

## Factors That Intervene in Students of First Semester of the Carrera Engineering in Computational System for the Election of Higher Studies: Case Instituto Tecnológico De Milpa Alta

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### Abstract

The present project constitutes an investigation about the factors that intervene in first semester students when choosing a university. The study employs 95% reliability for students in the first semester of the Computer Systems Engineering degree. The results obtained were that the factor that most influences students is the consideration factor of the university, other factors that also take into account are: geographical location and social consideration.

**Keywords:** factors, computer systems, choice, higher education, geographical location.

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### INTRODUCTION

Mendoza [1] mentions that the choice of professional career is a decision that will mark the future of a person and that, in addition, tends to become more complex to the extent that it is not always carried out according to the vocation of the person who takes this decision.

As mentioned by Villada *et al.* [2] this decision can be taken lightly by many young people and parents, although they see in it the possibility and the desire to improve their quality of life, based generally on the conception of professional education as the way to emerge or to become someone in life.

From the experience as a student and later as a teacher of basic and secondary education, a worrying panorama emerges regarding the factors that are associated with the choice of career [3]. In this way, the present study focused on the identification of the factors that intervene in students of the first semester of the engineering career in computer systems for the choice of higher education.

### BACKGROUND

The development of the human being takes place in different stages, each one with its own degree of complexity and with elements that affect and shape the perception of the individual on vital issues [4].

Attitudes are formed with experience, and in spite of their relative stability, they can also be changed through themselves. In them the peculiar way is involved in how man relates to reality; knowing it, appreciating it, and marking the way of relating to it, to finally intervene in and on it according to the authors [5].

Attitudes in adolescence and youth play an important role in the way they process vocational guidance that, according to Castells & Silber in [18], should help the adolescent recognize his real abilities and personality traits. This issue becomes relevant even in developed countries where about half of university graduates work in fields for which theoretically they have not been prepared according to the authors [6].

### HIGHER EDUCATION

De la misma forma en que la educación en general se considera una herramienta prioritaria para promover el desarrollo del conocimiento y la formación permanente de las sociedades e individuos, la educación superior se ve como un medio estratégico para acrecentar el capital humano y social de la nación. También es un elemento para impulsar el crecimiento del producto nacional, la cohesión y la justicia social, la consolidación de la democracia y la identidad nacional cimentada en nuestra diversidad cultural, así como para mejorar la distribución del ingreso de la población de acuerdo a un estudio de investigación de los autores [7].

The higher education system (SES) in Mexico is composed of more than two thousand public and private institutions that have different typological profiles and missions. The public subsector presents: federal universities, autonomous public universities, polytechnic universities, intercultural universities, federal and regional technological institutes, technological universities, research and postgraduate institutions, normal schools and other institutions [8]. De Garay [7] mentions that a system of higher education of good quality is one that is oriented to satisfy the needs of social, scientific, technological, economic, cultural and human development of the country.

Coulon [9] mentions that the incorporation to an institution of higher education supposes a process that combines two types of integrations: the institutional one, that means the dominion of the forms of organization, the norms, rules and cultural elements, in which the young university students of a determined institution, and the discipline to a specific branch of knowledge cultivated by the different academic bodies of each degree.

## PREVIOUS STUDIES

According to the research I do [10], this study describes the factors that influence the vocational choice of adolescents in the sixth semester of high school, this research served to analyze what is taken into account by young people when choosing a career. For this, the results obtained in this research indicate that the factors that influence such adolescents are the influence of the parents since it determines a large part of the behavior of the adolescents. Abdo [11] conducted an analysis in 4th grade students. During the UDEM high school, the results were based on 8 interviews and 135 surveys. After having analyzed the surveys and in-depth interviews it was possible to identify that there is 75% of the population that has a clear decision, since they are sure and happy about what they want in the future, so the remaining population the students affirm that they have no choice of their career either because of interest or because of confusion of choice and aptitude. García & Moreno [12] carried out an empirical study that was carried out within this university that was applied to a sample of 300 students taking into account the attributes they considered when choosing a university. During this investigation the results showed that the first factor to consider was the economic situation in which the students were, since some did not have the necessary resources to pursue their career. The second factor to consider was the location and development of the community where the university is located. The third factor refers to the school infrastructure either public or private due to the admission requirements that were required of students. López & Sánchez [13] proposed an exploratory and descriptive study of a quantitative nature. For this research, a sampling was carried out for 566 students

