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Evaluation of the Most Important Key Performance Indicators (KPIs) Related to Parental Satisfaction in School Selection

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Abstract

The aim of this study is to evaluate the most important key performance indicators (KPIs) related to parental satisfaction with elementary schools in the cities of Yazd, Shiraz, and Isfahan. The statistical population of this research consists of parents of elementary school students in these three cities, with a sample size of 1,152 individuals selected based on Morgan's table. Data collection was conducted using a researcher-designed questionnaire consisting of 33 questions, utilizing a 7-point Likert scale. The data collection method was survey-based, and simple random sampling was employed. For data analysis, the grey TOPSIS multi-criteria decision-making technique was used. The results indicated that parents in each of the three cities have differing opinions regarding the key satisfaction indicators. The findings show that educational quality is identified as the most important factor in school selection across all cities, while factors such as diversity and inclusiveness, as well as school culture and values, ranked lower.

Keywords: Key Performance Indicators, Parental Satisfaction, School Selection

Introduction

The advancement of societies and rapid changes in educational systems have led to an increased importance of selecting the appropriate school for children. Given the complexities of today's world and the need to educate children in schools that can best meet their educational, developmental, and social needs, parental satisfaction has emerged as one of the most significant factors in the school selection process (Dabholkar & Sheng, 2020; Lee et al., 2019). Parental satisfaction not only has a direct impact on students' academic performance but also reflects the quality of services provided by the school.

One way to assess parent satisfaction is by identifying and evaluating key performance indicators (KPIs) that play a significant role in this area. These indicators encompass a set of criteria that determine the quality of the school and its alignment with the needs and preferences of parents (Kayser & Smith, 2017; Johnson et al., 2020). For instance, indicators such as teacher quality, educational facilities, student performance, parental involvement in school processes, and management policies are among the factors that can attract parents' attention.

However, the fundamental issue is which of these indicators have the most influence on parents' decision-making and how these criteria can be improved. In fact, many studies have shown that factors such as the geographical location of the school, past academic achievements, and collaboration between the school and the community play a crucial role in school selection (Oliver & Kandampully, 2019; Schneider et al., 2018). A lack of precise understanding of these criteria may lead to decreased parent satisfaction and, consequently, a decline in school effectiveness.

The aim of this research is to identify and evaluate the most important key performance indicators related to parent satisfaction and their impact on school choice. In an era where competition between private and public schools has reached its peak, recognizing these indicators can play a key role in enhancing school quality and attracting parent satisfaction (Hoxby, 2016; Green et al., 2021). Additionally, as parents increasingly wish to take an active role in

their children's educational decisions, this research can contribute to a better understanding of parents' needs and strategies for improving educational service delivery.

From the perspective of the importance and necessity of the research, it should be noted that parent satisfaction, as one of the vital indicators of school success, not only affects students but also directly impacts the efficiency of the educational system. Furthermore, schools that identify and improve key performance indicators can optimally allocate their resources and achieve their educational and developmental goals in a shorter time frame (Fraser & Williamson, 2020; Darling-Hammond et al., 2019). Consequently, this research can assist in the formulation of more effective and successful policies in the field of education.

Literature Review

One of the most important topics in the field of education is identifying the fundamental factors that lead parents to choose a specific school. Research has shown that key performance indicators (KPIs) play a vital role in parents' decision-making when selecting a school (Mukhopadhyay & Gupta, 2018; Yang, 2021). Parents often seek schools that not only meet their children's educational needs but also provide a positive and meaningful experience for the family.

One key factor that significantly impacts parent satisfaction is the quality of teachers and teaching methods (Harris et al., 2019; Sundqvist & Góra, 2020). Experienced and professional teachers, utilizing up-to-date teaching methods, not only enhance students' academic abilities but also gain parents' trust (Miller & Campbell, 2017). Research on parents has shown that schools with a high percentage of teachers holding a master's degree or higher are significantly more popular. The combination of this indicator with professional development programs for teachers is also important (García-Moreno et al., 2019).

