

# Statistical Analysis of the Factors Affecting Student Exam Success 

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#### Abstract

This study aims to investigate the effects of economic, social and personal factors on students' exam success. The data used in the study were taken from the website kaggle.com. In this data set, there are variables such as gender, ethnicity, parental education level, lunch, exam preparation course, math score, reading score and writing score of 1000 university students. The data set of the study were analyzed using the Mann-Whitney U test and the Kruskal-Wallis H test. As a result of the analysis; According to gender, it was concluded that students' exam success is different from each other, the exam preparation course increases the exam success, regular nutrition increases the exam success, the increase of the education level of the parents increases the exam success and ethnicity is an important factor on the exam success. Another important result of this study is; The fact that the mathematics exam scores of the students whose parents are graduates of colleges (branded high schools) are statistically different from the students whose parents are high school graduates. Also, there was no statistically significant difference between the mathematics scores of the students whose parents were college graduates and the students whose parents graduated from associate, undergraduate and graduate degrees. Based on all these results, it was concluded that the effect of high school brands like colleges on students' mathematics achievement is higher than reading and writing classes. Students who want to increase their mathematics achievement may be advised to choose colleges instead of high schools.


## 1. Introduction

Reading habit is one of the most basic features that should exist in human beings. This feature is expected to have been gained by students in conditions where academic success is determined by exams today. As stated in Yılmaz (2012), students who love to read and have made a habit of reading books have higher grade point averages and are more successful academically. However, when the previous studies are examined, the general opinion is that the reading habit can not turn into a personality trait for students in all segments of education. For academic success, it is extremely important to be able to read and understand what you read and even express it in writing. Academic success needs to be able to read, understand what you read and even express it in written form.

[^0]The motivation to be developed about reading will also be important in ensuring the achievement of academic success, as it will provide students with the development of reading comprehension. From an early age, it is necessary to develop reading habits and reading comprehension skills with reading activities on subjects that will arouse curiosity in students.
Mathematics lesson has always preserved its importance in education life from past to present, and it comes to the fore with learning problems. These problems are observed in different ways from primary school to university, but in all semesters and most of the students. Numerous academic studies have been conducted to eliminate these problems and investigate ways to increase success in a mathematics lesson and determine the reasons for failure. Before this study, a literature review was conducted on a small part of the studies conducted to improve the negative image created by investigating the reasons for reading/writing skills and mathematics course success/failure.
Önal (2013), A significant portion of the students in Turkey that has difficulty understanding mathematics, mathematical topics in feeling anxiety, develop a negative approach to mathematics, Baykul (2005), according to; This negative approach indicates that it started to develop in the primary school years and continued increase in the following education years. Bekdemir et al. (2004), it is stated that the teacher factor is one of the most important causes of fear that develops in Mathematics courses. Özsoy and Yüksel (2007), on the other hand, state that there is a false belief in the society that mathematics can only be done by intelligent individuals and consequently, students who have not succeeded in mathematics lessons prefer to think that they are not intelligent. Thomson et al. (2003), the factors that determine mathematics course learning, students 'attitudes and characteristics (gender, family structure, individual abilities, socioeconomic status), teachers' attitudes and characteristics (age, gender, experience, thoughts about mathematics), They made it clear as the physical facilities of the school (Savaș, Taş, \& Duru, 2010).
According to Duran and Çeliköz (2017); In their studies where they examined the effects of teachers' behavior on mathematics course achievement (in line with the opinions of 8 th-grade students), they stated that mathematics teachers were very effective in learning, liking and achieving success in a mathematics lesson, respecting the rights of students, appreciating, encouraging, entertaining, joking. They say that the profile of teachers who are friendly, sincere, fair and able to use different methods and techniques is effective in being successful. While Hotaman (2012) describes a good teacher who can positively affect success in mathematics class, he has high communication skills, enthusiastic, social personality, tolerant, patient, open-minded, adaptable, loving, understanding, humorous, and hardworking. Hotaman also stated as the intellectual one encourages, encourages, supports the student, is democratic, open to innovation and change. In a study conducted by Şimșeker (2005) with 8th-grade students in different cities, it was concluded that the students who had leadership, helping, friendly approach and understanding as teacher behavior exhibited positive approaches in a mathematics lesson. The same study revealed that teachers' behaviors of uncertainty,
dissatisfaction, giving advice, trying to be harsh and disciplined, on the other hand, displayed negative attitudes towards mathematics lessons.
Durdun and Dede (2004), stated that there were too many factors affecting students' success and failure in a mathematics lesson and they were in constant interaction with each other. As a result of their study, it was determined that the most important factor in students' mathematics success was listening to the lesson well, and the least important factor was gender. Multi-disciplinary work, mathematics curriculum, teacher competencies, and students' socioeconomic levels are also effective for success.

