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Urbanization Patterns and Their Influence on Educational Outcomes: Insights from the Provincial Wellbeing Index Data of Türkiye

Kentleşme Eğilimleri ve Eğitim Çıktıları Üzerindeki Etkileri: Türkiye İlleri Yaşam Endeksi Verilerinden Bulgular

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Abstract: In this study, we investigate the factors influencing educational achievement in Turkish provinces using data from the Provincial Life Index in Türkiye. This quantitative research incorporates both correlational and causal comparisons in its analysis. Our analysis reveals several significant relationships between socioeconomic and environmental indicators as a part of urbanization and the average Transition to Upper Secondary Education Examination (TSE) scores by province. The study's primary findings reveal that factors such as the number of rooms per person, the number of traffic accidents with injury or death, the proportion of faculty and college graduates, and toilet availability in dwellings are positively associated with educational success. Conversely, higher infant mortality, unemployment, and lower health satisfaction rates negatively correlate with average TSE scores. Additionally, the analysis identifies rooms per person and infant mortality rates in a province as the most significant predictors, highlighting their importance in explaining variations in educational outcomes among provinces. Our findings provide valuable insights into the complex interplay between urbanization, socioeconomic factors, and education in Türkiye, shedding light on areas that require targeted interventions to improve educational outcomes.

Keywords: Educational achievement, High-stakes testing, Urbanization, Educational inequalities, Life satisfaction, Wellbeing index.

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Öz: Bu çalışmada, Türkiye İllerde Yaşam Endeksi verileri kullanılarak, Türkiye'deki illerde eğitim başarısını etkileyen faktörler araştırılmıştır. Bu nicel araştırma analizinde hem korelasyonel hem de nedensel karşılaştırmaları içermektedir. Analizler, kentleşmenin bir parçası olan sosyoekonomik ve çevresel göstergeler ile illere göre Ortalama Ortaöğretime Geçiş Sınavı (OOGS) puanları arasında birkaç önemli ilişkiyi ortaya koymaktadır. Çalışmanın temel bulguları, kişi başına düşen oda sayısı, yaralanma veya ölümle sonuçlanan trafik kazası sayısı, fakülte ve yüksekokul mezunu oranı ve konutlarda tuvalet bulunmasının eğitim başarısıyla pozitif yönde ilişkili olduğunu göstermektedir. Buna karşılık, yüksek bebek ölümleri, işsizlik ve düşük sağlık memnuniyeti oranları ortalama OOGS puanlarıyla negatif bir korelasyon sergilemektedir. Ayrıca analiz bir ilde kişi başına düşen oda sayısı ve bebek ölüm oranlarını en önemli göstergeler olarak tanımlamakta ve bu faktörlerin iller arasındaki eğitim sonuçlarındaki farklılıkları açıklamada ne denli önemli olduğunu göstermektedir. Bulgular, Türkiye'deki kentleşme, sosyoekonomik faktörler ve eğitim arasındaki karmaşık etkileşime dair değerli çıkarımlar sunarak, eğitim sonuçlarını iyileştirmek için hedeflenmesi gereken müdahale alanlarını aydınlatmaktadır.

Anahtar Kelimeler: Eğitim başarısı, Merkezi sınavlar, Kentleşme, Eğitim eşitsizlikleri, Yaşam memnuniyeti, İllerde yaşam endeksi.

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1. INTRODUCTION

Academic achievement and inequalities emerge due to various complex economic, social, political, and individual parameters. Revealing these parameters enables us to both increase academic achievement and better understand educational inequalities. This study addresses educational inequalities through the lens of the production of space theory (Lefebvre, 1991), focusing on a spatial context.

Studies that examine educational inequalities from a spatial perspective, focusing on differences in educational achievement between different regions or cities within the same country, broadly highlight that educational achievement in rural areas is lower compared to urban areas. Common findings identified in these studies include poorer physical facilities in educational institutions in rural areas, lower socioeconomic status of students, and challenges in teacher availability (e.g. Baroutsis & Lingard, 2017; Buyruk, 2014; Cornelius & Mackey-Smith, 2022; Erdoğan et al., 2010, 2011; Forster, 2006; Guenther, 2013; Smith et al., 2019). Another group of studies that investigate educational inequalities from a spatial perspective focuses on differences between neighborhoods. The common findings in these studies resemble those of other research, indicating that disparities in educational achievement are attributed to socioeconomic factors. Furthermore, research that specifically emphasizes inter-neighborhood differences has also identified inequalities stemming from ethnic origins and immigrant status (e.g. Ainsworth, 2002; Andersson & Subramanian, 2006; Bauder, 2001; Croft, 2004; Crowder & South, 2003; Galster et al., 2007; Sykes, 2011).

These long-term studies in the literature have indicated that educational inequalities arise from various factors, including cultural differences, socioeconomic conditions, physical deficiencies in rural areas, and concentrated poverty in certain urban areas. In this study, urbanization levels in the provinces of Türkiye are examined to investigate the underlying reasons for variations in academic educational inequalities among these provinces. Well-being indicators that are commonly associated with urban functions, as found in the literature (Choy & Li, 2017; Havighurst, 1967; Ji & Zhang, 2019; Kasarda & Crenshaw, 1991; Moomaw & Shatter, 1996; Pandey, 1977), are utilized to explore the urbanization levels across the provinces. The primary objective of this research is to understand which urban factors have a more significant impact on educational disparities emerging as a result of urbanization. The study aims to shed light on the key urban factors influencing educational inequalities among Turkish provinces. In this paper, we delve into these factors contributing to educational inequalities in more detail. We examined 40 indicators grouped under housing, employment, income and wealth, health, education, environment, safety, civic engagement, infrastructure services, social life, and life satisfaction. In other words, this study reveals the roles of spatial factors emerging because of urbanization in educational inequalities instead of merely understanding the reflection of individuals' attributes on these disparities.

1.1. Disparities in Urban Development and Education

Although educational inequalities, one of the major problems of education systems, are analyzed using various indicators, the factors that contribute to these inequalities are often considered to be related to in-school causes. While factors such as students' socioeconomic status, teacher shortages, or overcrowded classrooms are significant indicators of educational inequalities, it can be argued that the primary causes of these disparities do not originate within schools but rather stem from their physical location or geographical context. Hence, the approach adopted in this study is to explain how quality and quantity differences in education emerge in the context of urbanization. Therefore, the conceptual framework of the research examines the relationship between urbanization, educational inequalities, and urban functions.

Urbanization, described as the rise in urban population, is a phenomenon intertwined with economic development objectives, both as a catalyst and a consequence (Ooi & Phua, 2007). However, its characterization extends beyond mere demographic metrics due to its intricate nature. The influx of people into urban centers presents challenges for administrators, particularly concerning housing, infrastructure, and social services, including reproductive health (Ooi & Phua, 2007; Zhu et al., 2021). Consequently, the adequacy and accessibility of these amenities within a settlement serve as indicators of urbanization levels. As Martine (2008) suggests, in developed nations, this entails a more equitable and robust provision of such services, whereas in developing countries, urbanization often manifests as slum proliferation or exacerbated urban poverty (Ooi & Phua, 2007). This approach not only enables a country to assess its level of urbanization from a broad perspective but also allows for the comparison of individual cities in terms of their urbanization levels. Sarı et al. (2019), who consider the service and infrastructure requirements emerging parallel to urbanization as urban functions, reveal the urbanization levels of cities by measuring these functions. Their findings indicate significant disparities in urbanization levels among cities and even districts within the same country. Although Sarı et al. primarily approach these urban functions from an industrial perspective, it is plausible to assume that these disparities also create significant differences in the quality of education.

At this juncture, housing emerges as a primary indicator deserving attention. The quality of housing within a settlement serves as a significant gauge of urbanization. Numerous studies in the literature indicate that families seeking access to higher-quality education tend to migrate to cities or neighborhoods offering such educational standards, consequently influencing housing prices within a settlement (Collier & Venables, 2014; Croft, 2004; Curley, 2005; Dasgupta et al., 2014; Galster et al., 2007). In essence, an improvement in the educational quality of a region correlates with an increase in housing prices therein. This demand for quality education may inadvertently lead to adverse effects, such as population influx into specific settlements. Consequently, regions offering quality education may experience overcrowded public transportation, traffic congestion, challenges in accessing healthcare services, and larger class sizes in schools, negatively impacting the quality of education. To mitigate these issues, maintaining high housing prices within these regions serves as a filtering mechanism (Pérouse & Danış, 2005). Consequently, deliberate efforts to keep housing prices elevated in areas with quality education deter individuals below a certain socioeconomic threshold from relocating to these locales, thereby fostering segregation and gentrification in urban spaces.

