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Pattern detection in Higher Education evaluations

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October, 2020

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## **Abstract**

The effect that certain variables have on students' academic performance has a certain complexity attached to it. The present study focused not only on the student and teacher entities, but also included curricular units and scientific areas. From these entities, certain variables were used for this study to acknowledge if there is a certain dependency between some of them, for example if the Satisfaction with the Teacher explains a certain amount of the Students' Grades variance. The curricular unit was the unit of analysis for the present study since it was not possible to go on a deeper detail level, due to classified data. The present study validated all the models of study on an Overall Perspective, but not all models regarding the models by Scientific Area. It was also found significant effects in all study hypothesis, regarding the Scientific Areas.

**Keywords:** Data Analysis; Pattern Detection; Higher Education.

## Resumo

O efeito que certas variáveis têm no desempenho académico dos alunos tem uma certa complexidade ligada ao mesmo. O presente estudo incidiu não só sobre as entidades aluno e professor, mas também incluiu unidades curriculares e áreas científicas. Destas entidades, algumas das suas variáveis foram incluídas neste estudo de modo a verificar se existe uma certa dependência entre elas, por exemplo verificar se a Satisfação com o Professor explica alguma da variação das Notas dos Alunos. A Unidade Curricular foi a unidade de análise para o presente estudo, uma vez que não era possível ir a um nível de maior detalhe, devido a dados anonimizados. O presente estudo validou todos os modelos de estudo numa Perspetiva Geral, mas nem todos os modelos relativos aos modelos por Área Científica. Verificou-se também efeitos significativos em todas as hipóteses de estudo, relativamente às Áreas Científicas.

**Palavras-Chave:** Análise de Dados; Detecção de Padrões; Ensino Superior.

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## **Abbreviations and Acronyms List**

OLS – Ordinary Least Squares

TLS – Two-Stage Least Squares

CU – Curricular Unit

SEM – Semester

SET – Student Evaluation of Teaching

## Chapter 1 – Introduction

### 1.1. Context

There is a thoughtful amount of research on student's success in higher education (Nyström et al., 2019). One of these studies conclusions is that there is a possibility to predict students' academic achievement through a student behavioural and emotional strength, and the student-teacher relationship of that same student (Sointu et al., 2017).

Having a perspective on these types of effects on a Portuguese University, more precisely at ISCTE-IUL, may bring a new perception regarding higher education knowledge. For example, by studying a variable such as the Satisfaction with the Teacher (despite being only a variable in the extensive student-teacher relationship) will allow to have a clear understanding regarding the effect on a certain variable of student success such as Students Grades.

Despite all, there is a controversy in the academic world about how some of these variables values can be manipulated, for example improving teacher evaluations through grade inflation (Braga et al., 2014). A positive aspect of this study is that studies data from inquiries administrated before the exams' season which may exclude the influence of grade inflation.

## 1.2. Motivation and Objective

As a student, a certain relationship is developed with every teacher that can be either a negative, neutral or positive one. Also, as an individual we have different perceptions and likes regarding a certain curricular unit or even all curricular units from a specific scientific area but having them influence the students' performance and perspective is another matter.

Trying to understand how a teacher could have effect on students' academic performance goes way back in time, so it's not something new to discover. However, the diversity of divergent results is also quite considerable throughout the academic universe, and mostly focused on the student-teacher relationship and SETs, which causes inability to come across a concise result.

In order to better understand how some of these questions were answered on a Portuguese university, and to add some different variables, this dissertation started. Therefore, the objective of this dissertation is to find patterns between student knowledge evaluation, teacher performance evaluation and curricular units. Moreover, understanding how scientific areas could influence these patterns was also brought into question.

### **1.3. Structure of the dissertation**

This dissertation is organized in five chapters, presenting different stages to its conclusion.

The 1<sup>st</sup> chapter is an introductory chapter, describing as well the motivation to this study, the objective of the study, and a small description of the structure of the dissertation.

The 2<sup>nd</sup> chapter is referring to the literature review, which gives a theoretical framework on what will be discussed.

The 3<sup>rd</sup> chapter displays the methodology used to research the theoretical framework, how data was acquired and processed, and makes a brief reference to the study hypothesis.

The 4<sup>th</sup> chapter presents a description on the data of study and its characteristics, as well as the data analysis and the discussion of the obtained results.

The 5<sup>th</sup> and last chapter shows the study conclusions, as well as study contributions, limitations and future research.

## Chapter 2 – Literature Review

### 2.1. Students and its Relationships

On the last decade there has been a lot on interest on the researchers behalf with the purpose of understanding what motivates a student's academic motivation and how its interpersonal relationships have an impact to it (Anderman & Kaplan, 2008).

Concerning the social domain relation with the academic motivation there are two main focus to it: the social motives and the social relationships (Anderman & Kaplan, 2008). The social motives take the focus on subjects such as social goals, as for the social relationships has its focus related to the roles of relationships or interaction patterns, having this second one a certain focus on the teacher-student relationship (Anderman & Kaplan, 2008). There is a third focus, yet more generalised, about the students social acceptance and identification with school (Anderman & Kaplan, 2008). Needless to say, all of these social domain foci are crossed with the students' academic motivation.

Adolescent students who have a positive relationship with their peers (Wentzel et al., 2010) and teachers (Thijs & Fleischmann, 2015; Wentzel et al., 2010) tend to show better social and academic aptitude at school, suggesting social support as motivational factor on a student's success (Wentzel et al., 2010;Thijs & Fleischmann, 2015; Decker et al., 2007). Yet outcome differences may exist depending on the sources of support (Wentzel et al., 2010).

A study conducted by Wentzel et al. (2010) on adolescent students showed that classes whose students' reports on their teacher had substantial diverged values, its students had lower interest levels and a more reckless behaviour. Also suggested that, a teacher consistency in their support is more successful on promoting interest and social motivation.



## 2.2. Student-Teacher Relationship

A student-teacher relationship may not be enduring or exclusive as a parents-child relationship, particularly due to the joint time (Geerlings et al., 2017), however it can be extremely important to a student academic, behavioural, emotional and social development (McGrath & Van Bergen, 2015).

In spite of students being with their teacher for a limited period of time, teachers can be an important figure on a student's life as they can be there to support the student, for example, emotionally or as a figure that conveys security, something that is more noticeable on early school (Thijs & Fleischmann, 2015; Geerlings et al., 2017) as relationships are closer (Decker et al., 2007) but equally important throughout the academic journey (Thijs & Fleischmann, 2015). Teachers who are able to improve a student's achievement are subsequently improving that student's life outcomes in areas such as educational attainment and employment income (Cheng & Zamarro, 2018).

Teachers can be seen as secondary attachment figures who tend to bond affectionately with their students, and in some situations even outweigh parental support regarding students' academic development (Geerlings et al., 2017). Relatedness with their teachers may be a motivational factor for a student's engagement and achievement (McGrath & Van Bergen, 2015; Fauth et al., 2014).

Conscientiousness is just one of the teachers' skills that can be a determining factor to a student's outcome (Cheng & Zamarro, 2018). A teacher's enthusiasm is also a factor that can have a great influence on a student not only on a cognitive learning level but also on their affective, behavioural and motivational characteristics (Keller et al., 2014).

All of these spoken factors may, or may not, be integrated in a teacher's productivity, but studies have shown that a teacher's productivity has a considerable amount of lasting effects on a student's outcome (Pope, 2019).

Pointless to say, as teachers' characteristics may differ so can their assessment on the same student (Bates & Glick, 2013), as well as their relationships. These characteristics have also been associated with students lower achievement and grades (Perry & Weinstein, 1998).

Concerning teachers' characteristics, if a teacher is caring and demonstrates effective control of the classroom their students will feel a certain freedom to take academic risks and also will have higher productivity levels, since they would feel a certain safety and concerning

on their teachers behalf and because time would be used in a more productive way with less disruptive behaviour (Sandilos et al., 2017). Studies regarding the social psychology of the classroom have shown that the prediction of students' social and academic outcomes can be highly influenced by the 'climate' in students' classroom (Alansari & Rubie-Davies, 2019; Fauth et al., 2014).

Important to acknowledge that teachers with higher achieving classrooms have a tendency to set the expectation standards higher for their students (Wang et al., 2018). The quality of the teacher-student relationship can be positively linked to a teacher's expectations for that student (Wang et al., 2018).

Not that incongruous to say that teachers use information about a student's characteristics to set a foundation regarding the expectations they may have about that specific student (Wang et al., 2018). In a general perspective, some studies came across evidences that teachers usually have a higher degree of expectations for girls in literacy and the same happens for boys about mathematics (Wang et al., 2018). Despite that, studies with focus on general academic outcomes show a tendency about higher expectations being set for girls (Wang et al., 2018).

### **2.2.1 Positive and Negative Relationships**

Needless to say that aggressive, antisocial and disruptive students have a higher risk to be in a negative student-teacher relationship (McGrath & Van Bergen, 2015).

Despite positive and negative student-teacher being related to closeness and conflict between the two entities of the relationship, it cannot be assumed that they are synonyms as it can have a certain level of conflict and still be a positive relationship between the student and the teacher (McGrath & Van Bergen, 2015). A study conducted by McGrath & Van Bergen (2015) proposes that a relationships' quality is positive when both entities of the relationship have benefits with it and negative when either or both consider it harmful.

In a student-teacher relationship, closeness refers to the amount of confidence of emotional support the student has on the teacher (Davis, Kathryn S.; Dupper, 2008) and also being a safe base for the student (Thijs & Fleischmann, 2015), whereas conflict and dependency refers to either bad behaviour (Davis, Kathryn S.; Dupper, 2008) or a constant need of attention and reassurance meaning lack of security (Thijs & Fleischmann, 2015). A dependency relationship with the teacher may lead to students trying to get better grades than his classmates with the

purpose to impress the teacher and try to show that they are no less academically competent as they usually are sensitive about their teachers' judgement about them, something that can be motivational (Thijs & Fleischmann, 2015).

Although some studies show no differences between genders, others show that girls have a more positive relationship with their teachers being a closer relationship while boys are more of a conflictual relationship (McGrath & Van Bergen, 2015). Within this point of view, the student-teacher relationships have a higher impact on girls' academic performance and on boys' emotional engagement (McGrath & Van Bergen, 2015).

Having the finest student-teacher relationship to be a high closeness and low conflict relationship (Holdaway & Becker, 2018), there are some health issues may also be associated with the departure from it and to a student increased conflict, such as ADHD, ODD, CD, anxiety, depression or even sleep problems (Geerlings et al., 2017; Holdaway & Becker, 2018), issues not that unfrequently experienced (Perry & Weinstein, 1998). A student with temperamental issues may also affect the quality of the relationship with their teachers as they can be more aggressive, frustrated, impulsive or unhappy comparing with other students, sometimes related to an unstable family, an academic difficulty or even a frustration regarding their teacher (McGrath & Van Bergen, 2015). Sidewise, a student-teacher relationship can be of significant importance for students with emotional and behavioural disorders, especially concerning school achievement and student outcomes (Sointu et al., 2017).

A positive outcome may come from positive student-teacher relationship as well as the decrease of the likelihood of school dropout for at-risk students, but a negative one may also promote negative outcomes (Decker et al., 2007). It is also more likely that older students may have a less positive relationship with their teachers as it is expected from the a higher degree of maturity (McGrath & Van Bergen, 2015).

On a study conducted by (Decker et al., 2007), it showed students wanting to have a closer relationship with their teachers as they considered it important, despite teachers having a tendentially negative view on their relationship with their students. Also concluded that the student-teacher relationship was more related to social and engagement outcomes instead of academic outcomes.

This interpersonal relationship that teacher have with students can also have a great impact on students' attitudes regarding cultural diversity, as well as expressing their own views and

beliefs, which may lead students to be open to people from different cultural backgrounds (Geerlings et al., 2017).

Notwithstanding, teachers having a shared ethic or cultural background with their students can be an important aspect to set a positive student-teacher relationship (Sandilos et al., 2017; Redding, 2019), as teachers can be seen as a role model (Sandilos et al., 2017), which can improve a student's academic and non-academic performance (Redding, 2019).

### 2.3. Teacher Evaluation as Students' Feedback

A highly important element about the learning process is assessment feedback, but some barriers to feedback continue to persist as a problem in higher education due to students and teachers dissatisfaction (Henderson et al., 2019).

Teachers' feedback is a key factor to improve the educational level, reachable as a sub consequence of teachers development, and being the art of teaching a complex profession only with the proper feedback can it have better results (Van Der Schaaf et al., 2019). As teachers have a big amount of impact in a student's performance, it is imperative the identification of a teacher's quality and keep trying to improve it (Cheng & Zamarro, 2018). Students evaluations of teaching (SETs) can also be important for curriculum development, promotion decisions or even merit raises, although the validity, reliability and diagnostic power can vary between institutions (McClain et al., 2018).

Although teachers are evaluated by students, it is needed to take into account that teachers may sometimes be suffering from stress and uncertainty related to several problematic situations, such as conflicts with students, conflicts with colleagues, in-class experiences or even high work pressure (van der Wal et al., 2019), which can affect their work performance and also be reflected on their inquiries.

Regarding the teachers evaluations and ratings, it has been shown that when teachers acknowledge their rating if they are a low-rated teacher the performance tends to increase which may be a result of an effort increasement, whereas for a high-rated teacher only minor changes are found (Pope, 2019). Despite that, the experience of being inspected makes teachers take accountability which can impact their life-long teaching practices, especially for novice teachers (Robert Powell & Parkes, 2019).

It is important to refer that any of the teacher's performance evaluation will always be under the influence of the rating student's personal characteristics, which may include the student's personal interpretation of the teacher's personal characteristics (Wind et al., 2019). To obtain the most authentic results, it's imperative for a student to be honest as honesty is a key component for a truthful and valid SETs (McClain et al., 2018), which can be quite complicated. A study concluded that only 20% of students never changed the evaluation given to their teacher, for any reason (McClain et al., 2018).

The willingness of students to participate and be honest about the teachers evaluation is influence by students' satisfaction with the evaluation process and their perception about the evaluation system, for example, what is the purpose of those evaluations, whether to help teaching improvement or for teacher promotion decisions (McClain et al., 2018).

Despite not knowing the nature of the relationship, it has been established that there is a relationship between grades and SETs (McClain et al., 2018). These should also be taken into consideration the timing universities administer the SETs since some universities do it in the middle of the semester and others by the end of the semester, something that may influence the students' honesty and attitude towards it (McClain et al., 2018).

Not only the timing must be taken into consideration, but the way it is administered as well, as it can be done in-class or online (McClain et al., 2018), both having pros and cons. Regarding online evaluations a key factor to its success is anonymity, as well as other advantages such as wasting less resources and class time, even though there may exist some concerns about the thoroughness of the anonymity since students have to connect with their login credentials to perform the evaluation (McClain et al., 2018).

On a study conducted by McClain et al. (2018), it has been shown that there are no connections between students' grades and SETs responses, but also shown that students have a higher probability of being honest at semester's end than at the middle of the semester. Also, a study by Fauth et al. (2014) on primary school students showed student rating being influenced by teachers popularity, something that can have a high impact on the veracity of the evaluations.

