Study of variables likely to influence the reliability of student satisfaction surveys

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Abstract

In this final thesis, a study of the variables that affect the reliability of satisfaction surveys of both the subjects and the teaching staff is carried out. Based on the idea of striving to preserve and improve the quality of teaching at UPC institutions.

To achieve this objective, the satisfaction surveys issued by the UPC during the second four-month period of 2020 and the first four-month period of 2021 are analysed and a survey is generated in order to measure the students' perceptions of them.

Once this study has been completed, we conclude that the lack of reliability in the surveys is related to the lack of involvement and knowledge of the pupils.

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1 Introduction

At the UPC there is a system to guarantee the quality of teaching and subjects, this system is promoted by the Planning, Assessment and Quality Office, GPAQ.

This system consists in part in the dissemination of surveys for subsequent analysis in order to obtain data and conclusions in order to determine whether both teaching and subject quality are correct and with a view to improvement, in addition to the fact that it also involves an institutional use.

As mentioned above, the questionnaires are divided into two sections and each of them has a series of questions, where there is one question which is the key question, and which provides much more valuable information than the others.

The scoring consists of a numerical system from 1 to 5. 1 is equivalent to strongly disagree and 5 to strongly agree.

The surveys essentially ask whether the level and development of the course are correct, whether the course follows the teaching plan, whether you found the course interesting... On the other hand, it also asks about the teachers, if they are available to answer questions or if you consider them to be a good teacher.

In conclusion, the surveys seek to ensure a good level of the institution, either in terms of whether students are acquiring a good level of knowledge and the necessary skills to be able to develop correctly in their future job. As for the teaching staff, it is similar, if the teacher transmits the knowledge in an appropriate way, if he/she communicates correctly...

It is necessary to emphasise that these surveys, in part, have an institutional use, that is to say, they are used by the teaching staff when promoting their position within the internal

structure. For example, promotion to a professorship and, furthermore, they can also affect the area of salaries, thus leading to bonuses depending on the satisfactory results of their own surveys related to other factors.

1.1   Objectives

The aim of my work is to analyse the variables likely to influence the reliability of satisfaction surveys. Due to the existence of previous works, we already have premises with which to start working. As the information on this subject is not available locally, we will also include a synthesis section where all the conclusions drawn from previous studies will be put together. In addition, a list of the variables that have been analysed and their results will be included. As a complement to this, there will be a section where new variables will be proposed to be studied and a possible continuation of my work in particular, so that future students doing research on the improvement of the surveys can carry out a better, more effective, and more efficient work.

The aim of my work is based on two pillars. The first is the complementation of previous work and the second is the incorporation of a branch of study of variables.

Regarding the first branch, the work carried out in May 2019 and June 2020 will be complemented. The first is based on the analysis of the surveys in which several variables are analysed, but due to the data there is one in particular, which refers to academic performance, which does not have enough sample to determine whether the variable in question has an influence or not.

The second one analyses the part of the teaching staff. But it does not analyse a variable that in my opinion is very important, which is the age of the teaching staff. Because, according to my experience, it is common for teaching quality to be higher in terms of involvement during the first years of teaching, as there is a great deal of enthusiasm due to the fact that being a teacher is a job that is normally carried out on a vocational basis.

As for the second area, the study of the pupils would be incorporated. In reference to whether or not they make good use of the questionnaires, whether this possible misuse is conscious or unconscious? That is to say, my premise regarding this branch is based on the fact that it is possible that they are consciously analysing the questionnaires and finding ways of improvement, but if the students do not make an adequate use of this tool, is the conclusion reliable? Therefore, it is necessary to determine whether or not the students' use of the survey is correct in order to know if the end user of the survey could improve the results obtained through it.

1.2   Scope

The aim of this study is to complete previous work and extend the study to a new degree, thus adding a completely new area of study that has not been dealt with before.

Previous TFG's will be researched in order to gather information and not repeat processes that have already been analysed in the past in a decisive way.

Pooling of all the information gathered so far and the conclusions drawn in each case.

Previous studies will be completed by means of a new sample of a variable with a non-determinant result in terms of the analysis of subjects and the incorporation of a new variable in terms of the analysis of teaching staff.

It will be extended with a new area of study of the students, generating surveys with key questions that will lead us to reach conclusions that respond adequately to the questions asked at the beginning of the work and thus be able to determine with criteria whether or not the students make good use of the tool and if the answer is negative, to be able to analyse why and how to correct it.

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Proposing new variables to be studied or complementing work and proposing guidelines with which to continue the study in question.

1.3 Justification of the need for the TFG

The surveys are a necessary tool for the quality control of the university, through which it is possible to determine the good performance of both the subjects and the professors. Moreover, in the case of teaching staff, this tool can also lead to a promotion effect, therefore, it is necessary to take them into account in order to be able to detect shortcomings and implement improvements.

The marks obtained from the questionnaires are of great importance when it comes to detecting educational shortcomings on the part of the teaching staff, so that obtaining a relatively high score will indicate their skills and competences, which are essential for effectively meeting the demands of the profession.

On the other hand, it also has an institutional character, as a minimum mark in the examinations is necessary in order to apply for promotion, such as seeking access to a professorship.

Therefore, although a great deal of progress has been made in this area in the past. Can we be sure that the surveys are 100% reliable? Being such an important tool, it is necessary to ensure its reliability, therefore, any improvement is necessary in order to implement effective education.

2 State of art

The state of art serves to identify the conclusions and assumptions drawn from previous studies, so it is a good starting point from which to begin the project. The studies carried out previously will be mentioned below, as well as a brief description of what they have focused on and what conclusions have been drawn.

2.1 Previous projects

With regard to the study of satisfaction surveys, 5 studies have been carried out previously. Each of them has focused on a different aspect, therefore a very good starting point is to analyse them and combine their conclusions in order to see what work they have done, not to repeat it and thus to be able to extend previous studies in order to complement them and therefore improve the information we have today.

Study nº1. LAURA CAMPENY, OCT. 2010. Evaluation of statistical tests in finite populations with low sample size. Application to the analysis of teacher surveys.

This was the first study to be carried out in this respect, the essence of which was to concentrate on the study of the statistical model used to obtain conclusions from the surveys. Its basis was that a reliable survey model was needed to evaluate the performance of teachers. The aim is to find criteria to guarantee sensitivity and specificity in the resolution of the contrasted hypotheses. Various statistical models are evaluated in order to find the most appropriate one for this type of analysis.

Study nº2. JORDI FUSTER, SEPT. 2016. Analysis of UPC student surveys on subjects and teaching staff.

This was the second study, the basis of which was that the analysis of student satisfaction surveys affects aspects of teaching quality that can be used to improve and adapt the subject matter of courses. Moreover, it can also affect teachers and their salary supplements. On the other hand, the teachers, on several occasions, have shown some concerns about the surveys, both from a methodological point of view and from a participation point of view. The aim of the project is to address some of these concerns and, if necessary, to improve the surveys or provide some compensation criteria.

Study nº3. PALOMA MENÉNDEZ, JUNE 2017. Analysis of UPC student surveys on subjects and professors.

This was the third study, this project analysed the satisfaction surveys of the teaching staff, this project is a continuation of the previous one carried out by Jordi Fuster, on the subject surveys. This project aims to analyse the surveys in depth and provide answers to some questions that generate doubts about certain aspects related to the subjects and the teaching staff.

Study nº4. POL AGELL, MAY 2019. Study to improve the satisfaction survey model. Reduction of the influence of the variables that affect the process.

The fourth project studies the most common variables that influence the results of the satisfaction surveys of the courses. It is based on improving the reliability of the results obtained through this process.

Study nº5. Cunibert González, JUNY 2020. Study to improve satisfaction surveys. Analysis of the variables that may affect their reliability.

This last project is based on the analysis of the variables that may specifically affect the satisfaction surveys of the teaching staff. In this particular project, the different variables that can have a negative impact on the surveys are analysed. Based on the premise that these

negative effects can unfairly penalise teachers. Thus, by identifying the aspects that have an influence, it is possible to minimise the impact they represent.

3 Research of information

Surveys are extremely useful for any study. Through them it is possible to find out what makes a consumer satisfied with the product he/she is buying, or in which aspects he/she is dissatisfied.

However, in any survey, variables must be taken into account because, if they are not adequately controlled, they could affect the final results, thus rendering the study useless.

So, to situate ourselves, what is a survey? A survey is a questionnaire to find out the opinion of a representative sample of the population. The people surveyed must meet a series of characteristics in order to be valid and to be able to generalise the results.

In other words, what we need to do in our case is to find out the student's opinion about the quality of the degree, separating the study into two parts, one for the teacher and the other for the subject in question.

Once we have defined what a survey is, we will define what a variable is, since our study will be based on determining which of the existing variables are likely to influence the result in order to obtain the highest possible degree of reliability.

A variable is a quantifiable and/or qualifiable element that allows us to identify the attributes or characteristics that could influence the results of an investigation. These variables can be distinguished in different typologies, and furthermore, we can make subdivisions:

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3.1 Typology of variables

3.1.1 According to the type of data

- Qualitative variables: Made up of those factors that may have a difference in significance depending on the person surveyed.

- Quantitative variables: Made up of those factors that can be quantified numerically.

  o Continuous variables: These are variables that can adopt values between two numbers, intermittent reference points, some examples would be weight, height, time spent on a task, etc.

  o Discrete variables: These are variables that do not accept intermediate positions between two names, such as, for example, the number of people interviewed, which can only be an integer name; this variable does not accept decimals.

3.1.2 Depending on whether they are the object of study

- Internal variables: Conformed by those elements internal to the study.

- External variables: Conformed by those elements external to the study.

3.1.3 According to its interrelation

- Independent variables: Those controlled and known variables that we can manipulate for our studies.

- Dependent variables: Those variables that are the result of an independent variable.

3.1.4   According to their influence on results

- Controlled variable: Factors controlled by the researcher in order to eliminate or neutralise any effect that the observed phenomenon or subject of the study might otherwise have.

- Uncontrolled variable: These are those factors that can influence the results but cannot be controlled. For example, the gender of a person is an uncontrolled variable.

Before starting the study, we have to analyse and identify all the types of variables that we can find in the research field, paying close attention to the classification of a dependent and independent variable and studying whether there is any relationship between them.

This is very important because, depending on the classification of the variables that is made, one study or another will be derived. The possible types of studies are:

- Univariate study: This type of study analyses a single variable and the influence it may have.

- Bivariate study: Unlike the univariate study, this study studies two variables at the same time, thus taking into account the correlation that exists between them.

- Multivariate study: Like the bivariate study, this also studies the correlations between variables but in this case, it includes more than two variables in the study itself.

It is very important to define in each case the type of study and the possible variables that exist, so that we can analyse the studies carried out so far in subsequent sections.

As we have defined the types of studies that exist, we will go into more detail on each one.

3.2   Type of studies

3.2.1   Univariable

The simplest form of data analysis, this type of study is usually used to show the behaviour of a variable. Thus, this analysis is used to determine the effects of an independent variable on a dependent variable. For example, what is the level of student satisfaction with the teaching staff, using questions such as how interested you are in the subject (independent variable), which can clearly influence the grade, since we all know that it is not the same level of satisfaction with a subject if you are interested in it or not.

3.2.2   Bivariable

This is a more complex way of analysing a sample, as it looks for correlations between two variables known as "X" and "Y", thus looking for a simple causal relationship such as, for example, is it possible that the teacher's dedication, predisposition, and enthusiasm affect the score in the subject? That is to say, in my opinion, it is a completely different world when a subject is taught by a teacher who is fully dedicated to teaching compared to a teacher who has no interest in it. But then more questions arise: is it possible that the degree of vocation/dedication of the teacher is linked to age? And with their personal situation?

Some of these questions are easy to answer, such as, for example, whether the personal situation has an impact. Obviously, it is a very important factor in the teacher's grade, as there are certain situations in life, such as the death of a close relative, the break-up of a relationship, etc. (external variables), which can destabilise the teacher's emotional health. (External variables), which can destabilise the emotional health of the teaching staff and would clearly have a great influence on the results of the survey.

3.2.3 Multivariable

Multivariate studies are similar to univariate studies but have more than two dependent and independent study variables.

Multivariate analyses are used in complex fields of study where there are several interrelated factors. A multivariate study is much more realistic as it allows a much broader scope than labelling different groups of opinions in the hope that all the results will converge as predicted.

One of the most widespread applications for multivariate analysis are market research surveys, where data on perceptions and opinions about a service or product offered by a company can be obtained.

3.3 Starting point

As mentioned in section 2 of this same project, which corresponds to the state of the art, this is not the first project to analyse the variables of influence, but the sixth on the list. Each of the previous projects has studied a different branch of satisfaction surveys.

The first two studies were focused on improving the survey model by studying the results with different statistical models in order to obtain greater reliability, as well as considering changing the use of the mean to the median.

The third study, on the other hand, carries out two types of study, on the one hand a univariate study with variables such as the difficulty of the subject, but on the other hand it also carries out a bivariate analysis of the relationship between the average of the subject and the average of the teaching staff.

The last two studies are based on a univariate analysis of variables independent of both the subject and the teaching staff, thus extracting the respective conclusions in each analysis carried out.

Despite this basis of projects that we have, the main difficulty of the project to be carried out is the lack of information. Since we only have 6 works without practically any connection between them and without any information and/or documentation.

The basis of the work carried out so far is the student's own experience, since in a project like this, self-reflection is an essential tool to provide knowledge and information on the subject. Therefore, our point of view and experience within the university itself will be decisive in determining the influence of any of the variables.

To find the information we have, in this case we refer to the data collected by the GPAQ, the body in charge of regulating the data obtained through the surveys, we contact them via email and arrange an online meeting to discuss the line of research that I want to focus on my TFG and thus obtain the data to be able to carry it out.

Talking to Laura Campeny, at the meeting it was specified that the variables proposed on my part seemed attractive to her, so that they are, in terms of academic performance, the complement to a previous work which she was unable to obtain a response to. As for the variable of the teaching staff, the age of the latter is a variable that had not emerged prior to being the subject of the study and they find it attractive, so that there are many possible conclusions to be drawn from it, as there are many variables hidden behind the age itself, such as the dedication of the teaching staff or their experience, facts that will be detailed in section 5.2 of this study.

Ultimately, my proposal to measure the level of satisfaction of the students with their own surveys is also a parameter that they welcome, because not only that, but I also use a survey

model that will measure the quality of the answers obtained and the level of knowledge regarding the functioning of the surveys. At this point, I already have a survey model which I can teach to both Laura Campeny and Montserrat Sánchez so that they can contribute with their own experience and with their points of view and their complementarities I can improve my own survey.

3.4   The quality Planning and Evaluation Office (GPAQ)

The Quality Planning and Evaluation Office (GPAQ) is the body in charge of managing all the information obtained through the surveys. As defined by the UPC itself, it is committed to the quality of the center, in this case the ESEIAAT:

"ESEIAAT's Quality Policy

The Management Team of the Escola Superior d'Enginyeries Industrial, Aerospace and Audiovisual Engineering of Terrassa (ESEIAAT) is working on the definition of the Quality Policy of the centre that will be implemented through the definition of specific Quality Objectives that will guarantee the proper functioning of the curricula taught at the centre and that will ensure the achievement of the competences (knowledge, skills and attitudes) defined for each degree.

In this sense, ESEIAAT undertakes to devote the necessary technical, economic and human resources at its disposal, always taking into account its own competences.

At ESEIAAT we are committed to Quality, as a way of doing integrated in the vision, mission and management policy of the School, both to achieve excellence in academic quality and in the organisational processes.

At ESEIAAT we are committed to ensuring that quality and continuous improvement form part of the School's strategy and the day-to-day life of our university community."[1]

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[1] (Equipo Directivo de la Escuela Superior de Ingenieros Industriales, Aeroespaciales y Audiovisuales. UPC.: *"Política de Calidad de ESEIAAT."* 2019, https://eseiaat.upc.edu/ca/lescola/qualitat)

It is therefore essential to ensure that the satisfaction surveys work well, as they are a tool for achieving the final objective, which is to guarantee good quality both in teaching and in the curriculum at the school.

4 Variables likely to influence

4.1 Design of satisfaction surveys

Before defining what is an influential variable and which variables could be influential in satisfaction surveys, we will analyse the current model of surveys.

There is a UPC scheme that revises the survey model at regular intervals. The last revision was on 4 July 2019, when the agreement CG/2019/04/15 approved the student survey model.

This document defines satisfaction surveys as instruments that allow us to know and detect needs, expectations, interests, demands, opinions, or perceptions of the different groups that make up the University, in order to improve the University's own activity.

The UPC has a long tradition of collecting information on the students' assessment of the teaching performance of the teaching staff and of the subjects taught each term. This is so much so that different models, formats, and methodologies have been used since the 1995-1996 academic year.

The UPC has a UPC action plan 2018-2021 which defines two short-term actions related to student satisfaction surveys:

- Draw up an action protocol to improve the quality assurance of the surveys, both for teaching staff and students.

- Follow up on the surveys and the action plans derived from them for continuous improvement of teaching and to address specific problems.

The strategic objective of these actions is to improve the activity of the UPC through the analysis of satisfaction surveys (internal and external).

