

# Determination of Factors Affecting International Students' Satisfaction Levels Using CHAID Analysis

## Uluslararası Öğrencilerin Memnuniyet Düzeylerine Etki Eden Faktörlerin CHAID Analizi ile Belirlenmesi

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**Abstract:** Internationalization has recently been a core element for higher education institutions (HEIs) worldwide. Various components contribute to internationalization in HEIs. However, international students stand out from the others due to the numerous benefits they provide to host countries. Therefore, HEIs around the world seek to increase the number of international students and enhance their satisfaction levels. This study, inspired by the importance of international students, aims to determine the factors affecting the satisfaction levels of international students who study at a Turkish state university. To achieve this goal, an online survey consisting of 25 questions was administered to a total of 330 international students studying at Middle East Technical University (METU). Survey data were evaluated using CHAID (Chi-Squared Automatic Interaction Detection) analysis. The findings of the analysis indicated that the international students' implications, study degree and gender played a major role in their satisfaction levels. Considering these influential factors as determined by the CHAID analysis, will contribute to the internationalization strategies developed to attract more international students to HEIs.

**Keywords:** International Students, Student Satisfaction, Higher Education, Türkiye, CHAID Analysis

**Özet:** Uluslararasılaşma, son zamanlarda yükseköğretim kurumları için tüm dünyada vazgeçilmez bir unsur haline gelmiştir. Yükseköğretim kurumlarında uluslararasılaşmayı sağlayan pek çok bileşen olmakla birlikte, öğrenim gördükleri ülkeye sağladıkları önemli katkılar nedeniyle uluslararası öğrenciler bu konuda diğerlerine göre daha fazla ön plana çıkmaktadır. Bu nedenle, tüm dünyada yükseköğretim kurumları uluslararası öğrenci sayılarını ve bu öğrencilerin memnuniyet düzeylerini artırma arayışındadır. Uluslararası öğrencilerin taşıdığı önemden yola çıkan bu çalışma, Türkiye'deki bir devlet üniversitesinde öğrenim gören uluslararası öğrencilerin memnuniyet düzeylerine etki eden faktörleri ortaya koymak amacıyla yapılmıştır. Bu amaç için Orta Doğu Teknik Üniversitesinde (ODTÜ) öğrenim gören toplam 330 uluslararası öğrenciye 25 soruluk bir çevrimiçi anket uygulanmış ve anket verileri CHAID analizi ile değerlendirilmiştir. Analiz sonuçları; uluslararası öğrencilerin izlenimlerinin, öğrenim derecelerinin ve cinsiyetlerinin memnuniyet düzeyleri üzerinde önemli bir etkiye sahip olduğunu göstermektedir. CHAID analiziyle ortaya konulan bu faktörlerin dikkate alınması, yükseköğretim kurumlarına daha fazla sayıda uluslararası öğrenci çekmek amacıyla belirlenen ya da geliştirilen uluslararasılaşma stratejilerine katkısı olacaktır.

**Anahtar Kelimeler:** Uluslararası öğrenci, Öğrenci memnuniyeti, Yükseköğretim, Türkiye, CHAID analizi

## 1. Introduction

Internationalization and international students have become increasingly important in recent years as the world has become increasingly interconnected. Although universities have been known as universal education institutions since their first emergence in the 11th century, internationalization of Higher Education Institutions (HEIs)

has become particularly prominent especially after 1990s thanks to the recent advancements in technology providing greater integration and convergence between nations.

Various definitions of internationalization are available in the literature. Among them, the most cited one was Knight's definition of "the process of integrating interna-

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tional, intercultural and global dimensions into the purpose, functions or delivery of postsecondary education institutions and systems” (2004:11). However, this commonly accepted definition was revised and updated by the experts reviewing national reports and Delphi process on the future of Internationalisation of Higher Education in Europe. In this event, the new definition was offered as “the intentional process of integrating an international, intercultural or global dimension into the purpose, functions and delivery of post-secondary education, in order to enhance the quality of education and research for all students and staff, and to make a meaningful contribution to society.” (De Wit et al., 2015:29). The definition implies that various components should be integrated to the structure and the functions of HEIs to achieve internationalization, including but not limited to accreditation, exchange/mobility programs, curricula, medium of instruction (mostly English), collaborations, multicultural campus design, branch campuses and diversification of students and staff. From this, it can be understood that many elements provide internationalization in higher education, however, international students hold a central position among them due to two main reasons. The first one is the academic, economic, political, and social benefit they yield to host countries (Knight, 2021). The second one is that they are still the fundamental output of the higher education system and the leading customers<sup>1</sup> of the HE system (Pereira & Da Silva, 2003). Considering these two facts, countries are attempting to boost the number of international students at their HEIs. Accordingly, there is a clear and gradual increase in the mobility of international students worldwide year by year, which rose to 5.6 million from 2.1 million within a 20-year period between 1998 and 2018 (Education at a Glance, 2020:226). Similar developments have also occurred in Turkish Higher Education. Until the beginning of 2000s, there were only a limited number of international students studying at Turkish universities. However, under the coordination and leadership of the Turkish Higher Education Council, the number of international students in Türkiye gradually increased and reached 301,549 as of the 2022-2023 academic year, making Türkiye one of the countries hosting the most international students (YÖK, 2024). According to the 2018 UNESCO data, Türkiye became the 10th country hosting the highest number of international students in the world (Higher Education Report: Turkey, 2022).

Internationally mobile students are defined by UNESCO Institute for Statistics as “individuals who have physically crossed an international border between two countries with the objective to participate in educational activities in the country of destination, where the country of destination of a given student is different from their country of origin.” (UNESCO, 2023). In *Education at a Glance* (2022:191), international students are defined as “those who left their country of origin and moved to another country for the purpose of study”.