The most important alternative in terms of housing for the lower classes, whose access to residential areas with gentrified and qualified urban functions is blocked, is to create unauthorized structures in residential areas close to rich areas with urban functions and thus benefit from the job opportunities offered by wealthy areas as much as possible (Buğra, 2018; Erder, 2021, 2023; Harvey, 2020; Işık & Pınarcıoğlu, 2021). The settlements built by these settlers, who are mostly employed in marginal jobs needed by the city, without legal permits, lack urban planning by the authorities (Tekeli, 1991). Unable to benefit from infrastructure services such as sewage and clean drinking water, these settlements are used only for housing purposes due to a lack of planning, leaving insufficient space within the settlement area for social services such as schools, hospitals, post offices, and police stations. The fact that these settlements lack transportation facilities such as paved roads, train tracks, and metro is the choice of the settlers (Keyder, 2018). The biggest concern of the settlers, who deliberately choose to keep their illegally built shelters away from inspection and detection, is that their shelters will be demolished.

On the other hand, informal settlements created in this way may undergo different transformations over time. In some scenarios, these settlements may be demolished and replaced with gated communities to create more space for wealthy families (Davis, 2020). In some cases, due to populist policies, these settlements may be allocated title deeds, and their illegal status may be changed (Keyder, 2018; Tekeli, 1991). In the first scenario, slum dwellers are deported to more remote areas, while in the second scenario, the land titles they obtain illegally pave the way for their enrichment. With their land titles, they demolish

their shacks, which do not benefit from infrastructure services, and build multi-story apartment buildings in their place, and in exchange for their votes for politicians, they get the infrastructure services they did not have before (Işık & Pınarcıoğlu, 2021). In this type of income, which Tekeli (1991) refers to as urban speculation, the infrastructure services provided to slum dwellers with the taxes of the entire population increase the value of the buildings erected and provide large incomes to land owners. Nevertheless, since there is not enough space left for the construction of buildings to provide education, health, and security services in these settlements, which were created to fit the maximum number of people into a minimum-sized area and were subsequently subjected to urban transformation, the rate of satisfaction with social life and health in these settlements does not increase (Işık & Pınarcıoğlu, 2021; Ooi & Phua, 2007). Too many students in too few schools, not enough doctors in hospitals for the number of patients, and not enough security guards on the streets to respond to security problems that arise leave the standard of living and, therefore, the quality of education in these areas low. These areas are not favored as settlements by the wealthy, there are no people with the political connections necessary to bring in more investment, and the educated middle classes who could raise the sociocultural level of the region do not prefer to live in these areas (Sykes, 2011). Civic engagement, which means initiatives taken by the public to correct the problems in these settlements, which continue to exist as depressed areas within the city, also remains low due to the absence of middle and upper classes to lead the way for increased participation (Rotolo et al., 2010).

Encountering the same indicators in well-being data, it is possible to establish a relationship between life satisfaction data and the level of urbanization and urban functions. The above-mentioned indicators of housing, working life, income and wealth, health, education, environment, security, civic participation, infrastructure services, social life, and life satisfaction are usually discussed at the neighborhood level in the literature. This could be due to countries' geographical features, forms of local governance, or population densities. Many of these studies conducted at the neighborhood level approach the relationship between urbanization and education from a different perspective. Some studies examine ethnic and racial backgrounds, while others focus on socioeconomic status. Population densities of neighborhoods, employment conditions of residents, social class characteristics, and infrastructure conditions in neighborhoods are also subjects of studies related to education. This research has developed a more comprehensive perspective. It ensures that the indicators used in studies in the field of urbanization are gathered under a single research design, and instead of conducting a study at the neighborhood level, a comparison of provinces in Türkiye has been conducted.

For this purpose, two assumptions were developed in the research. According to the first assumption, if there are more depressed areas in a given province, the indicators of housing, working life, income and wealth, health, education, environment, security, civic participation, infrastructure services, social life, and life satisfaction are expected to be lower. If there is a balanced level of urbanization across districts, indicators will be relatively low.

The second premise suggests that Türkiye may be undergoing two negative conditions resulting from urbanization, termed overurbanization and urban primacy in scholarly discourse. Overurbanization denotes a scenario where a city's rate of urbanization surpasses the pace at which the service requirements of its expanding population are met. Urbanization takes on a detrimental aspect when the educational, healthcare, social, security, and infrastructural needs of the burgeoning population cannot be adequately addressed. While urbanization brings benefits to city dwellers in terms of employment, income, and education through urban functions, experiencing overurbanization means that inhabitants may not fully reap the advantages offered by these urban functions. Similarly, in rural areas lacking urban functions, residents are deprived of quality education, healthcare, and social services (Kasarda & Crenshaw, 1991; Moomaw & Shatter, 1996; Pandey, 1977).

Urban primacy, which is also defined as the urbanization of a city within the same country much more than other cities, argues that a city that urbanizes too much compared to other cities will hinder the development of others (Kasarda & Crenshaw, 1991). From a historical perspective, the foundations of urban primacy can be traced back to the colonial period. It is seen that colonial states invested in some cities in countries whose resources they wanted to exploit. Colonial states that wanted to capture the resources of a country through investments such as ports, railroads, and warehouses also built banks and insurance offices in the same city for monetary transactions. In addition to transferring the human capital of other cities to the overdeveloped cities due to the job opportunities created in the cities that developed with these functions, these over-urbanized provinces also transferred the underground and surface resources of the surrounding provinces to the western states (Erder, 2023). Approaching the concept of urban primacy from a confrontational perspective, Çavuşoğlu (2016) suggests that some cities within the same country are deliberately prevented from developing. According to this idea, the development of other provinces of the country is deliberately prevented in order to transfer the labor force needed in the over-urbanized provinces, which bear the burden of the country economically, to the city through migration and the migration of individuals who are dissatisfied with their lives to overdeveloped provinces in order to achieve urban functions is indirectly ensured.

Urban primacy also has important implications for education. Highly urbanized provinces with better quality educational institutions attract middle and upper classes seeking access to better education (Rutz & Balkan, 2022). In addition to public and private schools, shadow educational institutions also play a role in this migration in the Turkish context, depending on centralized exams. Private tutoring centers that guarantee success in centralized exams are also a factor of attraction for families aiming for more qualified academic success (Bray, 2013). In particular, the higher demand for quality education among the educated middle classes leads to the accumulation of highly educated individuals in provinces with high levels of urbanization. In this case, it is possible to predict that children of families living in provinces with high levels of urbanization will also have higher academic achievement.

As observed, assuming that cities with higher levels of urbanization will inherently be more advantageous compared to others may not be a universally applicable approach when examining urbanization levels within a country. Cities with high levels of urbanization but disadvantaged in terms of urban functions may be more disadvantaged compared to their rural counterparts. Conversely, with proper urbanization practices and sufficient urban functions, an urban area can offer significantly superior opportunities compared to regions with lower urbanization levels. When considered from an educational perspective, it is evident that merely conducting a correlational study may not suffice for identifying the urban functions that play the most crucial role in the quality of education. Therefore, based on this fact, it has been recognized in this research that a more accurate approach would involve developing a model to identify the urban functions that are most significant for education quality. It is deemed necessary to strengthen the research findings by conducting a second analysis method to test the predictive power of the model generated, in addition to verifying the findings obtained from the model. In the final stage, quantitative analyses were conducted to understand the factors influencing the formation of groups among cities based on the indicators obtained through quantitative analysis. For this purpose, this study aims to make a comparison between provinces and to understand the factors that play a role in academic achievement;

1) Which urban factors are significant predictors of academic achievement?
2) Which urban factors are significant predictors of the classification of provinces according to academic achievement?
3) Which urban indicators play a significant role in the classification of cities?

Research questions were developed. The research hypothesis is that at least one urban factor will be a significant factor in predicting academic achievement. As a result of the research it is aimed to understand the external factors affecting academic achievement and to open new research areas for further research.

2. METHODOLOGY

2.1. Research Design

This study is a quantitative research that investigates the relationship between the variables in the Provincial Life Index dataset and the average scores in the transition to upper education examination across various provinces. The research incorporates both correlational and causal comparisons in its analysis. This method enables the identification of significant predictors among the variables (Johnsson, 1992). The aim of this study is to examine educational inequalities with external factors other than education. The study is based on the theory that the factors that produce educational inequalities are related to urbanization. In other words, it is thought that the quality of education offered by a school is shaped according to the residential area in which the school is located. Therefore, the study aims to reveal which urban factors are related to the quality of education and to open new research areas for future research on educational equity. For this reason, a correlational design with causal comparison was preferred in order to identify the factors that are likely to play an important role in educational equity to be examined in more detail.

