IJER
ISSN: 2757-959X

INTERNATIONAL JOURNAL OF ECONOMIC AND ADMINISTRATIVE ACADEMIC RESEARCH

Available online, ISSN: 2757-959X | www.ijerdergisi.com | Economic and Administrative Academic Research

EVALUATION OF SCHOOL PREFERENCE CRITERIA OF ADMINISTRATORS WITH GRAY DEMATEL METHOD

Gülay DEMİR[a], Ahmet SAVAŞ*[b]

**Corresponding Author*

ARTICLEINFO

Research Article

Received : 15/01/2024
Accepted : 26/02/2024

Keywords:
Administrator, School Preference, Gray DEMATEL Method

ABSTRACT

The purpose of this study; to determine the priority order of administrator candidates in school selection criteria and to give weight to the criteria. In the study, the criteria affecting the school preferences of administrators were determined by taking expert opinions. In this context, transportation facilities, physical equipment, academic and social success of the school, school climate and culture (organizational climate), cash income of the school (school budget), workload at the school, parent profile, number of students and teachers were considered as criteria. The subjective weights of these criteria were calculated with the Gray DEMATEL method, again by taking expert opinions. According to the results obtained, it was seen that the three most important criteria affecting the school preferences of the administrators were the school budget, the workload at the school, and the academic and social success of the school.

Uluslararasi İktisadi Ve İdari Akademik Araştirmalar Dergisi, 4(1), 2024, 36-46

YÖNETİCİLERİN OKUL TERCİH KRİTERLERİNİN GRİ DEMATEL YÖNTEMİYLE DEĞERLENDİRİLMESİ

MAKALE BİLGİSİ

Araştırma Makalesi

Geliş :15/01/2024
Kabul : 26/02/2024

Anahtar Kelimeler:
Yönetici, Okul Tercihi, Gri DEMATEL Yöntemi

ÖZ

Bu çalışmanın amacı; yönetici adaylarının okul seçim kriterlerinde öncelik sıralaması belirleyip, kriterlere ağırlık değeri vermektir. Çalışmada yöneticilerin okul tercihlerini etkileyen kriterler uzman görüşleri alınarak belirlenmiştir. Bu kapsamda, ulaşım olanakları, fiziksel donanım, okulun akademik ve sosyal başarısı, okul iklimi ve kültürü (örgüt iklimi), okulun nakit geliri (okul bütçesi), okuldaki iş yükü, ebeveyn profili, öğrenci ve öğretmen sayısı kriter olarak ele alınmıştır. Bu kriterlerin öznel ağırlıkları, yine uzman görüşleri alınarak, Gri DEMATEL yöntemi ile hesaplanmıştır. Elde edilen sonuçlara göre idarecilerin okul tercihlerini etkileyen en önemli üç kriterin sırasıyla okul bütçesi, okuldaki iş yükü, okulun akademik ve sosyal başarısı olduğu görülmüştür.

[a] gulaydemir@cumhuriyet.edu.tr https://orcid.org/0000-0002-3916-7639

[b] ahmetsavas_5133@hotmail.com https://orcid.org/0009-0004-1259-1079

1. Introduction

Today, education plays a fundamental role in the development of societies and shaping the future and has a very different structure and functioning within itself (Akçakoca and Bilgin, 2016). In order for the education system to function properly and for educational activities to achieve their goals, effective communication with internal and external stakeholders is needed. Administrators and teachers are the most fundamental elements that enable the education system to act in accordance with its purpose. Many situations, such as the strategies, methods and materials used by school administrators and teachers depending on their professional seniority and experience, vary (Açıkalın, 1998; Şen and Tankutay, 2021). However, one of the factors that distinguish school administrators from their other colleagues is their ability to lead. With the changes in the education system in recent years, in addition to being able to lead, factors such as being objective, sharing responsibilities, participating in in-service training, expert knowledge and receiving postgraduate education are becoming more important day by day (Sayan and Yıldırım, 2019; Taymaz, 2003). As the times change, the needs expected from educational institutions and administrators have differed. Since today is the information age, expectations from education have increased on behalf of the information society. In this direction, the most important factor in educational institutions that have acquired new goals in achieving these goals is school administrators. According to Turan and Şişman (2003), the center of change in education is the school, and the pioneer of this change is school administrators. Therefore, we see school administrators as the locomotive of educational institutions.

