

CLUSTERING STUDENTS FOR EFFECTIVE COMMUNICATION BASED ON ENROLLMENT CHOICES - WHY DO STUDENTS CHOOSE THE UNIVERSITY?

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This study focuses on the primary stakeholders of higher education institutions, students, with a particular emphasis on first-year students. The aim of the study is to segment students by institutional choice and to characterize them by demographics and by level and field of education. An online questionnaire (2,330 students) was used to investigate the factors that influence the outcome of the decision-making process at the time of application. Based on the factors (education and reputation; dormitory and services; opinion of others; city), four groups of students could be distinguished: Uninterested Students; Conscious Students; Ambitious Students; and City Lovers. The focal points (avatar, headline, visual content and textual content) of a communication campaign were identified with the help of marketing master students (12) using the Design Thinking method.

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1 Introduction

Competitive environments in higher education (HE) are shaped by globalization, which extends beyond regional and national boundaries to international levels. While traditional marketing strategies have historically facilitated university–corporate collaborations, current trends stand challenges for marketing professionals. In order to increase competitiveness, universities must adopt effective marketing tools like profit oriented companies. Relying on European Commission data of Hungary (2.92%), the share of students in the population in 2020 was significantly lower than in neighboring countries such as Austria (4.73%), Slovenia (3.65%), and Croatia (3.99%). The differences in enrollment rates can be attributed to a variety of factors such as the quality of higher education and institutional tradition, which influence the willingness of young people to pursue further studies. Universities face major challenges in enrollment, recruitment, and retention. The decision-making process for selecting a higher education institution involves financial, psychological, and social considerations, as well as institutional image, or reputation. Today, universities are increasingly focusing their marketing activities on corporate branding, recognizing that a positive institutional image is a key factor to success in the competitive higher education market. This research focuses on the primary stakeholders of higher education institutions, university students, with a particular emphasis on first-year students.

The basic research question was what groups or clusters of students can be distinguished based on institutional choice and how they can be characterized based on demographics and educational circumstances. After the literature review, the paper presents the methodology of the empirical research, followed by the research results and concludes with the conclusions.

2 Theoretical Background / Literature Review

Students engage in a complex set of considerations when choosing a higher education institution, including factors such as institutional excellence, academic reputation, geographic location, accessibility, and financial considerations (Winkler, 2014). Researchers have highlighted the multifaceted nature of these decision-making processes (Ariffin et al., 2014, Azzone and Soncin, 2020, and Srivastava and Dhamija, 2022) and identified other aspects such as campus amenities, employment

prospects, and economic feasibility. Previous literature has highlighted the importance of geographic proximity, institutional prestige, and program reputation (Winkler, 2014; Walsh & Cullinan, 2017; Srivastava & Dhamija, 2022). On the other hand, socioeconomic status and proximity to hometown determine institutional choice. The influence of social networks, family, and structural factors such as location, institutional image, and academic standing significantly shape student preferences (Walsh & Cullinan, 2017; Dhaliwal et al., 2019). Financial considerations, including tuition and expected economic returns, also play a role in the decision-making process (Srivastava & Dhamija, 2022; Dhaliwal et al., 2019).

The segmentation of students based on psychographic (motivational) and demographic factors has received considerable attention in contemporary research due to the increased importance of recruitment and retention within higher education institutions (Nonis et al., 2021). Goodrich et al. (2020) emphasized the relevance of such segmentation by highlighting the utility of psychographic variables, which encompass attitudes, lifestyles, values, and interests. Using K-means clustering Goodrich et al. (2020) have distinguished six distinct segments within the U.S. student market and tailored specific messaging strategies accordingly. These segments were: 1) motivated post-trationals, 2) focused scholars, 3) unsupported trailblazers, 4) dependent wonderers, 5) privileged experientials, and 6) prestigious collegians (Goodrich et al., 2020:442). Motivated post-trationals prioritize practical factors such as convenience to work, affordability, and class availability. Focused scholars prioritize academic support, caring faculty, small class sizes, and campus involvement as they pursue successful careers or advanced education. Trailblazers are driven by their desire to set a positive example for their families by pursuing a college degree. Dependent wanderers are students without clear career goals who seek guidance and support, prioritizing colleges with supportive environments and good value. Privileged experiencers are socially conscious students from affluent backgrounds who prioritize campus social life and career-enhancing amenities. Prestigious collegians value challenging academics, extracurricular involvement, and a prestigious college reputation for career and graduate school readiness.

3 Methodology

The goal of the study is to segment undergraduate students by institutional choice and characterize them by demographics and by level and field of education. Based on the literature review, the authors assume that people can be classified into homogeneous customer groups and that they can be profiled.