In order to comply with the objectives of the UPC action plan 2018-2019, and to continue the trend started years ago, it involves the periodic review of the current model and all related aspects.

4.1.1   Surveys on subjects

The subject surveys seek to ensure that certain requirements previously stipulated in the programme of the degree or master's degree in question are fulfilled:

Therefore, the model survey is formulated as follows:

1. I found the contents of the course interesting.
2. Overall, I am satisfied with this course (*).
3. Observations, comments and/or suggestions for improving the development of this subject.

These questions are evaluated using a scale from 1 to 5 and the one marked with (*) will be used as an indicator in evaluation processes, if applicable. In other words, this marked question is the key question.

Moreover, it offers the possibility of incorporating new additional questions from among those offered in order to improve the survey itself defined by the institution.

The UPC itself proposes 5 points to be dealt with on the subject itself in order to be able to expand the survey:

- The assessment is to check that it corresponds to the objectives and level of the subject.

- Planning, where this requirement seeks the good distribution of activities and programming of the syllabus over time.

- The course materials, presentations, statements, scripts, bibliography and other resources are easy to access and are really useful for learning.

- The workload, that is to say, that the required dedication is adequate, well sized and distributed throughout the course.

- The repetition of the contents if repeated contents from other subjects are presented.

4.1.2   Teacher's surveys

In a similar way as with the subjects, these surveys also seek to ensure the school's excellence, but in this case in terms of the teaching staff.

The model questionnaire is made up of the following questions:

1. The teacher presents the contents in a clear way and resolves any doubts.
2. The teacher has helped me to learn (*).
3. Observations, comments and/or suggestions to the teaching staff to improve the teaching activity.

These questions, as in the case of the subjects, are assessed using a scale from 1 to 5 and the one marked with (*) will be used as an indicator in assessment processes, if applicable. In other words, this marked question is the key question.

Furthermore, the possibility of incorporating new additional questions from among those offered is offered again in order to improve the survey itself defined by the institution.

In this case, the UPC proposes 2 points to be dealt with on the teaching staff in order to expand the survey:

*   Motivation, that is, if the teacher encourages student participation in a respectful working environment.

*   The context, i.e., whether the teacher contextualises the contents of the subject within the syllabus of the degree or the field of knowledge.

4.2   Previously studied variables

Therefore, before beginning a study as complex as this one can be, we will start by listing the known variables and classifying them according to their typology. Subsequently, we will generate a table that compiles all the variables that have been analyzed so far and the conclusions that have been obtained in this respect.

But first, what is a variable susceptible to influence? A variable is an observable characteristic that can have more than one value, that is, any characteristic or quality of reality that is capable of varying. However, an influential variable is one that is capable of varying in such a way that it can affect the results and distort them in such a way that conclusions cannot be drawn from the results or even that the conclusions drawn are erroneous.

Today, different types of study have been carried out, referring to the survey model, the teacher survey, and the subject survey. Below, we will separate the different types of study and in each case, we will analyse the variables and conclusions.

4.2.1   Studies on the survey model

Study nº1. Laura Campeny; in the first instance, a simple approach was proposed which entailed the need to implement advanced statistical methods (exact combinatorial calculation, Monte Carlo simulation and Importance Sampling). Subsequently, the results were contrasted with an expert, and it became clear that a hierarchical model needed to be introduced. The results based on this model are validated by the expert and are satisfactory.

Study nº2. Jordi Fuster; it is studied by contrasting hypotheses of averages in order to find evidence of which factors influence the qualifications received in the subjects and linear modelling is used to finish analysing the groups found. A multivariate analysis technique is implemented in order to have a different view of the data and thus to identify new groups

and relationships. He determines that the use of the mean is not very accurate when it comes to extreme results and proposes that it is better to use the median, since the median is less sensitive to the extreme values of the data. Moreover, it draws conclusions about the susceptibility of certain variables to influence the final result.

4.2.2 Studies on the teachers' surveys and the subject's survey

STUDY	SURVEY TYPE	VARIABLE	TIPOLOGY	CONCLUSION
Study nº2	Subject	Semester (1st/2nd)	Dependent / Qualitative	Non-relevant
		Subject type (compulsory/optional)	Independent / Qualitative	Relevant
		Degree level (bachelor's/master's)	Independent / Qualitative	Relevant
		Number of subject repeaters	Dependent / Discrete quantitative	Non-conclusive
		Subject difficulty	Independent / Continue quantitative	Relevant
		Timetable (morning/afternoon)	Dependent / Qualitative	Non-relevant
		Number of students	Independent / Discrete quantitative	Non-relevant
		Survey participation	Independent / Discrete quantitative	Non-relevant*
Study nº3	Teacher	Semester (1st/2nd)	Dependent / Qualitative	Non-relevant
		Subject type (compulsory/optional)	Independent / Qualitative	Relevant
		Degree level (bachelor's/master's)	Independent / Qualitative	Relevant
		Number of subject repeaters	Dependent / Discrete quantitative	Non-relevant
		Subject difficulty	Independent / Continue quantitative	Relevant
		Phase (initial/non-initial)	Independent / Qualitative	Non-relevant
Study nº4	Subject	Subject type (compulsory/optional)	Independent / Qualitative	Relevant
		Number of students	Independent / Discrete quantitative	Relevant
		Academic performance	Dependent / Continue quantitative	Non-conclusive
Study nº5	Subject/Teacher	Subject type (compulsory/optional)	Independent / Qualitative	Relevant
		Degree level (bachelor's/master's)	Independent / Qualitative	Non-relevant
		Number of subject repeaters	Dependent / Discrete quantitative	Non-relevant
		Number of students	Independent / Discrete quantitative	Relevant
		Phase (initial/non-initial)	Independent / Qualitative	Non-relevant
		Teacher's gender (men/women)	Independent / Non-controlled	Non-relevant

Table 1: Variables studied previously (Own source)

5   Variable selection

However, as mentioned in section 1.3 and also reflected in other studies, teachers recognize the importance of the results obtained from the surveys, either because there are different variables that affect and distort the results or because of other factors.

This work, as has already been mentioned, aims to collect another branch of study, while all previous studies have exclusively analysed the surveys themselves, whether it is the model used, the variables of the subject, the teaching staff... There is also a very important factor, which is the student himself.

5.1   Subject variable

The first of the variables to be studied will be academic performance. In other words, whether the percentage of passes influences the assessment of the subject. This variable has been chosen because it was already studied prior to the work of Pol Agell in May 2019 and no conclusion was reached as to whether or not it was relevant. It is now intended that by studying it again a conclusion will be found.

In addition, it has been decided to include a brief analysis of whether participation is influenced by the pass rate.

Both studies will be analysed using a bivariate analysis, since it is possible to simplify them into two factors, one dependent and the other independent.

5.2 Teacher's variable

The teacher variable is the second variable to be studied, and in this case the chosen variable is the age of the teacher.

The first reason is dedication, as it is well known that the teaching job is vocational in nature; However, there is a dedication factor that we can relate to age because at a young age, novelty and enthusiasm can represent a great degree of dedication, but it should also be borne in mind that at more advanced ages, the performance of a monotonous job that can turn into teaching the same subjects year after year, term after term, can generate wear and tear that is reflected in the dedication due to the possible loss of enthusiasm.

On the other hand, there is the experience, by the same fact that has been mentioned before, experience is acquired through practice, it is also true that in the teaching of classes there is also the facility of each one, experience is something that can only be acquired through practice and therefore with age.

Furthermore, the type of contract that the teacher may have is also taken into account, as it is not the same to have a temporary contract, as you have to fight to be able to opt for or obtain a permanent position at the desired centre, as it is to have a permanent position where there may be a certain degree of relaxation due to the stability of the job.

Finally, teachers not only give classes, but also carry out research. These two factors tend to go hand in hand, so we can have three possible profiles. The first is a teacher who carries out research work in order to be able to continue teaching. The second is a researcher who teaches classes, even to the point of being obliged to do so, as his or her dream is research and not teaching. Finally, a balanced profile that enjoys both aspects of their profession.

However, there are profiles that can benefit the quality of teaching, while there is not one that can harm it. It should be made clear that I do not wish to say at any time that this damage

to the level is done consciously, but that we all know that it is not the same in terms of desire, energy or dedication to do a job out of devotion or obligation.

This variable, as in the previous case, will be analysed by means of a bivariate analysis since it is again possible to simplify it to a dependent variable and an independent variable.

5.3   Student's variable

In third instance, we have the student variable. This variable is a very complex variable, as we do not have any precedent and we have to be very careful about what information we want to obtain in order to ask the right questions and be able to obtain answers to our questions. It should be added that the variables that I have decided to investigate are those that, due to my work experience, I find fundamental and basic in order to begin the study.

This study, unlike the two previous variables and all previous studies, will not be carried out by analysing the satisfaction surveys, but will generate a survey only to ask the questions that are considered relevant to obtain the desired results. These questions will be shown and explained one by one in section 7.1 of this work.

This third variable will be analysed by means of a multivariate study which will try to draw conclusions about the students' perceptions of the satisfaction surveys and to draw correlations between them.

5.4   Reliability variable

To conclude the selection of variables, it has been decided to study the degree of reliability of the surveys to date, in order to subsequently cross-check conclusions with the other analyses to determine what is necessary for the satisfaction surveys to show a reliability value suitable for drawing valid conclusions and to be able to implement measures for academic improvement.

6   Study of survey generation

Before generating a survey, many parameters must be taken into account and the questions to be asked and the answers to be obtained must be carefully analysed. So, what do we have to take into account when generating a survey?

6.1   Wording of questions

In order to create a successful survey, the quality of the questions and answers must be taken into account. The creation of the questionnaire is a fundamental step in the process and the analysis of the text in a survey plays an essential role. Both the structure of the text used in the elaboration of the questions and the analysis of these is key, as the wording of the questions themselves can induce the respondent to give one answer or another, and therefore certain aspects must be considered when generating a survey.

Before embarking on a survey, before writing the questions, before establishing the type of answers, it is important to do some research. This research will allow us to deepen our knowledge of the subject, this knowledge will allow us to draw up an action plan with which we can define our questions, with these questions we can be clear about what the objective is and formulate the necessary questions correctly in order to be able to collect as much information as possible without saturating the respondents or being able to influence their answers. Subsequently, the text is chosen, written, and analysed.

The questionnaires can include different types of questions depending on the objective and the needs that are sought. Closed-ended questions have limited options that allow quantitative analyses to be carried out when it comes to determining the results, while open-ended questions allow opinions to be written freely and at a specific length.

These types of open-ended questions are of great value to companies because they provide a great deal of information and allow them to gain new perspectives, and respondents can also provide real examples related to their personal assessment.

However, extracting information from the answers given and obtaining statistical data is not so easy, especially when the volume of surveys is very high.

6.1.1   Close-ended questions

When formulating the questions, it is very important to choose the right words, this important parameter can make the difference between a good question or a biased question, then the answer could be biased, therefore it is very important to write in a neutral and clear way so that it does not cause doubts in the survey.

When drafting the questions, the most important facts to take into account are:

- Writing neutral questions, thus avoiding the introduction of both negative and positive adjectives that could influence the opinion of the respondent.

- Offer objective response options, when evaluating a service or product, all respondents know how to evaluate using a scale of adjectives such as, for example: very good, good, fair, fair, poor, poor, very poor, or include a numerical scoring system such as 1 to 10, with 1 being very poor and 10 being very good, thus providing more scope for response to the question.

- Avoid questions with absolute answers, the words "all or nothing", "always" or "never", are conditioning elements that force the survey to be 100% without any kind of intermediate answer.

6.1.2 Open-ended questions

On the other hand, not everything can be determined with closed-ended questions, but it is also necessary to have certain open-ended questions where the respondent can express his or her opinion freely and justify it properly so that a completely different point of view can be obtained from that of the open-ended questions.

In order to be able to work with the data obtained, it is necessary to use a textual analysis system in a survey. This analysis is carried out systematically by converting the individual responses into manageable and comprehensible data.

The different typologies for obtaining textual statistics are very useful but require some preliminary steps.

- In general terms, before starting to carry out a count, we can take a first look at the answers to try to discover the first patterns of behaviour.

- Establish categories, from the answers we can delimit some categories or patterns that are repeated in most of the surveys.

- One of the most important steps is to create a table that includes the selected categories, the response to the survey and a valuation method such as the NPS valuation.

- To add or remove categories, after a second evaluation of the answers, it may be necessary to add or remove sections of our table. Without any modifications being made, our aim must always be to carry out the most exhaustive and enriching analysis possible.

- Obtain results and percentages, thanks to the tally table we can measure the number of responses associated with the different categories, the NPS score and other data. Furthermore, we can establish correlations and possible associations between concepts that have appeared.

If we carry out this type of survey regularly, we can obtain statistics that allow us to assess changes over time, monitor improvements and evaluate progress in the different categories.

6.2   Net Promoter Score

Net Promoter Score (NPS) is a qualification tool developed by Bain & Co. and the consultant Frederick f. Reichheld, which was first introduced in the Harvard Business Review in 2003 and has had a great impact thanks to its simplicity and effectiveness.

The main purpose of the Net Promoter Score (NOS) question is to calculate a score to determine the level of customer loyalty towards your business.

Since its appearance, the NPS question type has been used by large companies to understand the perception that their users or consumers may have of them in order to establish lines of action that contribute to raising their NPS score.

The dynamic is based on asking a simple key question: How likely are you to recommend our company, product or service to a friend or acquaintance?

Respondents are asked to answer this question with a numerical rating on an 11-point scale of how likely they are to make a good comment or recommendation about the company, service or product on offer, with scores between 0 and 10, where 0 is equivalent to very unlikely and 10 to very likely.

Based on these responses, it is possible to calculate the NPS and determine the level of loyalty of end consumers.

Based on the responses of the NPS assessment, consumers will be classified on a scale divided into 3 sections: Detractors, Passives and Promoters.

6.2.1 Detractors

Consumers who rate the service with scores between 0 and 6 are called Detractors. These are the people who consider that the service provided is not satisfactory or are dissatisfied with some aspect of the company, service or brand, they are the ones who can discredit your company and at the same time it is from them that you can obtain more information to make improvements in the service

6.2.2 Passives

Respondents who score between 7 and 8 are known as Passives. These are not included in the Net Promoter Score calculation formula, as they are considered neutral or undecided, although they can be qualitatively considered as possible subjects or potential promoters. On the other hand, however, they are also subjects who could potentially become Detractors if the changes implemented in the future are not to their liking.

6.2.3 Promoters

Those who score 9-10 are the Promoters. These are the people who are completely satisfied with the service provided and at the same time provide the greatest benefit to the business, as they can promote and recommend the service provided to others. Therefore, they are an asset of great value to any service or business. As with Detractors, this group can also provide you with a large amount of information from which to draw conclusions, but in this case,

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positive information that can be enhanced, in other words, facts that the end customer can value very positively.

6.2.4 NPS Calculation

The score is calculated with the percentage of promoters and subtracts the percentage of detractors. The result is a compressed score in the range of values between -100 and 100.

$$NPS = \%\,Promoters - \%\,Detractors$$

As mentioned above, Passive customers are not included in the calculation of the NPS score because they do not act either for or against the service, they simply maintain a neutral position

6.2.5 Analysis of the NPS results

As the result of the NPS score has been mentioned, it is between -100 and 100. But how do you analyse the numerical result?

Any score above 0 is considered good, as the number of supporters is greater than the number of detractors. A score above 50 is considered excellent, as the number of supporters is significantly higher than the number of detractors. On the other hand, a score of less than 0 is a warning sign that something is not working well and how this is perceived by consumers.

PROS	CONS
Simple and effective analysis	Limited analysis
Provides an overview	It does not provide justifications for the answer received
Tool easy to use	Necessity of calculation software for large volumes of surveys

Table 2: NPS pros and cons (Own source)

7 Survey Generation

7.1 Type of survey used

It is very important that certain key parameters are taken into account when generating a survey. The factors that have the most decisive weight are obviously the questions that are asked.

These questions have been carefully thought out as the aim is to measure the degree of student satisfaction and to be able to capture their perceptions. At the same time, we will also take advantage of the opportunity to ask for their opinion so that they themselves can highlight the positive and negative aspects and proposals for improvement according to their own criteria.

The process of creating the survey was a laborious one, as it began by using the UPC survey model in the first instance. This model consisted of 3 questions to be answered in a closed-ended format. I then proceeded to detect the limitations of the proposed survey and one of the biggest limitations I found was that it was a very focused and limited survey in terms of answers.

Secondly, I implemented an open-ended question, as the UPC satisfaction surveys also do, but there are still problems, because if there is a completely open-ended response in the form of comments and/or observations, people can adopt two types of response. The first is not to respond, since, as you might think, it is possible that they are directly sent away and do not give a response. However, as our objective is to obtain as much data as possible, this is completely out of the question. The second option is for them to respond on completely random topics which, according to the individual perception of the respondent, are either negative or positive facts to be highlighted. This is not the objective either, so I thought about the option of implementing a type of open response but with a question that would specify the topic, that is, without suggesting any positive or negative response induced by the wording of the question but focusing on the topic of interest in question.