School administrators are effective and responsible from beginning to end in determining the goals of educational institutions, making the necessary plans to achieve the goals and implementing these plans in the most efficient way (Balyer and Gündüz, 2011). It is seen that school administratorship covers many areas such as carrying out activities to increase the academic and social success of students in order to realize the visions of the institutions they work in, carrying out studies that will contribute to the professional development of teachers and motivating them, communicating effectively with parents, and leadership (Akçakoca and Bilgin, 2016; Balyer. and Gündüz, 2011; Şen and Tankutay, 2021). Therefore, the quality of education in schools depends on qualified and competent administrators. The issues to be considered when selecting administrators for schools are important and are among

the issues that should be given priority as they directly affect the quality of education and training (Sezer, 2016).

The selection of administrators in schools affiliated with the Ministry of National Education is made by the Ministry of National Education in accordance with the "Regulation on Selection and Assignment of Administrators for Educational Institutions Affiliated to the Ministry of National Education" (MEB, 2021). According to this regulation, managerial candidates are appointed according to their score superiority and preference order. Candidates are offered 20 choices and manager candidates make their choices (Güler and Demirkaya, 2022; Özmen and Kömürlü, 2010). Manager candidates prioritize many criteria when choosing a school. The high number of criteria has caused various problems for managerial candidates. In this study, managerial candidates are expected to determine and make their choices in order of their importance. This reveals the importance of this research. Gray DEMATEL Method, one of the Multi-Criteria Decision Making Methods (MCDM) was used.

The purpose of this study; to determine the priority order of administrator candidates in school selection criteria and to give weight to the criteria. Administrative Managers should determine the schools they will choose in the most appropriate way according to their criteria. Because school choice directly affects their social, working lives and careers. For this reason, it is aimed to guide administrators while determining the criteria for school selection. Thus, managers will have a happy, efficient and productive life both in their social and business lives.

2. Literature Review

Multi-criteria decision-making techniques are a very developing field today. Problems encountered at every stage of life have become solvable with a decision-making method. There are many decision-making methods in the literature. With the proliferation of these methods, decision-making methods have begun to be classified among themselves. Their intended use and whether they are subjective or objective form the basis of these classifications (Arslan, 2020a). Criterion weighting methods are divided into two: subjective methods, which are based on the opinions of decision makers, and objective methods, which are not based on the opinions of decision makers (Arslan, 2020b). In this study, 5 school administrators were determined as decision makers, and the criteria taken into account in school preferences were weighted in line with their opinions.

As for the Gray The Decision Making Trial and Evaluation Laboratory (DEMATEL) {(GD)}, which is a subjective weighting procedure, some recent studies applied this procedure

can be summarized as follows. Han and Wang (2018), employing the GD approach, analyzed major barriers to off-site construction. Bhatia and Srivastava (2018) applied the GD method to investigate external barriers to remanufacturing in the electronic waste industry. Liu et al. (2019) designed an integrated model by combining GD with the uncertain linguistic MULTIMOORA method to evaluate electric vehicle charging stations. Using GD approach, Xia and Ruan (2020) evaluated the obstacles related to developing a sustainable circular economy in the field of agriculture. t optimal stock portfolio selection. Meidute-Kavaliauskiene et al. (2021), using the fuzzy Delphi method and GD methods, evaluated lean innovation practices in the pharmaceutical industry. Li et al. (2022) integrated GD with ANP for assessing the green mining performance of gold mines. Sohrabi (2022) applied GD-AHP method for assessing the elements influencing the agility of the cold supply chain. Menon and Ravi (2022) proposed GD method to assess the impediments influencing sustainable supply chain implementations for the electronics sector.

3. Research Methodology

This section presents the basic algorithm of the proposed integrated methodology. According to the application steps of the proposed MCDM approach, subjective weights of the evaluation criteria are calculated by Gray DEMATEL method.