Yalçınkaya (2016), in his study that he developed the causes of mathematics course failure scale, and stated that the causes of failure scale consisted of an eightfactor structure. He stated that negative thoughts are determined as student, family, teacher, school/environment, curriculum/program, productive work and lesson factors.

Cumhur (2018) states that mathematical achievement is affected by too many factors and in line with the opinions of teachers as the reasons for these; Student, family, teacher, curriculum, learning environment, school type, extra-school auxiliary courses, time devoted to learning and technological opportunities will be shown. Similar results were obtained with different studies and they were stated in the study: Beyaztaş and Senemoğlu, 2015, Kiwanuka et al, 2015, Savaş, Taş and Duru, 2010, Şengül, Kaba and Erdoğan, 2017, Yenilmez and Duman, 2008, etc. success in mathematics (depending on the characteristics of students) consists of subjects related to intelligence, anxiety, and background. Most of the studies emphasize that anxiety and attitude are effective in success/failure in mathematics. Yenilmez and Özbey (2006) stated that students with high mathematics achievement often have low levels of anxiety. Altun (2005) and Yıldırım (2008) observed a student behavior avoiding mathematics for fear of making mistakes.

Demir and Kıliç (2010), according to their studies, that the high level of morale of students can have positive effects on achieving success in a mathematics lesson. Keeping the morale of the students at a high level and developing positive emotions may increase their motivation if they are made willing to mathematics lessons. In addition to these, friendship environment, gender, eating habits and so on. Factors are also qualities that can be indirectly influential in success, although not directly. Beyaztaş and Senemoğlu, 2015, Güleç and Alkıș, 2003, Metin, 2013 etc. Studies have also examined these effects. The effects of families' educational status and income levels on the success of students have also been the subject of academic studies. According to Metin, 2013, Savaş, Taş and Duru, 2010, Yenilmez and Duman, 2008; The variables that are thought to be effective in achievement are factors such as methods used by teachers, technical possibilities, knowledge about the subject, adequacy of teaching, class mastery, communication ability, assigning homework and performing control. Peker and Mirasyedioğlu (2003) think that the application of teaching models, which can be found interesting by teachers in the process of mathematics lessons, will enable the student to establish a relationship between the lesson and daily life, and naturally, this may increase the success in the lesson. The information about the success of the students as a
result of loving their teacher is included in the study of Beyaztaş and Senemoğlu (2015). Communication between teacher and student is extremely important. It can be thought that students will be more sincere to teachers who show interest and empathize with them. Yenilmez and Duman (2008) emphasized the importance of learning environments in determining mathematical achievement by expressing the view that the classroom environment, class size, and physical conditions can affect achievement. Özer and Anıl (2011) stated in their studies that the correct use of technology (computer, programs, etc.) increases the success in mathematics, but the use of technology outside of its purpose can lead to failure by shortening the time spent on study.
Kesici (2018) analyzed the effect of high school students 'mathematics motivation on mathematics achievement and stated that motivation towards mathematics can be defined as students' enthusiasm for mathematics learning and their participation in mathematical topics and applications. Spir, Ay, Saygı 2011, Eklöf 2007, Bıçak, Aşılığlu 2017, Üredi, Üredi 2005, Yıldırım 2011 also support this situation in their studies. The study states that low motivation towards mathematics will cause apathy and a low level of participation towards learning mathematics and this situation will cause the mathematics lesson to become meaningless and negative attitude towards the course over time. The study states that it is necessary to listen to the lesson, to do repetitions, to do homework regularly, and to participate in mathematical activities in high school mathematics education, and mentions how important the effort of the student is in mathematics success.