who attend the sixth semester of high school. In this process we obtain a result where the identity of said students plays a very important role since parents, teachers, and classmates and nowadays the media are in the list of factors that intervention for the election of their students. Career. Mendoza [1] conducted a study where a questionnaire divided into three dimensions was used: Personal Factor, Family Factor and Economic Factor. Interview instruments were also required to determine some advantages and disadvantages of said instruments. Which determined that the most influential factors are the parents since most of them do not agree on the decisions that their children make when choosing their career.

Montesano & Zambrano [14] sought to analyze in depth the factors that intervened in young people when choosing a career, which choice is of the utmost importance because at this stage the student will be able to develop their skills, abilities and aptitudes, to be able to face a competitive labor market. This research determined that one of the most important factors was the cost of enrollment, distance and socio-economic level of each student. Del Pino [15] conducted an investigation where he determined that the family is a more influential factor when making a decision in his career and social class since it is a less important factor but has been perceived since elementary and high school. Sepúlveda, Turra, & Zavala [16] conducted a qualitative research study where a sample of 42 high school students was carried out. In this investigation, the result was that teachers do not influence this choice. Therefore in this research it is proposed that there be more preparation in vocational counselors and work more in the areas of personal identity, so that students can make their vocational choice without uncertainty and anxiety. Pineda [15] performs this research through the Logit Multinomial model, which is divided by three variables: The independent, which is a variable of discrete choice that corresponds to the classification of the career program chosen or registered and the second is the explanatory variable, which allowed to know the characteristics of the student, the territory, the socioeconomic level, as well as the education of their parents and the economic well-being of the home of each one of them. The third variable is academic, where we will know the expectations and preferences they have for these institutions. Villada [2] carries out an investigation of the factors that intervene in the choice of career and university of a descriptive and comparative nature in an approach that aims to identify these factors. In this analysis, it can be determined that the family is a determining factor in this choice since most of the students come from families that are too numerous for which many of its members persist that not all of them have studies and that they only have primary level including their parents, so it can be analyzed that cousins if they have university studies and this causes an index of motivation to continue with their studies.

## MATERIAL AND METHODS

The methodology used in this research involves the study of the participation of students who are studying at the institution in order to know what factors they took into account before choosing this institution.

First stage. In this stage, the topic to be researched was identified and for this, meetings were held with expert teachers on the subject. Figure 1 represents an example of a minute of the meetings that were held with some of the experts.

**Fig-1: Example of minutes.**  
Source: Own elaboration (2019)

Likewise, the questionnaire that was used has 38 items and has a reliability of 0.930 through the (IAC) Cronbach's Alpha Index, which will be analyzed in this research that takes place within the facilities of the Technological Institute of Milpa Alta. in the students of the engineering career in computer systems.

### Second stage

Application of the questionnaire. A meeting was held with the administrative part of the institution, in order to obtain the authorization to carry out the application of the questionnaire. Fortunately, there was a positive result (Annex 1).

### Third stage

Capture information and analyze data. In this stage, data capture and data interpretation was

performed. In the results section, the analysis of the information obtained will be explained.

### Fourth stage

Conformation of research. In this stage all the research is made up in order to leave evidence of everything that has been done over time and in all its stages.