3.1. Gray System Theory

The gray system theory was proposed by Deng (1982) to solve uncertainties in situations involving discrete data and incomplete information. Gray system analysis is carried out with gray numbers, gray equations and/or gray matrices (Deng, 1989). When it comes to gray numbers, neither black nor white concepts may come to mind once in a while, their values cannot be clearly expressed in numbers, but they are known to take values in which range. Gray number is $(\otimes x)$, $\otimes x \in \left[\underline{\otimes} x,\ \overline{\otimes} x\right]$ with x being a real number where, $\underline{\otimes} x$ and $\overline{\otimes} x$ refer to the lower and upper limits of the number of $\otimes x$ grays, respectively. $\otimes x_1$ and $\otimes x_2$ are used for basic mathematical operations that can be done with gray numbers.

$$\otimes x_1 + \otimes x_2 = \left[\underline{x_1} + \underline{x_2}, \overline{x_1} + \overline{x_2}\right] \quad (1)$$

$$\otimes x_1 - \otimes x_2 = \left[\underline{x_1} - \overline{x_2}, \overline{x_1} - \underline{x_2}\right] \quad (2)$$

$$\otimes x_1 .\ \otimes x_2 = \left[\min\left(\underline{x_1}.\underline{x_2}, \underline{x_1}.\overline{x_2}, \overline{x_1}.\underline{x_2}, \overline{x_1}.\overline{x_2}\ \right), max\left(\underline{x_1}.\underline{x_2}, \underline{x_1}.\overline{x_2}, \overline{x_1}.\underline{x_2}, \overline{x_1}.\overline{x_2}\ \right)\right] \quad (3)$$

$$\otimes x_1 : \otimes x_2 = \left[\underline{x_1}, \overline{x_1}\right] . \left[\frac{1}{\underline{x_2}}, \frac{1}{\overline{x_2}}\right] \quad (4)$$

$$k \in \mathcal{R}^+, k. \otimes x = \left[k.\underline{x}, k.\overline{x}\right] \quad (5)$$

3.3. Gray DEMATEL (GD) Method

The application steps of the GD approach, which integrates the gray numbers and the DEMATEL method, are given below (Bai and Sarkis, 2013; Gupta and Barua, 2018):

Step 1. Determining the evaluation scale of gray relationships.

Let "n" be the number of criteria used in the study and "k" as the number of decision-makers selected for the study. Each decision maker is tasked with evaluating the direct influence of criterion "i" on criterion "j" using an integer scale ranging from 0 to 4. This scale is defined by descriptors that depict the level of impact, namely, "no influence", "low influence", "medium influence", "high influence", and "very high influence". The evaluation is conducted across a set of "n" pre-identified criteria. Table 1 presents the linguistic terms and the corresponding grey numbers (Tseng, 2009).

Table 1. Gray Linguistic Expression Scale

Crisp Values	Linguistic Variables	Interval Gray Number
0	No influence (NI)	[0, 0]
1	Low influence (LI)	[0, 1]
2	Medium influence (MI)	[1, 2]
3	High influence (HI)	[2, 3]
4	Very high influence (VHI)	[3, 4]

Consequently, a comprehensive set of "k" initial relationship matrices was developed using the evaluations of the decision-makers influences.

Step 2. Generating the corresponding gray matrix for each initial relationship matrix.

Using the values obtained in Table 1 and Step 1, an upper range and a lower range of values are obtained with the corresponding gray matrices Eq. (6) (Rajesh and Ravi 2015).

$$\otimes z_{ij}^{l} = \left(\underline{\otimes} \, G_{ij}^{l}, \overline{\otimes} \, G_{ij}^{l}\right) \quad (6)$$

where $1 \leq l \leq k$; $1 \leq i \leq n$; $1 \leq j \leq n$.

Step 3. Obtaining the average of grey relation matrices.

Using the "k" gray relation matrices, the average gray relational matrix $[\otimes \check{G}_{ij}]$ is obtained by Eq. (7).

$$\left[\otimes \check{G}_{ij}\right] = \left(\frac{\sum \underline{\otimes}\, G_{ij}^{l}}{k}, \frac{\sum \overline{\otimes}\, G_{ij}^{l}}{k}\right) \tag{7}$$

Step 4. Calculation of crisp matrices using average gray matrices.

Crips matrices are obtained using the three-step procedure in Eqs. (8-13) (Rajesh et al. 2015; Rajesh and Ravi 2015).