Other important indicators include the level of welfare and physical facilities at the school (Johnson & Carter, 2018; Chen et al., 2020). Educational spaces such as modern classrooms, adequate sports facilities, and access to modern technologies have a high impact on parents' choices. For example, a study by Chen et al. (2020) found that schools with access to high-speed internet and well-equipped science laboratories experienced higher enrollment rates. Additionally, access to proper sanitation facilities and hygienic cafeterias is also a concern for parents (Johnson & Carter, 2018).

The cultivation of ethics and values is also regarded as one of the key performance indicators (Bryk et al., 2019; Matsunaga, 2018). Creating an environment where students are educated with respect, transparency, and accountability has become a key factor in the popularity of schools. According to research by Bryk et al. (2019), parents are more inclined to choose schools that incorporate moral values such as justice, honesty, and courage into their curriculum and extracurricular activities.

One of the important indicators is parental involvement in school activities (Borgonovi & Montt, 2018; Wang & Sheikh-Khalil, 2019). Schools can establish stronger connections with families by creating suitable opportunities for interaction between parents and teachers. Research shows that parents who are more involved in school matters have greater satisfaction with their children's educational experiences (Borgonovi & Montt, 2018). Regular feedback meetings, open school days, and inviting families to participate in cultural and sports events can reinforce this goal.

The reputation of the school is also a significant factor in attracting parental satisfaction (Walker & Dotger, 2016; Davies et al., 2021). Schools with a positive history and successful student achievements easily capture parents' attention. Studies have shown that parents tend to choose schools that perform well in national and international standardized tests (Davies et al., 2021). Additionally, reputation in extracurricular activities such as arts and sports also has a considerable impact.

The safety of the school environment is another vital indicator (Shukla, 2019; Brown & Evans, 2020). Parents seek a safe environment for their children. According to recent studies, the presence of surveillance systems, safety training, and effective management of undesirable behaviors is directly related to higher enrollment rates (Shukla, 2019). Furthermore, anti-bullying programs and training that help foster a culture of mutual respect are of great importance (Brown & Evans, 2020).

Finally, flexibility in curricula and their adaptation to the individual needs of each student is also an influential factor (Lo & Rao, 2019; Zhang et al., 2021). Schools that can offer personalized education programs typically create better learning experiences for students, thereby increasing parental satisfaction. Research by Zhang and

colleagues (2021) has shown that parents whose children benefit from individualized programs have higher satisfaction with the schools. A summary of past research and an analysis of existing literature identified 11 groups of indicators that are significant for parents when selecting schools, which are briefly introduced below.

Educational Quality

Educational quality is one of the most important components identified in various studies as a key performance indicator (KPI) in parental satisfaction with school choice. Teacher performance, educational resources, and student progress levels are highly influential criteria in this regard. A study by Wang and Degol (2016) showed that the quality of teaching and the effectiveness of educational programs on student academic progress are the main factors in increasing parental trust and satisfaction. This study also emphasized that the continuous efforts of teachers and their connection to academic outcomes can enhance a school's appeal (Wang & Degol, 2016). Additionally, another study by Johnson and colleagues (2018) concluded that modern equipment and technologies in schools play a key role in attracting parental interest, especially in elementary and middle school levels (Johnson et al., 2018).

School Environment

The school environment, which includes the physical space as well as the psychological and social atmosphere, is one of the most significant factors influencing parental satisfaction. Recent studies have emphasized that safe and supportive environments can enhance students' sense of belonging and security. Research by Bradshaw and colleagues (2015) demonstrated that a friendly atmosphere and school culture positively impact the relationship between parents and the school, and this factor directly influences school choice (Bradshaw et al., 2015). Furthermore, studies by Smith and colleagues (2020) highlight the importance of appropriate school infrastructure, such as sports facilities, libraries, and science laboratories, in increasing parental satisfaction (Smith et al., 2020).

Parent-School Communication

Another important component is the appropriate interaction between parents and the school. Research has shown that providing opportunities for parents to participate in school decision-making processes can enhance their commitment and satisfaction. Epstein's study (2018) indicated that models of communication that create opportunities for ongoing parent participation and collaboration have a positive impact on school choice (Epstein, 2018). Additionally, another study by Hoover-Dempsey and Sandler (2017) stated that programs designed to strengthen interaction not only affect parental satisfaction but can also contribute to student progress (Hoover-Dempsey & Sandler, 2017).