*Teachers are the prime evaluators of students' academic performance*

(Thijs & Fleischmann, 2015)

## 2.4. Student's Success

Success is a universal term as it can be applied in multiple areas of context, but for this particular study it will be related to the student's success.

Nowadays, there is a lot of research regarding the students success in higher education, mainly focusing on the improvement of success rates with a substantial amount considering students engagement, and frequently specifying on certain groups of students and disciplines (Nyström et al., 2019). One of the most used terms in educational research and assessment in higher education is 'academic success', a term with a high degree of complexity and extensivity but often misused on the encapsulation of generally accepted desired outcomes (Gibson III, 2015). It must also be acknowledged that terms 'student success' and 'academic success' can be seen being used interchangeably (Gibson III, 2015).

It's not random that student engagement is taken a lot into consideration being considered by some as key to student achievement and retention since a student positively engaging with their studies increases the odds to be successful, having engagement as a student's behavioural, cognitive and emotional connection to their education (Kahu & Nelson, 2018).

On another perspective, attaining anything but academic performance of excellency can lead the student to experience anxiety, fear of failure, low self-worth, shame and stress, which are some of the multiple reason that makes it so important to understand success itself (Nyström et al., 2019).

A study conducted by Sointu et al. (2017) came to the conclusion that a student's academic achievement could be predicted by his/her behavioural and emotional strength and his/her student-teacher relationship. This result may be derived from two main reasons since achievements are directly influenced by strengths and student-teacher relationships apparently look to set their foundation on strengths (Sointu et al., 2017).

Nonetheless, if a teacher assesses their students taking into consideration socially predominant stereotypes then the values behind the assessment will likely be distorted (Bates & Glick, 2013) compromising the students success.

*Student success and retention continue to be of concern for higher education institutions.*

(Kahu & Nelson, 2018)

### 2.4.1 Students' School Dropout

It is believed that the risk of school dropout can be recognised on early school stages as the learning and patterns of academic achievement regarding students' attitude also start at those same stages, and the teacher-student relationship may have some influence to it (Davis, Kathryn S.; Dupper, 2008). Students who had a positive relationship with their teacher(s) in kindergarten tend to be more sociable in preschool, as those who have a poorer relationship with their teacher(s) in the fifth grade usually had a more antisocial behaviour in kindergarten (McGrath & Van Bergen, 2015).

Having a mutual respect and confidence between students and teachers will promote the students' efforts and prospectively they will excel to try their best. The opposite will also occur if students have no trust on their teachers (Davis, Kathryn S.; Dupper, 2008). One of the main reasons that students claim for their school dropout is the lack of interest on them by their teachers (Davis, Kathryn S.; Dupper, 2008), giving the impression of a precarious student-teacher relationship which raises some attention to the high impact that this particular relationship has on students.

In spite of that, it is believed that the risk of school dropout can be recognised on early school stages as the learning and patterns of academic achievement regarding students' attitude also start at those same stages, and the student-teacher relationship may have some influence to it (Davis, Kathryn S.; Dupper, 2008). Students who have a negative student-teacher relationship may be more at-risk (Decker et al., 2007).

Despite all, there is a diversity of reasons for students withdraw from their studies, being some of them (Kahu & Nelson, 2018):

- Academic;
- Financial;
- Psychological;
- Quality.



## 2.5. Academic Theories on Students' Academic Performance

The first year of higher education can be particularly challenging for students and a transition theory (Kahu & Nelson, 2018) acknowledges some reasons such as:

Insufficient Skills;

Academic Socialisation, as students need to be inducted into the cultural academic ways;

The involvement of identity and power in learning, as students bring cultural and social capital which values them and represents;

The insufficient skills don't need much explanation to it as it can be obvious. Regarding the Academic Socialization, the best way to explain it is through a metaphor between a maze and the students, so if the students don't know how or can't navigate throughout the maze they will fail or leave (Kahu & Nelson, 2018). The involvement of identity and power in learning can be explained by way of if a student's practices are not as valued as the knowledge and experience of dominant groups that same student can be alienated (Kahu & Nelson, 2018). In this transition theory must be highlighted the importance of alignment between the student and the institution in order to increase the chances of student's success (Kahu & Nelson, 2018).

A study conducted by (Astin, 1999) came across with three more theories being them pedagogical theories related with student's achievement and development:

- The subject-matter theory;
- The resource theory;
- The individualized (or eclectic) theory;

The subject-matter theory has an elevated degree of popularity among college professors and considers that the exposure to right subject matter is critical to students learning and development (Astin, 1999). The resource theory has its favouritism among administrators and policymakers and believes that if the right resources such as physical facilities, human resources and fiscal resources are brought together that student learning and development will be enhanced (Astin, 1999). The individualized theory is the preference of several developmental and learning psychologists and tries to identify what best meets the needs of a student individually assuming that there is no subject matter, teaching or resource allocation approach suitable for all students (Astin, 1999).

## 2.6. Related Studies

Some similar studies have already been conducted analysing not only the correlation between students' grades and students' evaluation of teachers but also taking into consideration some exogenous influences that may affect the results. In this chapter I will enunciate some of them, as for their debated content and conclusion.

The understanding of the relationship between students grades and students' evaluation of teachers has become a subject of great importance in higher education for multiple reasons, but specially due to the increase of its often use as an indicator for hiring and promotion decisions (Krautmann & Sander, 1999; Braga et al., 2014; Ellis et al., 2003) as it can be a teacher's performance indicator (Braga et al., 2014). One of the biggest concerns regards to the fact that it can be easily manipulated if the increase of a student's grade lead to an increase of the teacher's evaluation, making it a flawed indicator (Krautmann & Sander, 1999).

So, are the teachers able to improve their students' evaluations by making it easier to have higher grades? Despite some studies suggest a positive relationship between a student's grades expectation and its teacher evaluation (Krautmann & Sander, 1999; Ellis et al., 2003; Braga et al., 2014) and some even consider this to be the key of grade inflation (Braga et al., 2014), others find no relationship between both variables (Krautmann & Sander, 1999; Ellis et al., 2003).

Factors not directly related to the teacher's teaching method may also affect the teacher's rating, such as background conditions, characteristics of the teacher or characteristics of the course itself, as well as many others (De Witte & Rogge, 2011; Krautmann & Sander, 1999). The teaching environments may also affect the teaching quality and subsequently the students' evaluations of teaching (De Witte & Rogge, 2011).

But if student ratings are not accurate, why still assess teachers using student ratings? Despite existing a negative relationship between ratings and deep learning, there are some positive outcomes attached to them. It is suspected that an average teacher would put less effort and time into their teaching if student rating ceased to exist, although it can also prejudice the student learning (Kornell & Hausman, 2016). In order to get better rating, teachers may inflate grades (Kornell & Hausman, 2016) or be more lenient on grading (Ellis et al., 2003). A teacher rating can improve even by giving students chocolates, and that doesn't mean that the students learned more (Kornell & Hausman, 2016).

Regarding the study of variables, in order to understand how much impact a variable or multiple variables have on a specific variable several approaches are possible such as a correlation analysis, a (multivariate) analysis of variance, a (multiple) regression analysis, or a multi-level modelling approach (De Witte & Rogge, 2011).

### **2.6.1 Study 1: Teachers influence on students' ratings**

A study conducted by (Krautmann & Sander, 1999) show results that support the hypothesis that teachers can influence students to give them better ratings through a less strict grading.

This particular study was conducted using data from DePaul University, in Chicago, more specifically from their students' evaluations of economic courses, from the academic year of 1994 to the one of 1996.

One of most relevant variables of their study, which was the grade that the student expected to receive in the course was also obtain as a response to the evaluation inquire. Almost every other variable was considered as dummy variables, for the exception of the class size. Student evaluations of teaching, the other major variable, was also obtain from the evaluation inquire, having values from 1 to 5 (lowest to highest). For the study, the unit of observation was the individual course.

They estimated evaluations using both Ordinary Least Squares (OLS) and Two-Stage Least Squares (TSLS), first approaching with an endogeneity test. After the test, if endogeneity was rejected, OLS would be the appropriate estimation technique. On the other hand, if some evidence was found that some of the independent variables were jointly determined, the alternative and appropriate method of estimation would be the TSLS, since the OLS would be biased and inconsistent.

Implications that student evaluations are positively related to expected grades were implied in both OLS and TSLS estimates, and also indications that neither gender differences nor class size had a substantial effect on evaluations. This positive relationship may imply a similar relationship regarding actual grades (Krautmann & Sander, 1999).

### **2.6.2 Study 2: Teachers penalization**

A study conducted by (Krautmann & Sander, 1999) show results that support the hypothesis that teachers can influence students to give them better ratings through a less strict grading.

Another study, this one conducted by (Ellis et al., 2003), which compared the average grades and the average ratings given by students to their respective teachers, also found a positive correlation between both variables, supporting the suggested implications of the previously referred study regarding actual grades.

It was based on data collected from a range of 165 behavioural and social science courses between 1997 and 1998, at Minot State University, in North Dakota. The data included 5,602 student evaluations, 24 teachers, and a class size range between 2 and 86 students. These evaluations were completed in the final week of the semester on where was asked to be provided two ratings on a 10-point scale (as 1 being the lowest and 10 the highest) regarding the teacher and the course.

Two analysis were performed, one correlating the independent variable (class grade point average) with the dependent variables (teacher and class ratings). During the analysis, and by performing a multiple regression, it was also concluded that “the average grade given on the course is a significant predictor of the average student ratings of the instructional quality”.

There are some concerns over the findings, being one the fact that strict grader teachers are being penalized for their thoroughness, which is subsequently penalizing the ones who facilitate student learning, since teachers with more rigorous grading standards encourage student learning (Ellis et al., 2003), something also verified on other studies (Kornell & Hausman, 2016).

### **2.6.3 Study 3: Evaluating Teachers**

On a different perspective, a study conducted by (Braga et al., 2014) contrasted the measures of teacher effectiveness with the students’ evaluations of teachers, however their results suggest that students evaluate teachers not by the observed quality of teaching but with basis on their enjoyment of the course or regarding their realized utility of the course, casting “doubts on the validity of students’ evaluations of professors as measures of teaching quality or effort” .

The empirical analysis was based on data from undergraduate students at Bocconi University, in Italy. More specifically, it's referent to the 1998/1999 freshmen from 3 different degree programs, each with more than 1 class: Management, Economics and Law & Management. This data covered the entire academic history of students, and the majority of student attended the Management program (74%).

Questions on students' opinion about several aspects of the teaching experience were answered on a scale from 0 to 10 or 1 to 5, being the least the most negative and the biggest the most positive. The study used methods as simple OLS, weighted OLS and other regressions to check the correlations.

A consequence of this study conclusions is acknowledging that good teacher can be wrongly evaluated, especially by students who dislike exerting effort, since, adding to that, finding also supported the idea that classes with an over-representation of high-skill students are more aligned with the estimated quality of the teacher.

## Chapter 3 – Methodology

In order to write this masters dissertation a certain methodology was followed, and that is exactly what will be broken down in this chapter and its sub-chapters.

### 3.1 Research

To better understand the dissertation, the dissertation goal is to “Detect patterns between student knowledge evaluation, teacher performance evaluation and curricular units”

In order to understand what kind of research had been made related to the dissertation goal, a certain system was followed, and several articles were taken under matter, some of which were chosen for the literature review.

Regarding the research, some things were needed to be taken in consideration, meaning what type of strategic decisions will most likely improve the study.

Being a search engine, Google Scholar was an essential tool for the research part of the process given the fact that searches through countless journals repositories, while giving relevant information such as how many times a certain article was cited. Science Direct and IEEE Xplore were also.

*Table 1 - Search Information*

<b>Repositories</b> (how many)	<ul style="list-style-type: none"> <li>○ Science Direct (13)</li> <li>○ Taylor &amp; Francis Online (11)</li> <li>○ Others (5)</li> </ul>
<b>Keywords / Search Strings</b>	<ul style="list-style-type: none"> <li>▪ "student-teacher relationships"</li> <li>▪ "social motivation"</li> <li>▪ "rating teacher"</li> <li>▪ "teacher evaluation by students"</li> <li>▪ "student outcomes"</li> <li>▪ "teacher evaluation"</li> <li>▪ "academic achievement"</li> <li>▪ "student teacher evaluation"</li> <li>▪ "higher education"</li> <li>▪ "student feedback"</li> <li>▪ "rating"</li> </ul>

<b>Year of Articles</b> (how many)	○ 1998 (1)	○ 2014 (2)
	○ 1999 (1)	○ 2015 (3)
	○ 2007 (1)	○ 2017 (3)
	○ 2008 (1)	○ 2018 (5)
	○ 2010 (1)	○ 2019 (9)
	○ 2013 (1)	

As it is shown on Table 1, more than 75% of the chosen articles have been written at less than 6 years ago. As social behaviour and interactions change throughout the years, a strategic choice was adopted as more recent articles may lead to more relevant content for this study.

Concerning the Keywords/Search Strings, the above presented on Table 1 were concatenated in different ways with the purpose of better segment the search focus. For example, the combination between "student–teacher relationships", "student outcomes", "teacher evaluations" and "academic achievement" had a total of 279 results on Google Scholar.

Notwithstanding the smaller amount of results, still a manual selection was needed in order to verify the relevance of the article for the study in question. It is also important to point out that some articles were also found through a snowball effect, either from related journals or due to citations on other articles.

Even with all the filtration done, another filter was applied before getting the final list of articles, a filter that is related to the quality of the content on those articles. Therefore, with the help of Scimago (<https://www.scimagojr.com/>), only articles from journals with Q1 or Q2 ranks were chosen.

A small glitch must be taken in consideration. Despite being ethic to reference primarily cited authors it was impossible to do it so, due to the lack of time to accomplish this study. This also may put in consideration if the content is reliable, but as it was chosen only articles from Q1 and Q2 ranked journals supposedly its content must be reliable.

## 3.2 Data

In this subchapter it will be explained where the data comes from, its liabilities and how it was analysed.

### 3.2.1 Data Content

The data used for this study is entirely from ISCTE-IUL, as the students' evaluations grades are from a database previously created on another master's degree dissertation (Gonzaga, 2019) and the inquiries of the teachers' evaluation were acquired directly from an ISCTE-IUL source. Must be acknowledged that the inquiries were always performed in the middle of the semester.

All the data was previously anonymised in order to preserve students' and teachers' identities. Despite the identity preservation being the focus, it also causes some constraints as it is not possible to cross references throughout the study.

### 3.2.2 Data Analysis

Concerning the data organisation, data processing, data filter, exclusion of incongruent values and even some data analysis, it was used the Microsoft Excel, a well-recognised Microsoft tool worldwide.

Regarding the data analysis, it was also used the SPSS software, a statistical analysis software with worldwide recognition.

Despite the whole process there are some thoughts that must be taken in consideration as no matter how much reliable the data is considered there are always some implications on the data that may or may not be visible on the results found.

Some factors that may have effect on the found results, although not specific for this study alone, are:

- The use of repeater students, as they may have some premade opinion on the teacher;
- The lack of honesty when the students are answering the inquiries;
- Inquiries performed before the semester's exams period;
- Data being analysed as a class and not individually due to the anonymity of the teacher's performance inquiries.