These parameters are the minimum to generate a survey, but we cannot stop here. However, when I was looking for information on how to measure a level of satisfaction, I found a scoring system called Net Promoter Score. This system is a system for measuring the degree of satisfaction of a client with a product or service, at the same time taking into account that the university course would be the equivalent of a product and the professor who teaches it would be the service that meets our needs.

But this is why we already have our own satisfaction surveys, so my idea was to measure the degree of satisfaction of the satisfaction surveys. Although it may seem complicated, the concept is simple. How satisfied are students with the quality measurement tools? What are their opinions and criticisms? And most importantly: How well do they use the tool provided?

However, it is possible that frustration with a subject or a teacher can cloud their judgement and that this score is negatively affected and does not reflect reality. On the other hand, it is possible that due to a lack of knowledge, people do not take the same survey seriously and answer without honesty or without any consideration for the answer given.

Subsequently, after all these conclusions, I proposed a first survey model that was generated with the aim of presenting it to the GPAQ in order to obtain, on the one hand, their opinion on my study proposal and, on the other hand, their proposals to improve my first model.

This first model and the subsequent ones were generated using an online survey creation tool called Question Pro, since with it the possibilities of creating the survey were very high and, moreover, it allowed the implementation of logical skip functions, thus making it possible to carry out an intelligent survey that allowed the derivation of questions according to your previous answer.
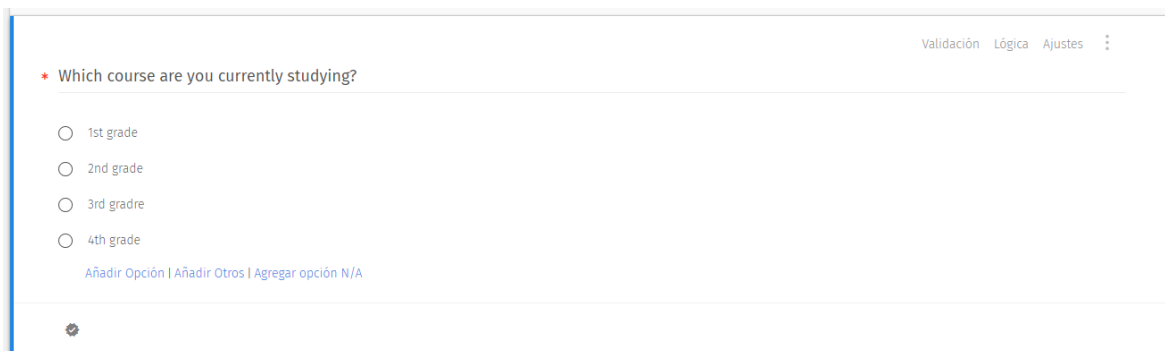
This model was incomplete as certain parameters were undefined and therefore established as standards by the creation web page itself, this first model can be consulted in the annex of the work, then the questions finally asked will be shown and the individual process in the creation will be commented on.

Figure 1: Initial message student's survey (Own source)
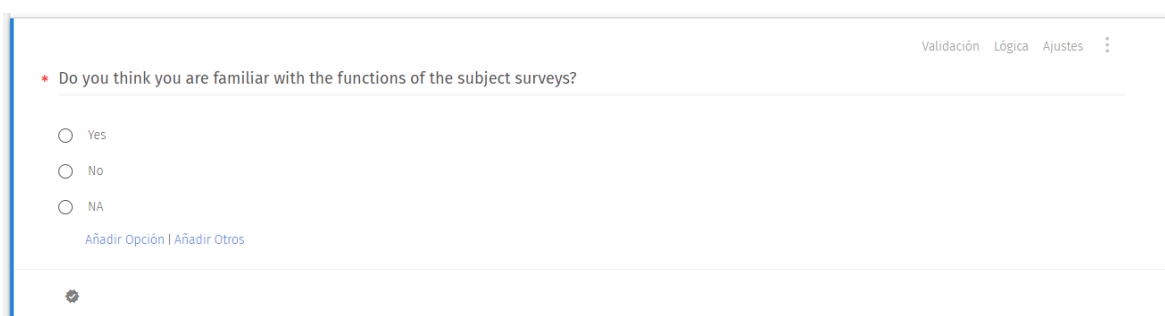
This is the first page that is displayed when you access it, it simply consists of a title and some brief instructions on how to complete the survey correctly. As my TFG is in English, this essay was also written in English, trying to use simple words for everyone to understand. It was only on the front page that the explanation was translated in order to avoid any misunderstanding in the explanations. It was also decided to incorporate the university logo to give it a certain degree of formality and also a touch of aesthetics.

Figure 2: Question 1 student's survey (Own source)
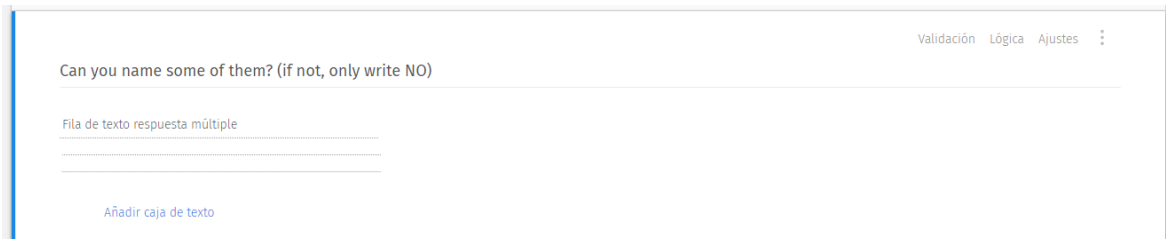
The first question was very simple, it only tried to obtain data on the homogeneity of the sample, as it is not the same to obtain majority data from fourth-year students who are already more experienced in the subject as from first-year students who are more novices.
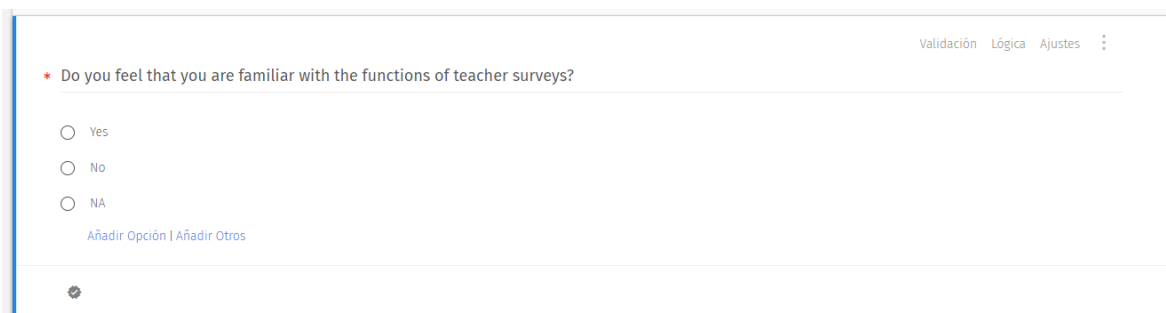
Figure 3: Question 2 student's survey (Own source)

The second question was a trick question, people faced with a knowledge question about the functions of something that is apparently simple will tend to answer yes but faced with this premise the third question accompanied it.
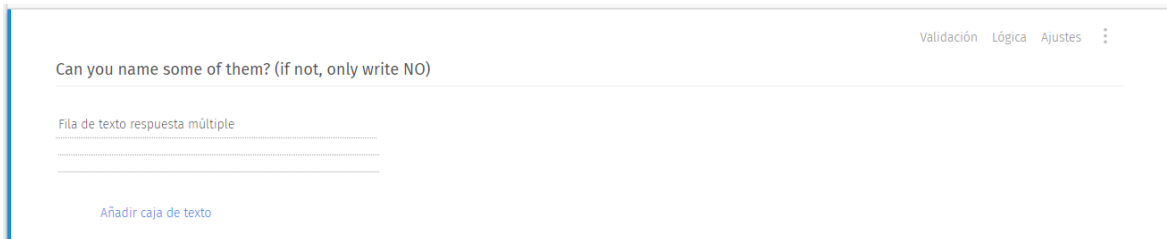
Figure 4: Question 3 student's survey (Own source)

This question was meant to probe a little more, it is not valid to say that you know how something works if you are not able to explain it, so we checked if the previous question had really been answered with criteria.
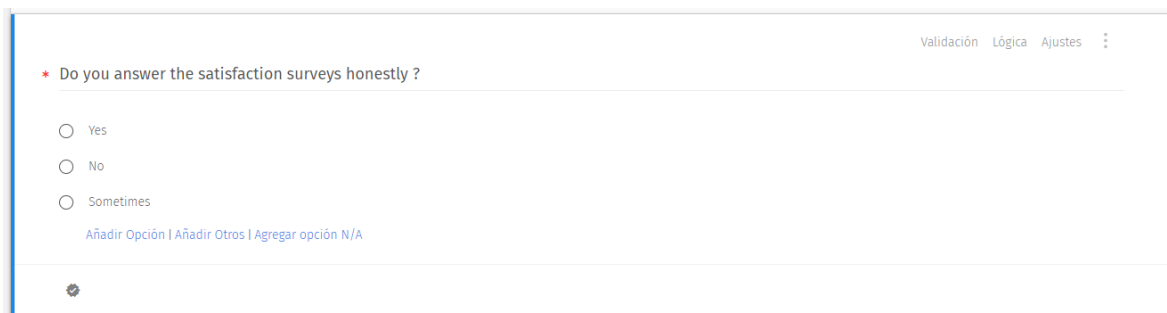
Figure 5: Question 4 student's survey (Own source)

The fourth question was similar to the second, but now in reference to the teachers' surveys. Similarly, question 5 accompanied it in order to verify the answers obtained.
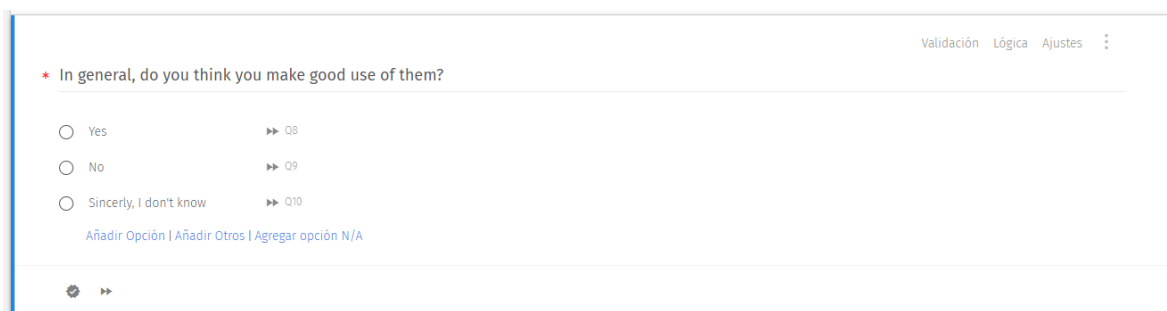
Figure 6: Question 5 student's survey (Own source)

As mentioned in question 3, the function of this fifth question is to verify the answers obtained to question 4.

Figure 7: Question 6 student's survey (Own source)
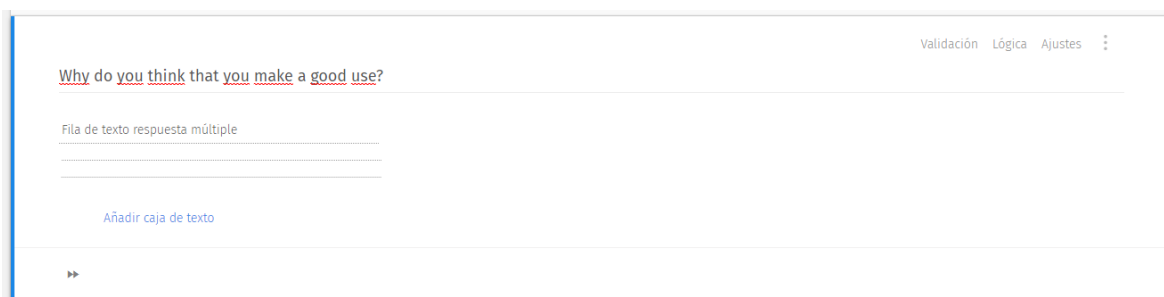
This sixth question seems to be a boilerplate question, but as I said earlier in this section, it seems to me that the simplest questions can provide us with the most important study parameters and that in these questions in particular, it is the answers to these questions that can surprise us the most.

Figure 8: Question 7 student's survey (Own source)
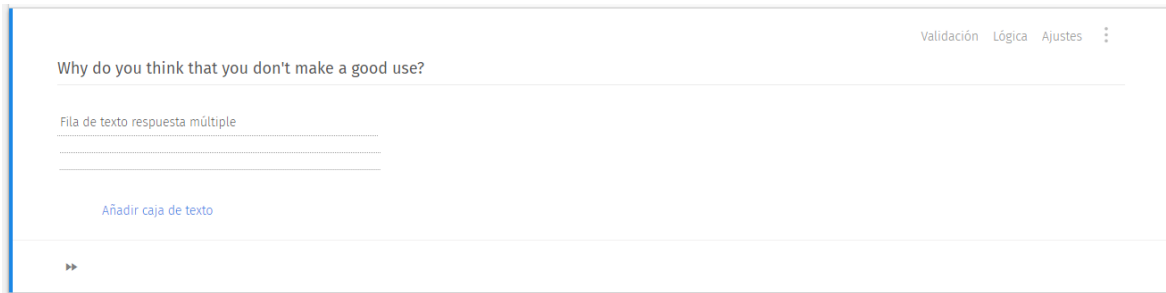
After questions 2 and 4, which sought to ascertain the level of knowledge of the end user, in addition to question 6, which sought to make the student reflect on whether he or she was really honest; The seventh question was asked with the expectation of having generated doubts in those students who, in the first questions, were sure that they knew perfectly well how it worked and that they were doing well, and also to make them reflect on the use they made of it in their own questionnaires.

This question is the first to incorporate a logical function that, depending on the answer you provide, leads to one or another question, so that the aim is to obtain more information by making the survey itself more personalized and so that the respondent does not feel that it is just another standard survey and thus obtains a greater degree of involvement in the answer.

Figure 9: Question 8 student's survey (Own source)

As with questions 3 and 5, this one seeks to verify the answer given to the previous question, but it is only accessed by those who have given a good answer to question 7.
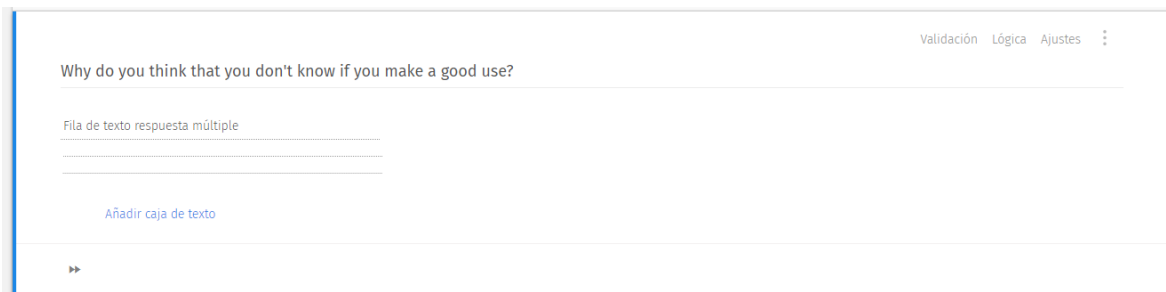
Figure 10: Question 9 student's survey (Own source)

This question sought information on why they did not use it correctly, those who had indicated this in question 7, as this misuse could be voluntary or involuntary. If it was voluntary, the student is completely aware of his or her misuse or misrepresentation of the results, but on the other hand, if it was involuntary misuse, it could be that with my survey the student himself or herself had realised that he or she was misusing it without knowing it; the fact that it is essential to know your mistake before correcting it, as you cannot correct a mistake if you do not know that you are making it.

Figure 11: Question 10 student's survey (Own source)

In a similar way to the previous question, the initial questions of the survey may have made some students reflect until they reached the conclusion that they did not know whether or not they were making good use of the survey. For example, a doubt derived from the conclusion of not knowing the functions of satisfaction surveys.

This question aims to collect the doubts of doubtful students in order to be able to implement some improvement, either in terms of the information on the tasks carried out in the surveys or the information that must be provided to them before carrying them out.
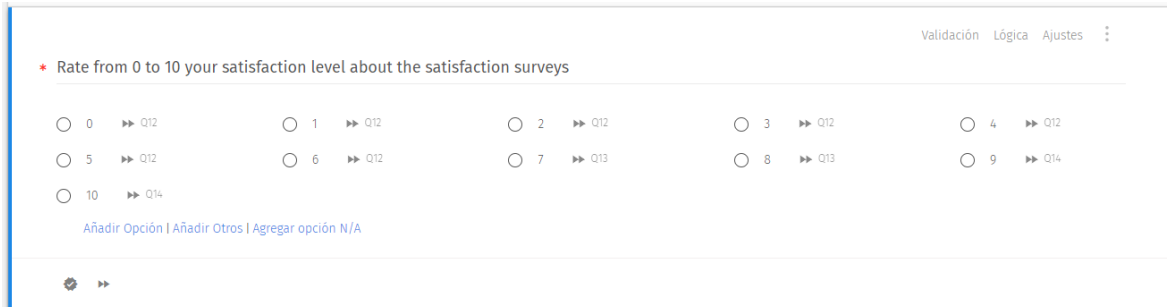
Figure 12: Question 11 student's survey (Own source)

Finally, I asked the eleventh question, the key question of my study. How satisfied are you? I gave a numerical answer from 0 to 10 that would allow me to carry out the subsequent study of this satisfaction.