Conclusion and Academic Progress

Parents are naturally concerned about their children's academic progress, and this factor emerges as one of the key indicators of performance. According to research conducted by Wilson and Harris (2021), schools that succeed in establishing outstanding academic records attract more parents. Furthermore, another study by Martin and Clark (2019) has shown that continuous monitoring of student performance and providing feedback to parents is crucial for increasing satisfaction.

Extracurricular Activities

Extracurricular activities, ranging from sports to arts and sciences, play an important role in parental choice. Research conducted by Taylor and Roberts (2020) in the journal Extracurricular Education has demonstrated that parents prefer schools with stronger extracurricular programs. Additionally, a study by Evans and Baker (2018) has shown that participation in extracurricular activities enhances students' social skills and self-confidence.

School Management and Leadership

School administrators and leaders play a key role in shaping the experiences of parents and students. According to a study by Carter and Lopez (2020) in the journal Leadership in Education, an open and responsive management style can increase parental satisfaction. Moreover, other research by Miller and Jackson (2019) has highlighted the importance of effective management and the ability to address challenges.

Goal Orientation and Clarity of Objectives

Having clear and purposeful goals is considered a key factor in attracting parental satisfaction. School objectives should align with parental expectations and social needs to gain their trust and support. Recent research indicates that specific goals can facilitate the decision-making process for parents and assure them of the appropriate school choice (Jones & Smith, 2020; Lee et al., 2019). Studies have shown that transparency in educational goals and the school's strategic plans can significantly influence parental choice (Brown & Black, 2022; Carter, 2021).

Financial Costs

Financial costs associated with children's education are a significant factor in parents' decision-making when selecting a school. Parents generally seek to strike a suitable balance between educational quality and financial expenses. According to studies, schools with transparent financial policies and diverse payment options can achieve higher satisfaction among parents (Anderson & White, 2018; Clark et al., 2017). Additionally, research indicates that financial aid and scholarship programs also have a positive impact on parents' school choice (Martin & Bush, 2019; Nelson, 2021).

Technology and Innovation

Technology and innovation in educational methods are recognized as effective factors in attracting parental satisfaction. Parents are more drawn to schools that utilize modern technologies to enhance the learning process. Research shows that schools employing digital and innovative tools for education not only improve the quality of teaching but also boost students' motivation to learn (Harris & Cooper, 2020; Bennett et al., 2019). Furthermore, the use of technology in school communications with parents can also contribute to enhancing transparency and positive interaction (Johnson & Wong, 2021; Patel, 2022).

School Culture and Values

The educational culture and values of a school play a crucial role in parents' decision-making. Parents typically prefer schools whose values and culture align with their family values. In other words, cultural alignment between the school and parents can not only increase their satisfaction but also help create a more supportive educational environment (Smith & Taylor, 2016; Roberts et al., 2018). Studies have shown that schools with cultures that promote social and moral interaction have a positive influence on parents' decisions (Williams & Brown, 2020; Evans, 2021).

Research Methodology

In this section, we will explain the research methodology used to evaluate the most important key performance indicators (KPIs) related to parent satisfaction and school choice. This section includes descriptions of the statistical population, sampling, measurement tools, data collection methods, and data analysis methods.

Statistical Population and Sample

The statistical population of this study consists of parents of elementary school students from three cities: Yazd, Shiraz, and Isfahan. These three cities were chosen due to their cultural and social diversity, which can provide a more comprehensive and applicable representation of the research results. According to Morgan's table, the required sample size for each city is determined to be 384 individuals, totaling 1,152 parents.

Sampling Method

For sampling, a simple random sampling method was employed to ensure that all parents in the statistical population had an equal chance of participating in the research. This method helps researchers avoid potential biases in data collection and obtain a more accurate representation of parents' thoughts and attitudes.