This doesn't mean that the results are not accurate, however these factors can inflate the error associated with the results.



### 3.3 Study Hypotheses

In order to have a preview of the next chapter, and to better acknowledge the study hypotheses in this dissertation, they are going to be broken down here:

1. Students' grades are affected by the Students Satisfaction with the Teacher
2. Satisfaction with the Teacher stimulate Students' Commitment
3. The Students Satisfaction with the Teacher can influence the Curricular Unit Satisfaction
4. The Students Satisfaction with the Teacher implies a higher Students Fail Rate
5. Students' Commitment depends on the Curricular Unit Satisfaction
6. Students Grades are related to the Students Commitment
7. Students' Grades are influenced by the Students Fail Rate
8. Students' Grades are influenced by the Curricular Unit Satisfaction

These hypotheses are connected in a wider perspective and can be observed on Figure 1. This figure displays the variables inside the boxes, being the independent variable on the arrow start point and the dependent variable on the arrow end point.

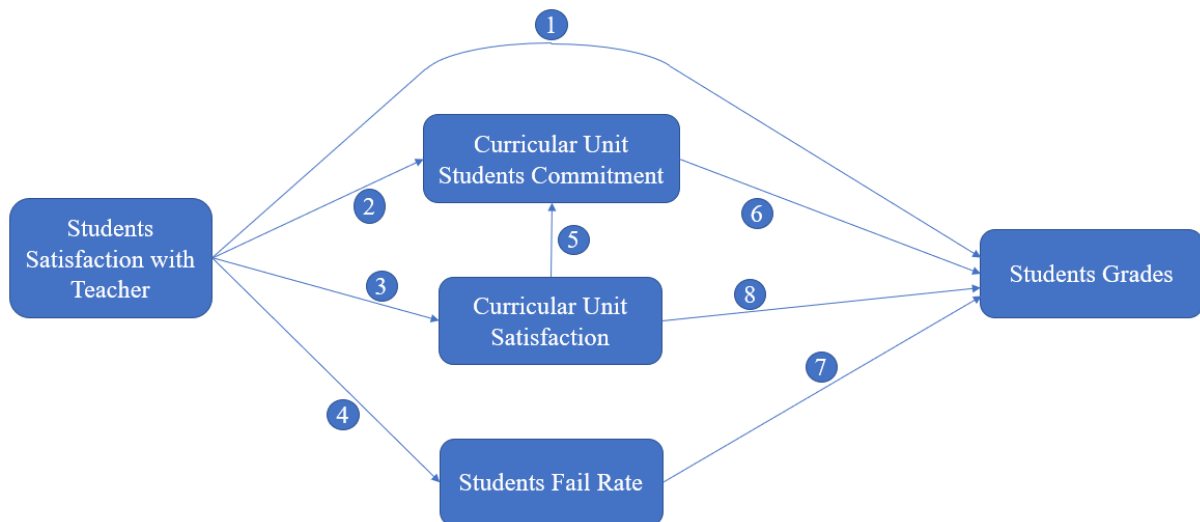


Figure 1 - Conceptual Model

The hypotheses will be tested with the available data, which will also be explained on the next chapter, as well as the variables of study.

However, to better understand the following chapter, the operational hypotheses regarding the study hypotheses, respectively, must be described first:

1. Students' Grades depend on Students' Satisfaction with Teacher  
Dependent Variable: Students' Grades  
Independent Variable: Students' Satisfaction with Teacher
2. Students' level of Commitment depends on Students' Satisfaction with Teacher  
Dependent Variable: Curricular Unit Students' Commitment  
Independent Variable: Students' Satisfaction with Teacher
3. Curricular Unit Satisfaction depends on Students' Satisfaction with Teachers  
Dependent Variable: Curricular Unit Satisfaction  
Independent Variable: Students' Satisfaction with Teacher
4. Lower Students' Fail Rate are related to higher levels of Students' Satisfaction with Teachers  
Dependent Variable: Students' Fail Rate  
Independent Variable: Students' Satisfaction with Teacher
5. Students' level of Commitment depends on Curricular Unit Satisfaction  
Dependent Variable: Curricular Unit Students' Commitment  
Independent Variable: Curricular Unit Satisfaction
6. Higher Students' grades are related to higher levels of Students' Commitment  
Dependent Variable: Students' Grades  
Independent Variable: Curricular Unit Students' Commitment
7. Lower Students' grades are related to higher Students' Fail Rate  
Dependent Variable: Students' Grades  
Independent Variable: Students' Fail Rate
8. Students' grades depend on Curricular Unit Satisfaction  
Dependent Variable: Students' Grades  
Independent Variable: Curricular Unit Satisfaction

## Chapter 4 – Data Analysis and Discussion

### 4.1 Data Collection

The data in study is referent to 15 out of 16 bachelor's degrees course ISCTE-IUL (since only data from those 15 degrees were available, therefore excluding Architecture), with an academic year interval between 2015/2016 and 2017/2018 since the available data only covered these specific academic years. In Table 2, it will be better specified the University and the courses in study:

*Table 2 - University and Courses*

ISCTE-IUL Schools	<ul style="list-style-type: none"> <li>• ISTA – School of Technology and Architecture</li> <li>• IBS – ISCTE Business School</li> <li>• ESPP – School of Sociology and Public Policy</li> <li>• ECSH – School of Social Sciences</li> </ul>
ISTA Degrees	<ul style="list-style-type: none"> <li>• Computer Science and Business Management</li> <li>• Computer Engineering</li> <li>• Telecommunications and Computer Engineering</li> </ul>
IBS Degrees	<ul style="list-style-type: none"> <li>• Economics</li> <li>• Finance and Accounting</li> <li>• Management</li> <li>• Marketing Management</li> <li>• Human Resources Management</li> <li>• Industrial Management and Logistics</li> </ul>
ESPP Degrees	<ul style="list-style-type: none"> <li>• Political Science</li> <li>• Social Work</li> <li>• Sociology</li> <li>• Modern and Contemporary History</li> </ul>
ECSH Degrees	<ul style="list-style-type: none"> <li>• Psychology</li> <li>• Anthropology</li> </ul>

Across these degrees, a total result of 1242 Curricular Unit entries were used. Despite having an initial number of 3399 entries, were only considered classes with at least 15 students, for the sample to have minimal relevance.

In these entries there is a total of 413 different curricular units (Annex ), throughout the 6 semesters. Having in consideration that the study will also compare samples from different scientific areas, each curricular unit must also be linked to a scientific area, from a total of 35 scientific areas designations (Table 3).

Table 3 - Scientific Areas

<b>Acronym</b>	<b>Scientific Area</b>	<b>Entries</b>
<b>PS</b>	Political Science	41
<b>SDA</b>	Statistics and Data Analysis	54
<b>SRM</b>	Social Research Methods	15
<b>NEL</b>	Non-Enterprise Law	3
<b>Econ</b>	Economics	95
<b>Hist</b>	History	76
<b>PP</b>	Public Policy	21
<b>SW</b>	Social Work	35
<b>Soc</b>	Sociology	89
<b>L</b>	Law	7
<b>Dem</b>	Demography	5
<b>Psy</b>	Psychology	94
<b>Ant</b>	Anthropology	86
<b>Geo</b>	Geography	3
<b>Mkt</b>	Marketing	57
<b>HR</b>	Human Resources	58
<b>TPO</b>	Technology, Production and Operations	51
<b>OR</b>	Operational Research	9
<b>Mat</b>	Mathematics	30
<b>ApI</b>	Applied Informatics	9
<b>Acco</b>	Accounting	51
<b>M</b>	Management	27
<b>Fin</b>	Finance	52

<b>EL</b>	Enterprise Law	15
<b>Ecot</b>	Econometrics	6
<b>CAOS</b>	Computer Architecture and Operating Systems	9
<b>PST</b>	Programming Sciences and Technology	29
<b>PE</b>	Physics and Electromagnetism	12
<b>IS</b>	Information Systems	24
<b>Tele</b>	Telecommunications	22
<b>DNSE</b>	Digital Networks and Service Engineering	14
<b>MVCG</b>	Multimedia, Vision and Computer Graphics	7
<b>AI</b>	Artificial Intelligence	6
<b>Ele</b>	Electronics	9
<b>TS</b>	Transversal Skills	121

These Scientific Areas were defined by other entities and accredited by A3ES (<https://www.a3es.pt/>) an agency of higher education evaluation and accreditation.

Despite the initial definition of the Scientific Areas, some of those had to be grouped, due to a scarce number of entries. The grouping was performed with the support of my thesis advisors and their knowledge, based on content similarity between the primary Scientific Areas.

*Table 4 - Grouped Scientific Areas*

<b>Acronym</b>	<b>Scientific Area Group</b>	<b>Scientific Areas</b>	<b>Entries</b>
<b>L/EL</b>	Law/Enterprise Law	<ul style="list-style-type: none"> <li>• Enterprise Law</li> <li>• Law</li> <li>• Non-Enterprise Law</li> </ul>	25
<b>SDA/Ecot</b>	Statistics, Data Analysis and Econometrics	<ul style="list-style-type: none"> <li>• Statistics and Data Analysis</li> <li>• Econometrics</li> </ul>	60
<b>CP</b>	Computing	<ul style="list-style-type: none"> <li>• Programming Sciences and Technologies</li> <li>• Information Systems</li> <li>• Artificial Intelligence</li> <li>• Multimedia, Vision and Computer Graphics</li> </ul>	75

		<ul style="list-style-type: none"> <li>• Applied Informatics</li> </ul>	
<b>Mat/OR</b>	Mathematics and Operational Research	<ul style="list-style-type: none"> <li>• Mathematics</li> <li>• Operational Research</li> </ul>	39
<b>DNSE/CAOS</b>	Computer Infrastructure	<ul style="list-style-type: none"> <li>• Digital Networks and Services Engineering</li> <li>• Computer Architecture and Operating Systems</li> </ul>	23
<b>Tele</b>	Telecommunications	<ul style="list-style-type: none"> <li>• Electronics</li> <li>• Physics and Electromagnetism</li> <li>• Telecommunications</li> </ul>	43
<b>Dem/SRM</b>	Demography and Social Research Methods	<ul style="list-style-type: none"> <li>• Geography</li> <li>• Social Research Methods</li> <li>• Demography</li> </ul>	23
<b>PS/PP</b>	Public Policy and Political Science	<ul style="list-style-type: none"> <li>• Public Policy</li> <li>• Political Science</li> </ul>	62

Regarding the variables existing on the database, the most relevant for this study in are:

- Students Grades – It's a weighted arithmetic mean of approved students' grades, because multiple courses have the same curricular unit (10 to 20 scale). It's weighted according to the number of students on each course;
- Students Fail Rate – It's the percentage of students that were enrolled on the curricular unit, but were not approved (0 to 1 scale);
- Curricular Unit Satisfaction – It's the mean of satisfaction that students have regarding the curricular unit (1 to 10 scale);
- Curricular Unit Student Commitment – It's the mean of how students rate their commitment to a certain curricular unit (1 to 10 scale);
- Students Satisfaction with Teacher – It's the mean of satisfaction that students have regarding their teacher, or teachers, performance (1 to 10 scale);

These variables were chosen for having the relevance necessary for the study and displaying a preestablished scale, allowing a numerical treatment.

## 4.2 Data Characteristics

In order to better the data the thesis is based on, some data characteristics will be shown in this sub-chapter.

On a primary perspective, an overall view of the main variables can give a sense on what is to come. The following table (Table 5) shows the average values for the most relevant variables, of the three academic years of study, from 2015 to 2018.

*Table 5 - Overall View – Variables Average Values and/or Percentage*

Variable	Average
<b>Students Grades</b>	14.06
<b>Students Fail Rate</b>	21.85%
<b>CU Satisfaction</b>	7.08
<b>CU Student Commitment</b>	7.01
<b>Teacher Satisfaction</b>	7.65

For a more detailed view, the following table (Table 6) displays the average values for the same variables but for each semester of each academic year.

*Table 6 - Overall View per Academic Year and Semester – Variables Average Values and/or Percentage*

Variable	2015/2016		2016/2017		2017/2018	
	1 <sup>st</sup> SEM	2 <sup>nd</sup> SEM	1 <sup>st</sup> SEM	2 <sup>nd</sup> SEM	1 <sup>st</sup> SEM	2 <sup>nd</sup> SEM
<b>Students Grades</b>	13.85	14.10	13.87	14.18	14.10	14.24
<b>Students Fail Rate</b>	21.41%	25.65%	19.70%	22.89%	19.73%	21.52%
<b>CU Satisfaction</b>	7.25	7.09	7.08	7.01	7.03	7.01
<b>CU Student Commitment</b>	7.16	7.00	6.96	6.96	6.96	7.00
<b>Satisfaction with Teacher</b>	7.82	7.66	7.67	7.57	7.59	7.57

Some details can be seen, for example the grades being higher on every 2<sup>nd</sup> semester as well as the students' fail rate, opposing to the teacher satisfaction rating which is always lower. Despite not being a significant difference, it's a detail that may be relevant.

For statistical purposes, Table 7 presents the number of teachers *per* Curricular Unit:

Table 7 - Overall View - Teacher per Curricular Unit

Number of Teachers per Curricular Unit	1	2	3	4	5+
Number of Curricular Units	770	245	92	52	83

As this study is not only on an overall basis, a better look at the variables average values and/or percentage for each Scientific Area was taken (Table 8).

Table 8 - Overall View - Scientific Areas - Variables Average Values and/or Percentage

Scientific Areas	Students Fail Rate	Students Grades	CU Satisfaction	CU Commitment	Satisfaction with Teacher
<b>Acco</b>	27.48%	13.33	7.14	6.94	7.76
<b>Ant</b>	26.20%	14.04	7.47	7.06	8.01
<b>CP</b>	37.95%	13.97	6.72	6.84	7.32
<b>Dem/SRM</b>	21.81%	13.90	6.91	7.23	7.63
<b>DNSE/CAOS</b>	38.73%	<b>13.00</b>	6.99	6.83	7.53
<b>Econ</b>	24.83%	13.95	7.05	6.85	7.52
<b>Fin</b>	23.14%	14.05	7.41	7.17	7.94
<b>Hist</b>	18.74%	14.07	7.22	7.06	7.65
<b>HR</b>	15.29%	14.48	7.06	7.32	7.79
<b>L/EL</b>	15.35%	13.58	<b>6.38</b>	6.43	<b>6.78</b>
<b>M</b>	18.61%	14.52	7.21	7.45	7.64
<b>Mat/OR</b>	35.58%	13.14	6.59	<b>6.40</b>	6.93
<b>Mkt</b>	18.94%	14.47	7.05	7.30	7.58
<b>PP/PS</b>	14.98%	14.44	7.05	7.03	7.47
<b>Psy</b>	20.23%	14.07	7.19	6.85	7.74
<b>SDA/Scot</b>	31.96%	13.59	6.72	6.65	7.60
<b>Soc</b>	27.32%	14.00	7.27	7.16	7.81
<b>SW</b>	<b>8.73%</b>	14.76	<b>7.67</b>	<b>7.65</b>	<b>8.06</b>
<b>Tele</b>	<b>41.12%</b>	13.43	6.85	6.62	7.64
<b>TPO</b>	14.49%	13.81	6.86	6.86	7.00
<b>TS</b>	22.56%	<b>14.83</b>	7.05	7.17	7.97

As it can be a bit confusing to have a clear view of the above information, the combination between Table 8 and Table 9 can lead to a better understanding, as Table 9 is an ordered scale of the above values, showing the scientific areas with the highest values on the first row and the ones with the lowest values on the last row.



