} > C_{28} > C_{29}$ $\varpi_{C_{j(k)}}$	$C_{31} > C_{32}$ $\varpi_{C_{j(k)}}$
E1	[(1),(1.5),(2)]	[(1),(1.5),(2),(2.5)]	[(1),(1.25),(1.5),(1.75),(2),(2.25),(2.5),(3),(3.25)]	[(1),(1.5)]

Based on the significance of the criteria, comparative significance of the criteria was calculated. For example, for the level of criteria C_1-C_3, for expert E_1, the following values are obtained:

$$\varphi_{C_1/C_2} = 1.5;\ \varphi_{C_2/C_3} = 1.333;\ \varphi_{C_1/C_3} = 2$$

At this level, for example, for expert E1, a vector of comparative priorities of the evaluation criteria is obtained, as in expression (2):

$$\Phi^{E1} = (1.5, 1.333, 2)$$

Applying expression (4) defines the final model for determining the weight coefficients, shown on the example of expert E1, at the level of criteria C_1-C_3:

$$\min \chi$$

$$\left|\frac{w_1}{w_2} - 1.5\right| = \chi, \ \left|\frac{w_2}{w_3} - 1.33\right| = \chi, \ \left|\frac{w_1}{w_3} - 2\right| = \chi$$

$$\sum_{j=1}^{3} w_j = 1, \ w_j \geq 0, \forall j$$

By solving the previous expression, the weight coefficients of the criteria are obtained, for each level of the hierarchy. An example for expert E1 the weight coefficients is given in the table (Table 3).

Table 3
Weight coefficients of criteria, by levels, for experts E1 and E2

Expert	$C_1 > C_2 > C_3$	$C_{11} > C_{12} > C_{13} > C_{14}$	$C_{21} > C_{22} > C_{23} > C_{24} > C_{25} > C_{26} > C_{27} > C_{28} > C_{29}$	$C_{31} > C_{32}$
E1	[(0.462), (0.308), (0.231)]	[(0.39),(0.26), (0.195),(0.156)]	[(0.199),(0.159),(0.133),(0.114), (0.1), 0.088),(0.08),(0.066),(0.061)]	[(0.667), (0.333)]

After averaging expert opinions (assessments), using the arithmetic mean, according to the expression: $A_n(w) = \frac{w_{11} + w_{12} + ... + w_n}{n}$ (1)

for each criterion, at each level, and by multiplying the local values of the weight coefficients of the sub-criteria with the values of the weight coefficients of the criteria, we arrive at the values of the total weight coefficients of the sub-criteria (Table 4).

Table 4
Weight coefficients of criteria and sub-criteria

Criterion	Weight coefficients of criterion	Sub-criterion	Local value of the sub-criterion weight coefficient	Global value of the sub-criterion weight coefficient
C_1	0.491	C_{11}	0.363	**0.179**
		C_{12}	0.261	**0.128**
		C_{13}	0.211	**0.104**
		C_{14}	0.165	**0.081**
C_2	0.292	C_{21}	0.242	**0.071**
		C_{22}	0.163	**0.048**
		C_{23}	0.127	**0.037**

		C_{24}	0.106	**0.031**
		C_{25}	0.091	**0.026**
		C_{26}	0.079	**0.023**
		C_{27}	0.072	**0.021**
		C_{28}	0.062	**0.018**
		C_{29}	0.057	**0.017**
C_3	0.217	C_{31}	0.667	**0.145**
		C_{32}	0.333	**0.072**

After defining the weight coefficients of the criteria, the selection of the optimal alternative from the set of alternatives is approached, ie the ranking of the candidate for teacher, based on the defined criteria using the fuzzy MAIRCA method. The starting point in the application of the mathematical apparatus of the MAIRCA method is the initial decision matrix, in which random values for 5 alternatives (candidates for teachers) were entered, for the purposes of testing proposed model:

$$D = \begin{array}{c} \\ A_1 \\ A_2 \\ A_3 \\ A_4 \\ A_5 \end{array} \begin{array}{c} \begin{array}{ccccccccccccccc} K_{11} & K_{12} & K_{13} & K_{14} & K_{21} & K_{22} & K_{23} & K_{24} & K_{25} & K_{26} & K_{27} & K_{28} & K_{29} & K_{31} & K_{32} \end{array} \\ \begin{bmatrix} 4:90 & 5:80 & 3:70 & 5:90 & 4:80 & 3:70 & 4:90 & 5:80 & 3:100 & 4:90 & 5:80 & 4:70 & 3:90 & 4:80 & 5:80 \\ 5:90 & 4:80 & 3:50 & 4:90 & 4:80 & 5:70 & 5:100 & 4:80 & 3:100 & 5:70 & 3:80 & 4:70 & 3:90 & 4:80 & 5:80 \\ 5:90 & 5:80 & 3:70 & 4:90 & 3:80 & 3:70 & 4:90 & 4:90 & 4:100 & 4:70 & 3:80 & 4:80 & 5:90 & 4:50 & 5:90 \\ 5:90 & 4:80 & 5:70 & 4:50 & 3:80 & 4:70 & 4:100 & 4:80 & 4:100 & 5:60 & 5:80 & 3:70 & 3:90 & 3:80 & 4:100 \\ 4:90 & 5:80 & 4:70 & 5:90 & 4:90 & 5:60 & 3:90 & 3:80 & 3:100 & 4:90 & 3:80 & 4:70 & 3:90 & 5:50 & 4:100 \end{bmatrix} \end{array}$$

The decision-maker, in the initial decision making matrix, enters the teacher candidate's rating for each criterion (rating scale is from 1 to 5, where 1 is the lowest rating and 5 is the highest), with the degree of confidence in the given statement, in percentages (e.g. rating 4, I am 90% sure of this claim - 4:90). By converting statements into fuzzy numbers [45], a new decision matrix is formed:

$$D = \begin{array}{c} \\ A_1 \\ A_2 \\ A_3 \\ A_4 \\ A_5 \end{array} \begin{array}{c} \begin{array}{cccccc} K_{11} & K_{12} & K_{13} & K_{14} & K_{21} - K_{31} & K_{32} \end{array} \\ \begin{bmatrix} (3.6,4,4.4) & (4,5,6) & (2.1,3,3.9) & (4.5,5,5.5) & & (4,5,6) \\ (4.5,5,5.5) & (3.2,4,4.8) & (1.5,3,4.5) & (3.6,4,4.4) & & (4,5,6) \\ (4.5,5,5.5) & (4,5,6) & (2.1,3,3.9) & (3.6,4,4.4) & \cdots & (4.5,5,5.5) \\ (4.5,5,5.5) & (3.2,4,4.8) & (3.5,5,6.5) & (2,4,6) & & (4,4,4) \\ (3.6,4,4.4) & (4,5,6) & (2.8,4,5.2) & (4.5,5,5.5) & & (4,4,4) \end{bmatrix} \end{array}$$

By applying steps 1 to 5 of the FuzzyMAIRCA method, the fuzzy values of the expected solution are obtained ($Q_i^{\%}$), Table 5:

Table 5
Fuzzy values of the expected solution

	$Q_i^{\%}$
A_1	(0.16,0.113,0.066)
A_2	(0.152,0.103,0.054)

A_3	(0.149,0.101,0.052)
A_4	(0.158,0.112,0.066)
A_5	(0.164,0.116,0.068)

The set of alternatives is ranked based on the defuzzified values of the criterion function assigned to each alternative, using expression (2) [43].

$$D = \left[\lambda d_3 + d_2 + (1-\lambda) d_1 \right] / 2 \tag{2}$$

By applying expression (2), the obtained values of the expected solution are defuzzified (for λ is taken the value 0.5), the initial ranking of alternatives was performed, and after determining the index and the threshold of dominance of the first-ranked alternative, the final rank of the alternative is obtained (Table 6).

Table 6
Defuzzified values of the expected solution

	$\%_i$	IRank	FRank
A_1	0.113	**4**	1"
A_2	0.103	**2**	1"
A_3	0.101	**1**	1"
A_4	0.112	**3**	1"
A_5	0.116	**5**	5

Based on the results in Table 6, the initial ranking of alternatives is as follows **A_3> A_2>A_4>A_1>A_5**, the alternative A_3 is the best-ranking**,** but alternatives A_1, A_2 and A_4 also come into account when deciding, depending on the number of candidates required.