In the study of Huyut and Keskin (2017); they say that students can be more successful if the language used by their teachers is found understandable as a result of their studies, which they try to determine the factors that cause success in mathematics and the effects of environmental factors through multiple adaptation analysis. They stated that students who do not have a room and physical means to work have less sympathy towards mathematics and that the physical facilities of schools have a positive relationship with success. Among the environmental factors, it was determined that their friends and teachers were quite effective, and female students were affected more by these factors.
Aydemir et al. (2020), in their studies, determined that first school undergraduate students and the compulsory mathematics course have an advantage in mathematics course success for university students. It has not been determined that the title of the lecturer giving the course and the order of preference of the students have no significance. It was stated that students with high university placement scores also have high mathematics achievement. The study suggests that students' motivation should be increased to increase their mathematics achievement.

Atess (2013) found that female students have higher levels of awareness in reading strategies than male students. Based on the studies conducted, the results of girls' being more successful than boys in the results of PISA, PIRLS, YGS, and TEOG and their high level of awareness in reading strategies found that they are compatible with each other. It can be said that there is a relationship between the level of awareness in reading strategies and test scores (Kilinc, 2020: 69).

Alan (2020) mentions that the development of reading skills is important in terms of the development of one's ego and establishing healthy relationships with the society in which they live, and reading is a process of making meaning. During this process, the reader creates effective communication between the author and the author by making use of the information formed in his mind. (Akyol and Yılmaz, 2010). Kızgın and Baștuğ (2020) state that the environment in which the reading act takes place (environment, class, student's socio-cultural characteristics, etc.) guides the reader's comprehension process (Angry, Baştuğ, 2020: 602-603) (Alan, 2020).

Belet and Yaşar (2007), in their study, tried to explain the meaning of reading and writing skills and these concepts with other academic studies. Speaking and listening are features that can be acquired outside of school, but reading and writing skills can be gained by educational institutions. Reading skill is the process of perception and comprehension of a text, words, sentences, punctuation marks (Oğuzkan, 1987: 37). Reading is the process of extracting meaning from written symbols, and when meaning is reached, the individual identifies himself with the communicated concept. They mention that their previous knowledge, familiarity with the subject, cultural level, life experiences will affect both understanding and interpretation. Since all of these factors vary according to the individual, it can be said that the reading experience is also individual (Carter et al. 2002: 136). Reading consists of two main components: gaining the habit of reading, understanding the reading and gaining the power to evaluate it. At the primary and secondary school stage, understanding the reading with Turkish lesson, finding a suitable title for the text, finding the main idea of the text, finding supportive ideas that support the main idea, being able to explain the text by staying true to its essence, finding cause and effect relationships, etc. is aimed. (Demirel, 2002: 79, Tekin, 1980: 80).

Writing; an individual can express his speech and thoughts in writing (Özdemir, 1987: 77). Writing consists of processes that involve collecting and expressing information. (Carter et al, 2002: 246). Writing helps people learn while meeting their communication needs. The development of writing ability in students enables them to go beyond what they have learned by applying the information they have learned. Students whose writing ability improves, while controlling their thinking skills are ensured, they become to use learning processes effectively by using their minds continuously. (Raimes, 1983). Studies involving the high-level relationship between the result of reading comprehension and academic achievement also support this judgment. (Demirel, 1992: 325). In the study of Egelioğlu (1993: 229), he points out that a person's learning at the level of knowledge is interpreted by looking at the reading comprehension level of the person and that no matter how much time he devotes to learning if the level of reading comprehension is not high, he will not be successful in learning above the level of knowledge.

Finally, Soykan's (2016) study conducted a study on Science High Schools, which were perceived as successful from a broad perspective. The promotions, marketing practices and advertising activities carried out by the institutions in the field of education are not taken into consideration by the parents. It has been observed that when parents who have experience or knowledge about schools come to the
stage of determining a school, they send their children to their schools, where they experience success. Or in the Soykan study, it has been observed that families send their children to schools where they have long been informed about their region and their achievements.

At the same time, as a result of his work, parents' images about the Science High School, having academic success, competent in terms of teaching staff, successful student profile, interested and supportive, etc. are listed as.