Given the pivotal role of international students in the internationalization of HEIs in the worldwide, their satisfaction and the factors influencing it have become crucial for the institutions seeking to attract more international students to their campuses. While satisfaction is a highly subjective and complex term influenced by various psychological factors, Karamova and Alikberora (2019:1292) defined this term as “a short-term attitude resulting from an evaluation of students’ educational experience, services and facilities”. Due to the importance of the issue, numerous studies have been carried out on international students’ satisfaction levels by various researchers using either qualitative or quantitative methods (Alemu & Cordier, 2017; Henning & Tanabe, 2018; Jiang, Yuen & Horta, 2020; Khan & Hague, 2018; Korobova & Starobin, 2015; Khosravi, Poshaneh, Rouzegar & Sohrabifard, 2013; Ngamkamollert & Ruangkanjanases, 2015; Polat, 2015; Qiting & Qianqian, 2016; Sanal & Takır, 2021; Uddin, Mamun, Soumana & Khan, 2017; Yu & Wright, 2015;). However, our study differs from others in its exploration of the factors influencing international students’ satisfaction levels using CHAID analysis, a quantitative method. It is essential to conduct such studies at regular intervals, as this allows host countries and HEIs to easily monitor international students’ changing expectations and satisfaction levels regarding to host universities and countries. The preferences of students may be affected by a range of factors such as host countries’ foreign policy, economy, approach to foreigners, bureaucracy, and educational system. Therefore, international students’ perspectives regarding their expectations and satisfaction levels should be evaluated regularly, as otherwise international students may easily tend to study in other countries or universities. In this scope, especially longitudinal studies that track international students’ satisfaction levels over time provide a broader and a comprehensive understanding of the dynamic nature of the students’ experiences. his study was originally intended to be conducted as a longitudinal study to explore and understand the direction of the change in the satisfaction levels of the students over time. However, due to some challenges specific to longitudinal studies such as need for repeated data collection, interruption possibility in the follow-ups of the students, increased financial needs or higher costs for the repeated research, and the achieving continuity in funding, this study was carried out as a single study to understand the nature of the satisfaction levels of international students in Turkey.

## 2. Literature Review

Given that international students have been a core element at universities, numerous local and international studies have explored various aspects of this issue in the literature. A recent book has been prepared and published to guide authors and researchers on conceptualizing and employing methodology for research on international students. In that book titled *Research with International Students: Critical Conceptual and Methodological Con-*

<sup>1</sup> The term “Customer” is used as a metaphor in the student focused HEIs to indicate the reflection of marketing approach to higher education sector.

siderations (Eds: J. Mittelmeier, S. Lomer and K. Unkule, 2024), the studies on international students have been accepted a major subfield with thousands of articles in the literature and some critical considerations have been provided on the concerns of international students.

From the initial studies on this field, it was understood that the process currently known as internationalization of higher education was initially referred to by various terms: multicultural education, global education, comparative education, transnational education, borderless education, cross border education (Knight, 2003), off-shore education and intercultural education (De Wit, 2001). According to Knight, internationalization of higher education has a dynamic nature with its components, and this term should be understood as a process of change since the suffix “ization” shows a process. However, this change can evolve some unintended directions over time. The commercialization of international student recruitment and mobility serves as a good example of this phenomenon. At the beginning, the main goal of international student mobility was to support financially the students of nations whose higher education system was negatively affected from their political and economic instability. Such kind of students generally went back to their own countries. However, today, developed or developing countries try to attract the brilliant students from low-income countries to use them for mostly satisfying their national needs and interests (De Souza et al., 2020). De Wit (2022: i). also acknowledged the change in the field and stated that “international education has become an industry, a source of revenue and a means for enhanced reputation”. However, the COVID-19 Pandemic led to serious disruptions in this process, and therefore the traditional function of internationalization (cooperation instead of competition) should be reconsidered (De Wit and Altbach, 2023).

In the literature, there are also studies which only explores international students' satisfaction levels. However, when these studies are reviewed, it will be seen that such studies were generally carried out on the international students who study at certain universities. Namely, Alemu and Cordier (2017) conducted such a study for the international students who study in Korean universities. In their study, they found that “satisfaction in academic and education quality, university's ability to effectively communicate with students before coming to Korea, satisfaction in living arrangements and with Korean food, socializing with Koreans and foreigners, information accuracy received about academic and social life, students' ability to understand Korean language, the number of years the student stayed at current university, and source of economic support such as full or partial scholarships” were the main determinants contributing positively to the overall satisfaction of international students (p. 63). Similarly, Henning and Tanabe (2018) indicated that knowing Japanese language differentiate satisfaction levels of international students who study in Japan. Another study was the one conducted by Khosravi, Poshaneh, Rouzegar and Sohrabifard (2013) on the basis of a certain university.

In this study investigating international students Islamic Azad University from Persia, Tehran, results showed that 7 factors from 12 factors had more impact on student satisfaction of Islamic Azad University: (1) Academic advising effectiveness, (2) Campus support services, (3) Campus life (4) Responsiveness to diverse populations, (5) Safety and Security, (6) Campus climate, (7) financial aid effectiveness (p. 581-582). One more example can be given from Collins, Sanal and Takır's study (2021) which was carried out in a private university in Türkiye. In this study, the authors indicated that international students' satisfaction is affected by several different factors such as perceived quality of teaching, living and support service experiences and scholarships. Another investigation conducted in the same topic is the one performed by Polat in Niğde University, Türkiye (2015). In his study, Polat included and investigated six variable groups as the influential factors: education quality, economic conditions, social life, facilities, and services offered, students' expectations, and empathy for students. The findings of the study revealed that the international students were generally satisfied with the overall service quality offered by the University. In another study, Uddin, Mamun, Soumana and Khan (2017) applied a questionnaire to the international students studying in various Turkish universities located in different cities of Türkiye and identified these five factors affecting students' satisfaction: academic and education quality, personal influence, safety, administrative and staff support of the university, and students' self-preparation. Such a study was also performed by Qiting and Qianqian on the international students in China (2016). In the study, they found six factors influencing student satisfaction in descending order as college reputation, campus environment, academic quality, teaching facilities, logistics service and teacher troop. In line with the similar attempts, Khan and Hague's study (2018) can also be added to these studies. In their study, the authors intended to examine the factors affecting international student satisfaction in Malaysia and found that international students in Malaysian public higher learning institutions treated three factors significant for their satisfaction level: facilities, teaching quality and E-learning. In another study, exploring international students' satisfaction studying in Thai Universities, four factors, namely academic and education quality, financial and economic consideration, administrative and staff support, and image and prestige of the university were found to be affective on students' satisfaction (Ngamkamollert & Ruangkanjanases, 2015). Similarly, Yu and Wright (2015) also conducted a study to explore the satisfaction of higher degree students in Australia and found that the most important issues were related to non-academic factors such as integration into the community, interacting with other students, the provision of adequate desk space and relationships with supervisors. The study conducted by Jiang, Yuen and Horta (2020) can also be categorized under this type of research. These authors studied factors influencing life satisfaction of international students in Mainland China and revealed that international students' satisfaction was influenced by four main domains: (i) the

quality of the courses offered, (ii) the greater use of English language to communicate at all levels, (iii) support services development, and (iv) counseling services. And lastly, Korobova and Starobin (2015:83) who investigated satisfaction among international and local students studying in the USA, found that “the level of academic challenge, student-faculty interaction, enriching educational experiences, supportive campus environment/quality of relationships, and supportive campus environment/institutional emphasis” were the best predictors of students’ satisfaction.