Using the NPS scoring system and its classification into detractors, passives and promoters, logical functions are implemented that lead to the following 3 questions.
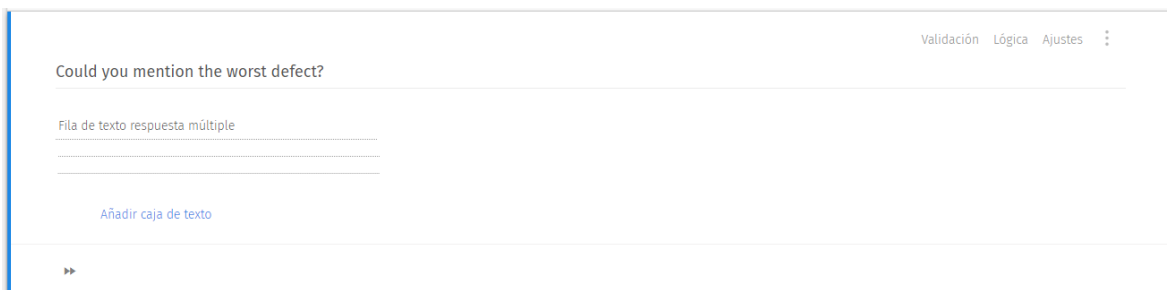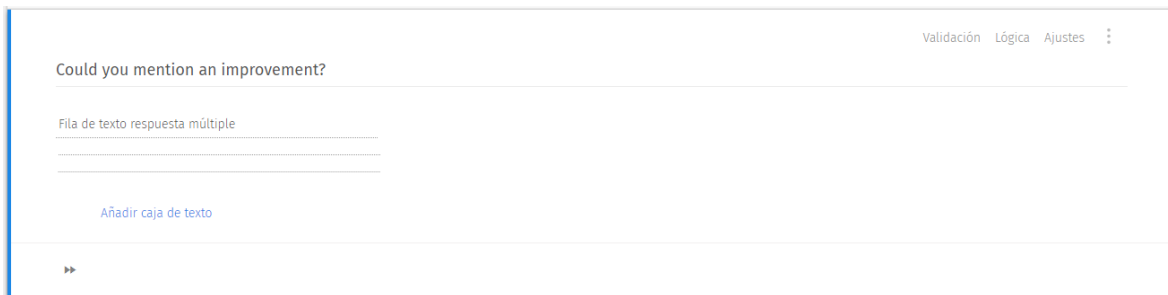
Figure 13: Question 12 student's survey (Own source)

Since, according to the NPS score, the detractors are those customers who are dissatisfied, they are asked to mention their biggest defect. This is because, since the characteristic feature of their type of customer is dissatisfaction, I seek to enhance this and turn it into something positive.
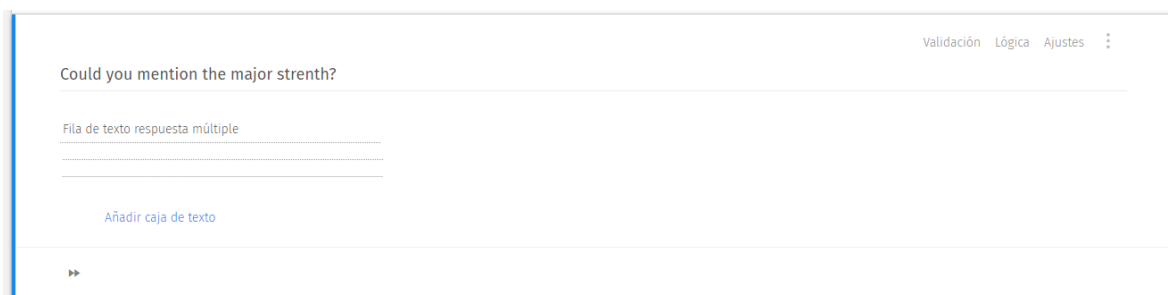
If we take advantage of the negative vision of the detractors, we can identify our weaknesses and thus be able to subsequently analyse them with the aim of being able to correct them.

Figure 14: Question 13 student's survey (Own source)

Those passive elements that are not characterized neither for being positive nor negative, are more prone to see the aspects with neutrality, then it is the ideal typology to approach improvement proposals, since in the majority of services the best way to satisfy the final user is to listen to him since many times, he himself gives you the solution to your problems.

Figure 15: Question 14 student's survey (Own source)

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The promoters are characterized by their good perception of the service that is offered, so this is the ideal typology to identify strengths.

With the survey shown, the general aim is to make the students reflect on whether or not they are making good use of the service, and thus to be able to derive their curiosity and to inform themselves about it if they consider that they are uninformed. On the other hand, the aim is to identify the strengths, weaknesses and options for improvement identified by the end user, who is the one who provides the data with which the analyses are subsequently carried out.

This survey was initially carried out with all the questions with the required response, a fact that had to be corrected within a few minutes of being carried out, since in the open answers there was a large number of answers which were the word no to unrelated questions such as the mention of the major defect or the proposal for improvement, and this would make the analysis process difficult. Therefore, it was preferable not to obtain no answers rather than to obtain a large number of unrelated answers that would later have to be dealt with.

7.2 Survey Scope

My survey will be available to all active students of the GRETI degree, during the second term of the academic year 2021/2022. This is because it is very likely that there will be low participation in the process of disseminating my survey.

This may be due in part to the means of dissemination, as some of the 654 active students on the GRETI degree will not read the message sent to the official university email, as it is true that this email receives a large number of spam emails and there is now a possibility that students will not check it. On the other hand, of the students who receive the e-mail, there will be a number of those who simply read the e-mail and do not enter the survey.

In addition to all this, the survey will be conducted in English and the fact that the students will find themselves when they open the survey will also have a high percentage of early dropouts due to the fact that there will be people who will send them away because of the language.

However, the expected response rate is 20%, which would represent a total of 130 responses, and with these data it would already be possible to draw conclusions from a first analysis, as we must remember that we will have students from all years and then the sample data will be distributed across all stages of the degree course, from the beginning, middle and end of the degree.

8 Analysis of the results

8.1 Subject analysis

8.1.1 Reception and data treatment

For the analysis of the subjects, as discussed at the meeting with the GPAQ and specified in this paper, we will proceed to analyse whether there is an influence of the performance of the subject on the grade of the subject. By performance, we refer to the percentage of passes in the subject in a four-month period.

With the data provided by the GPAQ in Excel format, they provide us with a lot of data which we will use or not according to the following criteria. The data collected were as follows:

- **Curs_QM:** Course and quarter (20202= 2nd quarter of course 2020-2021; 20211= 1st quarter of course 2021-2022)

- **Centre_sigles**: School acronym (ESEIAAT= Escola Superior d'Enginyeries Industrial, Aeroespacial i Audiovisual de Terrassa)

- **Codi_upc_ud:** Subject code

- **Nom assigantura:** Name of the subject

- **Credits_ects:** Credits of the subject

- **T_Matrícules**: Total registered at the end of the four-month period

- **NombreMatriculats:** Number of registrations in the survey

- **Respostes_Pclau:** Number of answers to the question key question of the survey of the course

- **Mitjana_Pclau:** Average mark for the key question of the course survey (rating scale from 1 very dissatisfied to 5 very satisfied)

- **Suma de T_Aprov:** Total amount of the number of passes in the subject

- **Suma de T_NP:** Total amount of no-shows for the course

- **Suma de T_Susp:** Total amount of the number of failures in the subject

The first 5 data are data to identify and classify the subjects in question, therefore, in our study it will not be necessary to use them. On the other hand, there are 2 variables with the number of students enrolled. The first one, T_Registration, refers to the number of students enrolled after the final assessment of the course. On the other hand, the variable NombreMatriculats refers to the number of students enrolled at the time of carrying out the surveys.

As these surveys are carried out before the final assessment, it is possible that in some cases the number of enrolments does not coincide in the two variables. For this study, the total number of students will be taken as the number of students enrolled on the dates of the final assessment, that is, T_Matrícules.

The following two data refer to the key answers, on the one hand the number of answers obtained to the key question and on the other hand the average obtained to the key question.

Finally, we have the data on passes, failures, and no-shows in the final assessment.

With these data, the pass mark for the course will be calculated using the following calculation:

$$\%approved = \frac{T\_Aprov}{T\_Matrícules}$$

On the other hand, although it has not been referred to at any time previously in this work, finally it has also been decided to add a table where the response rates of the surveys are represented. This has been derived from the first answers obtained to the survey given to the students, which will be analysed in section 6.3 of this work. This figure will be calculated using the following formula:

$$\%participation = \frac{Respostes\_Pclau}{NombreMatriculats}$$

In this case, as can be seen in the calculation, the number of enrolments at the time of dissemination of the survey is used.

8.1.2   Data computation

Firstly, we find the tables generated from the percentage of passes and their score of the half of the key question for the two quarters of study.

% Approved	Mitjana P Clau	% Approved	Mitjana P Clau
100,00%	3,17	60,32%	2,74
100,00%	3,67	56,15%	3,78
100,00%	2,57	55,77%	3,55
98,69%	3,02	54,55%	4,11
98,48%	2,50	51,61%	2,94
98,08%	2,15	47,56%	3,61
95,00%	3,50	46,15%	2,75
94,55%	4,25	44,34%	2,54
94,34%	4,00	41,41%	3,59
92,75%	3,83	40,98%	3,72
83,15%	3,10	37,93%	3,54
82,35%	3,00	36,00%	2,18
82,09%	3,47	35,54%	2,29
81,82%	2,46	35,35%	2,82
71,67%	2,90	29,41%	1,89
71,21%	3,76	27,69%	3,82
68,46%	3,27	24,49%	3,17
65,28%	3,02	18,98%	2,43
62,50%	3,88	16,22%	3,00

Table 3: Percentage approved subject surveys GRETI 2020_2 (Own source)

% Approved	Mitjana P Clau	% Approved	Mitjana P Clau
100,00%	27,94%	63,02%	27,08%
100,00%	37,74%	61,84%	34,21%
96,97%	34,85%	61,63%	19,77%
96,67%	45,00%	61,54%	24,04%
95,08%	24,59%	59,49%	25,32%
93,33%	34,67%	57,14%	39,29%
93,22%	22,03%	56,52%	23,48%
82,93%	17,07%	55,91%	25,20%
79,22%	15,58%	52,94%	24,51%
76,19%	33,33%	52,43%	22,82%
74,58%	25,42%	50,00%	10,00%
72,73%	30,91%	46,15%	17,31%
71,79%	25,64%	46,00%	24,00%
71,70%	30,19%	41,90%	24,76%
68,93%	21,36%	40,38%	30,77%
67,35%	30,61%	37,76%	22,45%
67,26%	23,01%	37,10%	25,81%
66,67%	41,03%	28,00%	33,33%
64,25%	23,83%		

Table 4: Percentage approved subject surveys GRETI 2021_1 (Own source)

On the other hand, as mentioned in the data processing, a table has been generated where the participation in each of the surveys is reflected.

% Approved	% Participation	% Approved	% Participation
100,00%	27,94%	63,02%	27,08%
100,00%	37,74%	61,84%	34,21%
96,97%	34,85%	61,63%	19,77%
96,67%	45,00%	61,54%	24,04%
95,08%	24,59%	59,49%	25,32%
93,33%	34,67%	57,14%	39,29%
93,22%	22,03%	56,52%	23,48%
82,93%	17,07%	55,91%	25,20%
79,22%	15,58%	52,94%	24,51%
76,19%	33,33%	52,43%	22,82%
74,58%	25,42%	50,00%	10,00%
72,73%	30,91%	46,15%	17,31%
71,79%	25,64%	46,00%	24,00%
71,70%	30,19%	41,90%	24,76%
68,93%	21,36%	40,38%	30,77%
67,35%	30,61%	37,76%	22,45%
67,26%	23,01%	37,10%	25,81%
66,67%	41,03%	28,00%	33,33%
64,25%	23,83%		

Table 5: Percentage participation subject surveys GRETI 2020_2 (Own source)

% Approved	% Participation	% Approved	% Participation
100,00%	25,53%	60,32%	26,98%
100,00%	18,00%	56,15%	31,54%
100,00%	25,00%	55,77%	21,15%
98,69%	26,80%	54,55%	16,36%
98,48%	24,24%	51,61%	25,81%
98,08%	25,00%	47,56%	28,05%
95,00%	20,00%	46,15%	7,69%
94,55%	36,36%	44,34%	26,42%
94,34%	22,64%	41,41%	22,22%
92,75%	50,72%	40,98%	29,51%
83,15%	23,60%	37,93%	14,94%
82,35%	27,94%	36,00%	28,00%
82,09%	28,36%	35,54%	25,62%
81,82%	36,36%	35,35%	33,33%
71,67%	35,00%	29,41%	27,94%
71,21%	25,76%	27,69%	26,15%
68,46%	28,46%	24,49%	12,24%
65,28%	34,03%	18,98%	35,77%
62,50%	25,00%	16,22%	13,51%

Table 6: Percentage participation subject surveys GRETI 2021_1 (Own source)

8.1.3 Variable conclusion

With the tables, we have been able to generate some graphics that shown the data in an optimal way to extract conclusions.
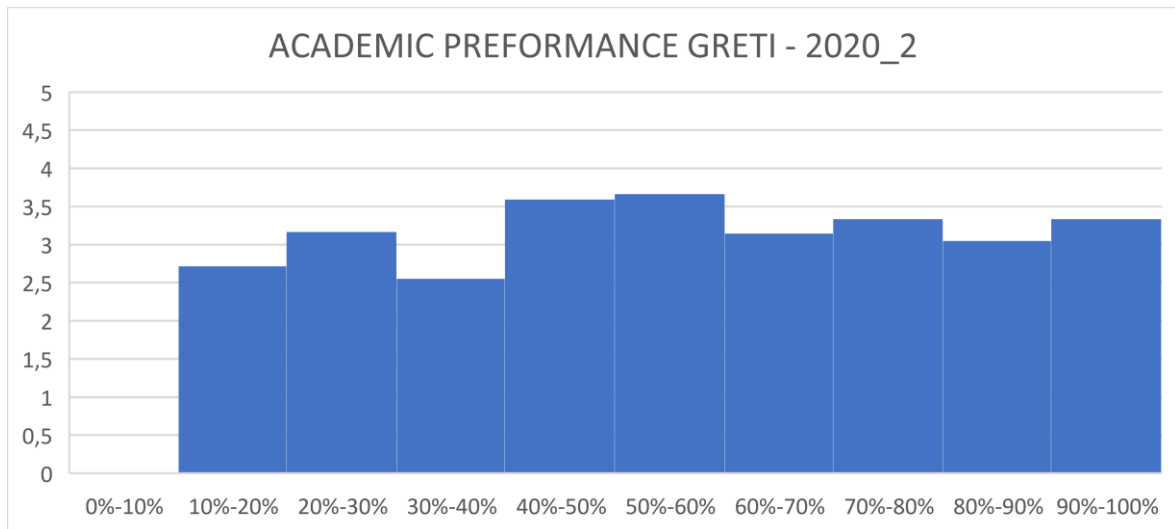
Graph 1: Academic performance GRETI 2020_2 (Own source)
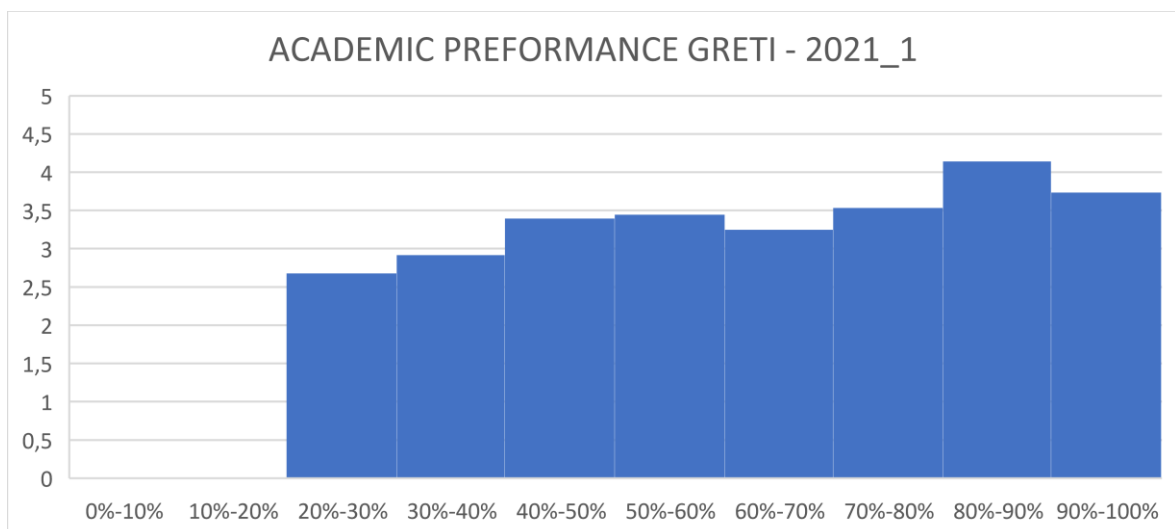
Graph 2: Academic performance GRETI 2021_1 (Own source)

By analysing the data obtained, classifying them by ranks according to the percentages of passes obtained. We can see that there are differences between the two four-month periods analysed. Moreover, it can be observed that there is a tendency for the mark obtained in the subject to increase as a function of the increase in the number of passes. Therefore, we can conclude that there is a dependence between academic performance and the grade obtained in the subject, and this relationship is directly proportional.