Table 9 - Overall View - Scientific Areas - Variables Scale

\	Taxa de Reprovação de Alunos	Notas dos Alunos	Satisfação dos Alunos com a UC	Comprometi-mento dos Alunos com a UC	Satisfação dos Alunos com o Professor
<b>Mais Elevado</b>	Tele (41.12%)	TS (14.83)	SW (7.67)	SW (7.65)	SW (8.06)
	DNSE/CAOS	SW	Ant	M	Ant
	CP	M	Fin	HR	TS
	Mat/OR	HR	Soc	Mkt	Fin
	SDA/Ecot	Mkt	Hist	Dem/SRM	Soc
	Acco	PP/PS	M	TS	HR
	Soc	Hist	Psy	Fin	Acco
	Ant	Psy	Acco	Soc	Psy
	Econ	Fin	HR	Hist	Hist
	Fin	Ant	Econ	Ant	Tele
	TS	Soc	PP/PS	PP/PS	M
	Dem/SRM	CP	TS	Acco	Dem/SRM
	Psy	Econ	Mkt	TPO	SDA/Ecot
	Mkt	Dem/SRM	DNSE/CAOS	Psy	Mkt
	Hist	TPO	Dem/SRM	Econ	DNSE/CAOS
	M	SDA/Ecot	TPO	CP	Econ
	<b>Mais Baixo</b>	L/EL	L/EL	Tele	DNSE/CAOS
HR		Tele	CP	SDA/Ecot	CP
PP/PS		Acco	SDA/Ecot	Tele	TPO
TPO		Mat/OR	Mat/OR	L/EL	Mat/OR
SW (8.73%)		DNSE/CAOS (13.00)	L/EL (6.38)	Mat/OR (6.40)	L/EL (6.78)

Having a closer look on the previous table, it's possible to see a scientific area such as Social Work (SW) has the lowest Fail Rate, the highest Curricular Unit Satisfaction, Curricular Unit Commitment and Teacher Satisfaction rating, and the second highest average Grades from all the scientific areas. For this reason, it will be the one used as a comparative variable in the following chapter (Data Analysis), on the multiple regressions using dummy variables.

One similar but on an inverted perspective is Mat/OR. It has the 4<sup>th</sup> highest fail rate, the second lowest average Grades, Curricular Unit Satisfaction and Teacher Satisfaction rating, and the lowest Curricular Unit Commitment.

### 4.3 Data Analysis

In order to better understand the following subchapters a small introduction to more technical terms may behold some relevance.

The methods used to analyse the data are simple linear regressions and multiple linear regressions using dummy variables. Moreover, the simple linear regressions will also be applied to each scientific area, meaning one model per scientific area.

Concerning the coefficients,  $R^2$ , or coefficient of determination, represents, in a regression model, the amount of the variance explained by the independent variable or variables regarding the dependent variable (correlation). The *Adjusted  $R^2$*  is the same as the  $R^2$ , except it takes in account the number of independent variables on a certain model. Therefore, in a model with 2 or more independent variables, the *Adjusted  $R^2$*  is the most adequate coefficient to consider.

The simple linear regression model is

$$Y_i = \beta_0 + \beta_1 * X_i + \varepsilon_i \quad , \text{where } i = 1, 2, \dots, n.$$

With the adjusted model being

$$\hat{Y}_i = B_0 + B_1 * X_i \quad , \text{where } i = 1, 2, \dots, n.$$

The variable defined as  $B_0$  refers to the constant and  $B_1$  to the regression straight slope.  $Y$  represents the dependent (or explained) variable and  $X$  the independent (or explanatory) variable. The values of  $\beta_0$  and  $\beta_1$  are estimated by  $B_0$  and  $B_1$ , through the OLS method. Subsequently,  $\hat{Y}_i$  is the predicted value for  $Y_i$ , given  $X_i$ . Thus, the difference  $e_i = Y_i - \hat{Y}_i$  is the residual or error term.

Regarding each statistical test there are two possibilities, either failing to reject the null hypothesis or rejecting the null hypothesis. If the null hypothesis is rejected it means that the independent variable or variables explain some percentage of variance of the dependent variable. In this study, all the decisions were taken at the 5% statistical level. This means a p-value less or equal than 0.05 is statistically significant and for that test the null hypothesis is rejected.

### 4.3.1. Relationship of Satisfaction with Teachers on Students' Grades

Perhaps one of the most debated questions on the educational world is whether a teacher performance, which is the student satisfaction perception, has influence, or not, on a student's grades. It should be acknowledged that the student-teacher relationship is being measured as the student satisfaction with the teacher's performance, despite not being synonyms. Other indicators were impossible to attain for the matter.

As it can be observed from looking at Figure 2, the satisfaction with the teacher's performance has a significant effect ( $F(1,1240) = 68.2, p < 0.001, R^2 = 0.052$ ) on the students' grades – which is expectable given the complex nature of the phenomenon in study - about 5.2% of the Curricular Unit Students Grades variance is explained by the Students' Satisfaction with the Teacher. For every unit increase in satisfaction with teacher an average increase of 0.29 on the students' grades is expected. Not considering the satisfaction with teacher, the average student grade is 11.9.

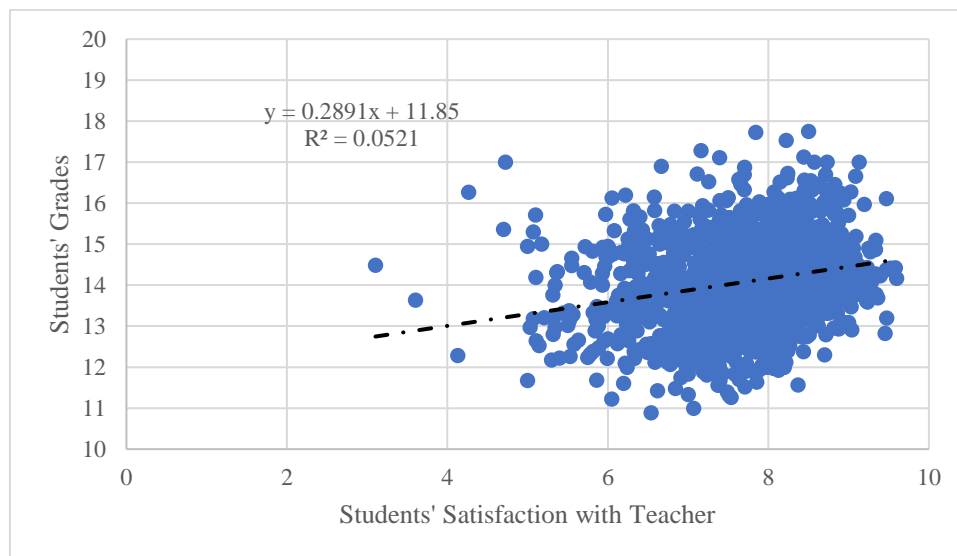


Figure 2 - Overall View - Students' Satisfaction with Teacher on Students' Grades

### Effect of Scientific Areas

Adding the Scientific Areas as dummy variables (except for SW, which is the reference area) increased the explained variance in students' grades from 0.052 to 0.175 (*Adjusted R<sup>2</sup>*), meaning scientific areas have an additional 12.4% significant effect in students' grades. Looking at Table 10, for the same level of teacher satisfaction an area such as, for example, DNSE/CAOS has students' grades 1.680 lower than the reference area (SW). Also, it allowed us to understand that in 5 out of 21 areas students' grades aren't significantly different from SW (highlighted in yellow), showing a p-value higher than 0.05.

Table 10 – Students' Satisfaction with Teacher on Students' Grades - Scientific Areas as Dummy Variables

	B	Std. Error	P-Value
<b>(Constant)</b>	12.855	0.328	0.000
<b>Teacher_Satisfaction</b>	0.236	0.035	0.000
<b>Acco</b>	-1.360	0.226	0.000
<b>Ant</b>	-0.707	0.206	0.001
<b>CP</b>	-0.613	0.212	0.004
<b>Dem/SRM</b>	-0.841	0.276	0.002
<b>DNSE/CAOS</b>	-1.680	0.277	0.000
<b>Econ</b>	-0.679	0.204	0.001
<b>Fin</b>	-0.684	0.225	0.002
<b>Hist</b>	-0.592	0.211	0.005
<b>HR</b>	-0.217	0.220	0.325
<b>L/EL</b>	-0.725	0.272	0.008
<b>M</b>	-0.140	0.264	0.597
<b>Mat/OR</b>	-1.306	0.243	0.000
<b>Mkt</b>	-0.168	0.222	0.448
<b>PP/PS</b>	-0.151	0.218	0.489
<b>Psy</b>	-0.615	0.204	0.003
<b>SDA/Ecot</b>	-1.032	0.219	0.000
<b>Soc</b>	-0.699	0.205	0.001
<b>Tele</b>	-1.259	0.235	0.000
<b>TPO</b>	-0.697	0.229	0.002
<b>TS</b>	0.100	0.198	0.614

**Effect of satisfaction with the teacher on students’ grades, by Scientific Areas**

Analysing the relationship between the satisfaction with the teacher and the students’ grades, by scientific area, allow us to understand that in some areas (Table 12) there is no significant relationship between those two variables. However, in 9 out of 21 areas a significant relationship was found. Moreover, in all those 9 areas except for TS the explained variance of the satisfaction with the teacher on students’ grades is higher than the one found in the overall analysis (Table 11).

*Table 11 - Scientific Area – Students’ Satisfaction with Teacher on Students’ Grades*

Scientific Area	R Square	P-Value	$B_0$	$B_1$
<b>DNSE/CAOS</b>	0.378	0.002	2.832	1.346
<b>Dem/SRM</b>	0.365	0.002	8.444	0.700
<b>Tele</b>	0.195	0.003	6.878	0.855
<b>L/EL</b>	0.192	0.029	10.453	0.475
<b>Acco</b>	0.175	0.002	8.132	0.669
<b>Mat/OR</b>	0.126	0.027	11.392	0.259
<b>Fin</b>	0.111	0.016	8.983	0.637
<b>CP</b>	0.101	0.005	9.979	0.548
<b>TS</b>	0.051	0.013	12.691	0.269

The remaining Scientific Areas models show a p-value higher than 0.05, failing to reject the null hypothesis, meaning that there is no significant influence on the students’ grades regarding the satisfaction with the teacher (full results on Appendix A).

*Table 12- Scientific Area – Students’ Satisfaction with Teacher on Students’ Grades – Failing to reject the Null Hypothesis*

▪ Ant	▪ Econ	▪ Hist
▪ HR	▪ M	▪ Mkt
▪ PP/PS	▪ Psy	▪ SDA/Scot
▪ Soc	▪ SW	▪ TPO

### 4.3.2. Relationship of Satisfaction with Teachers on Students' Commitment

Several factors can have an influence on a student's commitment one of which may be their teacher's performance.

Looking at Figure 3, the satisfaction with the teacher's performance has a significant effect ( $F(1,1240) = 646.2, p < 0.001, R^2 = 0.343$ ) on the students' commitment – about 34.3% of the Students' Commitment variance is explained by the Students' Satisfaction with the Teacher. For every unit increase in the satisfaction with the teacher an average increase of 0.39 in the students' commitment is expected.

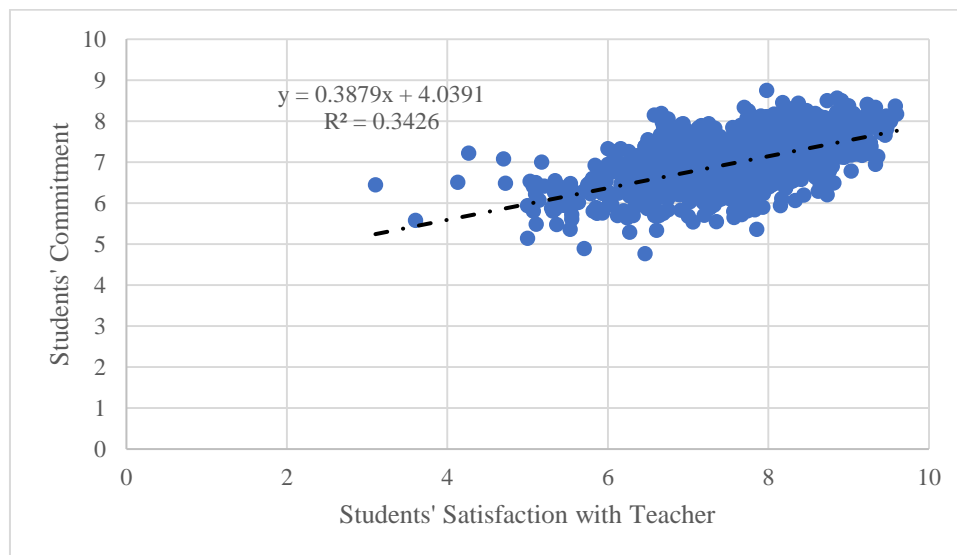


Figure 3 - Overall View - Students' Satisfaction with Teacher on Students' Commitment

### Effect of Scientific Areas

Adding the Scientific Areas as dummy variables (except for SW, which is the reference area) increased the explained variance in the students' commitment from 0.343 to 0.449 (*Adjusted R<sup>2</sup>*), meaning scientific areas have an additional 10.6% significant effect in students' commitment. Looking at Table 13, for the same level of teacher satisfaction an area such as, for example, Acco has students' commitment 0.601 lower than the reference area (SW). Moreover, only in 2 out of 21 areas students' commitment isn't significantly different from SW, showing a p-value higher than 0.05.

Table 13 - Students' Satisfaction with Teacher on Students' Commitment - Scientific Areas as Dummy Variables

	B	Std. Error	Beta	P-Value
<b>(Constant)</b>	4.683	0.140		0.000
<b>Teacher_Satisfaction</b>	0.369	0.015	0.556	0.000
<b>Acco</b>	-0.601	0.097	-0.201	0.000
<b>Ant</b>	-0.579	0.088	-0.248	0.000
<b>CP</b>	-0.527	0.091	-0.212	0.000
<b>Dem/SRM</b>	-0.278	0.118	-0.063	0.019
<b>DNSE/CAOS</b>	-0.643	0.118	-0.146	0.000
<b>Econ</b>	-0.604	0.087	-0.271	0.000
<b>Fin</b>	-0.442	0.096	-0.149	0.000
<b>Hist</b>	-0.440	0.090	-0.178	0.000
<b>HR</b>	-0.233	0.094	-0.083	0.014
<b>L/EL</b>	-0.702	0.116	-0.166	0.000
<b>M</b>	-0.050	0.113	-0.012	0.659
<b>Mat/OR</b>	-0.804	0.104	-0.237	0.000
<b>Mkt</b>	-0.179	0.095	-0.063	0.060
<b>PP/PS</b>	-0.417	0.093	-0.153	0.000
<b>Psy</b>	-0.686	0.087	-0.306	0.000
<b>SDA/Ecot</b>	-0.814	0.094	-0.295	0.000
<b>Soc</b>	-0.402	0.088	-0.175	0.000
<b>Tele</b>	-0.890	0.100	-0.274	0.000
<b>TPO</b>	-0.406	0.098	-0.136	0.000
<b>TS</b>	-0.449	0.084	-0.225	0.000

### Effect of satisfaction with the teacher on students' commitment, by Scientific Areas

The relationship between the satisfaction with the teacher and the students' commitment, by scientific area, shows a significant relationship between both variables amongst all the 21 scientific areas with a wide range of explained variance, going from 11.8% (SDA/Scot) to 66.2% (L/EL) (Table 14).