As seen in the above accounts, various factors were identified as influencing factors on international students’ satisfaction who studied in various countries. All these studies were performed using factor analysis, explanatory data analysis, regression, or correlation analysis to explore associations between variables. However, beyond establishing associations as others did, the method of our study differentiates from them by using the CHAID analysis to establish interactions between variables.

### 3. Study and Methodology

#### 3.1. Scope of Study (METU)

This study was conducted at a Turkish State University (METU-Middle East Technical University) situated in the capital city of Ankara<sup>2</sup>. METU is home to nearly 33,000 university students, of which 2,000 are internationals as of 2022-2023 academic year (YÖK, 2024). The number of international students studying at METU went up year by year and reached 2.060 as of 2022-2023 academic year (Figure 1), thus making the university one of the higher education institutions hosting the most international students in Türkiye. This is a direct result of internationalization strategies and higher education policies implemented by the Turkish Higher Education Council (YÖK) to attract more international students to Turkish University campuses

The university was established in 1956 under the name of “Middle East High Technology Institute” and moved to its current campus in 1963. In addition to the main campus located in Ankara (Türkiye), the university also has two additional campuses situated in Erdemli (Mersin/Türkiye) and Güzelyurt (Northern Cyprus). The university offers a total of 41 undergraduate, 107 graduate, and 72 PhD programs, all of which are instructed entirely in English (METU Administration Activity Report, 2022). According to the rankings for the 2022-2023 academic year, the university is ranked third highest in Türkiye (URAP, 2023) and is also ranked among the top 500 universities in the world (Round University Rankings, 2023; Webometrics, 2023).

METU was particularly selected for this study due to four main reasons shown below:

- When this university was established in 1956, its purpose was to contribute the development of Middle Eastern countries and Turkey by training and qualifying their young people (METU, 2024). According to this establishment policy, it can be said that internationalization has been inherent in the university’s nature since 1956.
- METU is a prestigious Turkish university with an impressive international student body from various countries and regions worldwide. According to YÖK, as of the 2022-2023 academic year, METU’s Ankara campus hosted a total of 2.060 international students from 100 different countries (YÖK, 2024).
- METU places utmost importance on internationalization at its campuses. This commitment is clearly stated in its 2023-2027 strategic plan (2023:6) which outlines goals such as “to increase the quality of education for national and international students sustainably” and “to maintain and strengthen the internationalization of the university and its impact on social contribution”.
- METU is a pilot university chosen by YÖK to support Türkiye’s 2018-2022 Internationalization Strategy (YÖK, 2017).

#### 3.2. Data Collection

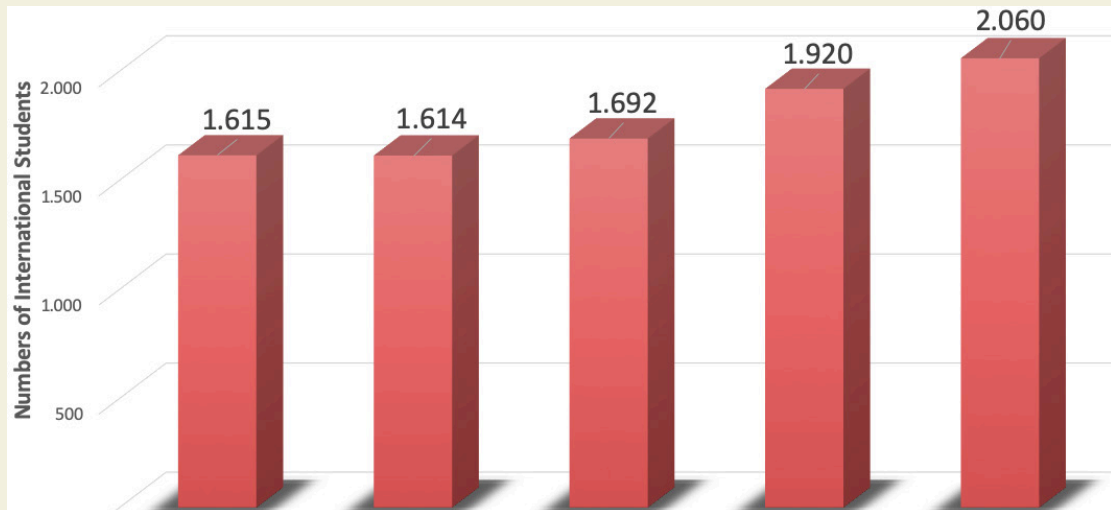
The primary instrument for data collection was an online survey, comprising an informative instruction and a total of 25 questions (including sociodemographic ones), all written in English. These questions were designed to collect information on the socio-demographic characteristics, academic expectations, satisfaction levels and issues of international students studying at METU. The survey consisted mostly of multiple-choice questions, except for the open-ended 2nd, 12th and 25th questions, which were open-ended. Administering the survey electronically through a link allowed for a larger number of participants in a relatively short time. This online procedure reduced time and labor costs by eliminating the need for printing, reproduction, distribution, collection, and possible coding errors of the survey. Furthermore, the system settings prevented respondents from taking the survey more than once. A total of 330 international students<sup>3</sup> visited the survey link and responded to the questions. This sample size, calculated using the Cochran formula (1977)<sup>4</sup>, was deemed large enough to accurately represent the total number of international students studying at METU.

<sup>2</sup> The original intention of this study was to include international students from other prestigious Turkish universities. It is evident that a more diverse range of universities would provide a broader perspective on the factors influencing international students’ satisfaction levels. However, our study remained limited to international students from METU due to constraints in time and budget.