Measurement Tools

This research utilized a researcher-developed questionnaire consisting of 33 questions, which was made available to parents electronically. This questionnaire was designed based on 11 key performance indicators that represent

various aspects of parent satisfaction in school choice. To assess the importance and impact of these indicators, a 7-point Likert scale was used, allowing for a more precise measurement of attitudes and satisfaction levels.
The design of the questions was such that all key indicators were evaluated independently and clearly. The questionnaire was structured to cover all significant aspects of parent satisfaction and to provide a quick and easy response capability for parents.

Data Collection Method
Data collection was conducted through a survey method, which is considered suitable for social and behavioral studies. In this study, the questionnaire was distributed electronically, and parents accessed it via a dedicated link. This method ensures that data is automatically stored and ready for analysis, thereby reducing human errors in the data entry process. Before the main data collection process began, a pilot test was conducted with a limited number of parents to ensure the clarity and structure of the questionnaire. The results of this pilot test were used to refine or improve the questionnaire.

Data Analysis Method
To analyze the collected data, the grey TOPSIS multi-criteria decision-making technique was employed. This method is regarded as one of the advanced approaches in multi-criteria data analysis. The grey TOPSIS technique allows for the comparison of various indicators with different weights and ranks them based on their degree of similarity to the positive or negative ideal. For this analysis, the data was first standardized, and the weighting of indicators was performed based on their relative importance. Then, using the grey TOPSIS method, each key performance indicator was ranked, and their impact on parent satisfaction was determined. This method is particularly suitable for situations where data is uncertain, as it utilizes grey values and provides reliable results.
Additionally, to complement the analysis and validate the obtained results, supplementary statistical analyses such as correlation tests were also employed. This helped to examine not only the key indicators but also the relationships between them.

Validity and Reliability of the Instrument
The validity of the questionnaire was ensured through content validity and consultation with experts and specialists in the field of education. To assess reliability, Cronbach's alpha coefficient was used, and the results indicated that the questionnaire possesses acceptable reliability.
Additionally, all steps taken in the methodology process were conducted in accordance with research ethics principles. Parents were informed of the research objectives prior to participating in the study and provided informed consent for their involvement. The information of the parents was also kept completely confidential.
The methodology of this research is designed in such a way that, regarding the statistical population, measurement tools, data collection methods, and analysis methods, it provides valid, reliable, and applicable results. This combination of advanced techniques and a comprehensive structure at all stages facilitates a better identification of key performance indicators related to parental satisfaction in school selection.

TOPSIS for MCDM
Multiple attribute decision making (MADM) is used to select an alternative from several alternatives according to various criteria. The technique for order preference by similarity to ideal solution (TOPSIS) was first developed by Hwang and Yoon (1981), based on the concept that the chosen alternative should have the shortest distance from the positive ideal solution (PIS) and the farthest from the negative ideal solution (NIS) for solving a multiple criteria decision making problem. In short, the ideal solution is composed of all best values attainable of criteria, whereas the negative ideal solution is made up of all worst values attainable of criteria.

Basic definitions in grey theory
Grey theory is one of the new mathematical theories born out of the concept of the grey set, which
was proposed by Deng (1989). It is an effective method used to solve uncertainty problems with discrete data and incomplete information. In this section, we briefly review some relevant definitions and the calculation process in grey theory (Zhang et al., 2005). Let $G = [\underline{G}.\bar{G}] = \{x | \underline{G} \leq x \leq \bar{G}.\underline{G} \leq \bar{G}.\underline{G}.\bar{G} \in R\}$. We call $G = [\underline{G}.\bar{G}]$ an

interval number. If $0 \le x \le \bar{G}$, we call interval number $G = [\underline{G}.\bar{G}]$ a positive interval number. Let $X = ([\underline{G}_1.\bar{G}_1].[\underline{G}_2.\bar{G}_2]. \ldots .[\underline{G}_n.\bar{G}_n])$ be an n-dimension interval number column vector.