Table 14- Scientific Area – Students' Satisfaction with Teacher on Students' Commitment

Scientific Area	R Square	P-Value	$B_0$	$B_1$
<b>L/EL</b>	0.662	< 0.001	2.646	0.559
<b>Acco</b>	0.644	< 0.001	2.914	0.519
<b>TPO</b>	0.563	< 0.001	3.789	0.438
<b>Ant</b>	0.536	< 0.001	2.445	0.576
<b>DNSE/CAOS</b>	0.526	< 0.001	2.207	0.613
<b>Psy</b>	0.505	< 0.001	3.248	0.465
<b>Hist</b>	0.394	< 0.001	4.458	0.340
<b>Dem/SRM</b>	0.385	0.002	4.918	0.302
<b>Tele</b>	0.384	< 0.001	2.929	0.482
<b>Mat/OR</b>	0.377	< 0.001	4.437	0.288
<b>M</b>	0.376	0.001	4.803	0.346
<b>PP/PS</b>	0.347	< 0.001	4.263	0.559
<b>TS</b>	0.310	< 0.001	4.263	0.369
<b>Fin</b>	0.294	< 0.001	4.245	0.367
<b>Econ</b>	0.278	< 0.001	4.269	0.365
<b>Mkt</b>	0.269	< 0.001	4.837	0.268
<b>HR</b>	0.185	0.001	5.638	0.219
<b>SW</b>	0.150	0.021	4.835	0.319
<b>Soc</b>	0.150	< 0.001	5.498	0.267
<b>CP</b>	0.131	0.001	4.691	0.316
<b>SDA/Scot</b>	0.118	0.007	4.880	0.269

(full results on Appendix A)



### 4.3.3. Relationship of Satisfaction with Teachers on Curricular Unit Satisfaction

Despite Curricular Units having specific subjects it's important to understand how much a teacher can make an influence on its image.

By the observation of Figure 4, it is noticeable that the satisfaction with the teacher's performance has a significant effect ( $F(1,1240) = 2473.0, p < 0.001, R^2 = 0.666$ ) on the curricular unit satisfaction – about 66.6% of the Students' Curricular Unit Satisfaction variance is explained by the Students' Satisfaction with the Teacher. For every unit increase in satisfaction with teacher an average increase of 0.74 in the curricular unit satisfaction is expected.

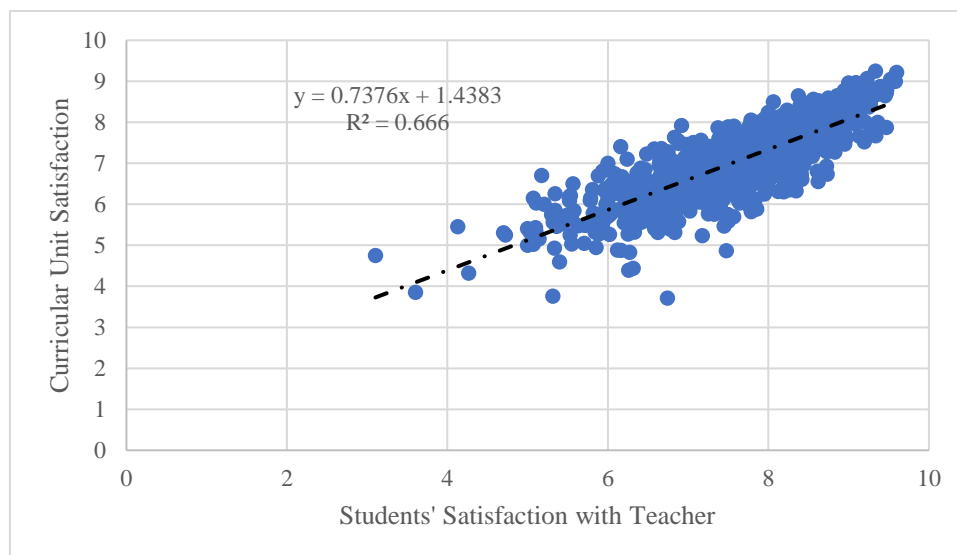


Figure 4 - Overall View - Students' Satisfaction with Teacher on Curricular Unit Satisfaction

### Effect of Scientific Areas

Despite being the one with the lowest increase, adding the Scientific Areas as dummy variables increased the explained variance in the curricular unit satisfaction from 0.666 to 0.699 (*Adjusted R<sup>2</sup>*), meaning scientific areas have an additional 3.3% significant effect in curricular unit satisfaction. Looking at Table 15, for the same level of teacher satisfaction an area such as, for example, Tele has curricular unit satisfaction 0.509 lower than the reference area (SW). Also, in 7 out of 21 areas curricular unit satisfaction isn't significantly different from SW, showing a p-value higher than 0.05.

Table 15 - Students' Satisfaction with Teacher on Curricular Unit Satisfaction - Scientific Areas as Dummy Variables

	B	Std. Error	P-Value
<b>(Constant)</b>	1.646	0.142	0.000
<b>Teacher_Satisfaction</b>	0.748	0.015	0.000
<b>Acco</b>	-0.303	0.097	0.002
<b>Ant</b>	-0.164	0.089	0.065
<b>CP</b>	-0.406	0.092	0.000
<b>Dem/SRM</b>	-0.471	0.119	0.000
<b>DNSE/CAOS</b>	-0.308	0.119	0.010
<b>Econ</b>	-0.213	0.088	0.016
<b>Fin</b>	-0.173	0.097	0.075
<b>Hist</b>	-0.146	0.091	0.108
<b>HR</b>	-0.415	0.095	0.000
<b>L/EL</b>	-0.281	0.117	0.017
<b>M</b>	-0.149	0.114	0.191
<b>Mat/OR</b>	-0.202	0.105	0.054
<b>Mkt</b>	-0.266	0.095	0.005
<b>PP/PS</b>	-0.176	0.094	0.062
<b>Psy</b>	-0.248	0.088	0.005
<b>SDA/Ecot</b>	-0.573	0.095	0.000
<b>Soc</b>	-0.209	0.089	0.018
<b>Tele</b>	-0.509	0.101	0.000
<b>TPO</b>	-0.020	0.099	0.842
<b>TS</b>	-0.552	0.085	0.000

### Effect of satisfaction with the teacher on the curricular unit satisfaction, by Scientific Areas

The relationship between the satisfaction with the teacher and the curricular unit satisfaction, by scientific area, shows a significant relationship between both variables amongst all the 21 scientific areas with a wide range of explained variance, going from 54.0% (Mat/OR) to 84.4% (TPO) (Table 16).

Table 16 - Scientific Area - Students' Satisfaction with Teacher on Curricular Unit Satisfaction

Scientific Area	R Square	P-Value	$B_0$	$B_1$
<b>TPO</b>	0.844	< 0.001	1.528	0.762
<b>M</b>	0.834	< 0.001	0.810	0.838
<b>L/EL</b>	0.832	< 0.001	0.453	0.877
<b>Ant</b>	0.815	< 0.001	-0.173	0.954
<b>Mkt</b>	0.783	< 0.001	1.890	0.680
<b>Acco</b>	0.757	< 0.001	0.356	0.875
<b>Dem/SRM</b>	0.747	< 0.001	2.290	0.603
<b>SW</b>	0.698	< 0.001	1.139	0.811
<b>Hist</b>	0.669	< 0.001	1.999	0.682
<b>Psy</b>	0.648	< 0.001	0.684	0.840
<b>HR</b>	0.637	< 0.001	-0.017	0.908
<b>PP/PS</b>	0.635	< 0.001	1.712	0.715
<b>Soc</b>	0.633	< 0.001	1.314	0.763
<b>Fin</b>	0.633	< 0.001	2.950	0.562
<b>Econ</b>	0.630	< 0.001	1.958	0.678
<b>TS</b>	0.626	< 0.001	0.694	0.798
<b>Tele</b>	0.598	< 0.001	1.498	0.700
<b>DNSE/CAOS</b>	0.575	< 0.001	1.089	0.781
<b>SDA/Ecot</b>	0.565	< 0.001	1.644	0.673
<b>CP</b>	0.564	< 0.001	1.696	0.685
<b>Mat/OR</b>	0.540	< 0.001	3.765	0.411

(full results on Appendix A)

#### 4.3.4. Relationship of Satisfaction with Teachers on Students' Fail Rate

On a previous question a look was taken regarding the influence of a teacher on the students' grades, but does it have the same influence regarding the students fail rate? To clarify, the Students' Fail Rate was indicator used to define the Curricular Unit Difficulty.

On Figure 5, it can be seen that the satisfaction with the teacher's performance has a significant effect ( $F(1,1240) = 17.9, p < 0.001, R^2 = 0.014$ ) on the curricular unit difficulty – about 1.4% of the Students' Fail Rate variance is explained by the Students' Satisfaction with the Teacher. For every unit increase on satisfaction with teacher an average decrease of 0.02 in the students' fail rate is expected.

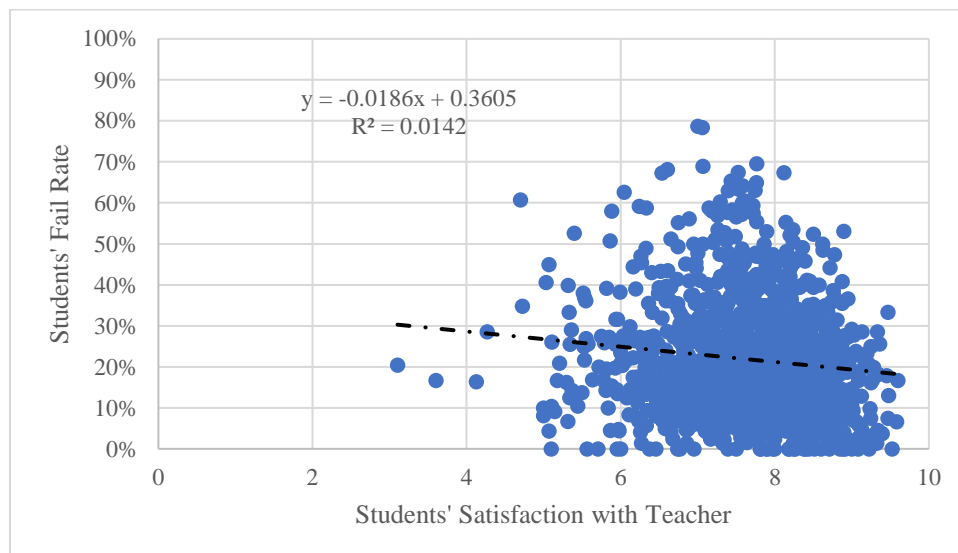


Figure 5 - Overall View - Students' Satisfaction with Teacher on Students' Fail Rate

### Effect of Scientific Areas

Despite that, by adding the Scientific Areas as dummy variables (except for SW, which is the reference area) the explained variance in curricular unit difficulty increased from 0.014 to 0.208 (*Adjusted R<sup>2</sup>*), meaning scientific areas have an additional 19.4% significant effect in curricular unit difficulty. Looking at Table 17, for the same level of teacher satisfaction an area such as, for example, Econ has students' fail rate 0.135 higher than the reference area (SW). Also, only in 3 out of 21 areas students' fail rate isn't significantly different from SW, showing a p-value higher than 0.05.

Table 17 – Students' Satisfaction with Teacher on Students' Fail Rate - Scientific Areas as Dummy Variables

	B	Std. Error	P-Value
<b>(Constant)</b>	0.225	0.040	0.000
<b>Teacher_Satisfaction</b>	-0.018	0.004	0.000
<b>Acco</b>	0.130	0.027	0.000
<b>Ant</b>	0.168	0.025	0.000
<b>CP</b>	0.177	0.026	0.000
<b>Dem/SRM</b>	0.101	0.033	0.002
<b>DNSE/CAOS</b>	0.280	0.033	0.000
<b>Econ</b>	0.135	0.025	0.000
<b>Fin</b>	0.135	0.027	0.000
<b>Hist</b>	0.093	0.025	0.000
<b>HR</b>	0.046	0.027	0.086
<b>L/EL</b>	0.048	0.033	0.142
<b>M</b>	0.090	0.032	0.005
<b>Mat/OR</b>	0.242	0.029	0.000
<b>Mkt</b>	0.120	0.027	0.000
<b>PP/PS</b>	0.062	0.026	0.018
<b>Psy</b>	0.098	0.025	0.000
<b>SDA/Ecot</b>	0.218	0.026	0.000
<b>Soc</b>	0.121	0.025	0.000
<b>Tele</b>	0.270	0.028	0.000
<b>TPO</b>	0.017	0.028	0.538
<b>TS</b>	0.141	0.024	0.000

**Effect of satisfaction with the teacher on the curricular unit difficulty, by Scientific Areas**

Analysing the relationship between the satisfaction with the teacher and the curricular unit difficulty, by scientific area, allow us to understand that in some areas (Table 19) there is no significant relationship between those two variables. However, in 5 out of 21 areas a significant relationship was found. Moreover, in all those 5 areas the explained variance of the satisfaction with the teacher on the curricular unit difficulty is higher than the one found in the overall analysis (Table 18).

*Table 18 - Scientific Area - Students' Satisfaction with Teacher on Students' Fail Rate*

Scientific Area	R Square	P-Value	$B_0$	$B_1$
<b>M</b>	0.388	0.001	0.911	-0.096
<b>Acco</b>	0.319	< 0.001	1.123	-0.117
<b>DNSE/CAOS</b>	0.243	0.017	1.305	-0.124
<b>TPO</b>	0.141	0.007	0.351	-0.033
<b>Econ</b>	0.049	0.032	0.468	-0.032

The remaining Scientific Areas models show a p-value higher than 0.05, failing to reject the null hypothesis, meaning that there is no significant influence on the curricular unit difficulty regarding the satisfaction with the teacher (full results on Appendix A).

*Table 19 - Scientific Area - Students' Satisfaction with Teacher on Students' Fail Rate - Failing to reject the Null Hypothesis*

▪ Ant	▪ CP	▪ Fin
▪ Hist	▪ HR	▪ L/EL
▪ Mat/OR	▪ Mkt	▪ PP/PS
▪ Psy	▪ SDA/Scot	▪ Soc
▪ SW	▪ Tele	▪ TS
▪ Dem/SRM		

### 4.3.5. Relationship of Curricular Unit Satisfaction on Students' Commitment

Having a certain Curricular Unit may trigger a student's interest depending on its content, but how much influence does it have in student's commitment?