<sup>3</sup> At the time this research was carried out (November 2018), the total number of international students studying at the university approximately 1.600, coming from 61 different countries and regions.

<sup>4</sup>  $n_0 = \frac{Z^2 p q}{d^2}$ ; N = Population Size (1.600);  $n_0$  = Sample Size;  $d^2$  = Margin of Error ( $\pm 5\%$ );  $t$  = Z value for 95% confidence level;  $p$  = Estimated proportion of an attribute that is present in the population (50%);  $q$  =  $1-p$  (50%)





**Figure 1.** Numbers of International students who study at METU (2018/19-2022/23)

**Source:** Compiled from the YÖK data, 2024.

**Table 1.** Reliability test with Chi-Square

Questions	Chi-Square	df	Asymp. Sig.	Questions	Chi-Square	df	Asymp. Sig.
Been to Turkey before	4,376 <sup>a</sup>	1	0,036	Experienced any difficulty during study time	46,594 <sup>a</sup>	1	0,000
Which degree	398,606 <sup>d</sup>	3	0,000	Believe they get enough assistance from the school	,684 <sup>e</sup>	1	0,408
Field studied	364,817 <sup>e</sup>	5	0,000	Where they solved their problems	18,970 <sup>e</sup>	1	0,000
Faced problems at application	87,576 <sup>a</sup>	1	0,000	Experienced any Eng. communication problems with staff	24,076 <sup>e</sup>	1	0,000
If yes which caused the most difficulty	22,810 <sup>f</sup>	6	0,001	Satisfied with the work of International Office	74,921 <sup>i</sup>	1	0,000
Apply to study any other country than Turkey	11,648 <sup>a</sup>	1	0,001	They satisfied with the school and recommended it	194,377 <sup>e</sup>	2	0,000
Attend any orientation program at startup	,368 <sup>e</sup>	1	0,544	How they rate current situation and previous expectations	35,559 <sup>j</sup>	3	0,000
If yes how it was useful	80,376 <sup>h</sup>	2	0,000	Their overall implications on the school and Turkey	312,640 <sup>k</sup>	3	0,000

The validity of the survey was established by experts working in the international office at a Turkish state university. Draft questions were submitted to them, and they were briefed on the objectives and purposes of the investigation. Subsequently, they were asked to assess whether the items were representative and evaluate the indicators and dimensions considered in the study. After obtaining their approval, the survey was sent to the participants.

In addition to the survey, the study included interviews with employees from the METU International Students Office. The purpose of these interviews was to cross-check the results obtained from the survey and to gain a deeper understanding of the university's internationalization strategy. The interview questions were designed to elicit the employee's views on various topics related to internationalization in higher education, including the university's internationalization policy, priorities of METU's internationalization policy, the effect of internationalization on the quality of education, and METU's strengths in terms of internationalization. The verbal responses of the interviewees were noted and subsequently analyzed by the authors of the study.

### 3.3. Analysis

Data obtained from the survey were analyzed using the Statistical Package for Social Science Software for Mac version 29.0 (SPSS Incorporation, Chicago, USA). Before proceeding to analysis, the questions underwent a reliability test with  $X^2$ . The reliability test indicated that all questions, except two, had an asymptotic significance value of  $p < 0.005$ . Questions that does not meet the significance criteria with a value of  $p > 0.005$ , were considered non-discriminatory questions and were therefore excluded from the evaluation (Table 1).

In the context of analysis, basic descriptive analysis with frequencies/percentages was performed for the closed-ended questions. However, the open-ended questions, another question type in the survey, underwent a different analysis method. First, all survey data were transferred to a MS Excel file, and the responses to the open-ended questions were filtered. Then, even if they were worded differently, responses were grouped into sub-categories based on whether they touched on the same theme. In addition to basic analysis, advanced analysis using CHAID (Chi-Squared Automatic Interaction

Detection) was also performed. CHAID is a decision-tree data-mining method defined as “a fast, statistical multi-way tree algorithm that explores data quickly and builds segments and profiles with respect to the desired outcome” (IBM SPSS Decision Trees, 2024). It is a predictive model that resembles a tree, with each branch showing a classification, and its leaves containing data sets. This model is often preferred in studies for its clear-cut results and visual representation of associations between dependent and independent variables as a tree diagram (Koyuncu & Özgülbaş, 2008; Şeker et al, 2023). In our study, the main purpose of using this model was its visual capability to indicate associations between dependent and independent variables as a tree diagram. Additionally, we aimed to demonstrate that CHAID analysis can be an alternative to other techniques in studies exploring international students’ satisfaction levels, as this technique is not frequently used in the literature for such studies.

## 4. Results

### 4.1. Findings on Survey

The survey consisted of various groups of questions to explore participants’ opinions on the following topics:

- **Sociodemographic characteristics:** Questions aimed to gather information about participants’ background, including age, gender, nationality, and academic level.
- **Türkiye as a destination to study abroad:** Participants were asked about their reasons for choosing Türkiye as their study destination, perceptions of the countries education system, and overall satisfaction with Türkiye as a study location.
- **Challenges faced during application:** Questions focused on any difficulties or obstacles participants encountered during the application process to study in Türkiye.
- **Application to other countries:** Participants were asked if they had also applied to study in other countries besides Türkiye, and their reasons for doing so.
- **Orientation program:** Participants were queried about their experience with the orientation program provided by the university, including its effectiveness in facilitating their transition to studying in Türkiye.
- **Performance of International Office:** Questions assessed participants’ satisfaction with the services and support provided by the university’s international office.
- **Satisfaction levels regarding the university and the country:** Participants were asked to rate their overall satisfaction with various aspects of the university and Türkiye, including academic quality, campus facili-

ties, living conditions and cultural experiences.

The answers provided by the participants were grouped and analyzed to gain insights into their perceptions and experiences in these key points.

#### 4.1.1 Sociodemographic Characteristics of the Participants

This set of questions aimed to understand the gender, nationality, Turkish proficiency, previous visits to Türkiye, degree, and field of study of the international students surveyed. The results showed that 68.80% (n=227) of the participants were male, while 31.21 (n=103) were female. This suggests a higher preference among male students for studying abroad in Türkiye, a trend also reflected in YÖK statistics for the same period, which reported 100.220 were male and 54.285 female international students in Turkey (YÖK, 2024). When asked about their country of origin, participants came from 61 different countries spanning every geographical region. However, the most common countries were Pakistan, Iran, Azerbaijani, Syria and Egypt, indicating that Türkiye was mostly chosen by students from neighboring or nearby countries. This finding aligns with 2018-2019 YÖK statistics, which showed Syrian (27.034) and Azerbaijan (19.384) students as the most hosted international students in Türkiye. Furthermore, neighboring countries such as Iraq, Iran, Turkmenistan, and Afghanistan were also among the top countries sending international students to Türkiye.