Taking advantage of the generation of participation tables, we also wanted to include graphs with the values of the tables in order to see if the number of answers to the questionnaires has any relation with the performance in the subject, a fact that could be directly linked to the satisfaction of passing or disillusionment of failing.

The graphs obtained are as follows:
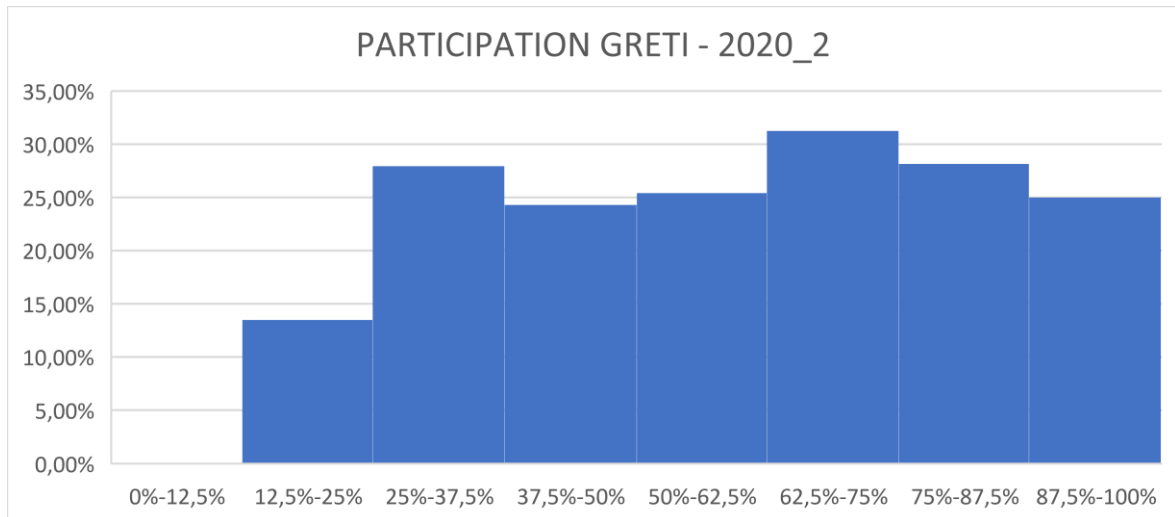
Graph 3: Percentage participation subject surveys GRETI 2020_2 (Own source)

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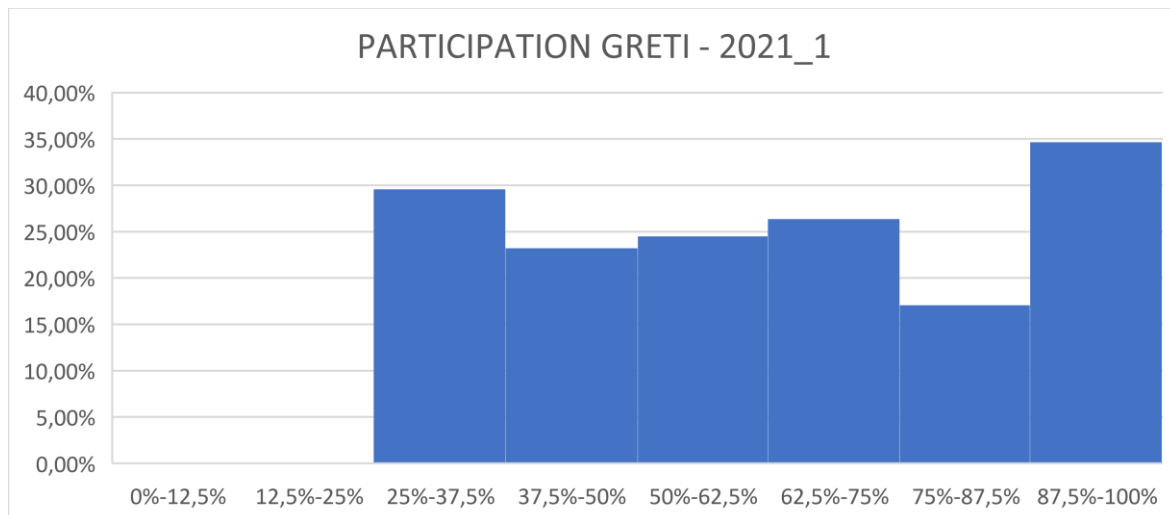
Graph 4: Percentage participation subject surveys GRETI 2021_1 (Own source)

As can be seen, there is no dependence in the proportion of responses. However, as can also be seen in the graphs and even in the tables, participation is notably low given the importance of the surveys. In view of this fact, we will also calculate the percentages of participation in the analysis of the teaching staff.

8.2 Teacher analysis

8.2.1 Reception and data treatment

For the analysis of the teaching staff, as was discussed at the meeting with the GPAQ, we will proceed to analyse whether there is an influence of the age of the teaching staff on the marks obtained in the questionnaires.

Once again, the data provided by the GPAQ are in Excel format and provide us with a lot of data which we will use or not according to the criteria that will be discussed below. The data received were as follows:

- **AnyAcademic:** Course of the subject (2020= corresponds to the academic year 2020-2021) (2021= corresponds to the academic year 2021-2022)

- **Semestre:** Quarter of the course (1= first quarter) (2= second quarter)

- **CodiCentre:** School Internal Code

- **NomCentre:** School name

- **CodiAssignatura:** Subject code

- **NomAssignatura:** Subject name

- **CodiGrup:** Group code

- **NOU_CODI_PDI:** Teacher's code (randomly generated)

- **EDAT:** Teacher's age

- **HORES:** total amount of the teacher's hours in the subject and group

- **NombreMatriculats:** Number of students registered when the surveys were carried out in the group

- **Respostes_Pclau:** Number of answers to the question Key question of the survey of the course

- **Mitjana_Pclau:** Average mark for the key question of the course survey (rating scale from 1 very dissatisfied to 5 very satisfied)

The first data are the identification of the school, subject and random code of the teacher. The EDAT, HORES, Respostes_Pclau and Mitjana_Pclau data are the ones that will help us to carry out the study.

With these data, a table will be created with the ages of the teachers and the average of the key question. In this study, lecturers with a number of hours of less than 10 will be excluded from the study, as indicated in the model of representativeness of the UPC's teaching performance surveys, which exclude them from the surveys.

On the other hand, as in the previous section, a table will also be generated with the percentage of participation in the surveys. This participation will be calculated using the following formula:

$$\%participation = \frac{Respostes\_Pclau}{NombreMatriculats}$$

The tables with the data derived from the calculations are as follows:

8.2.2 Data computation

In the first instance we find tables with the age of the teachers and their average of the key question for the two four-month periods of study.

AGE	Mitjana_Pclau	AGE	Mitjana_Pclau	AGE	Mitjana_Pclau
70	3,88	56	3,92	46	4,33
66	3,67	56	2,25	46	3,17
65	3,41	56	4,75	45	4,14
64	2,11	56	3,77	44	2,50
63	2,75	56	3,56	44	3,00
63	4,82	55	3,88	43	4,50
63	4,06	55	3,08	42	3,89
63	2,63	55	3,42	42	4,17
63	2,75	55	4,00	42	2,57
63	3,88	55	3,80	42	1,57
62	1,20	55	3,50	42	4,33
62	4,00	54	2,75	41	3,50
62	3,44	54	2,83	41	4,60
62	4,20	54	2,00	41	4,44
61	2,08	53	2,74	41	5,00
61	3,86	52	2,38	40	4,57
61	3,00	52	4,67	40	4,80
61	4,00	52	4,33	40	4,67
61	3,14	52	4,09	39	3,00
61	3,89	50	3,46	38	4,80
61	3,33	49	4,76	38	1,43
60	2,22	49	3,89	37	3,81
59	3,50	49	4,15	33	3,25
59	3,68	49	2,50	33	3,59
58	4,50	49	4,78	32	4,56
58	4,40	48	2,52	30	1,63
58	4,07	48	3,20	30	1,25
57	4,40	48	4,20	29	4,00
57	4,25	48	3,20	29	2,50
57	4,50	48	4,50	27	3,17
57	3,90	47	4,11	27	4,00
57	3,17	46	3,67		
57	2,80	46	4,69		

Table 7: Professor's age teacher's surveys GRETI 2020_2 (Own source)

AGE	Mitjana_Pclau	AGE	Mitjana_Pclau	AGE	Mitjana_Pclau
70	4,60	55	2,48	43	3,58
70	4,29	55	3,67	43	4,57
70	3,00	55	2,83	43	3,64
70	3,50	55	3,50	43	3,15
70	2,50	55	4,19	41	4,00
64	3,00	55	4,00	41	4,60
64	3,71	55	3,62	40	4,50
63	3,18	55	3,62	40	4,86
63	2,15	54	3,60	40	3,50
63	4,21	54	3,45	40	4,14
62	2,25	53	3,50	40	4,50
62	4,50	53	4,75	39	3,60
62	3,00	53	4,36	38	4,00
62	2,88	52	4,67	38	4,14
61	2,68	52	4,27	38	3,75
61	3,80	49	3,00	38	3,67
61	5,00	49	2,80	37	3,75
61	2,80	49	4,86	37	4,50
61	2,67	49	4,50	37	4,50
61	4,10	49	5,00	36	4,60
61	4,00	49	5,00	35	2,50
61	4,25	49	4,44	34	3,50
61	4,50	49	1,95	32	3,00
61	2,50	49	4,60	31	4,33
61	3,13	49	4,80	31	2,83
60	2,85	48	4,80	31	4,20
59	2,89	48	4,33	31	3,75
59	5,00	47	3,67	30	4,25
59	4,25	46	3,64	30	4,58
59	4,00	46	4,17	30	4,57
59	3,38	46	3,00	30	5,00
59	3,67	46	4,00	30	4,50
59	3,00	46	3,46	30	4,50
58	3,42	46	3,29	30	4,25

58	3,55	46	3,85	30	4,50
57	2,00	45	4,44	29	2,83
57	4,00	45	3,46	27	4,67
57	4,00	45	3,14	24	3,83
57	3,87	45	3,60	24	4,20
57	3,29	44	4,78		
56	2,00	43	4,27		

Table 8: Professor's age teacher's surveys GRETI 2021_1 (Own source)

On the other hand, as mentioned in the data processing, a table has been generated where the participation in each of the surveys is reflected.

AGE	% Participation	AGE	% Participation	AGE	% Participation
70	33,33%	56	33,33%	46	23,08%
66	27,27%	56	25,00%	46	19,35%
65	33,33%	56	26,67%	45	28,00%
64	26,87%	56	38,24%	44	20,00%
63	33,33%	56	45,71%	44	45,00%
63	44,00%	55	35,56%	43	23,33%
63	26,56%	55	20,97%	42	45,00%
63	30,65%	55	22,64%	42	26,09%
63	18,75%	55	23,53%	42	35,00%
63	25,00%	55	29,41%	42	35,00%
62	29,41%	55	22,22%	42	15,00%
62	26,67%	54	57,14%	41	23,53%
62	56,25%	54	40,00%	41	31,25%
62	29,41%	54	23,08%	41	50,00%
61	35,29%	53	28,79%	41	20,00%
61	20,00%	52	37,14%	40	43,75%
61	42,86%	52	52,94%	40	27,78%
61	33,33%	52	51,43%	40	33,33%

61	41,18%	52	18,33%	39	33,33%
61	25,00%	50	22,03%	38	18,52%
61	29,03%	49	26,56%	38	43,75%
60	27,27%	49	22,50%	37	24,24%
59	20,00%	49	30,95%	33	20,00%
59	31,67%	49	28,00%	33	22,08%
58	22,22%	49	32,73%	32	26,23%
58	28,85%	48	31,34%	30	20,51%
58	31,82%	48	24,59%	30	50,00%
57	30,30%	48	29,41%	29	21,43%
57	25,00%	48	29,41%	29	26,67%
57	26,67%	48	21,28%	27	35,29%
57	27,03%	47	26,47%	27	37,50%
57	37,50%	46	24,00%		
57	31,25%	46	52,00%		

Table 9: Percentage of participation teacher's surveys GRETI 2020_2 (Own source)

AGE	% Participation	AGE	% Participation	AGE	% Participation
70	29,41%	55	34,85%	43	40,00%
70	43,75%	55	23,08%	43	24,14%
70	44,44%	55	22,22%	43	36,67%
70	26,67%	55	23,08%	43	43,33%
70	22,22%	55	34,78%	41	33,33%
64	19,30%	55	43,75%	41	35,71%
64	28,00%	55	31,71%	40	22,22%
63	37,78%	55	37,14%	40	38,89%
63	31,71%	54	29,41%	40	20,00%
63	23,73%	54	31,43%	40	41,18%
62	22,22%	53	25,00%	40	25,00%
62	19,05%	53	25,00%	39	28,85%
62	21,95%	53	35,90%	38	25,00%
62	22,86%	52	25,00%	38	20,00%
61	35,71%	52	57,89%	38	28,57%
61	37,04%	49	20,00%	38	23,08%
61	18,18%	49	31,25%	37	20,00%

61	41,67%	49	41,18%	37	27,59%
61	23,08%	49	22,22%	37	20,00%
61	50,00%	49	50,00%	36	37,04%
61	25,00%	49	25,00%	35	26,67%
61	21,05%	49	22,50%	34	35,29%
61	23,53%	49	19,19%	32	20,75%
61	33,33%	49	21,74%	31	33,33%
61	30,19%	49	31,25%	31	33,33%
60	33,33%	48	33,33%	31	29,41%
59	50,00%	48	40,00%	31	36,36%
59	33,33%	47	23,81%	30	44,44%
59	57,14%	46	34,38%	30	35,29%
59	50,00%	46	18,18%	30	46,67%
59	44,44%	46	25,00%	30	26,67%
59	37,50%	46	48,00%	30	40,00%
59	25,00%	46	30,95%	30	20,69%
58	21,43%	46	30,43%	30	26,67%
58	27,50%	46	40,63%	30	42,86%
57	25,00%	45	25,00%	29	21,43%
57	33,33%	45	22,41%	27	35,29%
57	44,44%	45	35,00%	24	35,29%
57	31,94%	45	38,46%	24	27,78%
57	43,75%	44	28,13%		
56	22,22%	43	36,11%		

Table 10: Percentage of participation teacher's surveys GRETI 2021_1 (Own source)

As can be observed, participation rates are, once again, notably low in the majority of cases. However, the analysis of this variable could be distorted by the lack of sample in the surveys.