2.2. Data Source

In this research, the data source used for analysis is the Provincial Life Index (PLI) dataset published by the Turkish Statistical Institute (TUIK) in 2016[3]. The Turkish Statistical Institute (TÜİK) has conducted an index study aimed at measuring, comparing, and monitoring the lives of individuals and households at the provincial level using objective and subjective indicators to distinguish life dimensions. The purpose of this study is to develop an indicator system that underpins the monitoring and improvement of life in provinces across all dimensions. The Provincial Life Index covers 11 dimensions of life, including housing, employment, income and wealth, health, education, environment, security, civil participation, access to infrastructure services, social life, and life satisfaction, represented by 41 indicators within a single composite index structure. The index ranges from 0 to 1, with values approaching 1 indicating a higher quality of life. In this study, one of these 41 variables, namely, average Transition to Upper Secondary Education Examination (TSE) scores by provinces, is considered the dependent variable. The Transition to Upper Secondary Education Examination (TSE) scores represent the arithmetic average of scores obtained in the TSE in 2015 across provinces. The scores obtained by all students who took the TSE in 2015 were summed and divided by the number of students. This average score has been considered an indicator of academic achievement in this study. Another variable that could be considered an indicator of academic achievement, namely the average scores in the Higher Education Entrance Examination, has been excluded from the study. It is assumed that factors influencing success in the Higher Education Entrance Examination may be more individualized, and it is believed that more effective information regarding the academic success of regions can be obtained from TSE results, considering that only voluntary individuals take the exam. The remaining 39 variables in the dataset have been included in the study as independent variables.

The preferred use of this data set enables a more comprehensive approach to previous studies in the field of educational inequalities and elaborates on the variables used in previous studies. For instance, economic level is a factor often found in many studies on educational inequalities. In this study, concerning economic level, the categories of employment and income and wealth include the following variables: Employment rate, Unemployment rate, Average daily earnings, Job satisfaction rate, Savings deposit per capita,

[3] To reach information and the data set: https://data.tuik.gov.tr/Bulten/Index?p=Illerde-Yasam-Endeksi-2015-24561

Percentage of households in middle- or higher-income groups, and Percentage of households declaring to fail on meeting basic needs.

This research assumes that schools will be influenced by the conditions of the areas they are located in and, therefore, considers urban functions to be important. In this regard, categories such as the quality of social life, access to healthcare services, and security are also considered with detailed subheadings. For variables related to social life, the following are included: "Number of cinema and theatre audience," "Shopping mall area per thousand people," "Satisfaction rate with social relations," and "Satisfaction rate with social life." Regarding satisfaction with healthcare services, the variables are: "Infant mortality rate," "Life expectancy at birth," "Number of applications per doctor," "Satisfaction rate with health status," and "Satisfaction rate with public health services." For security, the variables used are: "Murder rate," "Number of traffic accidents involving death or injury," "Percentage of people feeling safe when walking alone at night," and "Satisfaction rate with public safety services."

As expressed in the literature, factors primarily affected by urbanization are housing, social services, and infrastructure services. As articulated in the analysis of overurbanization, the conditions in these factors also influence the residents of a specific region, leading to processes of segregation and gentrification in urban areas, which directly affect the quality of education. In the housing category, the variables used are the number of rooms per person; Toilet presence percentage in dwellings, and Percentage of households having problems with the quality of dwellings. For access to infrastructure services, the variables used are the number of internet subscriptions (per hundred persons), Access rate of the population to sewerage and pipe system, Access rate to the airport, and Satisfaction rate with municipal public transport services. In the civic engagement category, as also mentioned in the literature, the variables used are Voter turnout at local administrations, Rate of membership to political parties, and Percentage of people interested in union/association activities. To distinguish between urban and rural areas in the research, the category used is the environment, including the following variables: Average of PM10 values of the stations (air pollution); Forest area per km2; Percentage of population receiving waste services; Percentage of households having noise problems from the streets; Satisfaction rate with municipal cleaning services.

2.3. Data Analysis

Three different methods were employed in the analysis of the dataset. In the initial step, a stepwise multiple linear regression analysis was used to identify variables that had a significant relationship with the average scores of provinces in the TSE. Before proceeding with the stepwise linear regression analysis, normality tests, outlier checks, multicollinearity tests, and variance inflation factor assessments were performed (Fox & Monette, 1992; Hair et al., 1995). In the second step, the average of TSE scores for each province were calculated, and provinces were categorized into two groups: those above the average and those below the average. Discriminant function analysis was then performed to understand the differences between these groups (Klecka et al., 1980). After determining the suitable variables for discriminant function analysis by examining the dataset, normality tests were conducted, and it was observed that the distribution was normal. Homogeneity was tested using the Box M test, and, similar to the previous step, tolerance and variance inflation factor values were checked to examine the presence of multicollinearity issues[4]. In the final stage, cluster analysis was conducted (Hennig et al., 2015). The goal of performing cluster analysis was to identify which characteristics differentiate the provinces of Türkiye from each other. The variables obtained from this analysis were compared with the variables that have a significant relationship with education. Additionally, the aim was to determine the variables that most affect the level of urbanization.

[4] Please scan the QR code to reach the assumption checks and further analysis.

3. FINDINGS

A model of urban indicators influencing the quality of education

According to the results of the stepwise linear regression analysis using PLI indicators, it was seen that eight indicators formed a significant regression model that predicted the average TSE scores by province. The coefficient table for the model that was obtained from the number of rooms per person, the number of traffic accidents involving death or injury (per thousand people), the rate of infant mortality rate, the rate of faculty and high school graduates, the unemployment rate, the rate of toilet availability within the dwelling, the rate of satisfaction with health and social life is given below. Other variables in the data set did not enter the model as they were not statistically significant.

Table 1.

PLI stepwise regression coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	257,075	24,191		10,627	,000
	Rooms per person	31,982	9,789	,285	3,267	,002
	Number of traffic accidents involving death or injury (per thousand people)	10,979	1,777	,304	6,180	,000
	Infant mortality rate (‰)	-1,692	,562	-,187	-3,007	,004
	Percentage of higher education graduates	1,977	,575	,170	3,440	,001
	Unemployment rate	-,949	,401	-,132	-2,366	,021
	Availability of toilets in the residence	,515	,137	,206	3,762	,000
	Health satisfaction rate	-1,272	,364	-,192	-3,498	,001
	Social life satisfaction rate	,319	,143	,135	2,233	,029

As seen above in Table 1, a significant regression model emerged. According to the model, it was found that $F_{(8.69)} = 76,748$, $p < 0.001$, and 89% of the variance in the dependent variable (R^2 adjusted = .0.89) was explained by the independent variables. Accordingly, the number of rooms per person (β=0.285, $t_{(69)} = 3.267$, $p = 0.002$, $pr^2 = 0.133$); the number of traffic accidents involving death or injury (per thousand people) (β=0.304, $t_{(69)} = 6.180$, $p = 0.000$, $pr^2 = 0.356$); the proportion of faculty and college graduates (β=0.170, $t_{(69)} = 3.440$, $p = 0.001$, $pr^2 = 0.146$); toilet availability rate in the dwelling (β=0.206, $t_{(69)} = 3.762$, $p = 0.000$, $pr^2 = 0.17$); the rate of satisfaction with social life (β=0.135, t (69) = 2.233, $p = 0.029$, $pr^2 = 0.067$) independent variables has a positive relationship with TSE average scores by province. Infant mortality rate (β=-0.187, $t_{(69)} = -3.007$, $p = 0.004$, $pr^2 = 0.115$); unemployment rate (β=-0.132, $t_{(69)} = -2.366$, $p = 0.021$, $pr^2 = 0.008$); health satisfaction rate (β=-0.192, $t_{(69)} = -3.498$, $p = 0.001$, $pr^2 = 0.15$) independent variables have a negative relationship with the average TSE scores by province.

Classification of urban education achievements according to urban indicators

In the second part of the study on PLI, TSE average scores were divided into two groups according to the provinces. The first group consisted of averages higher than the lowest base score in 2016 for placement in an Anatolian high school[5] in Istanbul, and the second group was formed from the average TSE scores that were lower than the same baseline score. Accordingly, in the second part of the research, the aim is to determine which PLI indicators are significant predictors in the formation of these groups of TSE average scores by province.