## RESULTS AND DISCUSSION

In this phase, the sample to which the study was applied is determined. The formula proposed by Murray & Larry [17] was used. The formula is the following:

$$n = \left[ \frac{(z)^2(N)(p)(q)}{(i)^2(N-1) + (z)^2(p)(q)} \right] = \left[ \frac{(1.645)^2(62)(0.5)(0.5)}{(0.10)^2(62-1) + (1.645)^2(0.5)(0.5)} \right] = 32.6024$$

### Sample composition

A total of 36 items that were integrated and identified in the application of the final questionnaire; which was applied to 33 students who study the first

semester of the Computer Systems Engineering degree, the following table shows the total gender of the students enrolled in said career.

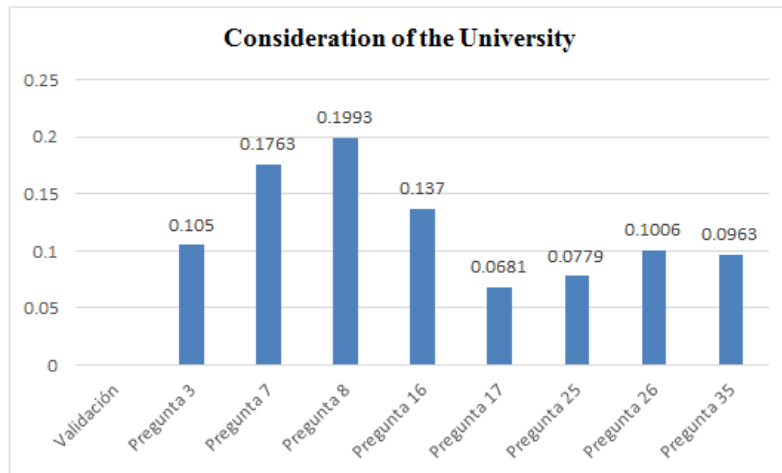
**Table-1: Description of the study sample**

Genero	Total
Femenino	10
Masculino	23
Total	33

Source: Own elaboration (2019)

The results of the Factor Consideration of the university are shown in Figure 2. These results were

obtained once the formula described above was performed.

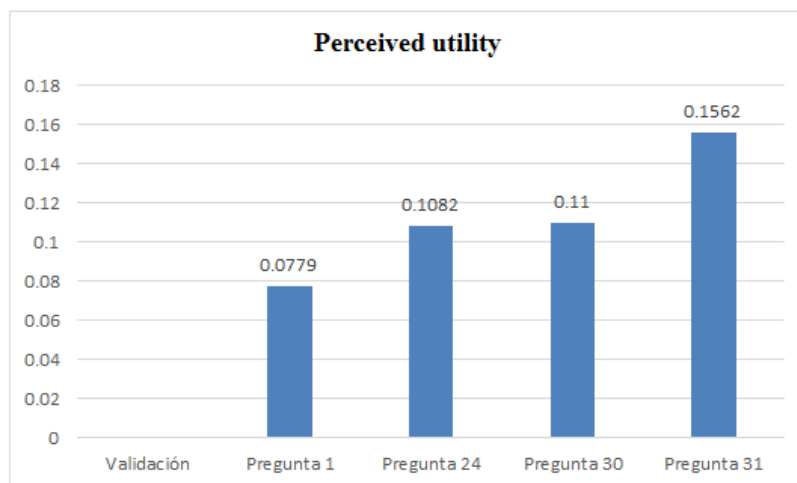


**Fig-2: Validation of the consideration of the university factor**

Source: Own elaboration (2019)

As shown in the previous figure, all the questions present a low variability, which describes that the number of samples is sufficient to carry out the study. Furthermore, the global variability index of this factor is 0.1201, which shows a low result.

Figure 3 represents the Perceived Utility Factor. These results were obtained once the formula described above was performed.