8.2.3 Variable conclusion

With the available data, once again, we have grouped the ages by ranks and analysed the corresponding graphs.
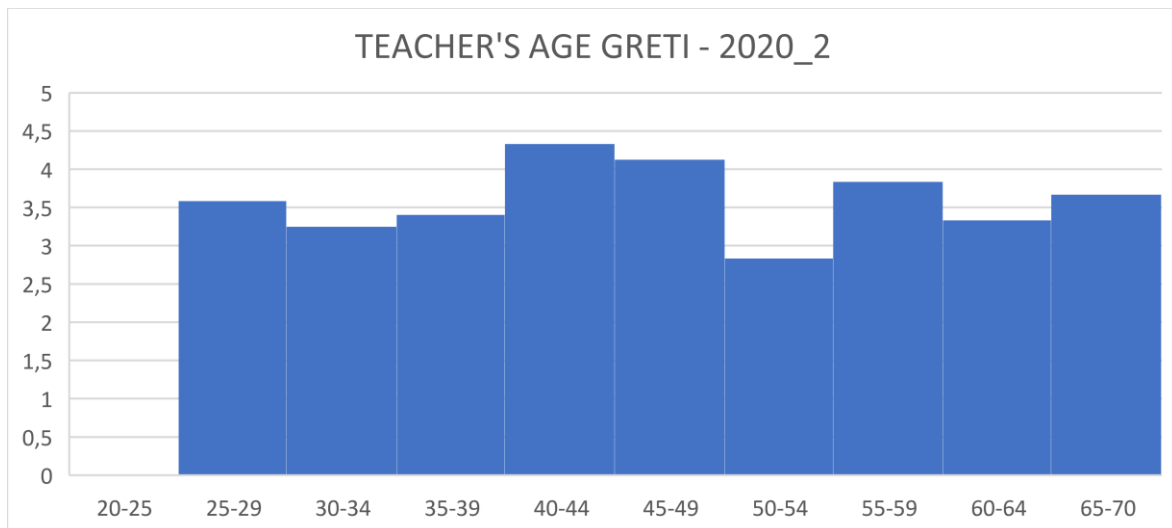
Graph 5: Professor's age teacher's surveys GRETI 2020_2 (Own source)
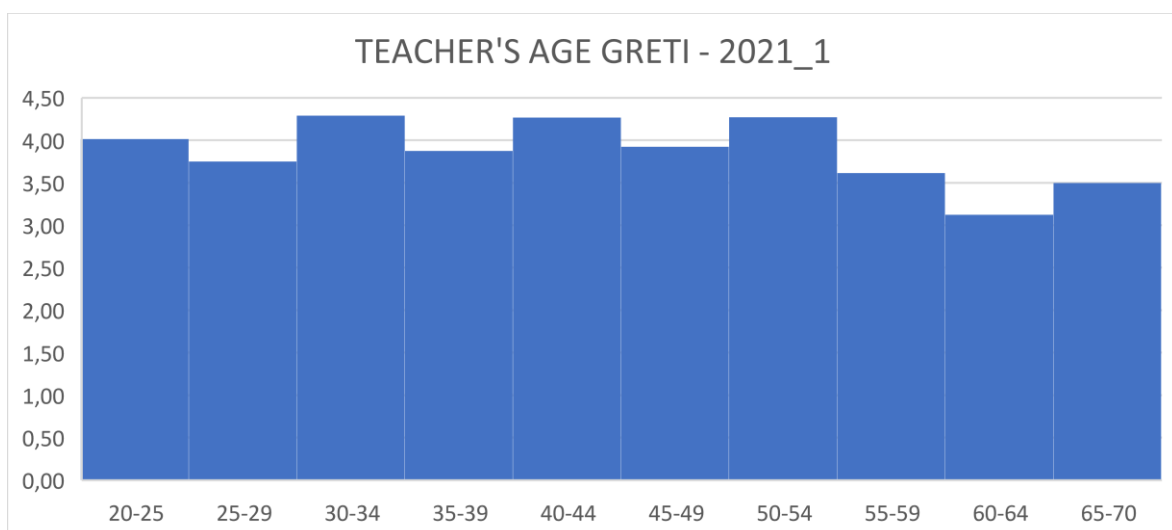
Graph 6: Professor's age teacher's surveys GRETI 20201_1 (Own source)

We can see that there are differences between the two four-month periods analysed, partly due to the fact that there has been a rotation from one term to the next and that many more teachers have been involved in the second year than in the first. On the other hand, there is no type of dependence in

terms of age and the marks obtained by the teaching staff, it seems that neither the vocational dedication at a young age nor the experience at a long age have any impact on the marks received, but rather they follow a random distribution that could be given by the profile and/or situation of each of the teachers.

As can be seen in the participation tables, the level of responses is very low, a fact that is repeated as has already been observed in the analysis of the subjects.

8.3   Student's analysis

Finally, we proceed to the analysis of the pupil variable. This analysis will be carried out using the data collected in the survey generated by this work.

Given the three types of response, each one will be analysed in a different way in order to be able to maximise the information that can be collected. As was done in the section on survey generation, the aim is to maximise the performance that can be obtained from the survey.

Closed-ended questions will be analysed qualitatively by means of graphs obtained from the same answers.

The open-ended questions will be analysed through a previous grouping of the same answers in common groups where they are intended to express the same idea or similar ideas. Subsequently, these groups will be analysed with the intention of obtaining as much information and ideas as possible for the future.

The key question of the survey will be analysed using the NPS scoring system detailed in section 6.2.4 of this paper.

We will now begin by analysing the questions in block and in order, as these are relevant to the analysis.

This survey was viewed by 265 people and received a total of 181 responses out of the 654 people to whom it was sent. This is equivalent to a participation of 27.68% of the GRETI population.

On the negative side, only 43.09% of the answers reached the end of the survey, although a large part of this abandonment was given towards the end of the survey itself, so the great majority of the questions had a very large number of answers.

The vast majority of answers were received from Spain, but we also had some occasional answers from the USA, Sweden and Germany corresponding to Erasmus students.

We begin the analysis of the survey, and we will do it in blocks. That is to say, we will analyse the questions in accordance with other questions that try to analyse complementary aspects.

The first block is made up of a single question, which is simply to find out which year the answers have been obtained.

Which course are you currently studying?
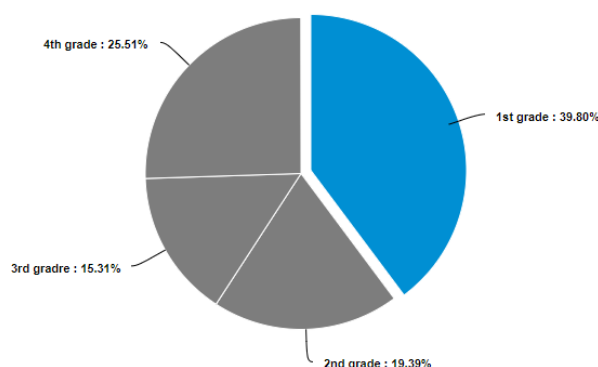
Graph 7: Results question 1 student's survey (Own source)

As can be seen, most of the answers received were from first-year students. This is a fact that may be due to the fact that they are more inclined to respond, this fact is due to the fact that the more years go by, and the more surveys are carried out, the greater the degree of dissatisfaction. This fact will be discussed and justified in the last questions of the survey.

In the second block, we find the next four questions. These questions tried to find out the level of knowledge about the functions of the surveys on the part of the students.

In the first instance, the question asked about the knowledge of the functions of the subject questionnaires.

Do you think you are familiar with the functions of the subject surveys?

No : 43.75%

Yes : 56.25%
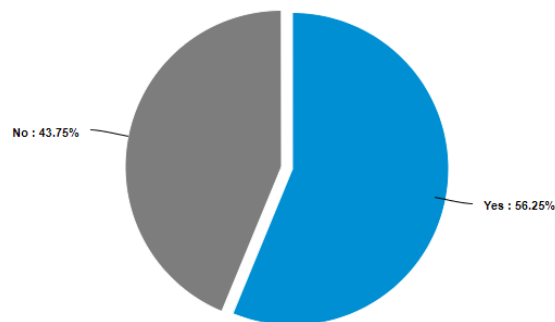
Graph 8: Results question 2 student's survey (Own source)

As was to be expected initially, people considered that they had knowledge of the functions of satisfaction surveys, in this case they were asked more specifically about the subject. However, when asked to mention a subject in the next question, this changed considerably.

CAN YOU NAME SOME OF THEM? (IF NOT, ONLY WRITE NO)
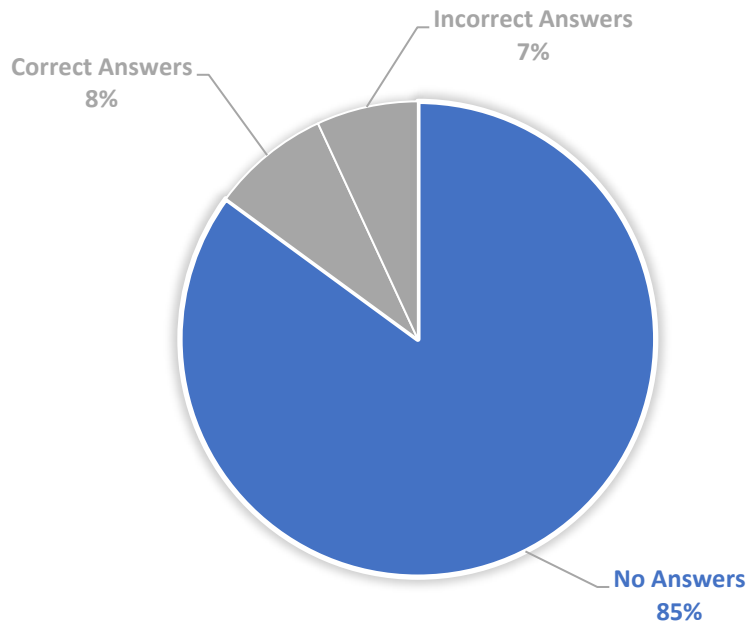
Graph 9: Results question 3 student's survey (Own source)

As can be observed, a large majority of the respondents did not know how to mention some aspect of the functionality of the questionnaires, another part of the answers were incorrect questions and only 7% gave correct answers. Therefore, even if they had answered the previous question in the affirmative, the level of knowledge they claimed to have was not there.

In the next two questions, the process carried out with the subject surveys is repeated, but in this case the question asks about the knowledge of the functions of the teaching staff's surveys, and it can be seen that, unlike the second question, the answers obtained at the percentage level are reversed.

Do you feel that you are familiar with the functions of teacher surveys?

Yes : 40.00%

No : 60.00%
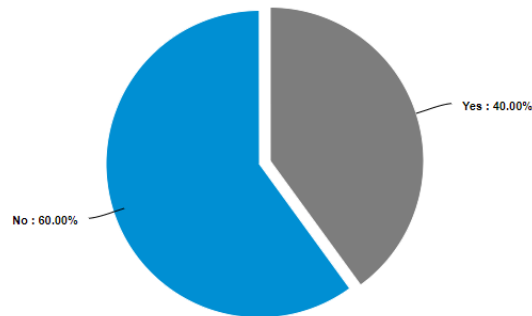
Graph 10: Results question 4 student's survey (Own source)

This is due to the fact that the survey was designed in this way. Initially, it is obvious that the students think they know the functions of the questionnaires, but when asked to mention them, most of them are unable to do so. Therefore, they were asked again about their knowledge of the functions and a large percentage of them rectified their opinion. This can be seen in the answers to the question about the functions, where, once again, the vast majority were unable to mention any of them.

Do you feel that you are familiar with the functions of teacher surveys?

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CAN YOU NAME SOME OF THEM? (IF NOT, ONLY WRITE NO)
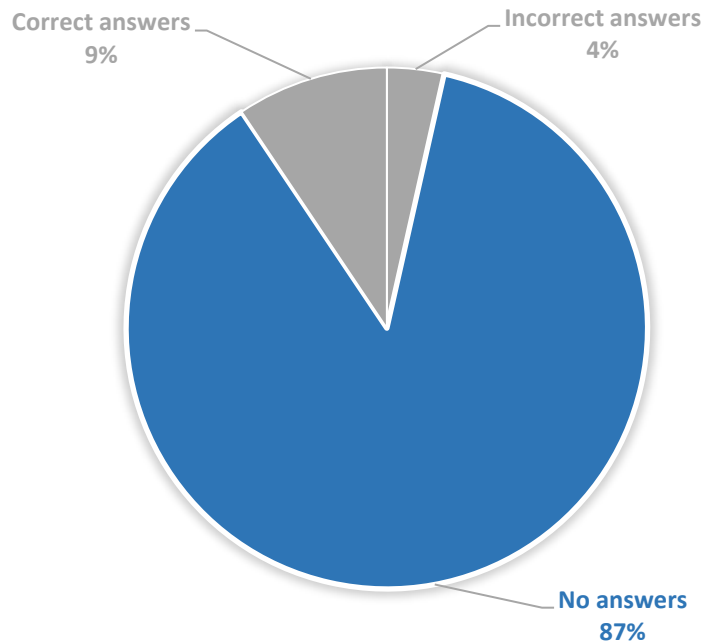
Graph 11: Results question 5 student's survey (Own source)

In the third block, we proceed to analyse one of the important questions of the survey, this one asked about the sincerity of the answers to the satisfaction surveys. This question was questioned by many people, including in the meeting with GPAQ by Meet, where Laura Campeny asked me if I thought people would say no. My answer was sincere and I argued that it was quite possible that because the survey is not official, the students surveyed would be more honest and we would draw decisive conclusions.

Graph 12: Results question 6 student's survey (Own source)

And so it has been, although the majority response has been that students answer the satisfaction surveys honestly, it is a very important fact that 8.16% say that they do not do so, it is also very important not to lose sight of the fact that 27.55% say that they do not always answer honestly. In conclusion, 35.77% of the students surveyed say that they have provided or currently provide data that are not reliable in any way to the answers given to the satisfaction surveys.

However, how reliable are the overall responses? Why don't they answer honestly? These two facts will be discussed later in the analysis of the following questions and in the conclusions.

In the fourth block, we proceed to the analysis of another question that can give us interesting conclusions: do people make good use of it?

In general, do you think you make good use of them?
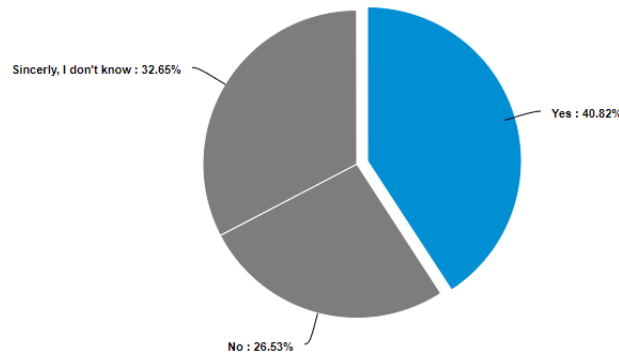
Graph 13: Results question 7 student's survey (Own source)

In response to this question, 40.82% of those surveyed say they use it well, 26.53% say they don't and 32.65% say they don't know whether or not they use it well.

These data are very worrying, as 59.19% of pupils do not know whether or not they use it properly, whether consciously or unconsciously. This figure means that only 2 out of every 5 students are aware that they are making good use of it, and this is a worrying fact as it can generate a certain degree of dissatisfaction and even frustration that can lead to not responding in the future.

But here the question is, why do they consider that they do or do not make good use of it? To answer this question, we have to analyse the following three questions that, according to the use of a logical function, lead to the question in question according to the answer you gave to the previous question.

The most popular opinions in the group of respondents who consider that they make good use of them are:

WHY DO YOU THINK THAT YOU MAKE A GOOD USE?
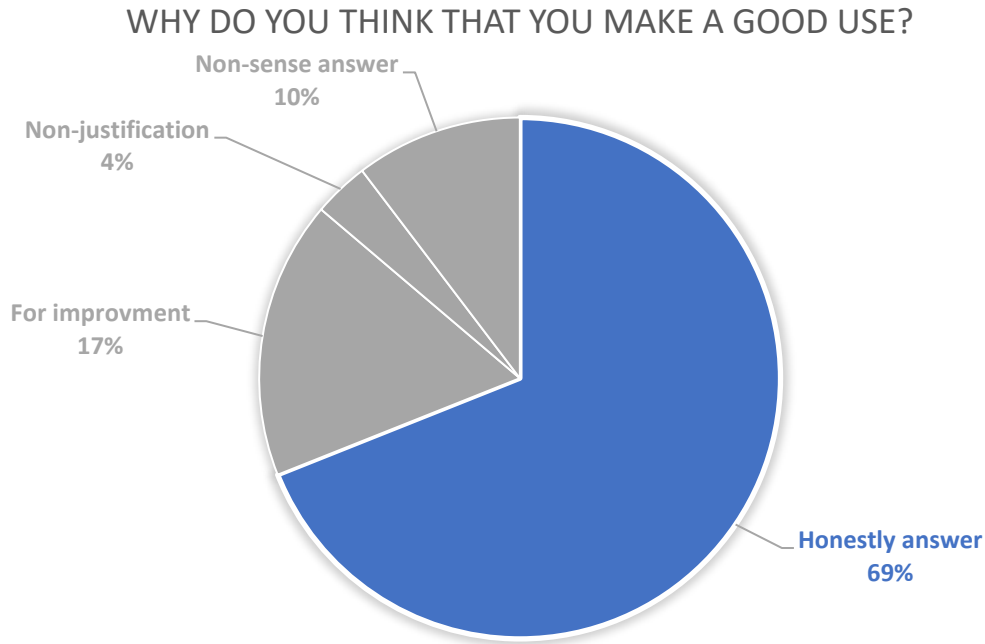
Graph 14: Results question 8 student's survey (Own source)

The great majority say that they make good use of it, as they provide an honest answer and argue their opinion without the use of derogatory phrases. This is indeed a good use of the survey system, as they aim to represent reality in order to be able to draw conclusions from it and improve the quality of teaching.

Another part remarked that they use the surveys to comment on both positive and negative aspects in order to be able to implement improvements in future courses; as in the previous case, this is a completely correct use, as the surveys were designed for this very purpose.