By studying Figure 6, it can be said that the satisfaction with the curricular unit has a significant effect ( $F(1,1240) = 1405.3, p < 0.001, R^2 = 0.531$ ) on the students' commitment – about 53.1% of the Students' Commitment variance is explained by the Curricular Unit Satisfaction. For every unit increase in curricular unit satisfaction an average increase of 0.53 in students' commitment is expected.

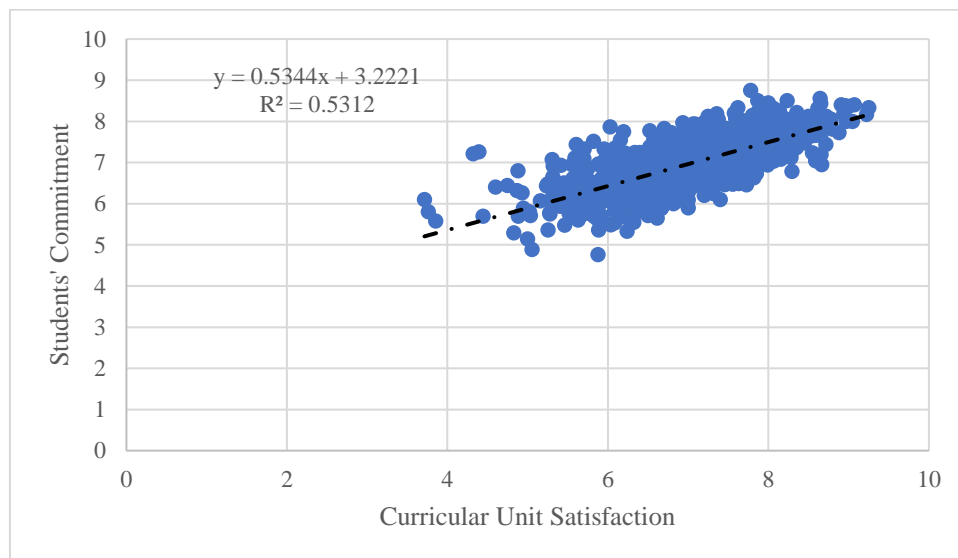


Figure 6 - Overall View - Curricular Unit Satisfaction on Students' Commitment

### Effect of Scientific Areas

The addition of the Scientific Areas as dummy variables (except for SW, which is the reference area) increased the explained variance on the students' commitment from 0.531 to 0.629 (*Adjusted R<sup>2</sup>*), meaning scientific areas have an additional 9.8% significant effect in students' commitment. Looking at Table 20, for the same level of curricular unit satisfaction an area such as, for example, Hist has students' commitment 0.357 lower than the reference area (SW). Also, only in 4 out of 21 areas students' commitment isn't significantly different from SW, showing a p-value higher than 0.05.

Table 20 - Curricular Unit Satisfaction on Students' Commitment - Scientific Areas as Dummy Variables

	B	Std. Error	P-Value
<b>(Constant)</b>	3.676	0.119	0.000
<b>UC_Satisfaction</b>	0.518	0.013	0.000
<b>Acco</b>	-0.438	0.080	0.000
<b>Ant</b>	-0.493	0.072	0.000
<b>CP</b>	-0.301	0.075	0.000
<b>Dem/SRM</b>	-0.027	0.097	0.784
<b>DNSE/CAOS</b>	-0.473	0.097	0.000
<b>Econ</b>	-0.484	0.072	0.000
<b>Fin</b>	-0.351	0.079	0.000
<b>Hist</b>	-0.357	0.074	0.000
<b>HR</b>	-0.013	0.078	0.872
<b>L/EL</b>	-0.536	0.096	0.000
<b>M</b>	0.035	0.093	0.704
<b>Mat/OR</b>	-0.678	0.085	0.000
<b>Mkt</b>	-0.032	0.078	0.686
<b>PP/PS</b>	-0.315	0.077	0.000
<b>Psy</b>	-0.552	0.072	0.000
<b>SDA/Ecot</b>	-0.509	0.078	0.000
<b>Soc</b>	-0.289	0.072	0.000
<b>Tele</b>	-0.618	0.083	0.000
<b>TPO</b>	-0.376	0.080	0.000
<b>TS</b>	-0.161	0.070	0.021



**Effect of the curricular unit satisfaction on students' commitment, by Scientific Areas**

The relationship between the curricular unit satisfaction and the students' commitment, by scientific area, shows a significant relationship between both variables amongst all the 21 scientific areas with a wide range of explained variance, going from 36.4% (SW) to 84.1% (L/EL) (Table 21).

*Table 21 - Scientific Area – Curricular Unit Satisfaction on Students' Commitment*

Scientific Area	R Square	P-Value	$B_0$	$B_1$
<b>L/EL</b>	0.841	< 0.001	2.241	0.654
<b>DNSE/CAOS</b>	0.739	< 0.001	1.904	0.705
<b>Acco</b>	0.714	< 0.001	3.058	0.544
<b>TPO</b>	0.707	< 0.001	2.795	0.592
<b>Ant</b>	0.678	< 0.001	2.484	0.612
<b>Psy</b>	0.672	< 0.001	3.152	0.515
<b>Tele</b>	0.666	< 0.001	1.814	0.701
<b>Mat/OR</b>	0.653	< 0.001	1.951	0.677
<b>Dem/SRM</b>	0.607	< 0.001	3.474	0.544
<b>Hist</b>	0.570	< 0.001	3.518	0.491
<b>TS</b>	0.549	< 0.001	3.753	0.485
<b>Fin</b>	0.540	< 0.001	1.972	0.701
<b>M</b>	0.539	< 0.001	4.188	0.452
<b>Soc</b>	0.532	< 0.001	2.641	0.621
<b>SDA/Ecot</b>	0.500	< 0.001	2.827	0.569
<b>CP</b>	0.467	< 0.001	3.122	0.556
<b>PP/PS</b>	0.440	< 0.001	3.754	0.463
<b>Econ</b>	0.424	< 0.001	4.114	0.388
<b>Mkt</b>	0.412	< 0.001	4.812	0.353
<b>HR</b>	0.378	< 0.001	4.489	0.402
<b>SW</b>	0.364	< 0.001	4.362	0.429

(full results on Appendix A)

### 4.3.6. Relationship of Students' Commitment on Students' Grades

Supposedly, the more commitment someone puts into something the better the results, but does that happen with grades?

Observing Figure 7, the students' commitment has a significant effect ( $F(1,1240) = 265.1, p < 0.001, R^2 = 0.176$ ) on the students' grades – 17.6% of the Curricular Unit Students' Grades variance is explained by the Students' Commitment. For every unit increase in students' commitment an average increase of 0.80 in students' grades is expected.

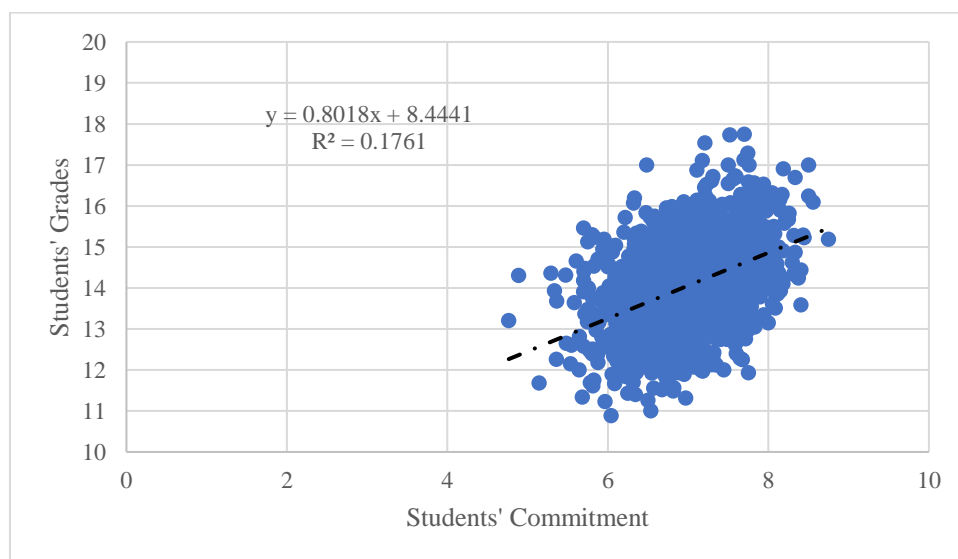


Figure 7 - Overall View - Students' Commitment on Students' Grades

### Effect of Scientific Areas

Led by adding the Scientific Areas as dummy variables (except for SW, which is the reference area), the explained variance in the students' grades increased from 0.176 to 0.251 (*Adjusted R<sup>2</sup>*), meaning scientific areas have an additional 7.5% significant effect in students' grades. Looking at Table 22, for the same level of students' commitment an area such as, for example, DNSE/CAOS has students' grades 1.229 lower than the reference area (SW). Moreover, in 8 out of 21 areas students' grades are significantly different from SW, showing a p-value not higher than 0.05.

Table 22 - Students' Commitment on Students' Grades - Scientific Areas as Dummy Variables

	B	Std. Error	P-Value
<b>(Constant)</b>	9.496	0.430	0.000
<b>UC_Commitment</b>	0.687	0.052	0.000
<b>Acco</b>	-0.942	0.218	0.000
<b>Ant</b>	-0.308	0.199	0.122
<b>CP</b>	-0.237	0.205	0.249
<b>Dem/SRM</b>	-0.644	0.264	0.015
<b>DNSE/CAOS</b>	-1.229	0.267	0.000
<b>Econ</b>	-0.254	0.198	0.200
<b>Fin</b>	-0.378	0.216	0.080
<b>Hist</b>	-0.283	0.203	0.163
<b>HR</b>	-0.052	0.211	0.804
<b>L/EL</b>	-0.225	0.263	0.392
<b>M</b>	-0.098	0.251	0.696
<b>Mat/OR</b>	-0.733	0.237	0.002
<b>Mkt</b>	-0.037	0.211	0.860
<b>PP/PS</b>	0.145	0.210	0.489
<b>Psy</b>	-0.138	0.199	0.487
<b>SDA/Ecot</b>	-0.466	0.215	0.030
<b>Soc</b>	-0.419	0.197	0.034
<b>Tele</b>	-0.641	0.230	0.005
<b>TPO</b>	-0.400	0.219	0.068
<b>TS</b>	0.409	0.190	0.031

**Effect of students’ commitment on students’ grades, by Scientific Areas**

Analysing the relationship between the students’ commitment and the students’ grades, by scientific area, allow us to understand that in some areas (Table 24) there is no significant relationship between those two variables. However, in 13 out of 21 areas a significant relationship was found. Moreover, in all those 13 areas except for SDA/Ecot, Mkt and Tele the explained variance of the students’ commitment on students’ grades is higher than the one found in the overall analysis (Table 23).

*Table 23 - Scientific Area - Students’ Commitment on Students’ Grades*

Scientific Area	R Square	P-Value	$B_0$	$B_1$
<b>CP</b>	0.527	< 0.001	2.436	1.686
<b>DNSE/CAOS</b>	0.490	< 0.001	0.583	1.815
<b>Mat/OR</b>	0.483	< 0.001	6.231	1.081
<b>Acco</b>	0.405	< 0.001	2.389	1.575
<b>Fin</b>	0.385	< 0.001	1.408	1.763
<b>Soc</b>	0.276	< 0.001	4.608	1.312
<b>Dem/SRM</b>	0.266	0.012	4.940	1.227
<b>TPO</b>	0.226	< 0.001	9.136	0.681
<b>Econ</b>	0.222	< 0.001	5.595	1.219
<b>HR</b>	0.195	0.001	10.166	0.589
<b>Tele</b>	0.163	0.007	6.747	1.007
<b>Mkt</b>	0.147	0.003	8.131	0.869
<b>SDA/Ecot</b>	0.112	0.009	9.742	0.581

The remaining Scientific Areas models show a p-value higher than 0.05, failing to reject the null hypothesis, meaning that there is no significant influence on the students’ grades regarding the students’ commitment (full results on Appendix A).

*Table 24 - Scientific Area – Students’ Commitment on Students’ Grades - Failing to reject the Null Hypothesis*

▪ Ant	▪ Hist	▪ L/EL
▪ M	▪ PP/PS	▪ Psy
▪ SW	▪ TS	

### 4.3.7. Relationship of Students' Fail Rate on Students' Grades

The expectations regarding a curricular unit difficulty usually implies that the higher the difficulty level the lower the grades, but does that truthfully happen?

Examining Figure 8, the curricular unit difficulty has a significant effect ( $F(1,1240) = 288.8, p < 0.001, R^2 = 0.189$ ) on the students' grades – about 18.9% of the Curricular Unit Students' Grades variance is explained by the Students' Fail Rate. The increase by 0.1 (10%) in the students' fail rate scale an average decrease of 0.353 in students' grades is expected.

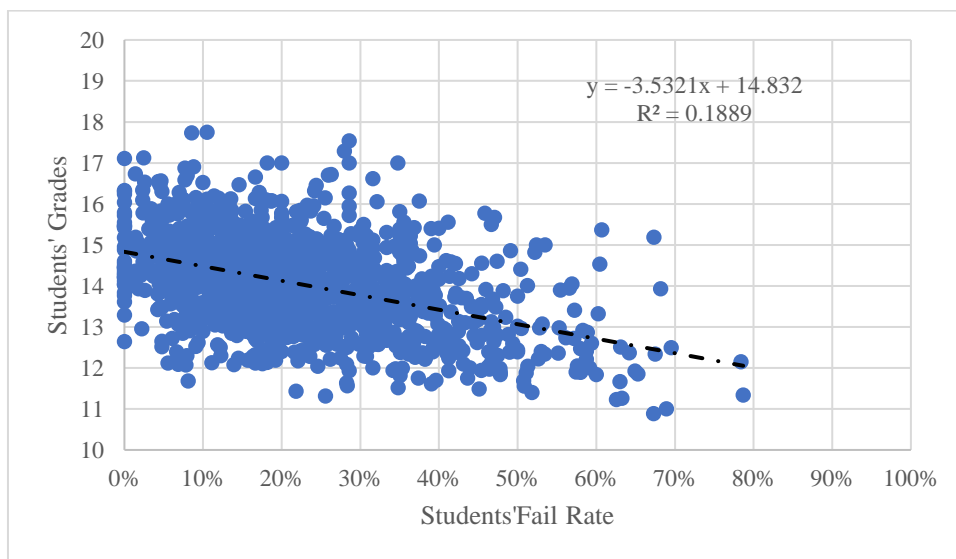


Figure 8 - Overall View - Students' Fail Rate on Students' Grades

### Effect of Scientific Areas

The addition of dummy variables, Scientific Areas, (except for SW, which is the reference area) increased the explained variance in students' grades from 0.189 to 0.284 (*Adjusted R<sup>2</sup>*), meaning scientific areas have an additional 9.5% significant effect in students' grades. Looking at Table 25, for the same level of students' fail rate an area such as, for example, Dem/SRM has students' grades 0.559 lower than the reference area (SW). Also, only in 7 out of 21 areas students' grades are significantly different from SW, showing a p-value not higher than 0.05.