Definition 1. If $G_1 = [\underline{G}_1.\bar{G}_1]$ and $G_2 = [\underline{G}_2.\bar{G}_2]$ are two arbitrary interval numbers, the distance from $G_1 = [\underline{G}_1.\bar{G}_1]$ to $G_2 = [\underline{G}_2.\bar{G}_2]$ is:

$$|G_1 - G_2| = \max(|\underline{G}_1 - \underline{G}_2|.|\bar{G}_1 - \bar{G}_2|) \quad (1)$$

Definition 2. If $G_1 = [\underline{G}_1.\bar{G}_1]$ and $G_2 = [\underline{G}_2.\bar{G}_2]$ are two arbitrary interval numbers, then

$$G_1 + G_2 = [\underline{G}_1 + \underline{G}_2.\bar{G}_1 + \bar{G}_2] \quad (2)$$

Definition 3. If $G_1 = [\underline{G}_1.\bar{G}_1]$ and $G_2 = [\underline{G}_2.\bar{G}_2]$ are two arbitrary interval numbers, then

$$G_1 - G_2 = [\underline{G}_1 - \bar{G}_2.\bar{G}_1 - \underline{G}_2) \quad (3)$$

Definition 4. If $G_1 = [\underline{G}_1.\bar{G}_1]$ and $G_2 = [\underline{G}_2.\bar{G}_2]$ are two arbitrary interval numbers, then

$$G_1 \times G_2 = [\min(\underline{G}_1\underline{G}_2.\underline{G}_1\bar{G}_2.\bar{G}_1\underline{G}_2.\bar{G}_1\bar{G}_2).\max(\underline{G}_1\underline{G}_2.\underline{G}_1\bar{G}_2.\bar{G}_1\underline{G}_2.\bar{G}_1\bar{G}_2)] \quad (4)$$

Definition 5. If $G_1 = [\underline{G}_1.\bar{G}_1]$ and $G_2 = [\underline{G}_2.\bar{G}_2]$ are two arbitrary interval numbers, then

$$G_1 \div G_2 = [\underline{G}_1.\bar{G}_1] \times \left[\frac{1}{\underline{G}_2}.\frac{1}{\bar{G}_2}\right] \quad (5)$$

Definition 6. If k is an arbitrary positive real number, and $G = [\underline{G}.\bar{G}]$ is an arbitrary interval number, then the number product between k and $G = [\underline{G}.\bar{G}]$ is

$$k \cdot G = [k\underline{G}.k\bar{G}]$$

Comparison of grey numbers

Li et al. (2007) proposed a degree of grey possibility to compare the ranking of grey numbers.

Definition 7. If $G_1 = [\underline{G}_1.\bar{G}_1]$ and $G_2 = [\underline{G}_2.\bar{G}_2]$ are two arbitrary interval numbers, the possibility degree of $G_1 \le G_2$ can be expressed as follows (Shi et al., 2005):

$$P\{G_1 \le G_2\} = \frac{\max(0.L^* - \max(0.\bar{G}_1 - \underline{G}_2))}{L^*}$$

where $L^* = L(G_1) + L(G_2)$.

Proposed approaches

The latest grey based method (LI) based on a grey possibility degree was proposed by Li et al.(2007) to evaluate and select the best supplier. This method is very suitable for solving the group decision making problem with uncertain and incomplete information. By considering the method, it can be concluded that there exists a certain degree of similarity between the input and operation of the model and the GR method (Zhang et al., 2005). Here, similar to the two methods, we propose a new grey based method (NG) based on TOPSIS concepts and compare it with the two methods as well. Same as the LI method, we also extend the GR and NG methods for solving the group decision making problem. In this section, we use Li's et al.[16] assumptions and information. it was assumed that S = {S_1, S_2, ..., S_m} is a discrete set of m possible supplier alternatives, Q = {Q_1,Q_2, ..., Q_n} is a set of n attributes of suppliers, and W = {W_1,W_2, ...,W_n} is the vector of attribute weights. They also considered the ratings of suppliers and attribute weights as linguistic variables that can be expressed in grey numbers by the 1-7 scale shown in Tab. 1 and Tab. 2, respectively.