The second option of derivation, contemplated the group that did not make a good use. Their answers were:

WHY DO YOU THINK THAT YOU DON'T MAKE A GOOD USE
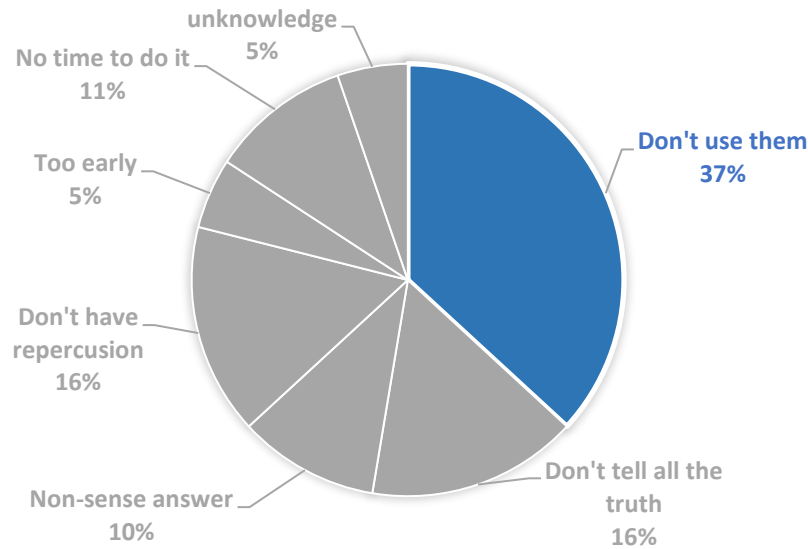
Graph 15: Results question 9 student's survey (Own source)

A 37% of those surveyed said that they do not use them, that this fact really makes them misuse them as they do not express their opinion and this can lead to a cancellation of the survey due to a lack of sample. On the other hand, the lack of expressiveness of their opinion can lead to a failure to detect errors or opportunities for improvement in order to improve the quality of the centre.

A 16% do not tell the whole truth in this respect, a fact that again leads to misuse as they do not provide a completely valid answer, so the conclusions drawn are not reliable.

A further 16% say that they do not make good use of them because they feel that the surveys do not have an impact and, therefore, consider that they use them incorrectly as they do not see the results afterwards. It is possible that this is one of the factors that will lead to a lower number of responses in the future, in other words, to a lack of representativeness and therefore a lack of reliability in future surveys.

A 5% of the answers considered that it took too much time to evaluate the surveyed aspects with a good criterion. This minority considers that they have not had enough time to draw the conclusions with which to respond to the survey.

An 11% consider that they do not have time to do them. This is an important factor as they are losing representativeness once again.

Lastly, another 5% stated that they do not make good use of them due to lack of knowledge. Although this group states that they do not make good use of them due to lack of knowledge, it is possible that they really do make good use of the surveys but that they do not really know how to use them.

The last question in this blog was the one that was asked by users who did not know if they were making good use of them.
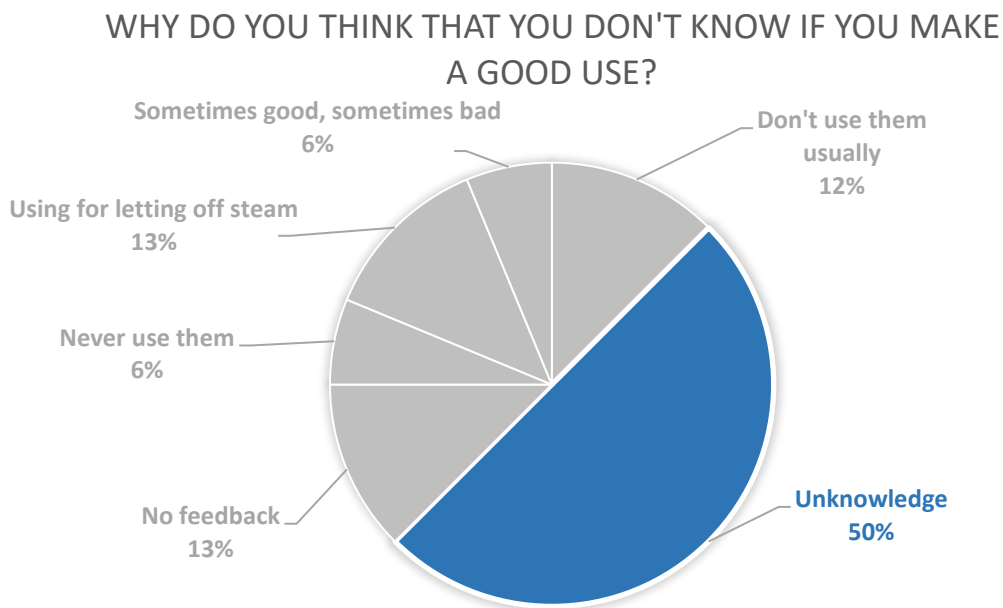
Graph 16: Results question 10 student's survey (Own source)

A 50% of the answers say that they do not know because they do not know the functions and uses of surveys. Once again, but now the variable of lack of knowledge appears to be more important. This is really worrying because the surveys are aimed at preserving quality and improving education.

A 13% do not know if they are using it correctly as there is no feedback. This group may or may not use it correctly without being able to reflect on it due to a lack of visibility of their response.

Another 13% do not know if they use them correctly because they use the questionnaires to vent against the university itself, but this fact means that the answers given by this segment are not valid for analysis in the great majority of them, as they vent by using perjorative expressions and phrases.

A 6% per cent say that they do not use them, which is an incorrect use, as low participation can lead to the cancellation of the survey and a lack of representativeness, and therefore a lack of reliability.

Finally, another 6% stated, without any argument, that sometimes it is used well and sometimes it is not. This segment is not possible to analyse as it does not provide any justification for its response.

Finally, we will analyse the last block of the survey. This is the measurement of the level of satisfaction according to the NPS score and the subsequent derivation of questions in order to obtain as much information as possible according to their classification into detractors, passives, and promoters.

Rate from 0 to 10 your satisfaction level about the satisfaction surveys
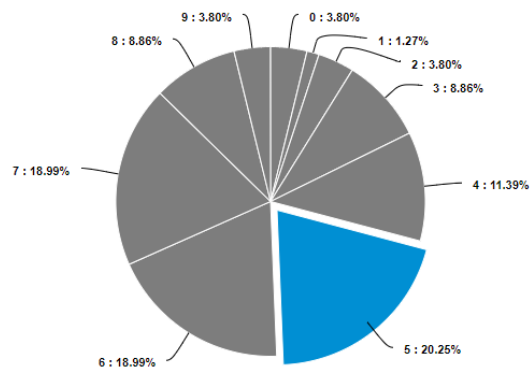
Graph 17: Results question 11 student's survey (Own source)

We can draw many conclusions from this graph, the most obvious answer would be to calculate the average mark in order to be able to draw a response to the students' opinion. This mark is 5.34, a rather poor mark for all the importance that satisfaction surveys represent. But let's go further, what is the conclusion of the NPS calculation?

$$NPS = 3{,}8\% - 68{,}35\% = \mathbf{-64{,}55}\%$$

This method, which we remember was designed to measure the level of satisfaction, gives a clear answer: students are not satisfied with the survey system.

The fact is clear, since the values of the results can be between -100% and 100%, the negative values represent the dissatisfaction of the end user, and in this case, as the data show, the pupils are, in general, very dissatisfied with the results.

The big question is, why are students dissatisfied? What aspects do they consider negative? What aspects do they consider positive? In order to obtain an answer, we have to analyse the last three questions which, as in previous questions, are derived according to the score given to the qualification from 1 to 10.

The detractors pointed out the defects:

COULD YOU MENTION THE WORST DEFECT?
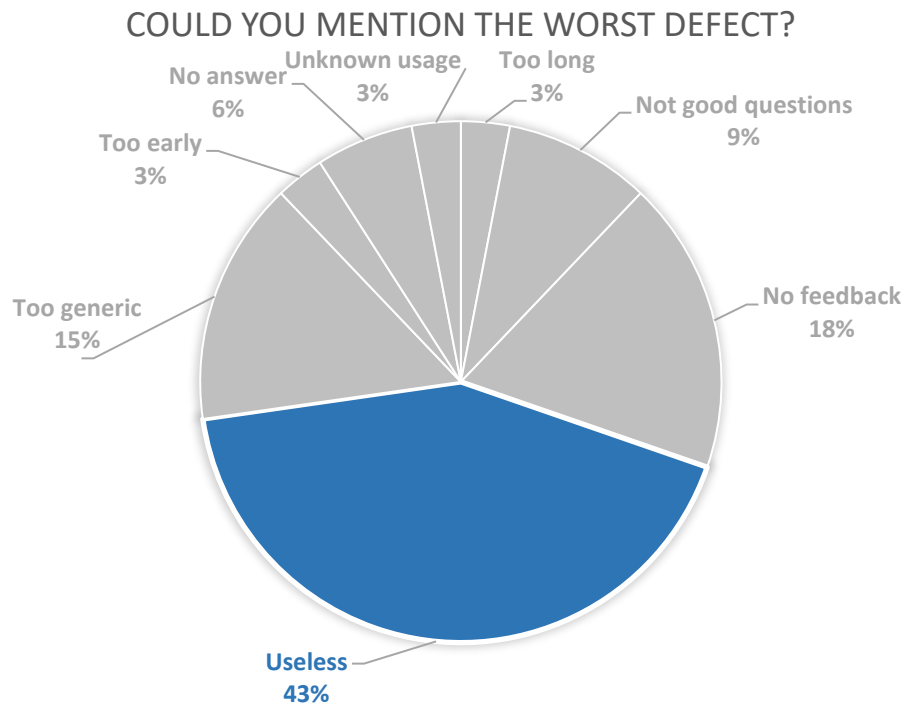
Graph 18: Results question 12 student's survey (Own source)

A 43% of respondents consider that the surveys are useless, i.e., that they have no impact. Once again, aspects previously mentioned appear, these are the lack of knowledge of the functions of the surveys and of the visualisation of their results.

An 18% believe that the biggest shortcoming is the lack of feedback. In other words, once again they feel that they do not see the results derived from their answers.

A 15% argue that the questions are too generic. Therefore, this segment considers that with the current questions the system is not able to draw the right conclusions.

A 9% believe that the questions are not correct. From this, we draw the same conclusion as the previous group; they consider that the questions are not accurate.

About 3% believe that the main shortcoming is that they do not know how useful they are. This variable of lack of knowledge is one of the most repeated during the analysis.

A 3% considered them to be too long. This fact can be related to one of the conclusions obtained in graph 16, where a certain group expressed the opinion of lack of time.

Another 3% said that they were too much time over the four-month period. This is a variable that appeared previously, where this small population expressed a lack of time to be able to draw conclusions about the subject and the teaching staff.

The passives, proposed options for improvement:
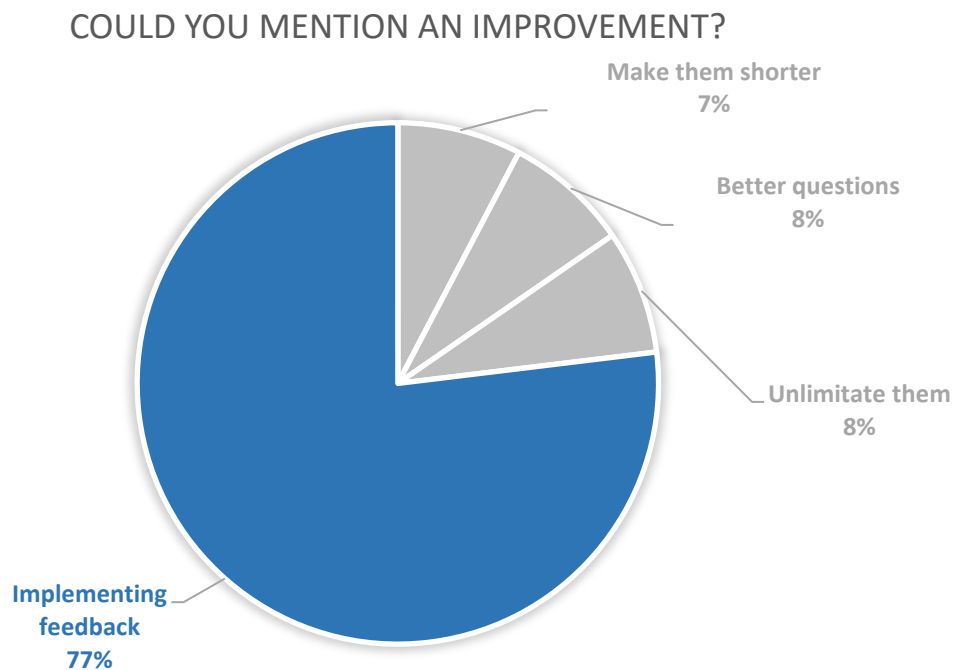
Graph 19: Results question 13 student's survey (Own source)

A 77% consider that the implementation of feedback is necessary. This option would be of great help as the lack of feedback is one of the most frequently mentioned aspects in the analyses of the survey.

Some 8% considered that an effective improvement would be to reduce the number of answers in order to be able to cover more concepts. An aspect that appeared earlier in graph 18, where two subgroups expressed the opinion that the questions were not accurate or were too generic.

Another 8% believe that the questions should be improved. In the same way as the previous segment, we can link it to other analyses to get the same opinion.

Finally, 7% considered that they should be shorter. In the same way as graph 18, we can connect it with graph 16, where they express the lack of time to carry out the surveys.

For the last question of the blog and the survey, we find the promoters, who point out the biggest strength?

COULD YOU MENTION THE MAJOR STRENTH?

Helps in student-university comunication
52%

It shows the true of the course
48%
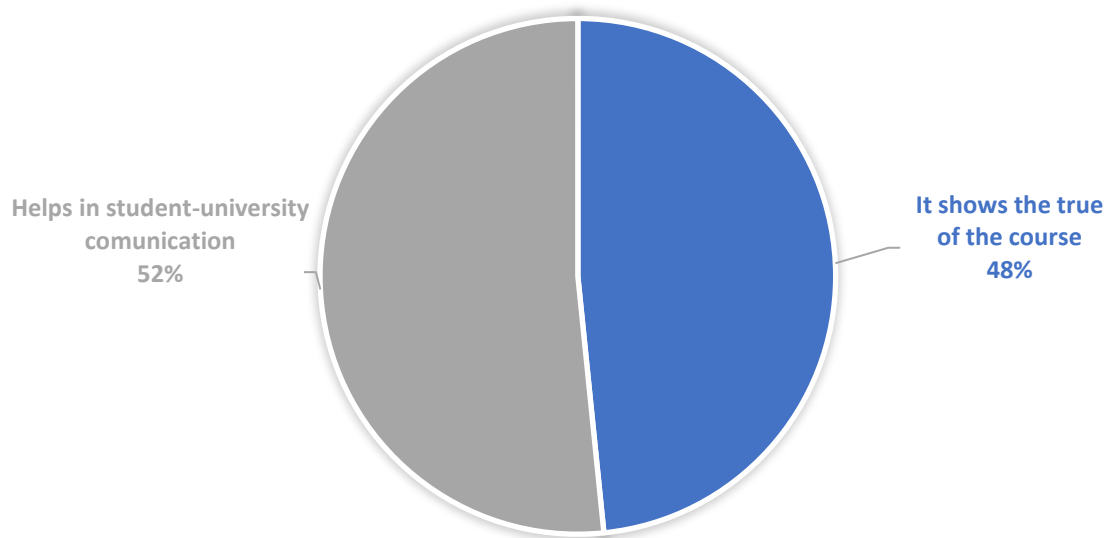
Graph 20: Results question 14 student's survey (Own source)

These answers can be grouped into two groups: 52% consider that it is a great tool for communication between students and the university. The fact that it is an essential tool for educational improvement and one of the bases on which the surveys are based.

The other 48% consider that the greatest strength is that it shows the truth of the course that has been given. Once again, we can reach the same conclusion as the previous group, as the aim of the surveys is to measure the reality in order to implement educational improvements.

8.4 Reliability analysis

After the analyses previously carried out, a question has emerged: How reliable are the surveys nowadays?

As can be seen in the participation tables generated in sections XX and XX, corresponding to the analysis of the subjects and teaching staff, participation in the surveys rarely exceeds 50% of those enrolled.

Although the reliability of the survey is not based on the percentage of participation, it plays an important role. The calculation procedure is by means of a table that makes it possible to classify the reliability of the survey as low or very low / medium / high / very high, depending on the number of registered students and responses. (CITAR). This table can be found in the annexes and has been used to generate four tables with the classification of the surveys according to their reliability.

CLASSIFICADOR		Fiablitat	APLICACIÓ ENQUESTES
[0,9-1]	A	Molt Alta	NO ANUL·LABLE
[0,8-0,9)	B	Alta	
[0,7-0,8)	C	Mitjana	ANUL·LABLE JUSTIFICACIÓ
[0,6-0,7)	D	Baixa	ANUL·LABLE D'OFICI
[0,5-0,6)	E	Molt Baixa	

Table 11: Reliability classification of surveys (UPC source)

For the two four-month periods of study, we can generate four tables as mentioned above; two that show the reliability of the satisfaction surveys of the subjects and the other two that show the reliability of the surveys of the teaching staff. These data are obtained from the same tables received by the GPAQ with which the previous analyses have been carried out and which can be found in the annexes.