Step 4.1. Obtaining lower and upper normalized values.

$$\underline{\otimes}\, \dot{G}_{ij} = \left(\underline{\otimes}\, \check{G}_{ij} - j^{min}\, \underline{\otimes}\, \check{G}_{ij}\right)/\Delta_{min}^{max} \tag{8}$$

where $\underline{\otimes}\, \dot{G}_{ij}$ represents the normalized lower limit value of the grey number $\underline{\otimes}\, \check{G}_{ij}$.

$$\overline{\otimes}\, \dot{G}_{ij} = \left(\overline{\otimes}\, \check{G}_{ij} - j^{min}\overline{\otimes}\, \check{G}_{ij}\right)/\Delta_{min}^{max} \tag{9}$$

where $\overline{\otimes}\, \dot{G}_{ij}$ represents the normalized upper limit value of the grey number $\overline{\otimes}\, \check{G}_{ij}$.

$$\Delta_{min}^{max} = j^{max}\overline{\otimes}\, \check{G}_{ij} - j^{min}\, \underline{\otimes}\, \check{G}_{ij} \tag{10}$$

Step 4.2. Calculation of the total normalized crips value.

$$X_{ij} = \left(\frac{\underline{\otimes}\, \dot{G}_{ij}\left(1 - \underline{\otimes}\, \dot{G}_{ij}\right) + \left(\overline{\otimes}\, \dot{G}_{ij} * \overline{\otimes}\, \dot{G}_{ij}\right)}{\left(1 - \underline{\otimes}\, \dot{G}_{ij} + \overline{\otimes}\, \dot{G}_{ij}\right)}\right) \tag{11}$$

Step 4.3. Calculation final net values.

$$X_{ij}^{*} = \left(min\, \underline{\otimes}\, \dot{G}_{ij} + \left(X_{ij} * \Delta_{min}^{max}\right)\right) \tag{12}$$

$$X = \left[X_{ij}^{*}\right] \tag{13}$$

Step 5. Obtaining normalized direct-relation matrix.

The normalized direct relationship matrix "N" is obtained through Eqs. (14) and (15). All elements in this matrix are between 1 and 0.

$$L = \frac{1}{1 \le i \le n^{max} \sum_{j=1}^{n} X_{ij}^{*}} \tag{14}$$

$$N = L * X \tag{13}$$

where N is normalized direct relation matrix; L is the normalization factor, and X is the initial crisp relationship matrix.

Step 6. Determining the total relationship matrix "S" using Eq. (16)

$$S = N(I - N)^{-1} \tag{16}$$

where I represents a unit matrix.

Step 7. Obtaining causal parameters

R denotes the sum of rows and *C* denotes the sum of columns. Using Eqs. (17) and (18), it can be computed as follows:

$$R_i = \sum_{j=1}^{n} s_{ij} \tag{17}$$

$$C_j = \sum_{i=1}^{n} s_{ij} \tag{18}$$

Step 8. Calculation of criterion weights.

Eqs. (18) and (20) are employed for computing the weight coefficients of the criteria.

$$\omega_i = \sqrt{(R_i + C_i)^2 + (R_i - C_i)^2} \tag{19}$$

$$w_i = \frac{\omega_i}{\sum_{i=1}^{n} \omega_i} \tag{20}$$

4. Empirical analysis and results

4.1. Data

The school preference criteria of the administrators are given in Table 2.

Table 2. School preference criteria of administrators

Criteria	Code
Transport facilities	C1
Physical equipment	C2
Academic and social success of the school	C3
School climate and culture (organisational climate)	C4
Cash income of the school (school budget)	C5
Workload at school	C6
Parent profile	C7
Number of students and teachers	C8

Before applying the GD algorithm, an expert committee consisting of 3 professionals with at least 10 years of experience in the education sector was formed in order to obtain more reasonable and realistic results. Detailed information about the 3 experts selected for the evaluation committee is given in Table 3. Using the three different expert opinions separately, grey direct relationship matrices were created for the use of Eq. (7) with the grey numbers in Table 1. These matrices are given in Table 4.

Table 3. Profile of experts

Experts	Duty	Experience	Age
E-1	Educator	10	33
E-2	Educator	13	35
E-3	Educator	13	41