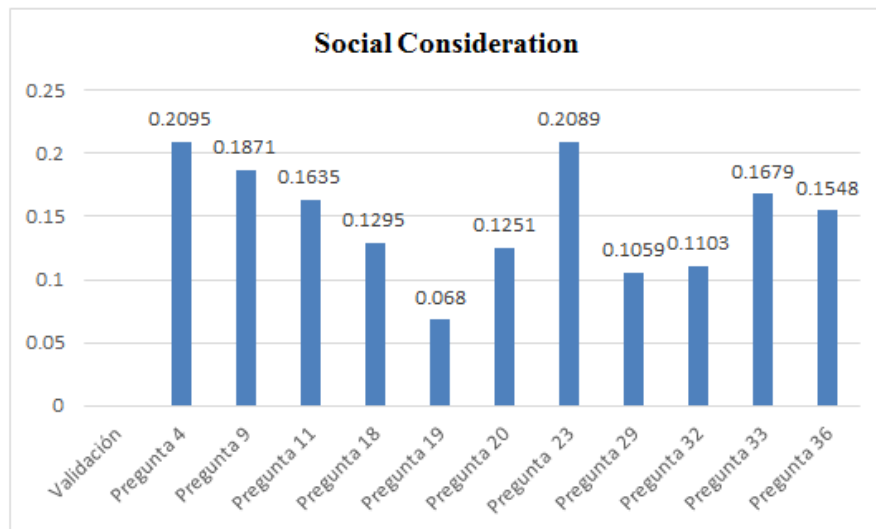


**Fig-3: Validation of the perceived utility factor**

Source: Own elaboration (2019)

As shown in the previous figure, all the questions present a low variability, which describes that the number of samples is sufficient to carry out the study. In addition, the global variability index of this factor is 0.1131, which shows a low result.

Figure 4 represents the Social Consideration Factor. These results were obtained once the formula described above was performed.

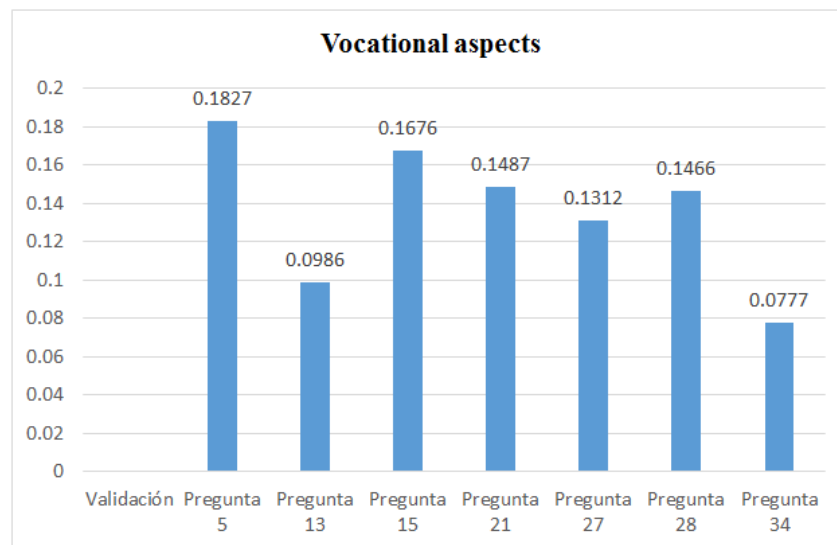


**Fig-4: Validation of the social consideration factor**

Source: Own elaboration (2019)

As shown in the previous figure, all the questions present a low variability, which describes that the number of samples is sufficient to carry out the study. In addition, the global variability index of this factor is 0.1482, which shows a low result.

Figure 5 represents the Factor Vocational Aspects. These results were obtained once the formula described above was performed.