As a result of the discriminant analysis, a single function was obtained. The eigenvalues and Wilk's Lambda values of the obtained function are presented in the tables below.

Table 2.

Eigenvalues and Wilk's Lambda statistics of discriminant analysis

Eigen Values

Function	Eigen Value	% of variance	Cumulative %	Canonical Correlation
1	1.308[a]	100.0	100.0	.753

Wilks' Lambda

Test of function	Wilks' Lambda	X^2	Df	p
1	.433	59.389	10	.000

As seen in Table 2, the obtained function explains 75.3% of the variance. Wilk's lambda statistics of the model show that the obtained function is significant in separating the groups (Wilk's Lambda $_{(10)}$ = .433; X^2 = 59.389; p < .001). The significance values of the variables included in the model according to the discriminant function analysis in separating the groups are presented in Table 3.

Table 3.

Significance values of the variables included in the discriminant analysis

	Wilks' Lambda	F	df1	df2	p
Percentage of higher education graduates	.737	27.147	1	76	.000
Savings deposit per capita	.856	12.786	1	76	.001
Percentage of households in middle or higher income groups	.811	17.762	1	76	.000
Infant mortality rate (‰)	.626	45.362	1	76	.000
Life expectancy at birth (Year)	.866	11.778	1	76	.001
Satisfaction rate with health status (%)	.886	9.796	1	76	.002
Net schooling ratio of pre-primary education between the ages of 3 and 5 (%)	.766	23.179	1	76	.000
Forest area per km2 (%)	.869	11.415	1	76	.001
Number of traffic accidents involving death or injury (per thousand people)	.736	27.229	1	76	.000
Percentage of people feeling safe when walking alone at night (%)	.910	7.537	1	76	.008

As seen in Table 3, it is observed that the 9 PLI indicators included in the model are significant variables in separating the groups (p < 0.05).

Significant predictors found in the model obtained by discriminant analysis are presented in Table 4.

[5] High secondary education institutions enrolling students based on centralized exam scores with a high level of academic success.

Table 4.
Standardized canonical discriminant function coefficients

	Function 1
Percentage of higher education graduates	.662
Savings deposit per capita	-.376
Percentage of households in middle or higher income groups	.237
Infant mortality rate (‰)	-.458
Life expectancy at birth (Year)	.078
Satisfaction rate with health status (%)	-.038
Net schooling ratio of pre-primary education between the ages of 3 and 5 (%)	.156
Forest area per km2 (%)	.046
Number of traffic accidents involving death or injury (per thousand people)	.315
Percentage of people feeling safe when walking alone at night (%)	.398

According to the standardized canonical discriminant function analysis coefficients seen in Table 4, the highest coefficient in distinguishing TSE average scores by provinces is the ratio of faculty and college graduates. The second highest coefficient is the infant mortality rate. This variable is negative in terms of distinctiveness. In other words, it is expected that the average TSE scores of the provinces with high infant mortality rates will be at a low level of success. The variables with the lowest discrimination level are the rate of satisfaction with health, forest area per km2, and life expectancy at birth. The structure matrix of the model is presented in Table 5.

Table 5.
Discriminant analysis structure matrix

	Function 1
Infant mortality rate (‰)	-.675
Number of traffic accidents involving death or injury (per thousand people)	.523
Percentage of higher education graduates	.523
Net schooling ratio of pre-primary education between the ages of 3 and 5 (%)	.483
Percentage of households in middle or higher income groups	.423
Savings deposit per capita	.359
Life expectancy at birth (Year)	.344
Forest area per km2 (%)	.339
Satisfaction rate with health status (%)	.314
Percentage of people feeling safe when walking alone at night (%)	.275

As seen in Table 5, when the order of importance of the variables is examined, it is seen that the highest value is in the infant mortality rate. The number of traffic accidents involving death or injury, which ranks second, and the rate of faculty and college graduates are equally important. The variables with the lowest level of importance were observed in the rate of those who felt safe walking alone at night and the rate of satisfaction with their health. The findings regarding the classification results of the model are presented in Table 6.

Table 6.
PLI discriminant analysis classification results

Groups	n (%)	n (count)	Predicted lower group membership	Predicted upper group membership	Total	Prediction percentage	Prediction percentage
303,236 Lower group	43,6	34	24	2	34	70,6	4,5
303,236 Upper group	56,4	44	10	42	44	4,5	95,5

According to the estimation rates presented for the groups in Table 6, 24 out of 34 provinces in the first group and 42 out of 44 provinces in the second group were estimated in the correct class. The total estimation success of the model obtained after adding the variables was determined as 84.6%.

Formation of clusters among provinces

The two-step cluster analysis conducted with 39 variables yielded two clusters with a fair cluster quality (0,0 < p < 0,5). Figure 1 illustrates the clustering model summary.

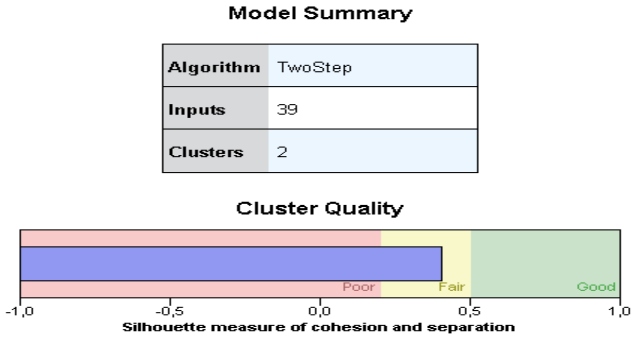

Figure 1. *Model summary of cluster analysis with PLI variables*

As seen in Figure 1, the model yields two clusters with 39 variables. While the size of the smallest cluster is 20 (24,7%), the size of the largest cluster is 61 (75,3%) and the ratio of sizes of the clusters is 3,05. The significant predictors of the cluster analysis are presented in Figure 2.

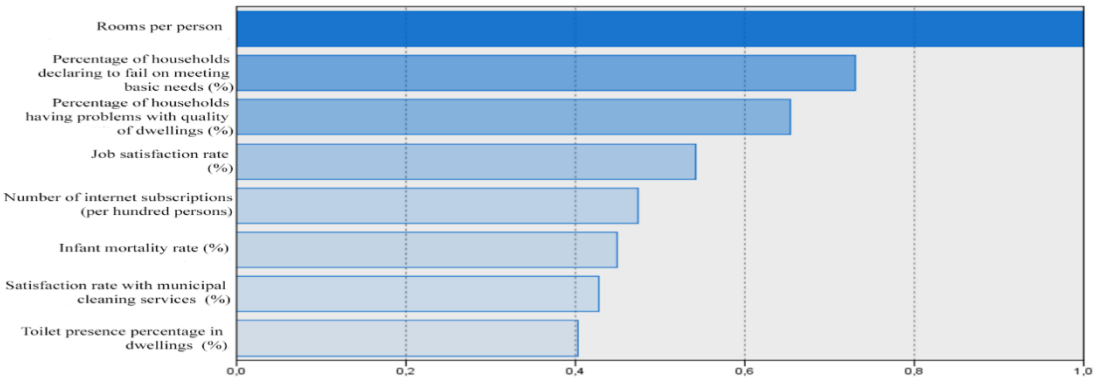

Figure 2. *The significant predictors of the cluster analysis with PLI variables*

As seen in Figure 2, the most significant predictor of the clusters is rooms per person, while the second most significant predictor is the percentage of households declaring to fail to meet basic needs.

The comparison of three different analysis findings

The findings of three different quantitative analysis methods are presented in the table below.

Table 7.
The comparison of findings

Stepwise Regression	Discriminant Function	Cluster
Rooms per person	Infant mortality rate	Rooms per person
Number of traffic accidents involving death or injury (per thousand people)	Number of traffic accidents involving death or injury (per thousand people)	Percentage of households declaring to failing in meeting basic needs.
Infant mortality rate	Percentage of higher education graduates	Percentage of households having problem with quality of dwellings
Percentage of higher education graduates	Net schooling ratio of pre-primary education between the ages of 3 and 5	Job satisfaction rate
Unemployment rate	Percentage of households in middle- or higher-income groups	Number of internet subscriptions
Availability of toilets in the residence	Savings deposit per capita	Infant mortality rate
Satisfaction rate with health status	Life expectancy at birth (Year)	Satisfaction with municipal cleaning services
Social life satisfaction rate	Forest area per km^2	Availability of toilets in the residence
	Satisfaction rate with health status	
	Percentage of people feeling safe when walking alone at night	

As observed in Table 7, the infant mortality rate has been identified as a significant variable in all three analyses. The infant mortality rates are illustrated on the map according to regions, as depicted below.