Table 1. The scale of attribute ratings G[16]

Scale	G
Very poor (VP)	[0, 1]
Poor (P)	[1, 3]
Medium poor (MP)	[3, 4]
Fair (F)	[4, 5]
Medium good (MG)	[5, 6]
Good (G)	[6, 9]
Very good (VG)	[9, 10]

Table 2. The scale of attribute weights w[16]

Scale	w
Very low (VL)	[0.0, 0.1]
Low (L)	[0.1, 0.3]
Medium low (ML)	[0.3, 0.4]
Medium (M)	[0.4, 0.5]
Medium high (MH)	[0.5, 0.6]
High (H)	[0.6, 0.9]
Very high (VH)	[0.9, 1.0]

Firstly, the LI, GR and NG methods are described. Then, a comparative analysis is used to determine the differences between the models as well as percentage of improvement of the proposed new method (NG).

The LI method

This method calculates the grey possibility degree between compared supplier's alternatives set and ideal referential supplier alternative to determine the ranking order of all alternatives based on grey numbers. The procedures of the method are summarized as follows (Li et al., 2007):

Step 1. Arrange a committee of DMs and identify the attribute weights of suppliers. Assume that a decision group has K persons, then the attribute weight of attribute Qj can be calculated, where W^K_j (j=1, 2, ..., n) is the attribute weight of Kth DMs and can be described by linguistic variable.

Step 2. Use linguistic variables for the ratings to make an attribute rating value. Then, the rating value can be calculated in Eq. (8).

$$G_{ij} = \frac{1}{K}\left[G_{ij}{}^{1} + G_{ij}{}^{2} + \ ... + G_{ij}{}^{K}\right]1 \tag{8}$$

where G^K_{ij} (i = 1, 2, ..., m; j = 1, 2, ..., n) is the attribute rating value of Kth DMs and can be described by the grey number $G_{ij}{}^{K} = [\underline{G_{ij}{}^{K}}.\overline{G_{ij}{}^{K}}]$.

Step 3. Construct the grey decision matrix D that the structure of the matrix can be expressed in Eq. (9).

$$D = \begin{bmatrix} G_{11} & G_{12} & \cdots & G_{1n} \\ G_{21} & G_{22} & \cdots & G_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ G_{m1} & G_{m2} & \cdots & G_{mn} \end{bmatrix} \tag{9}$$

where G_{ij} are linguistic variables based on the grey number.

Step 4. Normalize the grey decision matrix in Eq. (10): the process is to transform different scales and units among various criteria into common measurable units to allow comparisons across the criteria. Assume G_{ij} o be the element of the evaluation matrix D of alternative i under evaluation criterion j then an element G_{ij} of the normalized evaluation matrix D^* can be calculated in Eq. (11) and Eq. (12).

$$D^* = \begin{bmatrix} G^*_{11} & G^*_{12} & \cdots & G^*_{1n} \\ G^*_{21} & G^*_{22} & \cdots & G^*_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ G^*_{m1} & G^*_{m2} & \cdots & G^*_{mn} \end{bmatrix} \tag{10}$$

Where for a benefit attribute, G^*_{ij} is expressed as:

$$G^*_{ij} = \left[\frac{\underline{G_{ij}}}{G_j^{max}} \cdot \frac{\overline{G_{ij}}}{G_j^{max}}\right] \tag{11}$$

$$G_j^{max} = \max_{1\le i\le m}\{\overline{G_{ij}}\} \tag{12}$$

Where for a cost attribute G^*_{ij}, is expressed as:

$$G^*_{ij} = \left[\frac{G_j^{min}}{\overline{G_{ij}}} \cdot \frac{G_j^{min}}{\underline{G_{ij}}}\right] \tag{13}$$

$$G_j^{min} = \min_{1\le i\le m}\{\underline{G_{ij}}\} \tag{14}$$

The normalization method mentioned above is to preserve the property that the ranges of the normalized grey number belong to [0, 1].

Step 5. Establish the weighted normalized grey decision matrix in Eq. (15). Considering the different importance of each attribute, the weighted normalized grey decision matrix can be established as

$$D^* = \begin{bmatrix} V_{11} & V_{12} & \cdots & V_{1n} \\ V_{21} & V_{22} & \cdots & V_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ V_{m1} & V_{m2} & \cdots & V_{mn} \end{bmatrix} \quad (15)$$

where $V_{ij} = G_{ij}^* \times W_j$.