Regarding Turkish proficiency, responses were evenly distributed, with participants rating their proficiency as good (29.1%), poor (23.3%), fair (23.0%), and excellent (22.1%). Additionally, 55.8% of participants had not been to Türkiye before, while 44.2% had visited previously. In terms of degree or program enrolled in at the university, 67.58% selected undergraduate, 31.52% selected graduate, and 0.9% selected postgraduate programs. While there is no specific data on the number of international students enrolled at METU based on their degrees<sup>5</sup>, our findings indicate a higher enrollment in undergraduate programs. Lastly, when asked about their field of study, most students (n=180, 54.5%) choose engineering. Other responses included architecture 9.7%, social sciences 8.2%, administrative sciences 6.4%, and education 3.6%.

#### 4.1.2 Satisfaction Levels

The last section of the survey aimed to assess participants’ overall satisfaction levels with the university and Türkiye. This section comprised five questions. The first question asked participants was “In general, are you satisfied with your school, and would you recommend it to others?”. The majority, 69.1% (n=228) answered affirmatively, while only 11.5% (n=38) responded negatively. Participants who answered “Yes” were asked to specify reasons for recommending their university with the question of “You recommend your university due to a) the city where the campus is located, b) Education quality, c) Opportunities offered, d) Social life, e) Living cost, f) Overall impression, g) /Quality of facilities, h) International recognition,

<sup>5</sup> The available data on this issue indicates that the share of master’s and Ph.D. students among total METU students in the 2018-2019 academic year was around 16.5% and 10.5%, respectively (YÖK, 2024).

1) Other (please specify)". The top reasons cited were education quality (62.4%), cost of living (47.3%), international recognition (38.2%), quality of facilities (30.9%), social life (30.3%), overall impression (30.0%), opportunities offered (29.1%), and campus location (25.5%). The third question assessed participants' perceptions compared to their initial expectations upon arriving Türkiye with the question of "How would you rate your current situation compared to what you expected when you first came to Turkey?". Responses varied, with 35.2% indicating that their situation matched their expectations, 28.5% reporting a worse-than-expected situation, 23.3% experiencing a better-than-expected situation, and 12.7% unsure. Participants were asked about their overall impressions of the university and Türkiye upon completion of their studies in the fourth question. The question was "After completing your study in Turkey, your overall implications on your school and Turkey will be very positive / positive / negative / very negative / no idea". A majority (78.2%) expressed positive sentiments, with 65.2% responding positively and 13.0% responding very positively. Only 7.0% had negative impressions, and 10.9% were undecided. These findings indicate that majority of the students' overall impression on Türkiye and the school is either positive or very positive. The final question in this section was "If you were asked to advise officials of your school regarding the problems of international students' problems, what would you say to them?". This question, although optional, received responses from 77.27% of participants. Responses mainly focused on issues such as English communication problems with administrative staff, limited representation of international students, lack of Turkish prep courses, limited dormitory capacity, lack of scholarships and career opportunities, difficulties obtaining Turkish residence permits, and absence of English-speaking student clubs. These responses underscore the importance of addressing the challenges faced by international students to enhance their experience and retention.

#### 4.1.3 CHAID Analysis

The CHAID algorithm, based on Pearson's Chi-square statistic and corresponding p-value, is commonly used to explore the associations between a dependent variable and independent variables within a dataset (Milanovic & Stamenkovic, 2016). In our study, the question "In general, are you satisfied with your school, and would you recommend it to others?" was considered as an independent variable, while other questions from the survey serving as dependent variables were "After completing your study in Türkiye, how will you rate your overall implications on your school and Türkiye?", "Have you experienced any difficulty during your time at your Turkish University?", "In which offices/departments do you usually solve your problems?", "Do you experience (English) communication problems when you are in contact with administrative staff who work in various departments of the school?", "Which degree/program are you taking?", and "what is your gender?". The associations between the independent variable (satisfaction level) and the dependent variables were illustrated in Figure 2, Figure 3, and

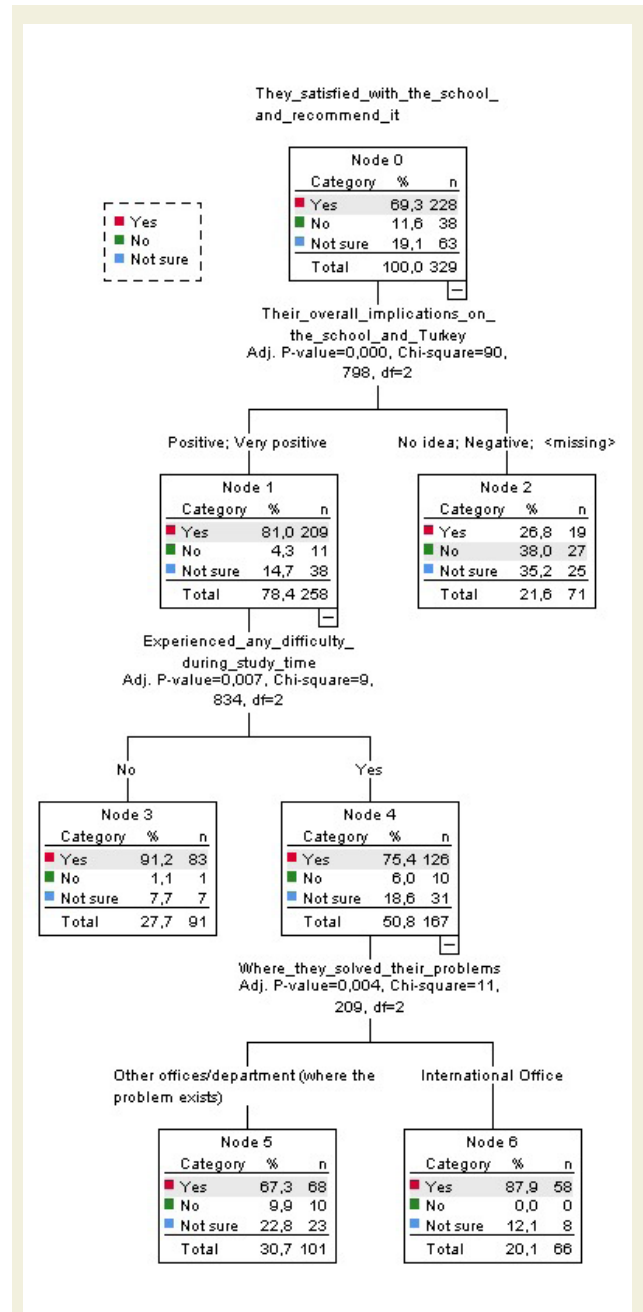


Figure 2. The CHAID decision tree model for students' school satisfaction and its impact on overall implication