This study aims to investigate the effects of various factors such as economic, personal and social characteristics on student examination performance. For this purpose, the following questions were sought in the study:

- Is there a difference between gender and exam performance?
- Does Ethnicity have an impact on exam performance?
- Do exam preparation courses have an impact on exam performance?
- Does eating lunch at regular standards affect students' exam success?
- Does the education status of the parents have an impact on test performance?
- Is there a difference between the exam performances of the children who graduated from colleges (high schools that can be qualified as brands) and the children of the parents who graduated from public high schools?


## 2. Method and Data Set

In this study, the factors affecting the exam success of university students were analyzed using the Mann-Whitney U test and the Kruskal-Wallis test.

### 2.1. Mann-Whitney U Test

The Mann-Whitney $U$ test is used for random samples drawn independently of two main populations. This non-parametric test is an alternative to the $t$ test of two independent samples (Çakıcı, Oğuzhan, Özdil, 2017: 367). In this test, ranking scores are used instead of real observations. Ranking scores are calculated by transforming the two samples into a single observation series. The sum of the ratios of these ranking scores for the $n_{1}$ sample is $R_{1}$ and the sum of the ratios of the $n_{\mathbf{2}}$ sample is $R_{\mathbf{2}} . U_{\mathbf{1}}$ and $U_{\mathbf{2}}$ test statistics are calculated as in equation (1) by using unit numbers and total ranking scores (Özdamar, 2013: 428).

$$
\begin{align*}
& U_{1}=n_{1} * n_{2}+\frac{n_{1}\left(n_{1}+1\right)}{2}-R_{1} \\
& U_{2}=n_{1} * n_{2}+\frac{n_{2}\left(n_{2}+1\right)}{2}-R_{2} \tag{1}
\end{align*}
$$

As a result of the calculations, if $U_{1}<U_{2}, U=U_{1}$ and if $U_{1}>U_{2}$, then $U=U_{2}$. Also, if $n_{1}>20$ and $n_{2}>20$, the significance of $U$ is found using the normal approximation. For this, the mean and standard deviation ( $\mu_{U}, \sigma_{U}$ ) are found and the test statistics are calculated as in equation (2) (Özdamar, 2013: 428).
$z=\frac{U-\mu_{U}}{\sigma_{U}}=\frac{U-\left(n_{1}\right)\left(n_{2}\right) / 2}{\sqrt{\frac{\left(n_{1}\right)\left(n_{2}\right)\left(n_{1}+n_{2}+1\right)}{12}}}$
When the Mann-Whitney test is performed, the following hypotheses are tested.
$H_{0}=$ The means of the distribution with two populations are the same.
$H_{1}=$ The means of the distribution with two populations are different.

### 2.2. Kruskal-Wallis H Test

The nonparametric Kruskal-Wallis H test is used to determine whether three or more groups of samples are taken from the same population. The Kruskal-Wallis H test is the non-parametric counterpart of one-way analysis of variance (Bayram, 2012: 122) and is used when one-way analysis of variance assumptions are not met.

The basic assumptions of the Kruskal-Wallis H test are:

- The examined variable must have a continuous distribution.
- The analyzed variable should be at least at the level of the ranking scale.

The hypotheses of the Kruskal-Wallis H test are as follows.
$H_{0}=$ The populations are similar
$H_{1}=$ The populations are not similar
If the basic hypothesis is correct, then the rows between the groups must be randomly distributed.

### 2.3. Data set

The data used in this study were taken from kaggle.com (https://www.kaggle.com/spscientist/students-performance-in-exams). In this data set, which includes information about 1000 university students in total, the variables of the students' gender, ethnicity, education level of the parents, whether they have eaten their lunch as standard, whether they take an exam preparation course, math score, reading score and writing score.

## 3. Findings

In the study, the distribution of mathematics, reading and writing scores were primarily examined and it was seen that these three variables did not fit the normal distribution. For this reason, the nonparametric Mann-Whitney U test was used to test whether there was a statistically significant difference between the group averages in terms of gender.