Table 4. Gray Direct Relationship Matrix for Expert-1-2-3

Criteria	C1	C2	C3	C4	C5	C6	C7	C8
C1	0, 0, 0	LI, NI, LI	MI, NI, MI	NI, NI, LI	NI, LI, LI	NI, NI, NI	MI, NI, NI	VHI, VHI, HI
C2	MI, VHI, MI	0, 0, 0	HI, MI, HI	HI, HI, NI	VHI, VHI, VHI	MI, NI, NI	HI, VHI, LI	HI, VHI, MI
C3	HI, LI, HI	VHI, VHI, HI	0, 0, 0	VHI, VHI, MI	HI, VHI, MI	HI, MI, MI	VHI, VHI, HI	VHI, HI, HI
C4	VHI, VHI, VHI	VHI, MI, HI	VHI, VHI, VHI	0, 0, 0	HI, VHI, MI	HI, MI, MI	HI, VHI, MI	VHI, VHI, MI
C5	MI, MI, HI	MI, NI, VHI	HI, HI, VHI	HI, VHI, LI	0, 0, 0	MI, VHI, NI	HI, VHI, MI	VHI, VHI, VHI
C6	VHI, MI, MI	HI, MI, VHI	HI, HI, VHI	HI, HI, MI	HI, VHI, MI	0, 0, 0	MI, VHI, LI	VHI, VHI, VHI
C7	MI, MI, HI	HI, NI, HI	HI, HI, MI	HI, HI, MI	LI, VHI, LI	MI, NI, LI	0, 0, 0	HI, HI, LI
C8	HI, MI, HI	HI, MI, MI	VHI, VHI, VHI	HI, NI, MI	HI, VHI, LI	HI, VHI, NI	VHI, HI, NI	0, 0, 0

The combined gray direct relationship matrix obtained by averaging the gray direct relationship matrices created by the experts with Eq. (7) is given in Table 5.

Table 5. Combined Gray Direct Relationship Matrix

Criteria	C1	C2	C3	C4	C5
C1	[0.0000,0.0000]	[0.0345,0.0862]	[0.1034,0.1552]	[0.0345,0.0862]	[0.0862,0.1379]
C2	[0.0345,0.0862]	[0.0000,0.0000]	[0.0345,0.0862]	[0.0862,0.1379]	[0.0690,0.1207]
C3	[0.1552,0.2069]	[0.1034,0.1552]	[0.0000,0.0000]	[0.0862,0.1379]	[0.1207,0.1724]
C4	[0.0172,0.0690]	[0.0517,0.1034]	[0.0862,0.1379]	[0.0000,0.0000]	[0.0690,0.1207]
C5	[0.0862,0.1379]	[0.1207,0.1724]	[0.0172,0.0690]	[0.0690,0.1379]	[0.0000,0.0000]
C6	[0.0690,0.1207]	[0.0172,0.0690]	[0.0690,0.1207]	[0.0690,0.1207]	[0.1207,0.1724]
C7	[0.0517,0.1034]	[0.0345,0.0862]	[0.0172,0.0690]	[0.0345,0.0862]	[0.0690,0.1207]
C8	[0.0690,0.1207]	[0.0517,0.1034]	[0.0000,0.0517]	[0.0862,0.1379]	[0.0345,0.0862]

Criteria	C6	C7	C8
C1	[0.0517,0.1034]	[0.0172,0.0690]	[0.0345,0.0862]
C2	[0.0862,0.1379]	[0.0345,0.0862]	[0.0345,0.0862]
C3	[0.0690,0.1207]	[0.0690,0.1207]	[0.0345,0.0862]
C4	[0.0517,0.1034]	[0.0345,0.0862]	[0.0345,0.0862]
C5	[0.1207,0.1724]	[0.1207,0.1724]	[0.0690,0.1207]
C6	[0.0000,0.0000]	[0.1379,0.1897]	[0.1034,0.1552]
C7	[0.0172,0.0690]	[0.0000,0.0000]	[0.0345,0.0862]
C8	[0.0690,0.1207]	[0.1207,0.1724]	[0.0000,0.0000]

Using Eqs. (8-13), a final relationship matrix X was obtained. Normalized direct-relation matrix was obtained with the normalization factor calculated Eq. (14). Eqs. (17-18) is used for row and column sum. The criteria weights and order of importance calculated using the Eqs. (19-20) are also given in Table 6.