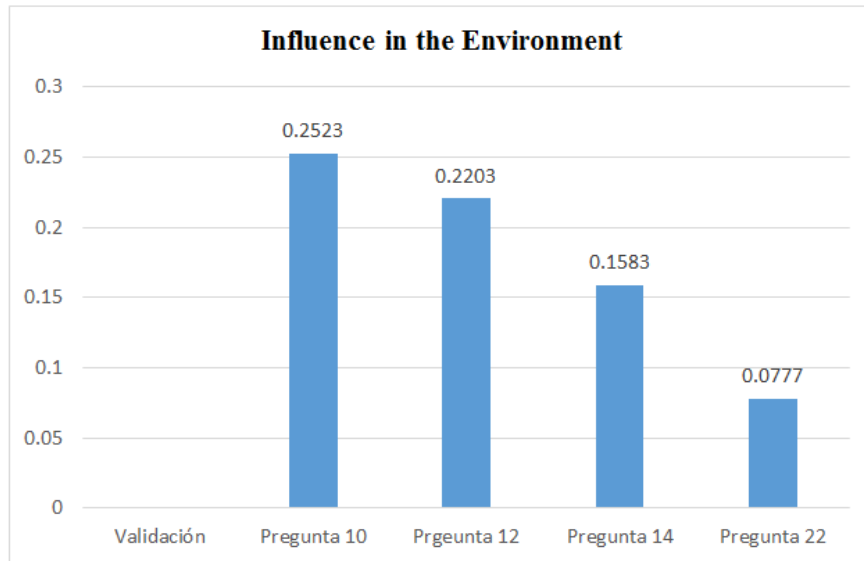


**Fig-5: Validation of the vocational aspects factor**

Source: Own elaboration (2019)

As shown in the previous figure, all the questions present a low variability, which describes that the number of samples is sufficient to carry out the study. In addition, the global variability index of this factor is 0.1361, which shows a low result.

Figure 6 represents the Influence Factor of the Environment. These results were obtained once the formula described above was performed.

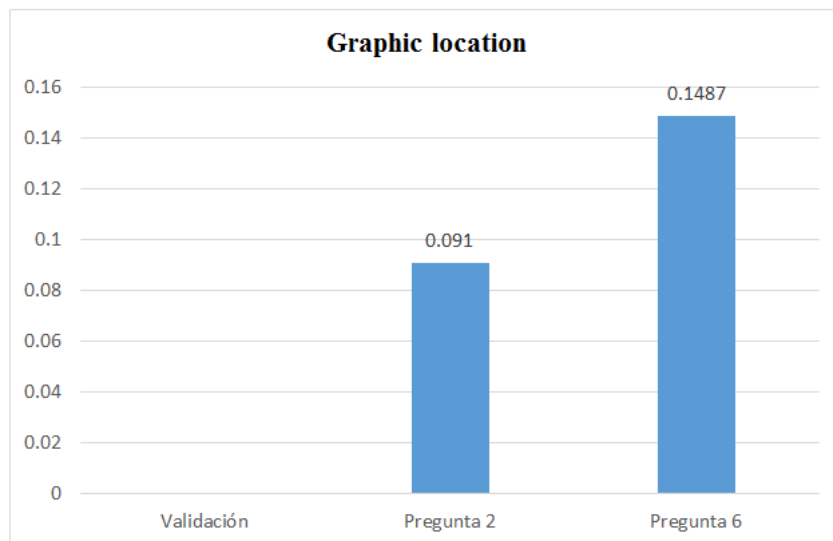


**Fig-6: Validation of the influence in the environment factor**

Source: Own elaboration (2019)

As shown in the previous figure, all the questions present a low variability, which describes that the number of samples is sufficient to carry out the study. In addition, the global variability index of this factor is 0.1771, which shows a low result.

Figure 7 represents the Graphical Location Factor. These results were obtained once the formula described above was performed.