### 3.1. Mann-Whitney U Test Results

Descriptive statistics obtained as a result of the analysis are given in Table 1.
Table 1: Exam Scores Descriptive Statistics

| Dependent Variable | $\mathbf{N}$ | Mean | Std. Deviation | Minimum | Maximum |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Math Score | 1000 | 66,0890 | 15,16308 | , 00 | 100,00 |
| Reading Score | 1000 | 69,1690 | 14,60019 | 17,00 | 100,00 |
| Writing Score | 1000 | 68,0540 | 15,19566 | 10,00 | 100,00 |

According to the results in Table 1, the average of students' reading scores was found to be the highest, and their math score averages were the lowest. In this case, students' reading and writing exam success are higher than mathematics. In other words, students are more successful in verbal exams than quantitative exams.

Table 2: Descriptive Statistics of Exam Scores by Gender

| Dependent Variable | Gender | $\mathbf{N}$ | Mean Rank | Sum of Ranks |
| :---: | :---: | :---: | :---: | :---: |
| Math Score | Female | 518 | 455,96 | 236189,50 |
|  | Male | 482 | 548,36 | 264310,50 |
| Reading Score | Female | 518 | 569,36 | 294929,00 |
|  | Male | 482 | 426,50 | 205571,00 |
| Writing Score | Female | 518 | 587,60 | 304377,50 |
|  | Male | 482 | 406,89 | 196122,50 |

According to the results in Table 2, men are more successful than women in mathematics lessons according to gender. On the other hand, women are more successful in reading and writing than men. From here, it can be said that men are superior to women in terms of numerical intelligence and women are superior to men in terms of verbal intelligence.

Table 3: Mann-Whitney Test Statistics by Gender

|  | Math Score | Reading Score | Writing Score |
| :---: | :---: | :---: | :---: |
| Mann-Whitney U | 101768,500 | 89168,000 | 79719,500 |
| Wilcoxon W | 236189,500 | 205571,000 | 196122,500 |
| Z | $-5,056$ | $-7,818$ | $-9,889$ |
| Asymp. Sig. (2-tailed) | , 000 | , 000 | , 000 |

Considering the results of Table 3, the sig. value was less than 0.05 . Therefore, there is a statistically significant difference between the achievement scores of men and women in terms of gender according to the 5\% significance level. In other words, student achievement is different in terms of gender.

Table 4: Descriptive Statistics for Lunch

| Dependent Variable | Lunch | $\mathbf{N}$ | Mean Rank | Sum of Ranks |
| :---: | :---: | :---: | :---: | :---: |
| Math Score | Standard | 645 | 572,73 | 369412,00 |
|  | Free | 355 | 369,26 | 131088,00 |
| Reading Score | Standard | 645 | 547,57 | 353183,00 |
|  | Free | 355 | 414,98 | 147317,00 |
| Writing Score | Standard | 645 | 551,51 | 355724,00 |
|  | Free | 355 | 407,82 | 144776,00 |

According to Table 4, the test scores of those who eat lunch standard (those who eat lunch every day) are higher than those who sometimes eat lunch (who do not always eat lunch). Therefore, it can be said that regular nutrition increases student exam success.

Table 5: Mann-Whitney U Test Statistics for Eating Lunch

| Table 5: Mann-Whitney U Test Statistics for Eating Lunch |  |  |  |
| :---: | :---: | :---: | :---: |
|  | Math Score | Reading Score | Writing Score |
| Mann-Whitney U | 67898,000 | 84127,000 | 81586,000 |
| Wilcoxon W | 131088,000 | 147317,000 | 144776,000 |
| Z | $-10,663$ | $-6,949$ | $-7,530$ |
| Asymp. Sig. (2-tailed) | , 000 | , 000 | , 000 |

Considering Table 5, according to the $5 \%$ significance level sig. value was found to be less than 0.05 . For this reason, there is a statistically significant difference between the exam scores of the students who have a standard lunch and the exam scores of the students who have irregular lunch.
Table 6 contains the statistics of the students who completed the test preparation course and did not attend any preparatory course.