Step 6. Create positive ideal and negative ideal alternatives as reference alternatives for the gray-based model. For m sets of possible supplier alternatives S = {S_1, S_2, ... ,S_m}, the positive ideal reference supplier and negative ideal reference supplier are obtained using relations (16) and (17), respectively.

If the attribute Q_i is positive:

$$A^+ = \left\{\max_{1\le i\le m} \overline{G_{ij}^*}\right\} = [r_1^+ . r_2^+ . \dots . r_m^+] \quad . \quad A^- = \left\{\min_{1\le i\le m} \underline{G_{ij}^*}\right\} = [r_1^- . r_2^- . \dots . r_m^-] \quad (16)$$

If the attribute Q_i is negative:

$$A^+ = \left\{\min_{1\le i\le m} \underline{G_{ij}^*}\right\} = [r_1^+ . r_2^+ . \dots . r_m^+] \quad . \quad A^- = \left\{\max_{1\le i\le m} \overline{G_{ij}^*}\right\} = [r_1^- . r_2^- . \dots . r_m^-] \quad (17)$$

The discriminative evaluation of positive and negative alternatives ($d_i^{k+} . d_i^{k-}$) is calculated for the dataset. Calculate the individual positive and negative ideal alternatives for decision-maker k using relations (18) and (19).

$$d_i^+ = \sqrt{\frac{1}{2}\sum_{j=1}^{m}[|r_j^+ - \underline{G_{ij}^*}|^2 + |r_j^+ - \overline{G_{ij}^*}|^2]} \quad (18)$$

$$d_i^- = \sqrt{\frac{1}{2}\sum_{j=1}^{m}[|r_j^- - \underline{G_{ij}^*}|^2 + |r_j^- - \overline{G_{ij}^*}|^2]} \quad (19)$$

Step 7. Calculate the closeness of alternative A_i to the positive and negative ideals. The closeness of the ith alternative is obtained as follows. The value C_i^* ranges between 0 and 1, with the highest value indicating the best option.

$$C_i^+ = \frac{d_i^+}{d_i^+ + d_i^-} \quad (20)$$

Step 8. Rank the preferences of the choices based on the set of ranking indices C_i^* obtained in step (6.)

Data Azanaly

As previously mentioned, based on a review of the literature and expert evaluations, 11 key indicators are significant for parents when selecting a school. Each of these indicators was assessed through three questions (items). The responses collected from the research samples in the cities of Yazd, Isfahan, and Shiraz were initially used to calculate the gray numbers for the 11 mentioned items, the results of which are presented in Table 3. The collected opinions were rewritten as gray numbers, and then, using relation (9), the average opinions of DMs for each item were extracted and subsequently normalized and weighted according to relations (10) to (15). After calculating the positive and negative ideal alternatives (A+, A-) for each indicator (relations 16 and 17), the positive and negative ideal distances (d+, d-) were computed using relations (18) and (19) (Table 3).

Table 3. Grey weight

Yazd					
Key Indexes	**Grey Wights**	**A^+**	**A^-**	**C^***	**Rank**
Educational quality	0.092	3.839	4.011	0.511	1
School environment	0.091	4.011	3.977	0.498	6
Parent-school communication	0.087	3.943	4.023	0.505	2
Diversity and inclusion	0.094	4.092	3.966	0.492	10
Academic achievement and progress	0.092	4.057	3.862	0.488	11
Extracurricular activities	0.088	3.977	4.011	0.502	4
School management and leadership	0.092	4.057	4.034	0.499	5
Clarity and purposefulness of goals	0.091	3.954	4.034	0.505	3
Financial costs	0.091	4.080	3.989	0.494	8
Technology and innovation	0.090	4.023	3.954	0.496	7
School culture and values	0.092	3.943	3.839	0.493	9
Isfahan					