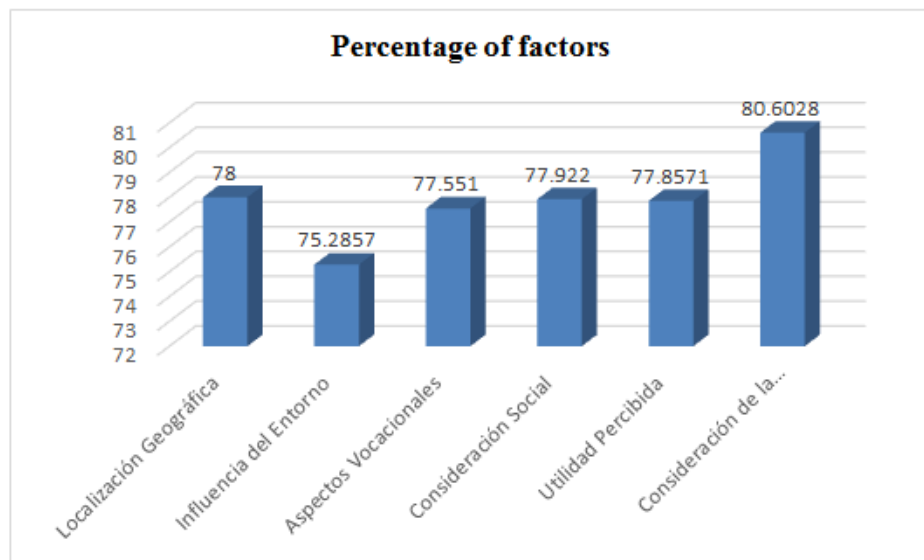


**Fig-7: Validation of the questions of the graphic location factor**

Source: Own elaboration (2019)

As shown in the previous figure, all the questions present a low variability, which describes that the number of samples is sufficient to carry out the study. In addition, the global variability index of this factor is 0.1199, which shows a low result.

Figure 8 represents in an integral way the percentage of each factor.



**Fig-8: Percentage of each factor**

Source: Own elaboration (2019)

The following graph shows the percentages obtained according to the application of the questionnaire:

- Geographical location: it can be perceived that 78% of the students believe that the location and comfort to enroll in a university is of the utmost importance.
- Influence on the environment: a percentage of 75.25% is obtained where students consider that the influence of family friends is an important factor when choosing their vocational career.
- Vocational aspects: 77.55% of students consider it important that universities should have flexible financial support, exchange programs with other institutions and flexible hours for working students.
- Social consideration: 77.92% of the students are obtained where they consider that the school must have the adequate tools for its performance.
- Perceived utility: according to the students, 77.85% consider that the costs within the institutions must be accessible so that the student can pay for an admission process or obtain a scholarship during the period of their stay at the university.
- Consideration of the universities: 80.60% of the students consider that it is very important that the school has an official validity and above all that it has a prestige and an adequate infrastructure for the performance of the students.

Given the following mentioned results, it can be concluded that one of the factors that most influence students in the Computer Systems Engineering (ISC) career are the university's considerations, since they mention that the costs that are handled within of the Technological Institute of Milpa Alta, are too high and not all can cover these expenses, that the laboratories do not have the necessary equipment to be able to carry out

their practices, that the professors are not fully trained in their teaching and that the establishment does not provide the necessary support to their students to study and work at the same time.

The second factor of importance for these students is the geographical location, where some students exclaim that the school is removed from the delegation where they live, and the area where it is very unfeasible because at a certain time the transport is scarce.

The third factor is the influence of their environment since said students of the race (ISC) mention that many of them chose the race because of their family's influence, others because from their upper middle school they studied the same and others just for fun or because they had no other choice.

Finally we obtain the factors of social consideration, perceived utility and vocational aspects as a not very important factor since the students consider that the admission process is flexible for this institution, that they have such financial aid through scholarships and that the Teachers who have entered are highly prepared to be able to carry out their career.

## CONCLUSION

According to the research carried out, we can determine that the factors that influence the choice of universities in the first semester students who are studying Computer Systems Engineering at the Technological Institute of Milpa Alta, helped us to determine the choices they make to the omento choose a career, and likewise support the institution to guide their work with students.