Let's start with the subjects:

codi_upc_ud	Reliability degree	codi_upc_ud	Mitjana P Clau
220080	D	220099	C
220081	D	220100	C
220082	D	220101	C
220083	D	220102	C
220084	D	220103	C
220085	C	220104	C
220086	C	220105	C
220087	C	220106	C
220088	C	220107	C
220089	C	220108	C
220090	C	220109	C
220091	C	220110	C
220092	C	220111	C
220093	C	220112	C
220094	C	220113	C
220095	C	220114	D
220096	C	220115	C
220097	C	220116	C
220098	C	220117	C

Table 12: Reliability subject surveys GRETI 2020_2 (Own source)

codi_upc_ud	Reliability degree	codi_upc_ud	Mitjana P Clau
220080	C	220100	C
220081	C	220101	C
220082	C	220102	C
220083	C	220103	C
220084	C	220104	C
220085	C	220105	C
220086	C	220106	C
220087	D	220107	C
220088	D	220108	C
220089	D	220109	C
220091	C	220110	C
220092	C	220111	C
220093	C	220112	C
220094	C	220113	C
220095	C	220114	C
220096	C	220115	C
220097	C	220116	C
220098	D	220117	C
220099	D		

Table 13: Reliability subject surveys GRETI 2021_1 (Own source)

With regard to the teacher surveys, the tables that we can generate through this new study are as follows:

NOU_CODI _PDI	Reliability degree	NOU_CODI _PDI	Reliability degree	NOU_CODI _PDI	Reliability degree
PDI_0070	C	PDI_0075	C	PDI_0040	C
PDI_0068	C	PDI_0113	C	PDI_0053	C
PDI_0073	C	PDI_0026	C	PDI_0053	C
PDI_0059	C	PDI_0113	B	PDI_0040	C
PDI_0033	C	PDI_0113	C	PDI_0053	C
PDI_0022	C	PDI_0064	D	PDI_0016	C
PDI_0108	C	PDI_0007	C	PDI_0093	C
PDI_0009	C	PDI_0064	C	PDI_0039	C

PDI_0005	C	PDI_0027	C	PDI_0031	C
PDI_0012	C	PDI_0083	B	PDI_0032	B
PDI_0114	C	PDI_0083	C	PDI_0031	C
PDI_0114	C	PDI_0058	C	PDI_0032	C
PDI_0005	C	PDI_0014	C	PDI_0042	C
PDI_0017	C	PDI_0099	B	PDI_0080	C
PDI_0111	C	PDI_0099	C	PDI_0042	C
PDI_0104	C	PDI_0025	C	PDI_0100	D
PDI_0104	C	PDI_0034	C	PDI_0080	C
PDI_0046	C	PDI_0050	B	PDI_0002	C
PDI_0003	C	PDI_0034	C	PDI_0081	C
PDI_0095	C	PDI_0050	C	PDI_0052	C
PDI_0003	C	PDI_0006	C	PDI_0002	C
PDI_0095	C	PDI_0094	C	PDI_0049	C
PDI_0067	C	PDI_0094	C	PDI_0056	C
PDI_0067	C	PDI_0094	D	PDI_0051	C
PDI_0015	C	PDI_0041	C	PDI_0091	C
PDI_0006	C	PDI_0047	C	PDI_0091	B
PDI_0103	C	PDI_0090	C	PDI_0112	C
PDI_0103	C	PDI_0008	C	PDI_0079	C
PDI_0040	C	PDI_0029	C	PDI_0028	C
PDI_0085	C	PDI_0043	C	PDI_0074	C
PDI_0010	C	PDI_0065	C	PDI_0092	C
PDI_0075	C	PDI_0030	C		
PDI_0011	C	PDI_0037	C		

Table 14: Reliability teacher's surveys GRETI 2020_2 (Own source)

NOU_CODI _PDI	Reliability degree	NOU_CODI _PDI	Reliability degree	NOU_CODI _PDI	Reliability degree
PDI_0013	C	PDI_0084	B	PDI_0116	C
PDI_0065	C	PDI_0097	C	PDI_0116	C
PDI_0024	C	PDI_0084	C	PDI_0116	C
PDI_0024	C	PDI_0076	C	PDI_0041	C
PDI_0024	C	PDI_0084	C	PDI_0047	C
PDI_0024	C	PDI_0015	C	PDI_0008	C

PDI_0045	C	PDI_0076	C	PDI_0018	C
PDI_0077	C	PDI_0087	C	PDI_0029	C
PDI_0009	C	PDI_0059	C	PDI_0043	C
PDI_0009	C	PDI_0107	C	PDI_0055	C
PDI_0023	B	PDI_0054	C	PDI_0065	C
PDI_0051	C	PDI_0048	C	PDI_0044	C
PDI_0057	C	PDI_0053	C	PDI_0055	C
PDI_0072	C	PDI_0085	C	PDI_0065	C
PDI_0082	C	PDI_0053	C	PDI_0044	C
PDI_0082	C	PDI_0053	C	PDI_0030	C
PDI_0112	C	PDI_0020	C	PDI_0037	C
PDI_0021	C	PDI_0063	C	PDI_0037	C
PDI_0101	C	PDI_0017	C	PDI_0037	B
PDI_0101	B	PDI_0063	C	PDI_0030	C
PDI_0069	C	PDI_0035	D	PDI_0062	C
PDI_0038	D	PDI_0113	C	PDI_0062	C
PDI_0066	C	PDI_0113	B	PDI_0037	C
PDI_0101	B	PDI_0035	C	PDI_0061	C
PDI_0079	C	PDI_0096	C	PDI_0016	C
PDI_0079	C	PDI_0093	C	PDI_0093	C
PDI_0074	C	PDI_0083	C	PDI_0093	C
PDI_0092	C	PDI_0058	C	PDI_0001	C
PDI_0115	C	PDI_0025	C	PDI_0032	C
PDI_0118	C	PDI_0089	C	PDI_0032	B
PDI_0005	C	PDI_0091	C	PDI_0042	C
PDI_0003	C	PDI_0089	C	PDI_0080	C
PDI_0104	C	PDI_0091	C	PDI_0002	C
PDI_0104	C	PDI_0006	C	PDI_0081	C
PDI_0004	C	PDI_0019	B	PDI_0049	C
PDI_0105	C	PDI_0019	C	PDI_0056	C
PDI_0078	C	PDI_0006	C	PDI_0056	C
PDI_0119	C	PDI_0019	C	PDI_0051	C
PDI_0036	C	PDI_0019	C	PDI_0057	C
PDI_0119	C	PDI_0041	C		
PDI_0087	C	PDI_0047	C		

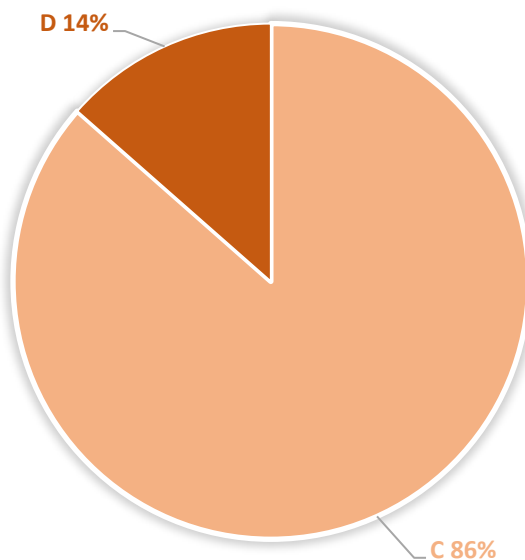*Table 15: Reliability teacher's surveys GRETI 2021_1 (Own source)*

From the tables, graphs have been generated in order to be able to analyse the data obtained with greater precision.

RELIABILITY SUBJECT GRETI 2020_2
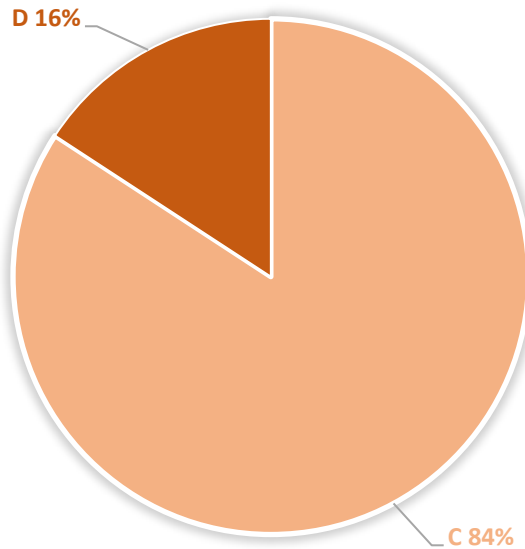
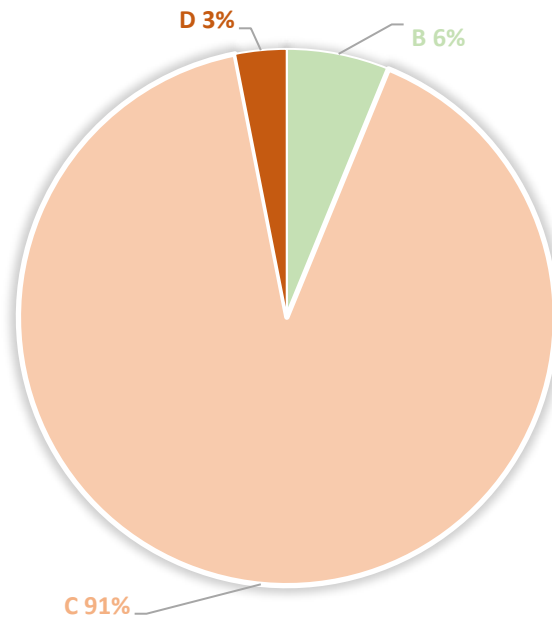*Graph 21: Reliability subject surveys GRETI 2020_2 (Own source)*

RELIABILITY SUBJECT GRETI 2021_1

Graph 22: Reliability subject surveys GRETI 2021_1 (Own source)
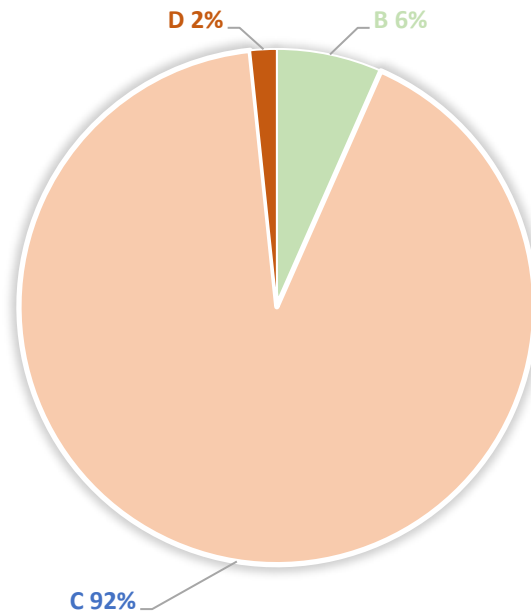
RELIABILITY TEACHER'S GRETI 2020_2

Graph 23: Reliability teacher's surveys GRETI 2020_2 (Own source)

RELIABILITY TEACHER'S GRETI 2021_1

Graph 24: Reliability teacher's surveys GRETI 2021_1 (Own source)

As can be seen in all the graphs, the great majority of surveys obtained have low reliability. The most common reliability range is C, which means that cancellation is possible with adequate justification.

In all the graphs, there is also a minority percentage of surveys with a reliability range D, which is equivalent to their official cancellation, that is, that they are not taken into account due to their low reliability.

In contrast to the surveys of the subjects, in those of the teaching staff, the rank B also appears, which is equivalent to a high reliability and therefore they are non-cancellable surveys.

The basic objective of the surveys is to guarantee teaching quality and strive for its improvement, therefore, it is obvious that a majority of surveys with high or very high reliability is desirable in the great majority of cases, so that they cannot be cancelled, as this would represent the reality of teaching in the schoolrooms.

In practice, at present, it is just the opposite; apart from the surveys classified with a rank C, there are more surveys classified with a rank D (officially voidable) than those classified with a rank B (non-cancellable). Furthermore, although there is no survey in this study with a very low reliability, rank E, which is highly unreliable, there is also no survey classified with a very reliable rank A, where this would be the ideal objective that should be achieved in all surveys.

These low reliabilities in the surveys are due to the students' perceptions of them, as many of them do not know their functions or consider them to be useless, which results in a low participation that leads to an insufficient reliability.

9 Conclusions

The conclusions of this study can be divided into parts. Firstly, we can affirm that there is a dependence between academic performance and the average mark of the key question in the satisfaction surveys. On the other hand, there is no relationship between participation and academic performance in the subject. Finally, with regard to the first analyses, there is no relationship between the age of the teaching staff and the average mark obtained for the key question in the surveys.

It is also true that, throughout the study, a low participation in satisfaction surveys has been detected, which leads to two conclusions. Firstly, that the majority of the surveys are currently only halfway reliable, and because of this first fact, we can draw the second conclusion; it is possible that the conclusions obtained with respect to the dependencies are affected by the lack of representativeness and, therefore, erroneous conclusions have been drawn in this study or previous studies.

Secondly, we will talk about the study carried out on the reliability of the surveys. As we have seen, the surveys are not representative. This representativeness is necessary in order to be able to reach high levels of reliability and not to be able to cancel the surveys, since they faithfully represent reality. It is obvious that reliability is improved by increasing the sample, but the question is how we can improve participation.

Participation is an exclusive right of the students and this is only possible through their involvement in the work. In order to achieve this involvement, we have to draw conclusions about their opinions.

To begin with, the students themselves acknowledge a lack of knowledge about the functions of satisfaction surveys, as can be seen in graphs 9, 11 and 16 of this study.

If we pay attention to graphs 15 and 16, the students themselves recognise that they do not make good use of them because they do not use the questionnaires. However, this fact can

be linked to a very repeated parameter, which is the lack of feedback. On the other hand, one of the proposals for improvement proposed by the students themselves is the implementation of this feedback, shown in graph 19, a fact that they also reason that they are not aware of whether they make a good use of the questionnaires for another time, lack of it, graph 16.

However, if we want to improve this participation, which will be translated into reliability in the conclusions obtained from the surveys, we need a sincere response from the students. This fact, although it may seem obvious, is not entirely the case. In graphs 14 and 20, students state that they make good use of the questionnaires by means of an honest response, as this helps communication between students and the university as well as improving teaching quality. However, on the other hand, there is a certain segment of students who state that they do not answer truthfully, a fact that can be seen in graphs 12 and 15.

In conclusion, it is vitally important to involve students in the task by making them aware of the functions of satisfaction surveys and thus be able to increase participation in the surveys by means of truthful answers, as students themselves are one of the main stakeholders in ensuring the quality and continuous improvement of the teaching they receive.

10 Improvement proposal

As a proposal for improvement, I present two options to be carried out in parallel. On the one hand, as has already been argued in the conclusions, it is necessary to inform students about the usefulness of the surveys. This would improve the participation and the quality of the answers, and therefore, it would also improve the reliability and the conclusions that can be drawn from the studies of the surveys themselves.

Secondly, pupils require a feedback system, however minimal it may be, as this is the most repetitive conclusion that we can draw from practically all the analyses carried out on pupils. This system would be complementary to the first proposal for improvement mentioned above, as the implementation of feedback would show students that their involvement in the work has borne fruit and this would mean that in the future they would be more willing to respond to surveys in order to form part of the preservation of teaching quality, Moreover, this would generate a tendency to increase the number of responses which, as with the first improvement proposal mentioned above, would increase the reliability of the surveys.

11 Future lines

As future lines regarding the study of variables likely to influence the reliability of student satisfaction surveys, I propose to continue analysing variables that affect reliability as has been done in this study and previous studies. Furthermore, I propose to extend the studies to new quarters and new degrees.

On the other hand, I invite you to study, analyse and criticise my own survey in order to draw conclusions about the students' perceptions in order to detect strengths and weaknesses and to improve it and expand the study population in order to draw better and new conclusions or to reaffirm the conclusions drawn in this work.

12 Budget

It was not necessary to use materials for this study, so there are no costs in this area. In addition, a programme called Question Pro was used to generate the survey; however, as it is online, a free version with certain limited tools was available, which made it possible to carry out this prototype of the student survey. Therefore, the budget will be based solely on the cost of the activities, understood as activities and actions carried out during the course of the project.

As for the fees, given the complexity of the subject in question, they are set at 50 €/hour. In order to determine the cost of each activity, the value assigned per hour and the duration must be taken into account.

ACTIVITY	DURATION (h)	SALARY (€/h)	TOTAL COST (€)
Project Charter	10	50	500
Information researching	25	50	1250
Study of variables	15	50	750
Definition of variables to submit to study	10	50	500
Study of satisfaction surveys	20	50	1000
Initial survey generation	60	50	3000
First survey evaluation	15	50	750
First survey remodelling	10	50	500
Definitive survey generation	25	50	1250
Survey analysis	90	50	4500
Conclusion generation	25	50	1250
TOTAL	**305**	**50**	**15.250**

Table 16: Budget (Own source)

As we can observed, the final cost of this project will be approximated of 15.250 € if it would have been a project contracted by a company.

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14 Annexos

All the information contained in the annexes will be provided in pdf format in the case of the first survey model and in Excel format in the case of the two tables provided by the GPAQ (subject surveys and teacher's surveys), in addition to the table for calculating the reliability of the surveys according to participation and the number of students enrolled.

This information will be provided attached to the document of the task uploaded to Atenea.