Figure 4. These figures depict the significant relationships identified through the CHAID analysis, shedding light on the factors influencing international students' satisfaction levels.

As shown in Figure 2, the most significant independent motivational variable was the students' overall implications on the school and Türkiye,  $X^2 = 90.798$ ,  $p = 0.000$ ,  $df = 2$ , indicating that this variable had the strongest impact on differentiating and classifying students into two groups concerning their satisfaction levels with the school. In this tree model, most of the participants ( $n = 258$ ) were placed in node 1, corresponding to positive and very positive implications for the satisfaction levels. The remaining 11 students belonged to node 2. Analyzing the

percentage distributions of the two categories of the students' satisfaction levels, the negative and no idea group (node 2) were composed of significantly fewer affirmative repliers (26.8%) compared to the positive and very positive group (node 2; 81,0%).

Upon examining the second level of the tree, experiencing any difficulty during study time was found to be statistically significant. This variable, classified as node 1, was divided into two groups,  $X^2 = 9.834$ ,  $p = 0.007$ ,  $df = 2$ . Those with a very high affirmative replies of no difficulty group (91.2%) belonged to node 3, and those with a high affirmative replies of difficulty group (75.4%) composed node 4. Further, when the third level of the tree was examined,

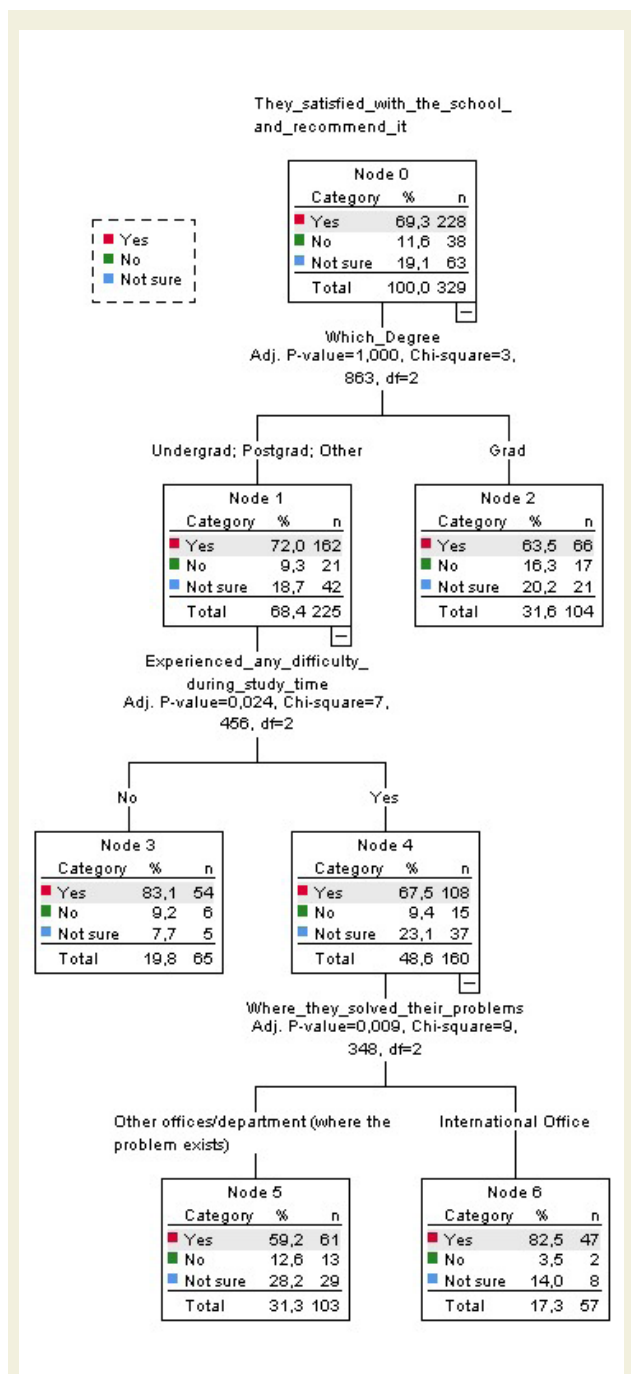
where they solved their problems were found to be statistically meaningful. This variable, classified as node 4, was divided into two groups,  $X^2 = 11.209$ ,  $p = 0.004$ ,  $df = 2$ . Those with a moderate affirmative replies of other offices/ departments group belonged to node 5, and those with a high affirmative reply of the international office group composed node 6. The international office group was dominated by those students with a high degree of problem-solving at the school's international office (87.9%).

As illustrated in Figure 3, the most significant independent motivational variable was the students' degree or program they attend,  $X^2 = 3.863$ ,  $p = 1.000$ ,  $df = 2$ , indicating that this variable had the strongest impact on differentiating and classifying students into two groups concerning their satisfaction levels with the school. In this tree model, most of the participants ( $n = 162$ ) were placed in node 1, corresponding to undergraduates, postgraduates, and others for the satisfaction levels. The remaining 66 students belonged to node 2. Analyzing the percentage distributions of the two categories of students' satisfaction levels, the graduate group (node 2) consisted of a lower percentage of affirmative repliers (63.5%) compared to the undergraduate, postgraduate, and others group (node 1; 72.0%).