4 Sensitivity Analysis

In such a complex process, such as decision making, it is possible to make mistakes, and it is necessary to perform a sensitivity analysis, using one of the approaches [48] [49] [50] [51] [52] [53] [54]. The paper analyzes the sensitivity of the FuzzyMAIRCA method to changes in weight coefficients, through 16 scenarios (Figure 3).

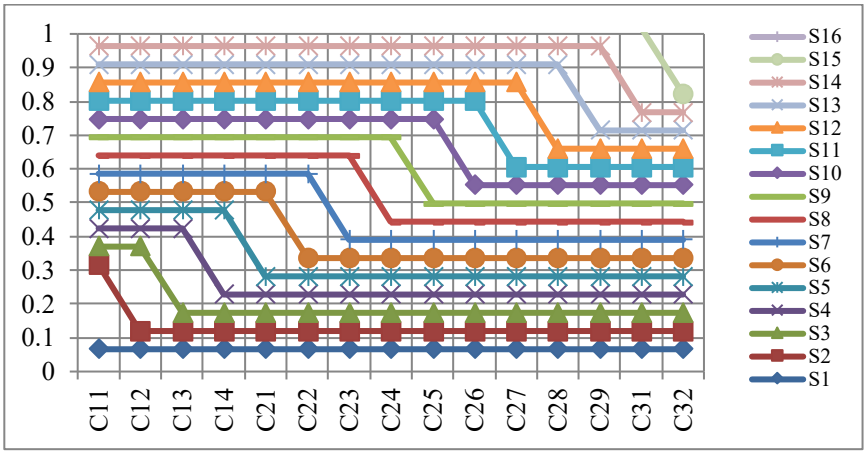

Figure 3

Scenarios with different weight coefficients of criteria

The ranking of alternatives after the application of previously defined scenarios is given in Figure 4.

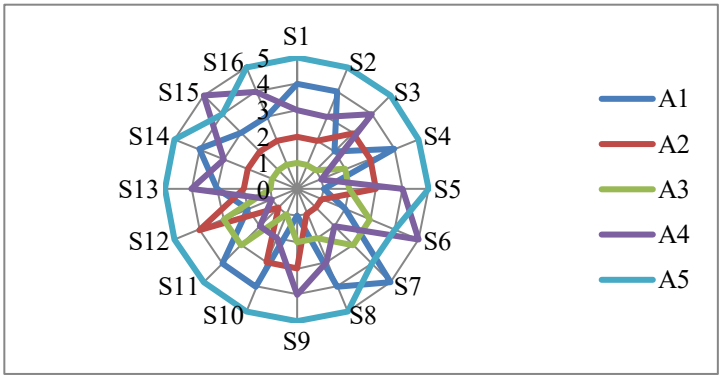

Figure 4

Ranking of alternatives by scenarios

From the previous figure it can conclude that the FuzzyMAIRCA method is sensitive to significant favoring of a certain criterion. In case all criteria are of equal importance, the method does not show any sensitivity. Also, we can conclude that alternative A_3 in most cases retained its rank or slightly changed it, while alternative A_5 in most cases was the last ranked alternative, which indicates the stability of the results of the method.

Also, one of the ways to check the consistency of the results of MCDM methods is given in [49], [55-57] and represents Spearman's rank correlation coefficient (S), which is calculated according to the following expression (3):

$$S = 1 - \frac{6\sum_{i=1}^{n} D_i^2}{n(n^2 - 1)} \tag{3}$$

where D_i – the difference between the rank of a given element in the vector w and the rank of the corresponding element in the reference vector, n – number of ranked elements. The Spearman's coefficient has values from the interval [-1,1]. Using expression (3), the following values of Spearman's coefficient (S) are obtained (Figure 5):