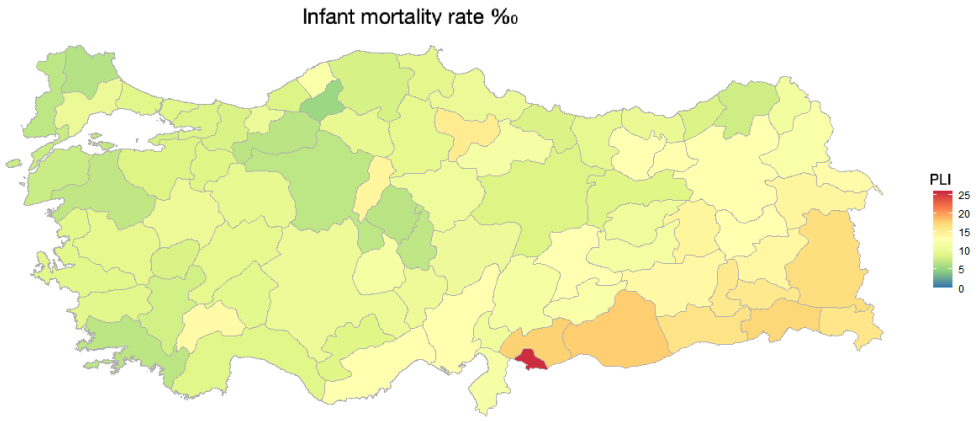

Figure 3. *Infant mortality rate map - The map presents infant mortality rates in per thousand. The colors are gradient from green to red, with green indicating the lowest infant mortality rate and red representing the highest rate. The data used to create the map corresponds to the TÜİK (Turkish Statistical Institute) data utilized in the research*

As evident in Figure 3, the infant mortality rate is higher in certain parts of the Southeastern Anatolia Region and Eastern Anatolia Region compared to the rest of Türkiye. In these regions, it is understandable that academic success is lower compared to other provinces. The infant mortality rate is associated with the level of education and access to health services. As the level of education decreases, an increase in the infant mortality rate is an expected finding.

The variable common to both stepwise linear regression and cluster analyses is the number of rooms per person. The map below illustrates the distribution of the ratio of rooms per person across Türkiye.

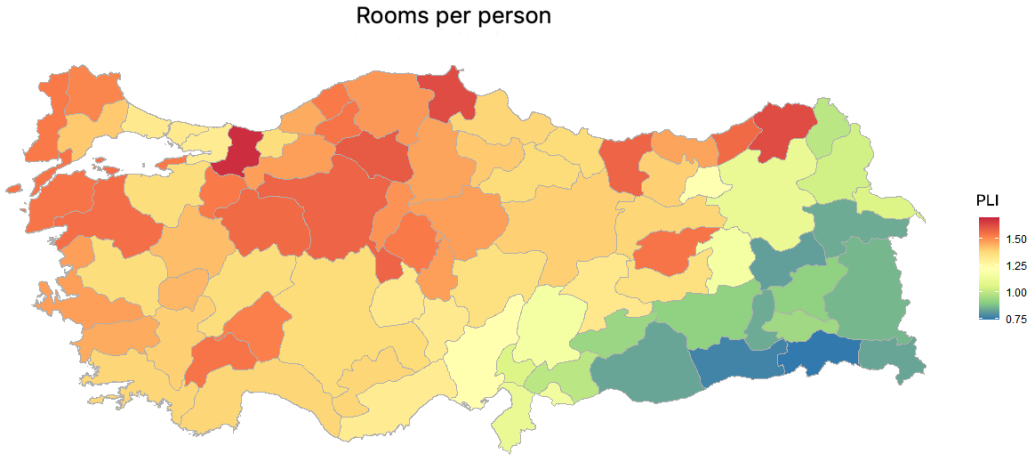

Figure 4. *Rooms per person - The map exhibits a transition from green to red. The red colors indicate an increase in the number of rooms per person, while green signifies a decrease. The data used to create the map corresponds to the TÜİK (Turkish Statistical In stitute) data utilized in the research.*

As evident in Figure 4, the variable of the number of rooms per person also exhibits noticeably lower ratios in the Southeastern and Eastern regions, similar to the infant mortality rate. In other words, in these regions, there is more than one person per room. The variable of the number of rooms per person can carry different demographic and sociological implications. In this research, it is not possible to explain the regional differences in the number of rooms per person. However, educational implications will be drawn in the conclusion section.

The map below provides the rate of fatal and injury-causing traffic accidents per thousand people, which is another indicator common to stepwise linear regression and discriminant analyses, categorized by provinces.

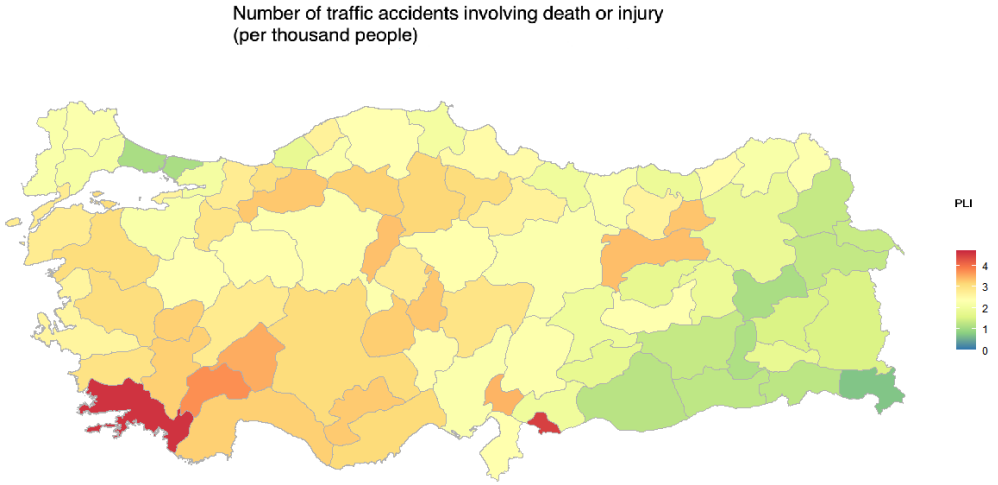

Figure 5. *Number of traffic accidents involving death or injury (per thousand people) - The map exhibits a transition from green to red. The red color indicates a high number of fatal and injury-causing traffic accidents, while the green color signifies a low nu mber. The data used to create the map is consistent with the TÜİK (Turkish Statistical Institute) data that constitutes the research dataset.*

As evident in Figure 5, the rate of fatal and injury-causing traffic accidents is higher in the western and southwestern parts of Türkiye compared to other provinces. These regions are also areas where academic achievement is high. Although this research establishes a relationship between the rate of fatal and injury-causing traffic accidents and academic achievement, the nature of this relationship is not intended to be explained. However, it is understood that urbanization influences both academic achievement and the rate of fatal and injury-causing traffic accidents. Findings from a study on traffic accidents in Türkiye by Asirdizer et al. (2014) indicate a significant relationship between fatalities and injuries in traffic accidents and the number of vehicles in a region. When examining the ratio of fatal and injury-causing traffic accidents to the number of vehicles in the study, regional differences seem to disappear. Accordingly, as the number of vehicles increases in a region, it is understood that both the incidence of fatalities and injuries in traffic accidents also increases. It is expected that economically more developed regions in Türkiye, with higher levels of tourism and industrial activities, would have a higher number of vehicles. Therefore, in these regions, not only a higher rate of fatal and injury-causing traffic accidents but also higher academic achievement would be anticipated.

Another variable shared between two different types of analyses is the ratio of individuals with a university and higher education degree. It is understood that regions with a high ratio of university and higher education graduates also have high academic achievement. The map below illustrates the ratios of individuals with university and higher education degrees by province.