Table 6: Descriptive Statistics of the Test Preparation Course

| Dependent <br> Variable | Test Preparation <br> Course | $\mathbf{N}$ | Mean Rank | Sum of Ranks |
| :---: | :---: | :---: | :---: | :---: |
| Math Score | None | 642 | 463,90 | 297827,00 |
|  | Completed | 358 | 566,13 | 202673,00 |
| Reading Score | None | 642 | 448,20 | 287742,00 |
|  | Completed | 358 | 594,30 | 212758,00 |
|  | None | 642 | 432,13 | 277430,00 |

Considering Table 6 , the average exam scores of the students who completed the test preparation course were higher than the test average scores of the students who did not complete the course. Therefore, it can be said that the test preparation course increases the success of the exam.

Table 7: Mann-Whitney U Test Statistics by Test Preparation Course

|  | Math Score | Reading Score | Writing Score |
| :---: | :---: | :---: | :---: |
| Mann-Whitney U | 91424,000 | 81339,000 | 71027,000 |
| Wilcoxon W | 297827,000 | 287742,000 | 277430,000 |
| Z | $-5,367$ | $-7,671$ | $-10,026$ |
| Asymp. Sig. (2-tailed) | , 000 | , 000 | , 000 |

Considering Table 7, there is a statistically significant difference between the exam success of the students who completed the exam preparation course and the students who did not complete the exam preparation course (sig. <0.05). In other words, the success of the students who take the exam preparation course and the students who do not are different from each other.

### 3.2. Kruskal-Wallis H Test Results

Since the assumption of normality, one of the basic assumptions of one-way analysis of variance, could not be provided, the Kruskal-Wallis H test was used to find out whether there was a statistically significant difference between three or more groups in the study.

Table 8: Test Statistics According to the Education Levels of the Parents

| Dependent Variable | Parental Education Level | N | Mean Rank |
| :---: | :---: | :---: | :---: |
| Math Score | High school | 375 | 444,40 |
|  | College | 226 | 518,50 |
|  | Associate Degree | 222 | 527,11 |
|  | Bachelor Degree | 118 | 559,93 |
| Reading Score | Master Degree | 59 | 569,13 |
|  | High school | 375 | 437,83 |
|  | College | 226 | 508,49 |
|  | Associate Degree | 222 | 533,35 |
| Writing Score | Bachelor Degree | 118 | 566,28 |
|  | Master Degree | 59 | 613,10 |
|  | High school | 375 | 420,00 |
|  | College | 226 | 517,38 |
|  | Associate Degree | 222 | 531,85 |
|  | Bachelor Degree | 118 | 596,62 |
|  | Master Degree | 59 | 637,27 |

Considering Table 8, when the education level of the parents increased, the exam scores of the students also increased. Therefore, there is a positive correlation between the education levels of parents and student test scores. It was also concluded that math education in branded schools such as colleges is better than high schools.

Table 9: Kruskal-Wallis H Test Results According to the Education Levels of the Parents

|  | Math Score | Reading Score | Writing Score |
| :---: | :---: | :---: | :---: |
| Chi-Square | 25,148 | 34,978 | 58,561 |
| Df | 3 | 3 | 3 |
| Asymp. Sig. | , 000 | , 000 | , 000 |

When Table 9 is examined sig. The basic hypothesis is rejected because the value is less than 0.05 . For this reason, there is a statistically significant difference between the exam scores of the students according to the education level of the parents. Paired comparisons are made to determine which type of education level this difference is due to. Pairwise comparisons were made using the Mann-Whitney U test. Table 10 includes paired comparisons reached with the Mann-Whitney U test.