Table 25 - Students' Fail Rate on Students' Grades - Scientific Areas as Dummy Variables

	B	Std. Error	P-Value
<b>(Constant)</b>	15.039	0.163	0.000
<b>Enrolled_Fail_Rate</b>	-3.406	0.220	0.000
<b>Acco</b>	-0.968	0.212	0.000
<b>Ant</b>	-0.143	0.196	0.465
<b>CP</b>	-0.150	0.201	0.455
<b>Dem/SRM</b>	-0.559	0.258	0.031
<b>DNSE/CAOS</b>	-0.823	0.265	0.002
<b>Econ</b>	-0.315	0.192	0.102
<b>Fin</b>	-0.245	0.212	0.248
<b>Hist</b>	-0.348	0.197	0.077
<b>HR</b>	-0.108	0.205	0.599
<b>L/EL</b>	-0.743	0.251	0.003
<b>M</b>	0.092	0.246	0.710
<b>Mat/OR</b>	-0.686	0.230	0.003
<b>Mkt</b>	0.155	0.208	0.454
<b>PP/PS</b>	-0.041	0.203	0.839
<b>Psy</b>	-0.338	0.191	0.077
<b>SDA/Ecot</b>	-0.364	0.210	0.083
<b>Soc</b>	-0.332	0.193	0.086
<b>Tele</b>	-0.417	0.226	0.066
<b>TPO</b>	-0.825	0.210	0.000
<b>TS</b>	0.565	0.187	0.003

**Effect of the curricular unit difficulty on students’ grades, by Scientific Areas**

Analysing the relationship between the curricular unit difficulty and the students’ grades, by scientific area, allow us to understand that in some areas (Table 27) there is no significant relationship between those two variables. However, in 14 out of 21 areas a significant relationship was found. Moreover, in all those 14 areas except for SDA/Ecot and Psy the explained variance of the curricular unit difficulty on students’ grades is higher than the one found in the overall analysis (Table 26).

*Table 26 - Scientific Area - Students’ Fail Rate on Students’ Grades*

Scientific Area	R Square	P-Value	$B_0$	$B_1$
<b>DNSE/CAOS</b>	0.590	< 0.001	15.435	-6.680
<b>Acco</b>	0.484	< 0.001	14.507	-5.397
<b>L/EL</b>	0.461	< 0.001	14.892	-7.389
<b>Tele</b>	0.442	< 0.001	15.058	-4.613
<b>Soc</b>	0.417	< 0.001	15.410	-6.780
<b>CP</b>	0.400	< 0.001	15.050	-3.990
<b>SW</b>	0.314	< 0.001	15.677	-11.065
<b>Econ</b>	0.298	< 0.001	15.077	-4.956
<b>Mat/OR</b>	0.286	< 0.001	14.067	-2.575
<b>Hist</b>	0.253	< 0.001	15.041	-5.313
<b>TPO</b>	0.241	< 0.001	14.363	-4.662
<b>Dem/SRM</b>	0.237	0.019	14.991	-6.085
<b>Psy</b>	0.148	< 0.001	14.773	-3.793
<b>SDA/Ecot</b>	0.084	0.024	14.250	-2.029

The remaining Scientific Areas models show a p-value higher than 0.05, failing to reject the null hypothesis, meaning that there is no significant influence on the students’ grades regarding the curricular unit difficulty (full results on Appendix A).

*Table 27 - Scientific Area – Students’ Fail Rate on Students’ Grades - Failing to reject the Null Hypothesis*

▪ Ant	▪ Fin	▪ HR
▪ M	▪ Mkt	▪ PP/PS
▪ TS		

#### 4.3.8. Relationship of Curricular Unit Satisfaction on Students' Grades

A student's interest may be triggered by a specific Curricular Units, but has it got any influence on a student's grades?

By studying Figure 9, it can be said that the satisfaction with the curricular unit has a significant effect ( $F(1,1240) = 73.3, p < 0.001, R^2 = 0.056$ ) on the students' grades – about 5.6% of the Students' Grades variance is explained by the Curricular Unit Satisfaction. For every unit increase in curricular unit satisfaction an average increase of 0.33 in students' grades is expected.

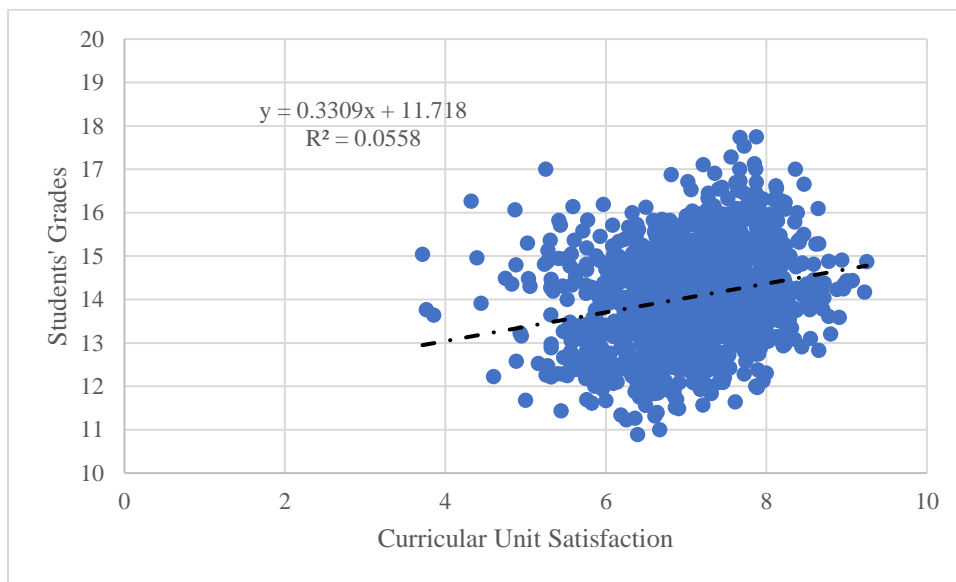


Figure 9 - Overall View – Curricular Unit Satisfaction on Students' Grades



### Effect of Scientific Areas

The addition of the Scientific Areas as dummy variables (except for SW, which is the reference area) increased the explained variance on the students' grades from 0.056 to 0.184 (*Adjusted R<sup>2</sup>*), meaning scientific areas have an additional 12.8% significant effect in students' grades. Looking at Table 28, for the same level of curricular unit satisfaction an area such as, for example, Mat/OR has students' grades 1.264 lower than the reference area (SW). Furthermore, only in 5 out of 21 areas students' grades aren't significantly different from SW significant showing a p-value higher than 0.05.

Table 28 - Curricular Unit Satisfaction on Students' Grades - Scientific Areas as Dummy Variables

	B	Std. Error	P-Value
<b>(Constant)</b>	12.493	0.337	0.000
<b>UC_Satisfaction</b>	0.295	0.038	0.000
<b>Acco</b>	-1.275	0.225	0.000
<b>Ant</b>	-0.659	0.205	0.001
<b>CP</b>	-0.505	0.213	0.018
<b>Dem/SRM</b>	-0.708	0.276	0.010
<b>DNSE/CAOS</b>	-1.598	0.276	0.000
<b>Econ</b>	-0.625	0.204	0.002
<b>Fin</b>	-0.635	0.224	0.005
<b>Hist</b>	-0.555	0.210	0.008
<b>HR</b>	-0.098	0.220	0.655
<b>L/EL</b>	-0.658	0.271	0.015
<b>M</b>	-0.102	0.263	0.697
<b>Mat/OR</b>	-1.264	0.242	0.000
<b>Mkt</b>	-0.097	0.221	0.660
<b>PP/PS</b>	-0.108	0.218	0.619
<b>Psy</b>	-0.547	0.203	0.007
<b>SDA/Ecot</b>	-0.870	0.220	0.000
<b>Soc</b>	-0.642	0.205	0.002
<b>Tele</b>	-1.116	0.235	0.000
<b>TPO</b>	-0.708	0.227	0.002
<b>TS</b>	0.261	0.198	0.188

**Effect of the curricular unit satisfaction on students’ grades, by Scientific Areas**

Analysing the relationship between the curricular unit satisfaction and the students’ grades, by scientific area, allow us to understand that in some areas (Table 30) there is no significant relationship between those two variables. However, in 12 out of 21 areas a significant relationship was found. Moreover, in all those 12 areas except for TS the explained variance of the curricular unit satisfaction on students’ grades is higher than the one found in the overall analysis (Table 29).

*Table 29 - Scientific Area – Curricular Unit Satisfaction on Students’ Grades*

Scientific Area	R Square	P-Value	$B_0$	$B_1$
<b>DNSE/CAOS</b>	0.707	0.000	10.932	0.428
<b>Dem/SRM</b>	0.332	0.004	0.508	1.788
<b>Mat/OR</b>	0.236	0.002	14.319	0.022
<b>Tele</b>	0.236	0.001	11.443	0.345
<b>Fin</b>	0.231	0.000	13.672	0.055
<b>Acco</b>	0.203	0.001	8.201	0.717
<b>CP</b>	0.176	0.000	8.669	0.793
<b>TPO</b>	0.117	0.014	13.045	0.254
<b>SDA/Ecot</b>	0.089	0.020	9.931	0.559
<b>Econ</b>	0.077	0.006	4.395	1.302
<b>Soc</b>	0.069	0.013	16.402	-0.215
<b>TS</b>	0.046	0.018	7.191	0.958

The remaining Scientific Areas models show a p-value higher than 0.05, failing to reject the null hypothesis, meaning that there is no significant influence on the students’ grades regarding the curricular unit satisfaction (full results on Appendix A)

*Table 30 - Scientific Area – Curricular Unit Satisfaction on Students’ Grades - Failing to reject the Null Hypothesis*

▪ Ant	▪ Hist	▪ HR
▪ L/EL	▪ M	▪ Mkt
▪ PP/PS	▪ Psy	▪ SW

### 4.4 Discussion

In this sub-chapter conclusions will be taken, not only regarding the analysed data but also having in consideration Chapter 2 – Literature Review.

Despite existing several studies regarding students’ academic performance, and several more studying the student-teacher relationship, this study takes it one step further, not only by studying patterns regarding students alone (4.3.6, 4.3.7), students & teachers (4.3.1, 4.3.2, 4.3.4), students & curricular units (4.3.5, 4.3.8) and teachers & curricular units (4.3.3), but also by studying it by scientific areas and understanding each area influence.

The following figure (Figure 10) represents the conceptual model of the study, presenting as well the  $R^2$  of each study hypothesis on the overall perspective.

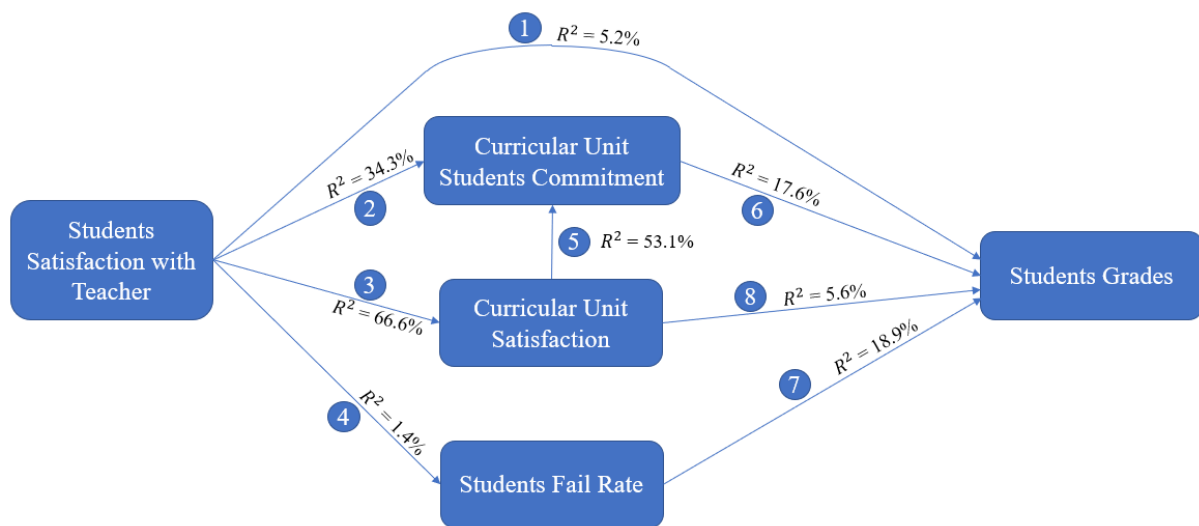


Figure 10 - Conceptual Model - Overall Perspective R-Square

On the subject student-teacher relationship, it shows that the teacher can have a certain influence on a student academic performance. This is noticeable not only by the effect of satisfaction with the teacher in the students’ grades (5.2%), which can spark a higher interest regarding this matter, but also by sub sequential effects. Considering the effect that a teacher can have in students’ commitment (34.3%), in curricular unit satisfaction (66.6%) and in students fail rate (1.4%), in addition to the curricular unit satisfaction effect on the students’ commitment (53.1%), it looks plausible that the explained variance that students’ commitment (17.6%), curricular unit satisfaction (5.6%) and students fail rate (18.9%) have on students’ grades is influenced by the students satisfaction with the teacher. Although the data may look this way, a more complex model would be needed to validate the plausibility of these chain effects.

The following figure (Figure 11) represents the conceptual model of the study, presenting the  $R^2$  (overall perspective) and the *Adjusted R<sup>2</sup>* (effect of Scientific Areas) of each study hypothesis.

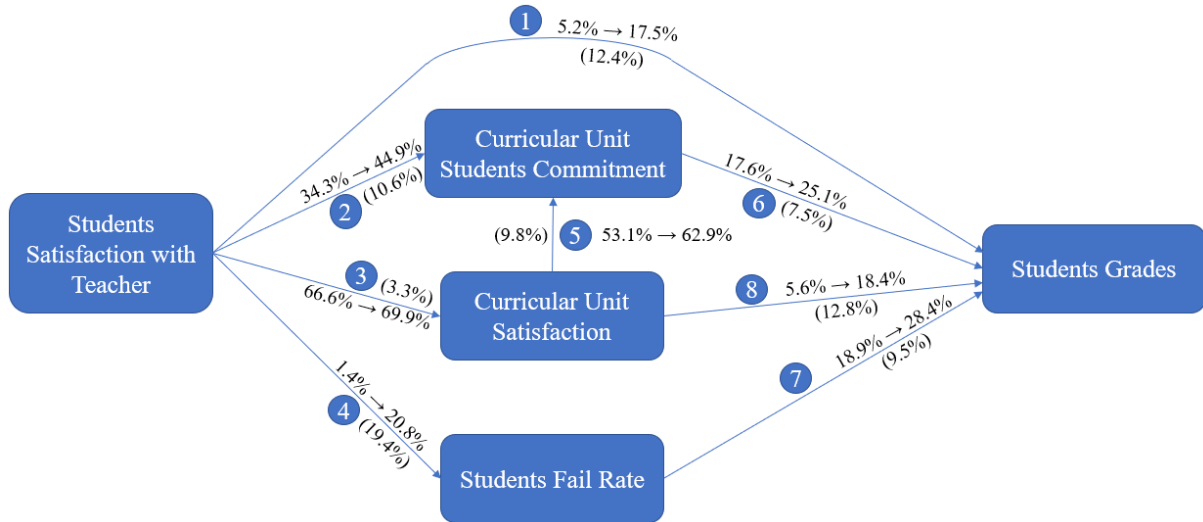


Figure 11 - Conceptual Model - Scientific Areas R-Square

By adding the Scientific Areas as dummy variables we were able to understand the effect that areas have in the dependent variable. Amongst all study hypothesis it was found significant effects from 3.3% to 19.4%, regarding the scientific areas.