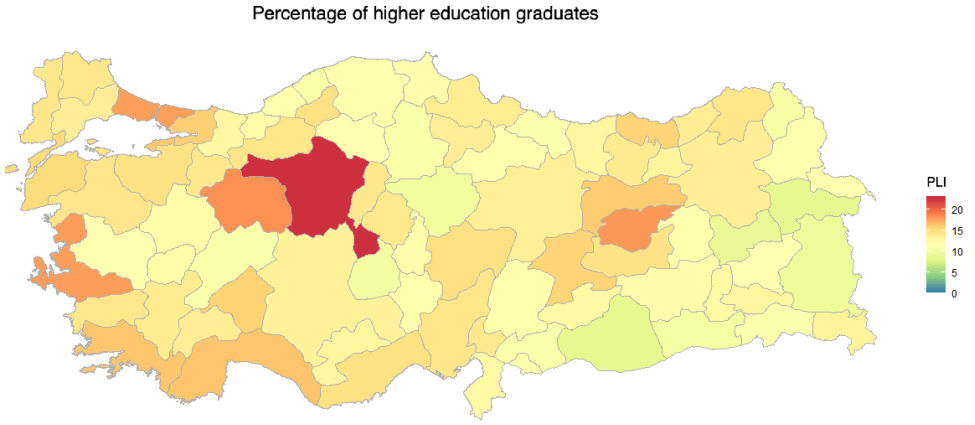

Figure 6. *Percentage of higher education graduates - As the map transitions from green to red, the ratio of residents with higher education increases in a region. The data used in creating the map corresponds to the TÜİK (Turkish Statistical Institute) data analyzed in the research.*

As illustrated in Figure 6, initially, including the capital city Ankara, the provinces with the highest ratios of university and higher education graduates are Istanbul and Izmir. Tunceli follows closely. Ankara, as the capital, holds a distinctive characteristic as the bureaucratic center of the country. As Şenyapılı (2016) indicated, this results in a higher number of educated individuals, particularly bureaucrats responsible for maintaining the bureaucratic functioning of the state. Istanbul, being the industrial powerhouse of Türkiye, may also have a high number of educated individuals due to the demand for white-collar workers in various industries.

In Türkiye, especially in rural settlements where adequate sewer infrastructure is lacking, toilets are often located in the yards of houses. Similarly, in shanty towns, communal toilets are commonly found. The rate of having a toilet inside the house provides information about a region's urban, rural, and formal or informal settlement patterns. Regions with a low rate of toilets inside the house are generally rural areas, while those with a high rate are urban areas.

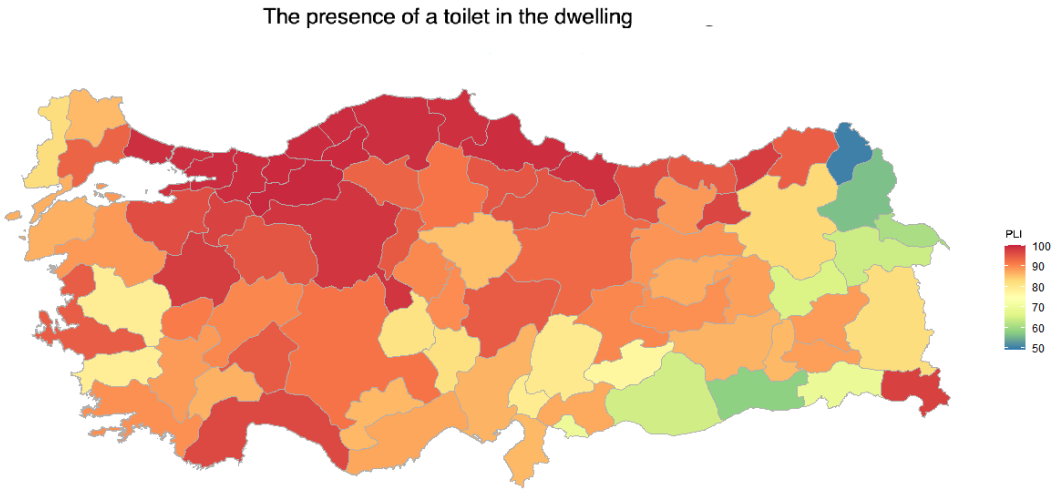

Figure 7. *The presence of a toilet in the dwelling - As the map transitions from green to red, the rate of having a toilet inside the house increases. The data used to create the map is consistent with the TÜİK (Turkish Statistical Institute) data used in the research.*

As observed in Figure 7, in the eastern and southeastern provinces of Türkiye, almost half of the households do not have toilets inside the house. Accordingly, it is plausible to assume that there is a high prevalence of rural settlement patterns in these regions, and academic achievement may be lower as a result.

Another variable identified consistently across different types of analyses is the satisfaction rate with one's health. The map below illustrates the variation in the satisfaction rate with health across provinces in Türkiye.

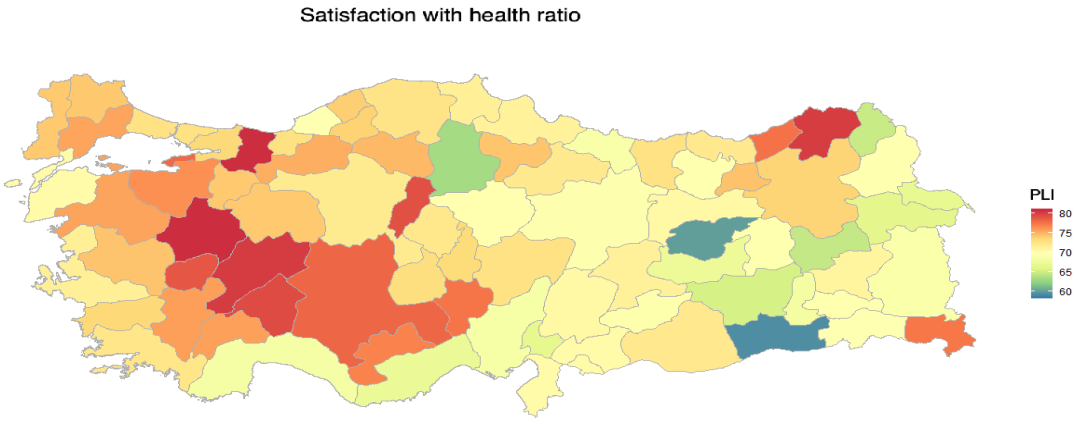

Figure 8. *Satisfaction with health ratio - As the map transitions from green to red, the satisfaction rate with health increases. The data used to create the map is obtained from the TÜİK dataset used in the research.*

As observed in Figure 8, the variable of satisfaction rate with health shows the lowest values in the southeastern and eastern provinces of Türkiye. When considered alongside other factors, it is possible to argue that urbanization plays a role in this variable as well. In regions where the level of urbanization is low, the satisfaction rate with health tends to be low. Consequently, it is possible to infer that public services related to health may not be adequately provided in these regions.

When examining studies on urbanization in Türkiye, it can be concluded that regions with relatively lower academic achievement also have lower urbanization rates. To enable a comparison with the maps presented above, Figure 9 below illustrates the levels of urbanization in districts of Türkiye.

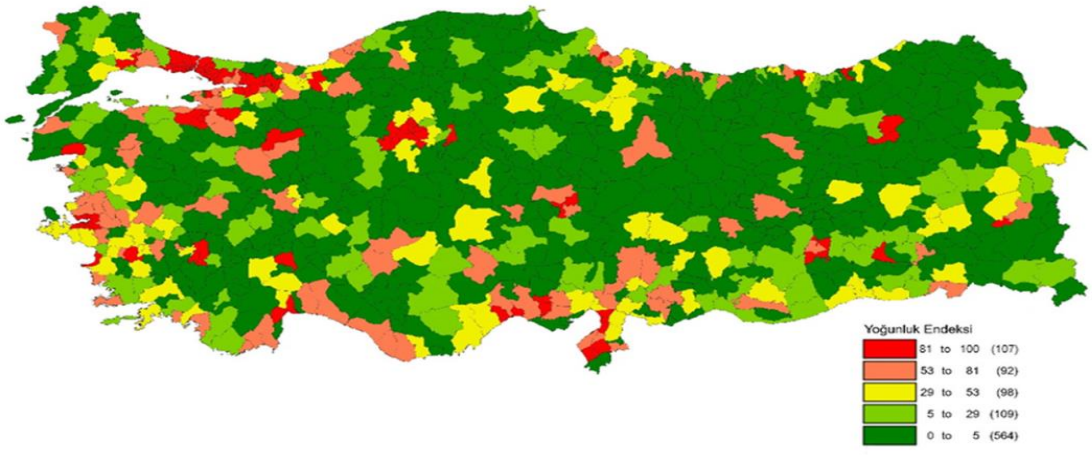

Figure 9. *Urbanization levels of districts in Türkiye - The map exhibits a transition from green to red. The green color indicates a low level of urbanization, while the red color signifies a high level. "yoğunluk endeksi" in the legend means "density index" (Sarı et al., 2019, p.31).*

The research conducted by Sarı et al. (2019) reveals that, although there are districts with higher urbanization levels throughout Türkiye, those with higher urbanization levels are predominantly located in the western and northwestern parts of the country. Similar findings parallel to this research are encountered in the current study. The map also indicates that the highest urbanization rates are along the coast of the Sea of Marmara, highlighting Istanbul's unparalleled urbanization. As understood from the map, urbanization rates are higher in districts located along the seaside. It is also evident from the map that urbanization is directly associated with port activities, tourism, and industry.