Upon examining the second level of the tree, experiencing any difficulty during study time were found to be statistically significant. This variable, classified as node 1, was divided into two groups,  $X^2 = 7.456$ ,  $p = 0.024$ ,  $df = 2$ . Those with a very high affirmative replies of no difficulty group belonged to node 3, and those with a high affirmative replies of difficulty group composed node 4. Further, when the third level of the tree was examined, where they solved their problems were found to be statistically meaningful. This variable, classified as node 4, was divided into two groups,  $X^2 = 9.348$ ,  $p = 0.009$ ,  $df = 2$ . Those with a moderate affirmative replies of other offices/department group belonged to node 5 and those with a high affirmative replies of international office group composed node 6. Similar to Figure 2, the international office group was dominated by those students with a high degree of problem-solving at the school's international office (82.5%).

As depicted in Figure 4, the most significant independent motivational variable was the students' gender,  $X^2 = 2.647$ ,  $p = 0.266$ ,  $df = 2$ , indicating that this variable had the strongest impact on differentiating and classifying students into two groups concerning their satisfaction levels with the school. In this tree model, the majority of participants ( $n = 162$ ) were placed in node 1, corresponding to the male gender for satisfaction levels. The remaining 66 students belonged to node 2. Examining the percentage distributions of the two categories of students' satisfaction levels, the male group (node 1) consisted of slightly more percentages (71.7%) compared to the female group (node 2; 64.1%).

Upon examining the second level of the tree, experiencing any communication problems with the staff were



**Figure 3.** The CHAID decision tree model for students' school satisfaction and its impact on degree/program



found to be statistically significant. This variable, classified as node 1, was divided into two groups,  $X^2 = 15.571$ ,  $p = 0.000$ ,  $df = 2$ . Those with a high affirmative response of no communication problem belonged to node 3, and those with a moderate affirmative response of communication problem composed node 4. Upon further examination at the third level of the tree, the way they solved their problems was found to be statistically significant. This variable, classified as node 4, was divided into two groups,  $X^2 = 11.387$ ,  $p = 0.003$ ,  $df = 2$ . Those with a moderate affirmative response of other offices/department belonged to node 5, and those with a high affirmative response of the international office composed node 6. Similar to Figure 2 and 3, the international office group was predomi-

nantly composed of those students who had a high degree of problem-solving at the school's international office (80.4%).

Analyzing the algorithm in Figures 2, 3, and 4, it can be inferred that if a student resolves their problems at any office other than the international office at the university, then there is a high probability that this student's satisfaction level with their school will be high. Conversely, if a student resolves their problems at the international office instead of any other offices at the university, then there is a high probability that this student's satisfaction level with their school will be low. This finding emphasizes the importance of resolving international students' problems on-site. Furthermore, the role of demographic factors (age, gender, and nationality) should not be overlooked when evaluating their satisfaction levels. In our study, gender (being a male international student) was found to be an influencing factor in their satisfaction with the education service they attended. Therefore, HEIs should consider the demographic characteristics of their target students when designing and delivering of their services.

#### 4.2. Findings on Interview

In this study, aside from the survey technique, the international office of the university was visited, and university employees were asked some questions regarding internationalization in higher education and METU's internationalization policy. During the visit, some of the prominent topics in the interview included internationalization in higher education, METU's internationalization policy, priorities of METU's internationalization policy, the effect of internationalization in higher education on the quality of education and METU's strongest aspects in terms of internationalization. Responses to the questions by the employees revealed that METU's internationalization strategy comprises six basic elements.

Firstly, they prioritize quality over quantity in the internationalization efforts. Secondly, they strive for diversification when hiring international faculty and accepting international students, focusing not only on specific countries but also on those from different regions. Thirdly, they prioritize certain geographical targets, particularly aiming to attract international students from various Asian and Balkan countries. Fourthly, they aim to expand and enhance scientific and educational collaborations with other institutions, with a special interest in adding universities from China and Singapore to their collaboration list, alongside those from the US and Europe. Fifthly, they emphasize inclusivity and seek to integrate all staff and students into the METU culture. Lastly, they prioritize digitalization with the support from their IT Department, ensuring that all international data, covering collaborations, exchange programs, students, and staff, are collected and recorded in a common digital platform. This facilitates more accurate decision-making in their internationalization strategy. Although the basic framework outlined by the international office employees is as described, they also stated that their internation-