Key Indexes	Grey Wights	A^+	A^-	C^*	Rank
Educational quality	0.098	3.889	3.778	0.507	1
School environment	0.073	3.951	4.002	0.497	11
Parent-school communication	0.098	4.068	4.037	0.502	3
Diversity and inclusion	0.122	3.982	3.988	0.500	8
Academic achievement and progress	0.122	4.083	4.037	0.503	2
Extracurricular activities	0.122	3.928	3.932	0.500	7
School management and leadership	0.073	3.862	3.910	0.497	10
Clarity and purposefulness of goals	0.073	4.001	4.022	0.499	9
Financial costs	0.073	4.074	4.075	0.500	6
Technology and innovation	0.073	4.060	4.030	0.502	4
School culture and values	0.073	3.915	3.898	0.501	5
Shiraz					
Key Indexes	**Grey Wights**	**A^+**	**A^-**	**C^***	**Rank**
Educational quality	0.087	4.055	3.980	0.505	1
School environment	0.087	4.014	3.972	0.503	2
Parent-school communication	0.087	4.031	4.063	0.498	10
Diversity and inclusion	0.109	4.103	4.065	0.502	3
Academic achievement and progress	0.065	3.925	3.953	0.498	9
Extracurricular activities	0.087	4.007	4.035	0.498	8
School management and leadership	0.087	4.045	4.070	0.498	7
Clarity and purposefulness of goals	0.109	4.021	3.998	0.501	4
Financial costs	0.087	4.098	4.092	0.500	5
Technology and innovation	0.087	3.898	3.915	0.499	6
School culture and values	0.109	3.983	4.038	0.497	11

Conclusion

The results of this research evaluate the key performance indicators (KPIs) related to parental satisfaction in school selection across three cities: Yazd, Shiraz, and Isfahan. The findings reveal diverse patterns and significant differences in the prioritization of these indicators. These insights can enhance the understanding of the factors influencing parents' school choices.

The first and most important finding of this study emphasizes educational quality as the most prominent indicator across all cities. This finding aligns with previous research indicating that parents typically consider teaching quality and teacher effectiveness as their primary criteria for selecting schools (Husain et al., 2016).

In Yazd, the relationship between parents and schools ranks second, highlighting the importance of this aspect in fostering trust and collaboration between parents and educational staff. Similar findings have been reported in other studies that stress the role of effective communication between parents and schools (Huang & Waxman, 2016).

It is noteworthy that in Isfahan, the indicator of academic progress and achievements ranks second, reflecting the emphasis parents in this city place on the actual academic outcomes of students. This is consistent with previous research that has highlighted the importance of academic results for parents (Baker et al., 2017).

In Shiraz, the school environment is regarded as the second most important indicator. Other results clearly indicate that parents value a safe and supportive environment, a finding that has also been confirmed in prior research (Vickery, 2018).

There are noticeable differences in the prioritization of other indicators among the three cities. For instance, in Yazd, extracurricular activities hold greater importance (ranked 4th), while in Isfahan and Shiraz, they are ranked 7th and 8th, respectively. Numerous studies indicate that parents view extracurricular activities as a tool for developing students' social skills and non-academic abilities (Gonzalez et al., 2018).

Additionally, other indicators such as educational management and leadership, as well as school culture and values, vary among parents' priorities. These findings suggest that different factors have varying impacts on parents' choices depending on the city and cultural and social context. For example, in Yazd, school management is ranked

fifth, whereas in Isfahan, this indicator is in tenth place. According to previous findings, attention to educational leadership can have a direct impact on parent satisfaction (Day & Sammons, 2016).

Significant differences in the results of this research highlight the need for a comprehensive and localized approach when addressing the issue of school choice by parents. Specifically, these results can assist policymakers and educational administrators in taking targeted and effective actions to improve educational quality and ultimately enhance parent satisfaction based on parents' priorities.

Focusing on factors such as the relationship between parents and schools, as well as the school environment, can lead to positive and sustainable outcomes in terms of choice and parent satisfaction. In particular, addressing the needs and expectations of parents as customers of educational services can expedite the process of improving school quality.

Therefore, based on these results and previous research, emphasizing the quality of education, supporting effective communication, and improving the school environment should be considered primary priorities in future planning aimed at enhancing parent satisfaction and school choice.

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