4. DISCUSSION and CONCLUSION

The aim of this research is to understand which urban functions play a significant role in the relationship between urbanization and educational inequalities. To achieve this objective, a model was developed through stepwise linear regression analysis on the Provincial Life Index dataset provided by the Turkish Statistical Institute (TÜİK). Cities were then divided into two groups based on academic achievement levels, and discriminant function analysis was conducted. Finally, cluster analysis was performed to understand which urban functions may be influential in the formation of groups among cities. The data obtained from three different analysis methods were compared to reach conclusions.

The initial finding of the research indicates a strong association between urbanization and academic achievement. Particularly, variables such as infant mortality rate and the presence of indoor toilets within housing, serving as indicators of rural areas, suggest lower educational achievement in provinces where rural life is prevalent. This finding is in line with existing research demonstrating lower educational achievement in rural areas compared to urban areas (Cornelius & Mackey-Smith, 2022; Erdoğan et al., 2010; Forster, 2006; Guenther, 2013; Han et al., 2015; Perlín, 2010). However, previous studies have linked the lower quality of education with the conditions of schools, insufficient numbers of teachers, and the socio-economic and cultural levels of students. In this research, it is highlighted that different regional factors may also be associated with the quality of education. It is understood that in these regions with high infant mortality rates, people are also dissatisfied with their health. Additionally, the proportion of highly educated individuals is significantly low in these areas. In other words, it is evident that social services other than education and health and reproductive services are not adequately provided in these regions.

This situation is recognized in the literature as a sign of the concentration of poverty in specific areas (Collier & Venables, 2014; Ooi & Phua, 2007). Additionally, it is noted that in areas where poverty is concentrated, there is also a tendency towards class homogenization. Consequently, it is argued that in regions where services such as education and health are insufficient, there is a lack of middle-class individuals with high levels of education who could serve as role models for lower classes and upper classes capable of providing necessary civic engagement for the development of a particular region through their personal connections (Sykes, 2011; Sykes & Musterd, 2011). The absence of educated middle classes to serve as role models for the lower classes and the absence of upper classes who could potentially facilitate access to educational opportunities in the region also contribute to the low quality of education. Additionally, the high number of foreign migrant populations in southeastern provinces where infant mortality rates are highest may also have an impact. It is possible that in some provinces in this region, such as Kilis, the number of foreign migrants exceeds the number of locals, and these impoverished migrants have significantly low educational levels (Koca & Altınoluk, 2022). Çavuşoğlu (2016) argues that services in these provinces are deliberately kept inadequate because individuals in these provinces with low life satisfaction rates are encouraged to migrate to highly urbanized provinces to provide the labor force needed by the industry, which is seen as a policy. However, in this research, it is observed that highly educated individuals are concentrated in certain provinces. This finding aligns with the results in the literature indicating migration to regions offering higher-quality education due to the demand for better education (Forster, 2006; Lu et al., 2023, 2023; Rahman, 2010; Rutz & Balkan, 2022), but this research shows that the migration of highly educated individuals is not solely driven by the pursuit of quality education. Highly educated individuals are observed to concentrate particularly in provinces where indicators such as social and health services are also high. In other words,

highly educated individuals prefer to live in regions with high life satisfaction values. It is understood that this situation also has implications for academic achievement.

On the other hand, the findings obtained in the research also demonstrate that there is not a linear relationship between the level of urbanization and the quality of education. In other words, it is not possible to speak of an increase in academic achievement as urbanization levels rise. For instance, in the research, the indicator with the highest impact level in various analysis types, rooms per person, shows that academic achievement is not necessarily high in cities with high population density and slum areas. In the literature, the relationship between the rooms per person variable and urban areas is explained by the need to accommodate more labor force in urban spaces, leading to smaller homes or allowing for the formation of numerous slums around city centers (Buğra, 2018; Curley, 2005; Davis, 2020; Moomaw & Shatter, 1996). While city centers attract a large number of people by generating job opportunities, they often struggle to provide adequate services for the growing population. This is reflected in education through overcrowded classrooms, difficulties in teacher employment, and low academic achievement (Croft, 2004; Crowder & South, 2003; Sykes & Musterd, 2011). This situation, although not as prevalent as in areas where rural life is common, also indicates a low quality of education in provinces with high levels of urbanization.

This situation can be considered as an indication of the overurbanization problem occurring in certain cities in Türkiye. Particularly, the statistical significance of a variable such as the rate of fatal and injury traffic accidents, which is not directly related to educational studies, also helps explain this situation. In provinces where the number of fatal and injury traffic accidents is high, indicators such as life expectancy at birth, forest area per square kilometer, the number of highly educated individuals, and life satisfaction are also observed to be high. Based on Asırdizer's (2014) findings, it is understood that there is also a high number of vehicles in these regions. In other words, it is understood that affluent and educated individuals settle in coastal cities near the Aegean and southwestern coasts. As expressed by Lefebvre (1991) and elaborated by Harvey (2020), cities in Türkiye are becoming homogenized according to their functions, and the affluent prefer holiday and leisure spaces for settlement purposes. This type of settlement likely plays a role in the increase in academic achievement in these areas.

In conclusion, it is understood that the level of urbanization is a significant phenomenon in terms of educational outcomes, and an increase in the quality of education can be expected with the increase in the level of urbanization in a region. However, the study also demonstrates that urbanization is not the sole actor. While planned and balanced urbanization is understood to increase life satisfaction and academic achievement, unplanned urbanization occurring as uncontrolled population growth will undoubtedly lead to deep stratification among provinces and districts and significant education inequalities. The research highlights that regions with high life satisfaction also exhibit high academic achievement, revealing that these regions have lower levels of urbanization compared to cities that serve as centers of trade and industry.

Limitations

The most significant limitation of this study is that the research data is from 2016. It is possible that the data has changed over time. Therefore, the cross-sectional nature of the study is another limitation. Although the analysis methods used in the study were diversified to increase the reliability of the results, the limitation remains that regional factors were not thoroughly examined, and the results were reached in accordance with the generalizing nature of quantitative research methods. It is possible that different cultural factors played a role in the identified differences depending on the regions. Additionally, despite the comprehensive dataset and analysis conducted with data from numerous participants, it is likely that other factors play a role within the concept of urbanization.

Future Delimiters

Based on the findings of this research, it is suggested that longitudinal analyses such as panel data analysis be conducted to reach more precise results. Another suggestion is to use qualitative analysis methods for in-depth examination of regional differences. Conducting phenomenological and ethnographic studies based on the obtained results has the potential to add new variables to the urbanization literature. The research results indicate that the quality of education cannot be corrected solely through improvements in education. Therefore, it is recommended that regional development be achieved through social services, healthcare services, and infrastructure investments. At this point, strategies should be developed and followed by local administrators such as mayors, district governors, and governors rather than education management authorities and local school administrators. Measures at the level of the Ministry of Health are seen as a necessity for addressing issues such as infant mortality rate and dissatisfaction with health. Furthermore, considering that the research was conducted in the context of Türkiye, similar studies conducted in countries with different levels of development while adhering to the same principles may yield different results and help discover measures that can be considered as role models.

Declaration of Interest

The authors declare that there is no conflict of interest regarding the publication of this research study. The research is conducted independently, and the authors have no affiliations with organizations or entities that might have a vested interest in the findings.

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UZUN ÖZET

1.GİRİŞ

Bu çalışma, Türkiye illerindeki eğitim başarısını etkileyen kentleşme ve sosyoekonomik faktörlerin rolünü araştırmaktadır. Eğitim eşitsizlikleri, yalnızca bireysel veya sosyoekonomik göstergelerle değil, aynı zamanda mekansal ve kentsel süreçlerle de ilişkilidir. Kentleşme, sosyal, ekonomik ve çevresel koşulları dönüştürerek eğitim olanakları üzerinde çeşitli etkiler yaratmaktadır. Türkiye'nin farklı illeri arasındaki eğitim başarı farklarının kentleşme süreci ve ilgili göstergelerle nasıl şekillendiğini anlamak, bu çalışmanın temel amacını oluşturmaktadır.