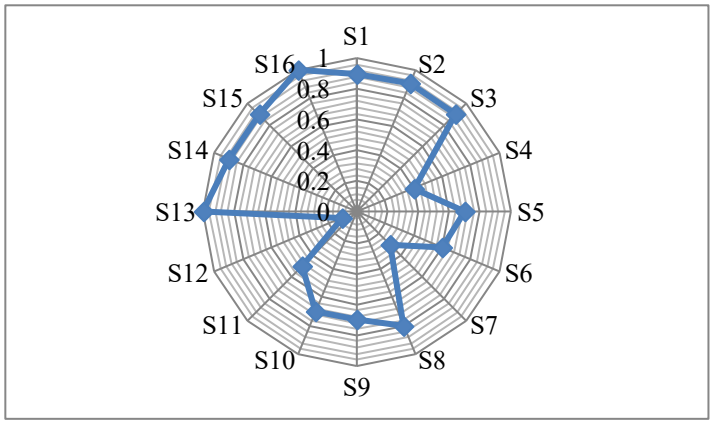

Figure 5
Values of Spearman's coefficient

From the previous figure we can conclude that the correlation coefficients in 16 scenarios tend towards ideal positive correlation and that the defined MCDM model is in most cases stable, in relation to the change of weight coefficients. The Commission of the Military Academy for the selection of officers for teachers may, before entering the data from the survey, conduct a preliminary interview and on the basis of it correct the data (grades, claims) on the candidates. Also, based on the results of the multi-criteria model, the Commission can direct interviews with candidates and make a better final decision. After the final decision is made, the final activities in the selection process are carried out.

Conclusions

The greatest potential of modern organizations is reflected in the abilities, knowledge and skills of their employees. By recognizing the need for quality staff, the field of human resource management is being constantly improved. The selection of human resources is one of the most important activities of human resource management, and the human factor is a key link in the success and achievement of the set goals of every organization, including higher education institutions, and it must be given maximum attention. Achieving the goals of the educational work of all higher education institutions is primarily the responsibility

of teachers. The quality of the teaching staff influences strongly the outcome of the teaching and educational process. The Military Academy, as an accredited higher education unit, encounters numerous obstacles related to teaching staff in the accreditation process. In order to solve this problem, the question of the selection of teaching staff arises, as well as the conditions and criteria that a candidate for a teacher should meet. The parameters that are taken into consideration when deciding in this process are a key issue in the selection of staff and the quality of the future teacher depends on the correct definition of the selection criteria. Also, the way in which the decision is made must be clearly defined, taking into account all the important factors that influence the final decision. Guided by the previously mentioned problems and scientific facts that treat this area, the paper proposes a new model for candidate selection.

The model is based on the stages of human resources selection, from the aspect of teacher personality characteristics and necessary conditions that they must meet, using the MCDM methods, in a multi-criteria model. The main findings of the research are reflected in several points. First, based on numerous studies that study this area of research, the criteria for evaluating future teachers were defined. Then, the calculation of the unique weighting coefficients of the criteria was carried out, according to expert assessment using the FUCOM method, at two levels of the hierarchy of criteria. After determining the significance of each of the criteria, five alternatives were defined, which represent five different candidates for teachers. With entering the values of alternatives based on the degree of conviction in the given statement, fuzzifying the initial decision matrix and by applying steps of the FuzzyMAIRCA method, ranking of alternatives was performed based on previously defined criteria. During the sensitivity analysis of this model, by changing of weight coefficients of criteria through 16 scenarios, the FuzzyMAIRCA method showed good stability of the output results and the MCDM model was confirmed as sustainable and applicable in practice.

The presented model can be further improved by elaborating the criteria in more detail, by applying other methods for determining the weight coefficients of the criteria, the application of different operators for the aggregation of group decisions, as well as other areas that treat the area of uncertainty well and other methods for ranking the alternatives or choosing the optimal solution. The main limitation of this research is related to the specificity of the research problem, i.e. the fact that the presented model with its criteria was proposed for the selection of candidates for teachers at the Military Academy of the University of Defence in Belgrade (Republic of Serbia) and that due to possible specific andragogic and methodological approaches to education of future military officers, may not be applicable at other higher education institutions, but it is not exclusive.

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