Table 6. Row and Column Totals of the Total Relationship Matrix

Criteria	R	C	R+C	R-C	Weights	Rank
C1	[0.7040,4.0199]	[0.8564,7.0082]	[4.7240,7.8647]	[-6.3042,3.1635]	0,1249	4
C2	[0.7032,4.0202]	[0.7521,6.4990]	[4.7235,7.2511]	[-5.7958,3.2681]	0,1188	6
C3	[1.1332,5.2303]	[0.6057,5.6606]	[6.3635,6.2663]	[-4.5273,4.6245]	0,1253	3
C4	[0.6590,3.8944]	[0.8285,6.8045]	[4.5534,7.6330]	[-6.1455,3.0659]	0,1209	5
C5	[1.0479,5.0667]	[1.0150,7.7759]	[6.1146,8.7909]	[-6.7280,4.0517]	0,1479	1
C6	[1.0391,4.9680]	[0.8425,6.6224]	[6.0071,7.4649]	[-5.5833,4.1255]	0,1336	2
C7	[0.4772,3.3890]	[0.9615,6.9383]	[3.8662,7.8998]	[-6.4612,2.4276]	0,1167	7
C8	[0.7382,4.1225]	[0.6401,5.7839]	[4.8607,6.4239]	[-5.0457,3.4825]	0,1119	8

According to the weights calculated by the GD method, it can be said that cash income of the school (school budget) symbolised by C5 is the most important criteria.

CONCLUSİON

In order for the education system to function properly and for educational activities to achieve their goals, effective communication with internal and external stakeholders is needed. Administrators and teachers are the most fundamental elements that enable the education system to act in accordance with its purpose. Many situations such as strategies, methods and materials used by school administrators and teachers vary depending on their professional seniority and experience. School administrators are effective and responsible from beginning

to end in determining the goals of educational institutions, making the necessary plans to achieve the goals and implementing these plans in the most efficient way. The selection of administrators in schools affiliated with the Ministry of National Education is made by the Ministry of National Education in accordance with the "Regulation on Selection and Assignment of Administrators for Educational Institutions Affiliated to the Ministry of National Education" (MEB, 2021). According to this regulation, managerial candidates are appointed according to their score superiority and preference order. In this study, managerial candidates are expected to determine and make their choices in order of their importance. This reveals the importance of this research.

In this context, transportation facilities, physical equipment, academic and social success of the school, school climate and culture (organizational climate), cash income of the school (school budget), workload at the school, parent profile, number of students and teachers were considered as criteria. The subjective weights of these criteria were calculated with the Gray DEMATEL method, again by taking expert opinions. According to the results obtained, it was seen that the three most important criteria affecting the school preferences of the administrators were the school budget, the workload at the school, and the academic and social success of the school.

References

Açıkalın, A. (1998). Okul Yöneticiliği (4. Basım). Ankara: Pegem Yayıncılık.

Akçakoca, A., & Bilgin, K. U. (2016). Okul Müdürlerinin Liderlik Stilleri ve Öğretmen Performansı. Çağdaş Yönetim Bilimleri Dergisi, 2(2), 3-5.

Arslan, R. (2020b). ENTROPY Yöntemi. H. Bircan içinde, Çok Kriterli Karar Verme Problemlerinde Kriter Ağırlıklandırma Yöntemleri(s. 19-34). Ankara: Nobel.

Arslan, R. (2020a). CRİTİC yöntemi. İçinde H. Bircan (Çev.), Çok kriterli karar verme problemlerinde kriter ağırlıklandırma yöntemleri (1. Baskı). Nobel Akademik Yayıncılık.

Bai, C. and Sarkis, J. (2013), "Grey-based DEMATEL model for evaluating business process management critical success factors". International Journal of Production Economics, 146(1). 281-292. Doi: 10.1016/j.ijpe.2013.07.011i

Balyer, A., & Gündüz, Y. (2011). Değişik Ülkelerde Okul Müdürlerinin Yetiştirilmesi: Türk Eğitim Sistemi İçin Bir Model Önerisi. Kuramsal Eğitimbilim, 4(2), 182-197.

Bhatia, M. S., & Srivastava, R. K. (2018). Analysis of external barriers to remanufacturing using grey-DEMATEL approach: An Indian perspective. Resources, Conservation and Recycling, 136, 79-87. Doi: 10.1016/j.resconrec.2018.03.021

Deng, J.L. (1989), "Introduction to Grey System Theory". Journal of Grey Systems, 1(1). 1-24.

Gupta, H. and Barua, M.K. (2018), "A grey DEMATEL-based approach for modeling enablers of green innovation in manufacturing organizations". Environ Sci Pollut Res, 25. 9556–9578 Doi: 10.1007/s11356-018-1261-6

Güler, A., & Demirkaya, H. (2022). Devlet Okullarındaki İdari Yöneticilerin Okul Seçimlerinin Bulanık DEMATEL Yöntemi ile İncelenmesi. Aksaray Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 14(3), 231.240.