Table 10: Mann-Whitney U Test Results by Parental Education Level

| Dependent Variable | Parental Education Level | Parental Education Level | Sig. |
| :---: | :---: | :---: | :---: |
| Math Score | High School | College | 0.002* |
|  | High School | Associate Degree | 0.001* |
|  | High School | Bachelor Degree | 0.000* |
|  | High School | Master Degree | 0.002* |
|  | College | Associate Degree | 0.377 |
|  | College | Bachelor Degree | 0.177 |
|  | College | Master Degree | 0.194 |
|  | Associate Degree | Bachelor Degree | 0.347 |
|  | Associate Degree | Master Degree | 0.399 |
|  | Bachelor Degree | Master Degree | 0.778 |
| Reading Score | High School | College | 0.003* |
|  | High School | Associate Degree | 0.000* |
|  | High School | Bachelor Degree | 0.000* |
|  | High School | Master Degree | 0.000* |
|  | College | Associate Degree | 0.377 |
|  | College | Bachelor Degree | 0.071 |
|  | College | Master Degree | 0.011* |
|  | Associate Degree | Bachelor Degree | 0.310 |
|  | Associate Degree | Master Degree | 0.049* |
|  | Bachelor Degree | Master Degree | 0.347 |
| Writing Score | High School | College | 0.000* |
|  | High School | Associate Degree | 0.000* |
|  | High School | Bachelor Degree | 0.000* |
|  | High School | Master Degree | 0.000* |
|  | College | Associate Degree | 0.596 |
|  | College | Bachelor Degree | 0.013* |
|  | College | Master Degree | 0.004* |
|  | Associate Degree | Bachelor Degree | 0.044* |
|  | Associate Degree | Master Degree | 0.011* |
|  | Bachelor Degree | Master Degree | 0.362 |

* It is statistically significant according to the 5\% significance level.

When Table 10 is examined sig. There is a statistically significant difference between the groups whose value is less than 0.05 . On the other hand, in terms of mathematics scores, a statistically significant difference was not found between the mathematics exam success scores of the children of the parents of collegeassociate degree, college-bachelor degree, college-master degree, associatebachelor degree, associate-master degree and bachelor-master degrees. For this reason, it can be said that mathematics education in branded educational institutions such as colleges is better than high schools and increases the success of students.

In terms of reading scores, no statistically significant difference was found between the exam success of the students whose parents graduated from the college-associate degree, college-undergraduate, associate degree bachelor's degree and undergraduate master's degree.

Finally, in terms of writing scores, there was no statistically significant difference between the exam success of the students whose parents were college-associate degree and undergraduate-graduate graduates. Kruskal-Wallis $H$ test was performed to test the exam success according to ethnicity and the results obtained are given in Table 11.

Table 11: Kruskal-Wallis Test Results by Ethnicity

|  | Math Score | Reading Score | Writing Score |
| :---: | :---: | :---: | :---: |
| Chi-Square | 57,079 | 21,354 | 26,609 |
| Df | 4 | 4 | 4 |
| Asymp. Sig. | , 000 | , 000 | , 000 |

Considering Table 11, sig. values were found to be less than 0.05 . For this reason, there is a statistically significant difference between students' success in exams in terms of ethnicity. Therefore, it can be said that ethnicity is an important factor in student success.

## 4. Conclusion

As a result of this study and literature reviews, it was determined that students' mathematics lesson, reading and writing lesson success were related to many variables. These; teacher's attitudes and characteristics, experience, field knowledge, learning environment (physical facilities), students' characteristics (gender, family structure, individual abilities, socio-economic status), motivation towards the lesson, etc. can be summarized as.

In this study, the data obtained from 1000 university students were analyzed and the economic, personal and social factors that affect the student's success in the exam were statistically examined. As a result of the analysis, the following conclusions have been reached.

- Students are more successful in oral exams than quantitative exams.
- There is a difference in the exam success of students in terms of gender.
- Male students are more successful in mathematics lessons than female students.
- Female students are more successful in reading and writing exams than male students.
- Students who regularly eat lunch are more successful than students who do not eat regularly or not at all.
- Students who complete the exam preparation course are more successful in exams than those who do not.
- The higher the education level of the parents, the higher the student's success in the exam.
- There is no difference between the mathematics scores of the students whose parents are college graduates and the students whose parents are associate, undergraduate and graduate graduates. Therefore, it can be said that a high level of education is given in colleges.
- Student exam success is different in terms of ethnicity. So ethnicity is on student exam success

The most important result of this study is that it guides students while choosing a high school and college. According to the results obtained in the study, the mathematics exam success of the children of the college graduate parents is higher than the mathematics exam success of the children of high school graduate parents. This result is a guide for parents and students in their high school and college preferences. Another important result of the study is that ethnicity plays an active role in exam success. In other words, the student's exam success may vary according to ethnicity. As a result, we believe that all the findings obtained in this study will guide educators and parents in providing better education to students.

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