The empirical research focused on first-year students at a single university in Central Eastern Europe. First-year students admitted to the university completed a questionnaire at the time of enrollment that asked a wide range of questions to understand students' views of the university's enrollment marketing. The questions assess students' aspects in choosing an institution, sources of information, but it also examines student applications by faculty, education, level, and funding. In addition, student demographics such as gender, age, location, and type of residence are assessed. In this paper, the authors focus on students' institutional choice. The questionnaire was launched on July 27, 2023, following the release of the 2023 admissions cut-offs by the Ministry of Education. A total of 2,330 students were reached, with the last response received on September 7. The survey was conducted through an online platform on the university's website and was completed anonymously.

The questionnaire consisted of three distinct sections: (1) choice of institution, (2) sources of information about programs, and (3) sociodemographic characteristics. Participants described their choice by indicating their level of influence on a 5-point Likert scale, ranging from 1 indicating minimal influence to 5 indicating complete influence. Relying on the literature review, 15 institutional choices were examined, like practical training, university-industry link, available scholarships, reputation of the institution, free language learning opportunities, tuition fees, better chance of getting into college, low college fees, sport facilities, opinions of friends, friends, opinions of family members, city, distance from home and job opportunities.

Sociodemographic characteristics included gender, age (in years), residence status (in Hungary or abroad), and type of locality (village, town, county center, or capital city).

Respondents represented a variety of academic disciplines, with the majority specializing in engineering (47.1%), followed by social sciences (15.7%), economics (13.9%), law (9.6%), health and physical education (7.8%), agriculture (4.0%), and the arts (1.8%). The gender distribution was 48.7% female and 51.3% male, with the majority belonging to Generation Z. The majority of respondents live in Hungary, with a significant proportion living in towns and villages, accounting for 84.2% of the sample.

Data analysis was performed using SPSS 26.0 software. Cluster analysis, specifically Ward's hierarchical cluster analysis using agglomerative clustering (Malhotra, 2022), was used to address the research questions. The Euclidean square distance metric was used to quantify dissimilarities between data points. After assessing the prerequisites, various cluster solutions were explored, culminating in the selection of a five-cluster solution. These five clusters were then treated as nominal variables. The relationship between cluster membership and basic demographics and educational circumstances was examined using cross-tabulation (chi-square analysis). This analytical approach took into account both the expected values and the characteristics of variables measured on nominal scales.

After the clusters were typed, the clusters were personalized and social media messages were created using design thinking with the participation of 12 Master of Marketing students. Design thinking is a human-centered methodology for creative problem-solving, encompassing user empathy, creative ideas and prototypes (Johnson et al., 2021, Dykhnych et al., 2022). It involved five different phases: (1) empathy (understanding the problem, choice of students), (2) definition (characterizing each segment), (3) ideation (brainstorming), (4) prototyping (anemify and avatarify each segment) and (5) testing (creating social media posts with headline, visual and textual content).

4 Results

Previously, factor analysis was conducted and four factors were distinguished from the 15 motivators (based on the factor scores) explaining 64.2% of the total variance: education and reputation (22.68%); dormitory and services (15.83%); opinion of others (14.19%) and finally the city (11.50%). Accordingly, the average of the variables belonging to a factor was calculated and this calculated value was used to

create the clusters. The clusters created using the factor scores run as a check showed full agreement, however, we have retained the use of factor averages for better interpretation. The coefficient, the elbow criterion and the preliminary hypotheses all resulted in four clustered solutions.

The first cluster represents 13.5% of the sample, with 314 respondents. For the factors examined, they are those who were not influenced by anything when choosing their higher education institution. Accordingly, they are the *uninterested* ones. The second cluster includes the largest share of the sample, 42.5%, with 989 respondents. In their case, all factors are rated higher than the average, i.e. for them everything is an influencing factor, i.e. they take everything into account when making their choice. In their case, however, the influence of other people's opinions is prominent, but as all factors are above average, they are the *conscious* students. The third cluster contains 10.8% of the sample, 252 people. In their case, the additional functions that are not part of the core service of higher education institutions do not matter, so they are the ones who decide on the basis of education and reputation alone, they are the *ambitious* ones. The fourth cluster accounts for 33.1% of the sample, with 771 people. In their case, the basic service and the opinion of others do not matter, but the city itself and the opportunity of a college do. They will be our *city lovers*.

It is interesting, however, to see how we can profile our clusters in terms of the relationships we find with other variables. There are significant relationships between clusters and gender (Khi² value 21.859, sig. 0.000), generations (Khi² value 15.999, sig. 0.014), residence (Khi² value 64.161, sig. 0.000), disciplines (Khi² value 102.964, sig. 0.000), form of funding (Khi² value 40.479, sig. 0.000) and form of education (Khi² value 86.383, sig. 0.000).



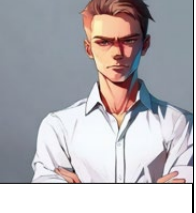
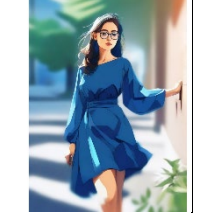
- Clusters and *gender*: Women are more likely to belong to the uninterested and city lover clusters, while men dominate the conscious and ambitious clusters.
- Clusters and *generations*: Generation Z is overrepresented in the uninterested and ambitious clusters, Generation Y tends to align with the city lovers cluster, and Generation X shows a stronger presence in the conscious cluster.