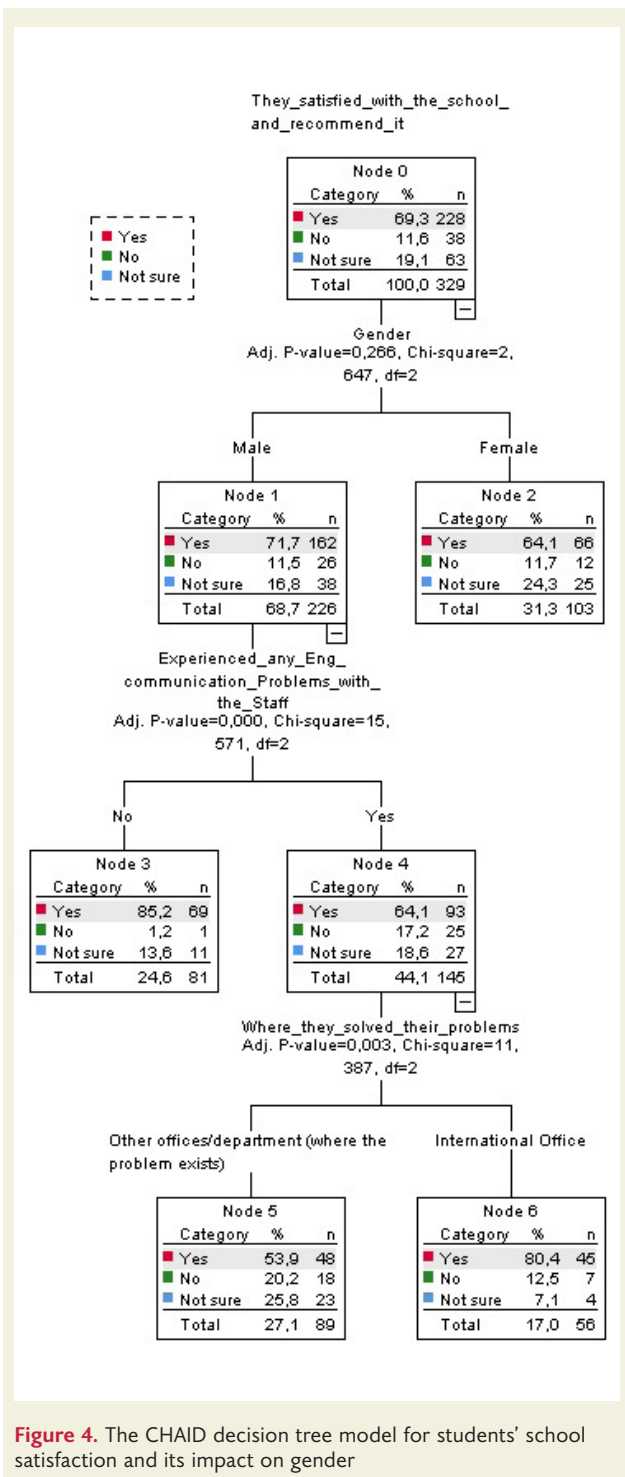


Figure 4. The CHAID decision tree model for students' school satisfaction and its impact on gender

alization policy is flexible, considering feedback from internal and external stakeholders. Additionally, they identified METU's strongest aspects in terms of internationalization as education quality, reasonable tuition fees, university prestige, academic strength, curriculum (English-medium teaching), the spacious and green campus with comprehensive services, and other services provided by METU. Particularly noteworthy is the importance of English as the medium of instruction at METU, as graduating from an English-medium school offers students job opportunities not only regionally but also internationally. Furthermore, as international office employees, they strive to provide ample support and assistance through a comprehensive orientation program for international students, emphasizing sympathetic communication and providing fast, practical, and solution-oriented responses. Finally, they highlighted language barrier (lack of Turkish knowledge) and adaptation to Turkish culture as the main challenges faced by international students on campus.

## 5. Discussion and Conclusion

As previously stated, while various parameters affect internationalization in higher education, one of the most important is still the international students themselves. They represent the main outputs of the higher education system and provide many benefits to both universities and host countries. These benefits are particularly critical in a setting where HEIs face financial challenges, and countries seek to become active players in the political arena using soft power. This fact has led to intense competition among HEIs and countries to attract more international students to their institutions. At the core of this issue lies a perspective that evaluates international students as customers of HEIs. In fact, studies have shown a direct relationship between customer-centric service and customer satisfaction at universities. According to this approach, providing more customer-centric service at a university leads to higher levels of student satisfaction. Among HEIs, this perspective has created a competitive higher education market worldwide. (Guilbault, 2018). This viewpoint can be summarized with the phrase "Students are the customers of institutions, and all effort should be made to retain them" (Haverila et al., 2020:360).

However, accommodating all differences while ensuring a high level of satisfaction among international students is not easy, as they come from diverse settings, cultures, and countries. Therefore, internationalization policies should be regularly reviewed and reestablished by host countries. Otherwise, incoming students, may consider trying other countries based on their positive or negative satisfaction levels at any time.

Recently, Turkey has emerged as an important player and a regional attraction center, hosting over 300.000 international students. Kondakçı (2011) explains the emergence of Türkiye as a popular destination for mobile students within the context of the core and periphery approach. According to this approach, the flow of international stu-

dents in the world typically gravitates towards core (Anglophone) countries such as the US, Canada, UK, and Australia. However, if core countries are not attainable, students tend to choose periphery countries such as Türkiye. Kondakçı believes that Türkiye's unique culture, quality universities and geopolitical position have made it a popular destination for international students.

In this study, the factors affecting satisfaction levels of international students studying in Türkiye were investigated using CHAID analysis. According to the findings of the survey conducted at a top-ranked Turkish state university, the satisfaction levels of the participants from 61 countries were found to be highly positive, despite some problems and complaints about their experience in Türkiye. The results of the CHAID analysis indicated that three independent variables were significantly associated with international students' satisfaction levels: overall implications on the school and Türkiye (having a positive implication), program degree (attending undergrad or postgrad degree) and gender (being a male student). On the other hand, according to the CHAID analysis, other independent variables of the study (nationality of the students, choosing a country for study abroad, channels they use when choosing a destination, orientation program, existence of any other country options, etc.) showed no potential to differentiate students' satisfaction levels. When our results were compared to other studies in the literature, it is seen that the results of our study overlap with the findings of other studies which showed the greater usage of English, support of administrative staff, and counselling services as affecting factors on students' satisfaction levels (Uddin et al., 2017; Ngamkamollert & Ruangkanjanases, 2015; Jiang, Yuen & Horta, 2020). Furthermore, Min and Khoo (2014) who conducted studies on students' satisfaction levels in Singapore found that demographic factors including gender had a considerable impact on the education service which international students attended. This finding is also similar with our finding indicating gender as a statistically significant factor in our study. Topal and Tascher (2020) also conducted empirical research on the international students who study at Sakarya University. In this study whose sample size is very similar to ours (n=333), they found that lack of orientation, communication problems, financial difficulties and expected education quality were affecting factors of student mobility. Another study carried out at a Turkish university was the one conducted at Recep Tayyip Erdoğan University. In this study, Kartal et al. (2019) tried to explore the satisfaction levels of the international students using both qualitative and quantitative methods. According to the study findings, education quality, importance of learning Turkish, lack of accommodation, and economic difficulties were found as the most prominent topics. Other than these studies, Gibbs (2011) conducted a Ph.D. thesis at METU to investigate the factors affecting the international students' psychological and socio-cultural adaptation. In his study using a sample of 250 individuals, Gibbs found that "language proficiency led to better sociocultural adaptation, and high cultural distance had a

negative impact on both psychological and sociocultural adaptation". (Gibbs, 2011: 1). These results show the importance of offering counselling and supportive services to the internationals. At our study, we believe that the international students who satisfied from the educational service provided by their universities would also tend to recommend their universities to others. This (latent) assumption was also tested and verified by another study conducted by Öztrak and Karaşin (2022). These authors carried out a study on the international students who studied at Kütahya Dumlupınar University and found that there was a meaningful association between satisfaction level of the internationals and their intent to recommend their university to others.

Although numerous studies have been conducted in the literature to investigate the factors affecting international students' satisfaction, this study differentiates itself by using CHAID analysis. Further research should be conducted in this field using different methods to explore and understand the nature of the associations between international students' satisfaction levels and various dependent factors.

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