Türkiye İstatistik Kurumu'nun (TÜİK) 2016 yılında yayımladığı İllerde Yaşam Endeksi verilerine dayanan bu araştırma, Türkiye'deki iller arasında kentleşme düzeylerine bağlı olarak ortaya çıkan eğitim eşitsizliklerini incelemektedir. Eğitim başarısındaki bölgesel farklılıklar, yalnızca bireysel çabalarla açıklanamaz; kentleşmenin sağladığı altyapı, sosyal hizmetler ve ekonomik fırsatlar da bu sürecin önemli bir parçasıdır. Bu çalışma, eğitimdeki eşitsizliklerin nedenlerini derinlemesine inceleyerek, kentleşmenin eğitim üzerindeki etkilerini kapsamlı bir şekilde analiz etmektedir.

Önceki araştırmalar, kentsel ve kırsal bölgeler arasındaki eğitim farklarının temelinde sosyoekonomik koşulların yattığını ortaya koymuştur. Eğitimdeki farklılıkların kentleşme ile ilişkisi ise genellikle kentleşme düzeyinin eğitime erişim olanaklarını artırması üzerinden açıklanır. Ancak bu çalışmada, kentleşmenin etkisi daha geniş bir perspektiften ele alınmış, sadece fiziki ya da ekonomik koşullar değil, kentsel mekandaki sosyal dinamiklerin de etkisi araştırılmıştır.

2. YÖNTEM

Bu araştırma, TÜİK'in 2016 İllerde Yaşam Endeksi verilerini kullanarak yapılmıştır. Veri seti, konut, istihdam, gelir ve sağlık gibi yaşam kalitesini ölçen 41 farklı göstergeyi içermektedir. Araştırmada, illerin Ortaöğretime Geçiş Sınavı (TSE) ortalama puanları bağımlı değişken olarak ele alınmış, 39 farklı gösterge ise bağımsız değişken olarak değerlendirilmiştir. Araştırmada kullanılan analiz yöntemleri arasında aşamalı doğrusal regresyon analizi, ayırıcı fonksiyon analizi ve küme analizi yer almaktadır.

Aşamalı doğrusal regresyon analizi, illerin eğitim başarısı ile kentleşme göstergeleri arasındaki anlamlı ilişkileri belirlemek amacıyla kullanılmıştır. Bu analiz, iller arasındaki eğitim başarı farklarını açıklamada önemli rol oynayan faktörleri ortaya koymuştur. Ardından, iller TSE başarılarına göre iki gruba ayrılmış ve ayırıcı fonksiyon analizi gerçekleştirilmiştir. Bu analiz, iller arasındaki farklılıkların hangi göstergelere dayandığını anlamak için yapılmıştır. Son olarak, küme analizi kullanılarak iller arasındaki gruplandırma süreçleri ve bu süreçleri belirleyen değişkenler incelenmiştir.

3. Bulgular, Tartışma ve Sonuç

Araştırmanın bulguları, kentleşmenin eğitim başarısı üzerinde önemli etkiler yarattığını açıkça ortaya koymaktadır. Aşamalı doğrusal regresyon analizinde, kişi başına düşen oda sayısı, trafik kazası oranı, yükseköğretim mezunu oranı ve konutlardaki tuvalet bulunma oranı gibi değişkenlerin eğitim başarısı ile pozitif ilişkili olduğu tespit edilmiştir. Bu göstergeler, illerin yaşam kalitesini ve dolayısıyla eğitimdeki başarıyı belirlemede kritik rol oynamaktadır. Özellikle kişi başına düşen oda sayısının yüksek olduğu illerde, eğitimde daha yüksek başarı oranları gözlemlenmiştir. Aynı zamanda, yükseköğretim mezunu oranının da öğrencilerin eğitim performansı üzerinde güçlü bir olumlu etkiye sahip olduğu görülmüştür. Buna karşın, bebek ölüm oranı, işsizlik oranı ve sağlık memnuniyeti gibi değişkenlerin, eğitim başarıları üzerinde olumsuz etkileri olduğu saptanmıştır.

Ayırıcı fonksiyon analizine göre, iller arasındaki eğitim başarı farklarını belirleyen en önemli değişkenler, yükseköğretim mezunu oranı ve bebek ölüm oranıdır. Türkiye'nin doğu ve güneydoğu bölgelerinde, yüksek bebek ölüm oranlarının düşük eğitim başarıları ile doğrudan ilişkili olduğu görülmüştür. Bu bulgular, sağlık hizmetlerine erişim ve sosyal hizmetlerin eksik olduğu bölgelerde eğitimdeki başarısızlıkların artabileceğini göstermektedir. Ayrıca, bölgeler arası farklılıkların derinleşmesinde kentsel altyapı ve sağlık hizmetlerinin eksikliği önemli rol oynamaktadır.

Kümeleme analizi ise, kişi başına düşen oda sayısının illerin eğitim başarısını açıklamada en önemli faktörlerden biri olduğunu ortaya koymuştur. Bu bulgu, kentleşmenin yaşam kalitesi ile doğrudan ilişkili olduğunu ve eğitim başarılarının bu göstergelerle bağlantılı olarak değiştiğini göstermektedir. Kentleşmenin yarattığı olanaklar eğitim başarısını olumlu yönde etkilemekle birlikte, aşırı kentleşmenin de eğitim üzerinde olumsuz etkiler yaratabileceği tespit edilmiştir. Örneğin, trafik kazalarının yoğun olduğu illerde, eğitim başarılarının düşük olduğu gözlemlenmiştir. Bu durum, kentleşmenin eğitim üzerindeki karmaşık etkilerinden biri olarak değerlendirilebilir.

Araştırmanın genel bulguları, Türkiye'deki eğitim eşitsizliklerinin yalnızca eğitim sistemine bağlı olmadığını, aynı zamanda kentleşme ve sosyoekonomik koşulların da önemli rol oynadığını göstermektedir. Planlı kentleşme, altyapı yatırımları ve yaşam kalitesini artıracak sosyal hizmetlerin yaygınlaştırılması, eğitim eşitsizliklerini gidermede kritik bir rol oynayabilir. Özellikle kırsal bölgelerde sağlık hizmetlerine ve sosyal hizmetlere erişimin artırılması, eğitimde başarıyı destekleyecek önemli adımlardan biridir. Kişi başına düşen oda sayısı, eğitimde başarıyı etkileyen en önemli faktörlerden biri olarak öne çıkarken, yaşam kalitesinin yükseltilmesi de eğitimde eşitlik ve başarıyı artıracaktır.

Sonuç olarak, kentleşmenin planlı ve dengeli bir şekilde gerçekleştirilmesi, eğitimde başarıyı artırmak ve eşitsizlikleri gidermek için kritik bir öneme sahiptir. Türkiye'deki iller arasındaki eğitim farklarının azaltılabilmesi için sosyoekonomik ve mekansal faktörlerin dikkate alınarak planlanması gerekmektedir. Eğitim başarısının artırılması, sadece eğitim politikalarının değil, kentleşme ve sosyal hizmet politikalarının da bir arada ele alınmasını gerektirmektedir. Kentleşme düzeyi yüksek olan illerde yaşam kalitesinin artmasıyla birlikte eğitim başarısında da artış gözlemlenmiştir. Ancak aşırı kentleşmenin getirdiği yoğun nüfus ve altyapı eksiklikleri gibi unsurlar eğitim kalitesini olumsuz etkileyebilmektedir. Bu bulgular, Türkiye'nin eğitim politikalarının gelecekteki yönelimleri için rehber niteliğindedir ve eğitimde fırsat eşitliğini sağlamada etkili sonuçlar doğurabilir.

ARAŞTIRMANIN ETİK İZNİ

Bu çalışmada "Yükseköğretim Kurumları Bilimsel Araştırma ve Yayın Etiği Yönergesi" kapsamında uyulması gerektiği belirtilen tüm kurallara uyulmuştur. Yönergenin ikinci bölümü olan "Bilimsel Araştırma ve Yayın Etiğine Aykırı Eylemler" başlığı altında belirtilen eylemlerden hiçbiri gerçekleştirilmemiştir.

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Yazar 1: Araştırmanın tasarlanması, veri analizi, raporlaştırma.

Yazar 2: Yöntemin belirlenmesi, danışmanlık

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this research study. The research is conducted independently, and the authors have no affiliations with organizations or entities that might have a vested interest in the findings.