As it could be analyzed within the investigation one of the most important factors that influenced the decision of the students was the influence of the environment since it could be noticed in these students that their decision is influenced by third parties (friends and family), others for the sake of technology and others because they had no other choice and had higher studies of that career.

Another factor that was visible was the location in said institution that although it is in accessible points, many consider that the hours handled by the institution are not very considerable since at certain times the transportation is scarce and there is not adequate surveillance, the As a solid area, assaults against said students occur and they are stripped of their work tools that are purchased with sacrifices.

It is also considered as an important factor that the institution has a good infrastructure and that it has adequate areas and laboratories for the performance of these students, since the materials they require for their internships are too expensive and not everyone has the possibility of acquiring said tools.

Finally, it is considered that the school has trained personnel to perform its teaching role, that the courses taught are free or that a voluntary fee is provided so that students can be trained and finally that the costs of paperwork are not high, since to have a document they have to pay high amounts and not all have economic solvency.

## RECOMMENDATIONS

- In accordance with the above, it is necessary to carry out new educational projects to update the teaching staff, that is, to have new techniques, that the classes are not only theoretical that are more practical and dynamic.
- Develop a strategic plan that includes teachers and students, so that they are aware of the educational counselors and can triangulate the information of the students.
- That the quotas are accessible to the students and no more increases are made in workshops or paperwork, since all procedures must be free within the institution.
- That the English module is taught by trained teachers and has higher quality in learning and its cost is fixed as well as the support materials.
- Teachers take a preparation course at the end of each semester to teach the classes with higher quality.
- The schedules are flexible for all students who have work performance so they can conclude their performance.
- That the institution has association with companies to offer a job exchange.
- These requests were made according to the needs of the students because for it and many reasons more

students are forced to abandon their studies and work for lack of financial solvency, or for schedule issues within that institution.

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### ANNEX

Instituto Tecnológico de México  
Instituto Tecnológico de Milpa Alta



Encuesta para alumnos de 1er. Semestre de nivel superior, Delegación Milpa Alta, CDMX

Nombre (opcional): Alan Olvera

Edad: 19 Género: F ☐ M ☒ Trabaja: Si ☒ No ☐

Vive con: Sus padres ☒ Pareja ☐ Solo ☐ Otros ☐

La siguiente encuesta tiene como objetivo conocer las razones principales por las que usted decidió ingresar a una Universidad, por lo que solicitamos de la manera más atenta, que lea con calma los aspectos o puntos presentados, e indique con una 'X', en la columna correspondiente, el nivel de importancia que tuvo para usted ese aspecto para tomar la decisión de ingresar a una Universidad.

Marca con una 'X' el nivel de importancia de cada aspecto que consideres para ingresar a nivel superior.

a) Completamente de acuerdo  
b) De acuerdo  
c) Ni en desacuerdo o en acuerdo  
d) Algo desacuerdo  
e) Totalmente desacuerdo

¿Qué tan importante es para ti?	A	B	C	D	E
1. ¿Es de vital importancia el costo y la disponibilidad de ayuda financiera que te otorgue la Universidad para realizar tu elección?			X		
2. ¿La ubicación y comodidad que ofrezca la Universidad es importante?		X			
3. ¿El contar con la infraestructura, así como el de laboratorios te brinda seguridad para garantizar tu desarrollo académico?	X				
4. ¿Consideras que existe diferencia entre las escuelas de nivel superior privadas o públicas?					X
5. ¿Consideras que los requisitos de admisión a la Universidad deben ser más flexibles?					X
6. ¿Es de vital importancia la cercanía de tu vivienda con respecto a la Universidad?				X	
7. ¿Es un factor importante el nivel académico de la Universidad de tu elección?	X				
8. ¿Consideras importante la reputación de la Universidad a la que pretendes entrar?					X

#### Annex-1: Sample questionnaire

Source: Own elaboration (2019)