Han, Y., & Wang, L. (2018). Identifying barriers to off-site construction using grey DEMATEL approach: case of China. Journal of Civil Engineering and Management, 24(5), 364-377. Doi: 10.3846/jcem.2018.5181

Li, Y., Zhao, G., Wu, P., & Qiu, J. (2022). An Integrated Gray DEMATEL and ANP Method for Evaluating the Green Mining Performance of Underground Gold Mines. Sustainability, 14(11), 6812. Doi:10.3390/su14116812

Liu, H. C., Yang, M., Zhou, M., & Tian, G. (2019). An integrated multi-criteria decision making approach to location planning of electric vehicle charging stations. IEEE Transactions on Intelligent Transportation Systems, 20(1), 362-373. Doi: 10.1109/TITS.2018.2815680

MEB. (2021). Milli Eğitim Bakanlığı. Eğitim Kurumlarına Yönetici Seçme ve Görevlendirme Yönetmeliği. 05Şubat 2021 Tarihli ve 31386 Sayılı Resmî Gazete.: http://mevzuat.meb.gov.tr adresinden alınmıştır

Meidute-Kavaliauskiene, I., Cebeci, H. I., Ghorbani, S., & Činčikaitė, R. (2021). An integrated approach for evaluating lean innovation practices in the pharmaceutical supply chain. Logistics, 5(4), 74. Doi:10.3390/logistics5040074

Menon, R. R., & Ravi, V. (2022). An analysis of barriers affecting implementation of sustainable supply chain management in electronics industry: a Grey-DEMATEL approach. Journal of Modelling in Management, 17(4), 1319-1350. Doi: 10.1108/JM2-02-2021-0042

Özmen, F., & Fatih Kömürlü. (2010). Eğitim Örgütlerine Yönetici Seçme ve Atamada Yaşanan Sorunlar ve Yönetici Görüşleri Temelinde Çözüm Önerileri. Sosyal ve Beşerî Bilimler Dergisi, 2(1). 25-33.

Rajesh, R. & Ravi, V. (2015). Modeling enablers of supply chain risk mitigation in electronic supply chains: a Grey–DEMATEL approach. Comput Ind Eng, 87, 126-139. Doi: 10.1016/j.cie.2015.04.028

Rajesh, R., Ravi, V., & Venkata, R. R. (2015). Selection of risk mitigation strategy in electronic supply chains using grey theory and digraph-matrix approaches. Int J Prod Res, 53(1), 238-257. Doi: 10.1080/00207543.2014.948579

Sayan, İ., & Yıldırım, N. (2019). Okul Yöneticisi Atama Türlerinin, Öğretmenler, Okul Yöneticileri ve Eğitim Öğretim Süreçleri Üzerine Etkilerinin Nitel Bir Analizi. Kocaeli Üniversitesi Eğitim Dergisi, 2(1), 13-34.

Sezer, Ş. (2016). Okul Yöneticilerinin Seçimle Belirlenmesine İlişkin Yönetici Görüşleri: Fenomenolojik Bir Çözümleme. Kuram ve Uygulamada Eğitim Yönetimi, 22(3), 351-373.

Sohrabi, R. (2022). Agility Factors in Cold Supply Chain Using GRAY-DEMATEL and AHP. International Journal of Industrial Engineering, 33(2), 1-14. Doi: 10.22068/ijiepr.33.2.10

Şen, E., & Kasapoğlu Tankutay, H. (2021). Okul Yöneticilerinin Atanma Usulüne İlişkin Öğretmen Görüşleri. Çağdaş Yönetim Bilimleri Dergisi, 8(2), 297-312.

Şişman, M., & Turan, S. (2003). Eğitimde Yerelleşme ve Demokratikleşme Çabaları. Kuram ve Uygulamada Eğitim Yönetimi, 34, 300-315.

Taymaz, H. (2003). Okul Yönetimi. Ankara: Pegem A Yayıncılık.

Tseng, M.L. (2009), "A causal and effect decision making model of service quality expectation using grey-fuzzy DEMATEL approach." Expert Systems with Applications, 36. 7738–7748. Doi: 10.1016/j.eswa.2008.09.011

Xia, X., & Ruan, J. (2020). Analyzing barriers for developing a sustainable circular economy in agriculture in China Using Grey-DEMATEL approach. Sustainability, 12(16), 6358. Doi:10.3390/su12166358