- *Residence* and clusters: Residents of the capital are more present in both the uninterested and ambitious clusters. Residents of the county cities in the city-loving group, the city dwellers in the conscious group, while the residents of the municipalities are also present in the conscious and city-loving groups.
- Clusters and *disciplines*: The faculties offered by the institution under study were clustered according to disciplines, with the resulting groups being natural sciences, social sciences, engineering and law and economics. The natural sciences are the clustered group, the social sciences are the city-loving and uninterested group, engineering is highly represented in the ambitious and knowledgeable group, while students of economics and law are also more represented in the city-loving group.
- *Form of funding* and clusters: In this case, the knowledgeable group is the majority of those in publicly funded courses, while the other three have a higher than expected proportion of self-financed students.
- *Form of education* and clusters: The proportion of those enrolled in higher education is higher in the cluster of the knowledgeable and the city-lovers, the proportion of those enrolled in a postgraduate course is also higher in the cluster of the city-lovers, the proportion of those enrolled in a bachelor's course is higher than expected in the cluster of the knowledgeable and the ambitious, while the proportion of those enrolled in a master's course is higher than expected in the cluster of the uninterested and in the cluster of the ambitious.

Based on the results of the design thinking, the marketing master's students personalized each cluster using the Canva software and the application of Anemify and then Avatarify. After personalization, posts on social media were created to target specific groups, with Instagram being the platform of choice for younger generations (Z, Y) and Facebook for middle-aged people (X). When developing the creative content, visual content was chosen as a priority, as it is suitable for display on the university's website. The table summarizes the creative elements (headline, visual content, textual content) that could be used in the recruitment campaign to reach the student groups identified in the quantitative research (Table 1). The result of this scientific process is a well-crafted social media plan that meets the diverse

needs of our clusters. By integrating design thinking principles, the authors ensured effective communication.

Table 1: Characteristics of students

Clusters	Uninterested students	Conscious students	Ambitious students	City lovers
Avatar				
Gender	female	male	male	female
Generation	Z	X	Z	Y, X
Residence	capital city, city	town, village	capital city	city
Disciplines	social sciences	engineering	engineering	law, economics
Form of education	MA	vocational training, BA	BA, MA	vocational training, MA
Reputation Services Opinion City	2.51 (SD: 0.95) 2.28 (SD: 1.03) 1.19 (SD: 0.37) 2.06 (SD: 0.72)	3.87 (SD: 0.75) 3.61 (SD: 0.93) 3.75 (SD: 0.82) 3.91 (SD: 0.80)	3.88 (SD: 0.64) 2.05 (SD: 0.83) 1.68 (SD: 0.66) 3.12 (SD: 0.98)	3.28 (SD: 1.03) 3.29 (SD: 1.06) 1.55 (SD: 0.51) 4.15 (SD: 0.77)
Headline	'Apply with us' 'Find your goals and grow with us'	'Come and experience the most exciting years of your life'	'The choice is yours'	'Learn in the city, get a degree at university'
Visual content	young females talking and chatting to each other	man in suit in front of laptop	young males wearing gown and gown hat	young very elegant females, yuppies
Textual content	Quality education Diverse student programs Career support	#evolvewithus Get a quality education at our university and secure your career	Expand your knowledge and become the best	Become a part of an extraordinary community

Source: Based on the results of empirical research and design thinking

Note: The source of the images is based on our own prompt using Microsoft Copilot.

5 Discussion

Knowing the resulting groups, and the variables and factors that determine their basis, makes it possible to plan a more precise strategy. Similarly, by understanding the student population and developing research with longitudinal data, the institutional strategy for attracting students can be made more effective. By defining a message, a visual content and a message targeted at specific groups, it is possible to gain ground and attract potential students in a market that is currently very limited and highly competitive. The aim, of course, remains to attract the uninterested among the four groups of students and, where possible, to increase the proportion of aware and ambitious students among those who are admitted. Another direction of research development is a longitudinal extension to test the temporality of the hypotheses. A limitation would be the limited resources available for implementation. The novelty of the research lies in the approach, the manageability of the groups formed on this basis and the combination of methods. By applying design thinking, the groups studied are more tangible and easier to interpret for decision making. In the following, the stability over time and the applicability of the research results will be demonstrated through longitudinal research with the available data.

6 Conclusions

In the present study, our aim was to understand and thus strategically manage the groups of students who have chosen to study at a particular higher education institution. To this end, we used a questionnaire to investigate the factors influencing the outcome of the decision-making process at the time of application. The resulting factors were then used for group mapping, first to define the strategically important groups and then to profile them by finding similarities and differences. Using the Design Thinking method, we identified focal points (avatar, headline, visual content and textual content) that could be used and built upon to further develop the communication campaign.

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