Table 31 - Scientific Areas dependent variable significantly different from SW

Scientific Areas	1	2	3	4	5	6	7	8
Acco	X	X	X	X	X	X	X	X
Ant	X	X		X	X			X
CP	X	X	X	X	X			X
Dem/SRM	X	X	X	X		X	X	X
DNSE/CAOS	X	X	X	X	X	X	X	X
Econ	X	X	X	X	X			X
Fin	X	X		X	X			X
Hist	X	X		X	X			X
HR		X	X					
L/EL	X	X	X		X		X	X
M				X				
Mat/OR	X	X		X	X	X	X	X
Mkt			X	X				
PP/PS		X		X	X			
Psy	X	X	X	X	X			X
SDA/Ecot	X	X	X	X	X	X		X
Soc	X	X	X	X	X	X		X
Tele	X	X	X	X	X	X		X
TPO	X	X			X		X	X
TS		X	X	X	X	X	X	

Having SW as the reference area made it a little predictable to understand if the values for each variable were going to be higher or lower than the ones on SW since, as it was observed on Table 9, SW has the lowest Students' Fail Rate percentage, the 2<sup>nd</sup> highest Students' Grades and the highest Students' Commitment, Curricular Unit Satisfaction and Satisfaction with the Teacher. Looking at Table 31, it is possible to overview the scientific areas in which the dependent variable is significantly different from SW, for each study hypothesis. Only Acco and DNSE/CAOS always significantly differ from SW, regardless of the hypothesis.

Referring to scientific areas alone, Table 32 displays the scientific areas models where a significant relationship between the independent variable and the dependent variable was found, and the respective explained variance.

Table 32 - Effect of independent variable on dependent variable, by Scientific Area

Scientific Areas	1	2	3	4	5	6	7	8
<b>Acco</b>	17.5%	64.4%	75.7%	31.9%	71.4%	40.5%	48.4%	20.3%
<b>Ant</b>	-	53.6%	81.5%	-	67.8%	-	-	-
<b>CP</b>	10.1%	13.1%	56.4%	-	46.7%	<b>52.7%</b>	40.0%	17.6%
<b>Dem/SRM</b>	36.5%	38.5%	74.7%	-	60.7%	26.6%	23.7%	33.2%
<b>DNSE/CAOS</b>	<b>37.8%</b>	52.6%	57.5%	24.3%	73.9%	49.0%	<b>59.0%</b>	<b>70.7%</b>
<b>Econ</b>	-	27.8%	63.0%	<b>4.9%</b>	42.4%	22.2%	29.8%	7.7%
<b>Fin</b>	11.1%	29.4%	63.3%	-	54.0%	38.5%	-	23.1%
<b>Hist</b>	-	39.4%	66.9%	-	57.0%	-	25.3%	-
<b>HR</b>	-	18.5%	63.7%	-	37.8%	19.5%	-	-
<b>L/EL</b>	19.2%	<b>66.2%</b>	83.2%	-	<b>84.1%</b>	-	46.1%	-
<b>M</b>	-	37.6%	83.4%	<b>38.8%</b>	53.9%	-	-	-
<b>Mat/OR</b>	12.6%	37.7%	<b>54.0%</b>	-	65.3%	48.3%	28.6%	23.6%
<b>Mkt</b>	-	26.9%	78.3%	-	41.2%	14.7%	-	-
<b>PP/PS</b>	-	34.7%	63.5%	-	44.0%	-	-	-
<b>Psy</b>	-	50.5%	64.8%	-	67.2%	-	14.8%	-
<b>SDA/Scot</b>	-	<b>11.8%</b>	56.5%	-	50.0%	<b>11.2%</b>	<b>8.4%</b>	8.9%
<b>Soc</b>	-	15.0%	63.3%	-	53.2%	27.6%	41.7%	6.9%
<b>SW</b>	-	15.0%	69.8%	-	<b>36.4%</b>	-	31.4%	-
<b>Tele</b>	19.5%	38.4%	59.8%	-	66.6%	16.3%	44.2%	23.6%
<b>TPO</b>	-	56.3%	<b>84.4%</b>	14.1%	70.7%	22.6%	24.1%	11.7%
<b>TS</b>	<b>5.1%</b>	31.0%	62.6%	-	54.9%	-	-	<b>4.6%</b>

On the different scientific areas models it was noticeable different values of explained variance, having a wide range on values regardless of the study hypothesis.

In conclusion of each study hypothesis:

1. Students' grades are affected by the student-teacher relationship  
 Overall – Model Validated  
 By Scientific Area – Model Validated for Acco, CP, Dem/SRM, DNSE/CAOS, Fin, L/EL, Mat/OR, Tele and TS
2. Teachers stimulate their students' commitment  
 Overall – Model Validated  
 By Scientific Area – Model Validated for all 21 scientific areas
3. The lecturing teacher of a certain curricular unit can influence the curricular unit image  
 Overall – Model Validated  
 By Scientific Area – Model Validated for all 21 scientific areas
4. A poorer teacher performance implies a higher curricular unit difficulty  
 Overall – Model Validated  
 By Scientific Area – Model Validated for Acco, DNSE/CAOS, Econ, M and TPO
5. Students' commitment has variations depending on the curricular unit  
 Overall – Model Validated  
 By Scientific Area – Model Validated for all 21 scientific areas
6. A higher final grade is related to a higher student commitment  
 Overall – Model Validated  
 By Scientific Area – Model Validated for Acco, CP, Dem/SRM, DNSE/CAOS, Econ, Fin, HR, Mat/OR, Mkt, SDA/Scot, Soc, Tele and TPO
7. Students' grades are lower when the curricular unit difficulty is higher  
 Overall – Model Validated  
 By Scientific Area – Model Validated for Acco, CP, Dem/SRM, DNSE/CAOS, Econ, Hist, L/EL, Mat/OR, Psy, SDA/Scot, Soc, SW, Tele and TPO
8. Students' grades are higher when the curricular unit satisfaction is higher  
 Overall – Model Validated  
 By Scientific Area – Model Validated for Acco, CP, Dem/SRM, DNSE/CAOS, Econ, Fin, Mat/OR, SDA/Scot, Soc, Tele, TPO and TS

## Chapter 5 – Conclusions

### 5.1 Main Conclusions

Understanding how academic variables relate between each other may lead to a better understanding on how to improve the existing academic methods, or at least where to improve.

In this dissertation, it was possible to understand a bit more on how a student relationship with the teacher can influence, directly or indirectly, the student academic performance. Regardless of the significant variance value, it has an effect that should be taken into consideration.

Also, the existence of different significant variances on the dependent variable due to the influence of independent variable, concerning the study hypotheses by scientific area, shows how scientific areas have a certain influence on the results. These results may be consequence from several reasons, from students' different degrees to curricular units' subjects, between others.

Regarding all the study hypotheses “Students’ grades are affected by the student-teacher relationship”, “Teachers stimulate their students’ commitment”, “The lecturing teacher of a certain curricular unit can influence the curricular unit image”, “A poorer teacher performance implies a higher curricular unit difficulty”, “Students’ commitment has variations depending on the curricular unit”, “A higher final grade is related to a higher student commitment”, “Students’ grades are lower when the curricular unit difficulty is higher” and “Students’ grades are higher when the curricular unit satisfaction is higher”, their models on an overall level were all validated. Regarding their models by scientific area, the hypotheses “Teachers stimulate their students’ commitment”, “The lecturing teacher of a certain curricular unit can influence the curricular unit image” and “Students’ commitment has variations depending on the curricular unit” had them validated for all scientific areas, but the remaining hypotheses didn’t have all scientific area models validated.

## **5.2 Contributions to the Academic community**

Understanding how much a teacher can have an influence in their students grades is a highly debated subject, and this study allows the academic community to have a different point of view on the matter, not only by adding other variables in the study, but also by understanding how much a scientific area does or doesn't have an influence on each of the variables relationships in study.

## **5.3 Limitations**

There were some limitations regarding data availability, being the reason why only 3 academic years data were of study.

Not being able to know reprovved students' grades had also influence on the results because the curricular unit average grades were built only with approved students grades, being precise on a curricular unit average grades of approved students but impossible to determine a curricular unit overall average grades.

Last, and possibly one of the biggest limitations on this study, is the data being analysed as a class and not for each student, due to necessary anonymity reasons.

## **5.4 Future Research**

A wide study on what motivates students to evaluate their teachers, curricular units and academic related variables would bring some clearing for the importance of SATs and similar evaluations. Perhaps a more complex study on the conceptual model may also be of interest.

On a technologic perspective, creating a platform where students inquiries data were automatically analysed could bring academic entities one step further to improve the teaching quality.



## References

- Alansari, M., & Rubie-Davies, C. (2019). What about the tertiary climate? Reflecting on five decades of class climate research. In *Learning Environments Research*. Springer Netherlands. <https://doi.org/10.1007/s10984-019-09288-9>
- Anderman, L. H., & Kaplan, A. (2008). The role of interpersonal relationships in student motivation: Introduction to the special issue. In *Journal of Experimental Education* (Vol. 76, Issue 2, pp. 115–119). Routledge. <https://doi.org/10.3200/JEXE.76.2.115-120>
- Astin, A. W. (1999). *Student Involvement: A Developmental Theory for Higher Education*. [https://www.asec.purdue.edu/lct/hbcu/documents/Student\\_Involvement\\_A\\_Developmental\\_Theory\\_for\\_HE\\_Astin.pdf](https://www.asec.purdue.edu/lct/hbcu/documents/Student_Involvement_A_Developmental_Theory_for_HE_Astin.pdf)
- Bates, L. A., & Glick, J. E. (2013). Does it matter if teachers and schools match the student? Racial and ethnic disparities in problem behaviors. *Social Science Research*, 42(5), 1180–1190. <https://doi.org/10.1016/j.ssresearch.2013.04.005>
- Braga, M., Paccagnella, M., & Pellizzari, M. (2014). Evaluating students' evaluations of professors. *Economics of Education Review*, 41, 71–88. <https://doi.org/10.1016/j.econedurev.2014.04.002>
- Cheng, A., & Zamarro, G. (2018). Measuring teacher non-cognitive skills and its impact on students: Insight from the Measures of Effective Teaching Longitudinal Database. *Economics of Education Review*, 64, 251–260. <https://doi.org/10.1016/j.econedurev.2018.03.001>
- Davis, Kathryn S.; Dupper, D. R. (2008). Student-Teacher Relationships: An Overlooked Factor in School Dropout. *Human Behavior in the Social Environment*, 179–193. [https://doi.org/10.1300/j137v09n01\\_12](https://doi.org/10.1300/j137v09n01_12)
- De Witte, K., & Rogge, N. (2011). Accounting for exogenous influences in performance evaluations of teachers. *Economics of Education Review*, 30(4), 641–653. <https://doi.org/10.1016/j.econedurev.2011.02.002>
- Decker, D. M., Dona, D. P., & Christenson, S. L. (2007). Behaviorally at-risk African American students: The importance of student-teacher relationships for student outcomes. *Journal of School Psychology*, 45(1), 83–109. <https://doi.org/10.1016/j.jsp.2006.09.004>
- Ellis, L., Burke, D. M., Lomire, P., & McCormack, D. R. (2003). Student grades and average

- ratings of instructional quality: The need for adjustment. *Journal of Educational Research*, 97(1), 35–40. <https://doi.org/10.1080/00220670309596626>
- Fauth, B., Decristan, J., Rieser, S., Klieme, E., & Büttner, G. (2014). Student ratings of teaching quality in primary school: Dimensions and prediction of student outcomes. *Learning and Instruction*, 29, 1–9. <https://doi.org/10.1016/j.learninstruc.2013.07.001>
- Geerlings, J., Thijs, J., & Verkuyten, M. (2017). Student-teacher relationships and ethnic outgroup attitudes among majority students. *Journal of Applied Developmental Psychology*, 52, 69–79. <https://doi.org/10.1016/j.appdev.2017.07.002>
- Gibson III, C. E. (2015). *Defining and Measuring Academic Success. Practical Assessment, Research & Evaluation*, 20(5). <https://www.researchgate.net/publication/278305241>
- Gonzaga, H. (2019). *Provision of Academic Data for Research: A Step for Academic Success*. <https://repositorio.iscte-iul.pt/handle/10071/20124>
- Henderson, M., Ryan, T., & Phillips, M. (2019). The challenges of feedback in higher education. *Assessment & Evaluation in Higher Education*, 44(8), 1237–1252. <https://doi.org/10.1080/02602938.2019.1599815>
- Holdaway, A. S., & Becker, S. P. (2018). Children’s sleep problems are associated with poorer student–teacher relationship quality. *Sleep Medicine*, 47, 100–105. <https://doi.org/10.1016/j.sleep.2017.12.001>
- Kahu, E. R., & Nelson, K. (2018). Student engagement in the educational interface: understanding the mechanisms of student success. *Higher Education Research & Development*, 37(1), 58–71. <https://doi.org/10.1080/07294360.2017.1344197>
- Keller, M. M., Goetz, T., Becker, E. S., Morger, V., & Hensley, L. (2014). Feeling and showing: A new conceptualization of dispositional teacher enthusiasm and its relation to students’ interest. *Learning and Instruction*, 33, 29–38. <https://doi.org/10.1016/j.learninstruc.2014.03.001>
- Kornell, N., & Hausman, H. (2016). Do the Best Teachers Get the Best Ratings? *Frontiers in Psychology*, 7(APR), 570. <https://doi.org/10.3389/fpsyg.2016.00570>
- Krautmann, A. C., & Sander, W. (1999). Grades and student evaluations of teachers. *Economics of Education Review*, 18(1), 59–63. [https://doi.org/10.1016/s0272-7757\(98\)00004-1](https://doi.org/10.1016/s0272-7757(98)00004-1)

- McClain, L., Gulbis, A., & Hays, D. (2018). Honesty on student evaluations of teaching: effectiveness, purpose, and timing matter! *Assessment & Evaluation in Higher Education*, 43(3), 369–385. <https://doi.org/10.1080/02602938.2017.1350828>
- McGrath, K. F., & Van Bergen, P. (2015). Who, when, why and to what end? Students at risk of negative student-teacher relationships and their outcomes. *Educational Research Review*, 14, 1–17. <https://doi.org/10.1016/j.edurev.2014.12.001>
- Nyström, A. S., Jackson, C., & Salminen Karlsson, M. (2019). What counts as success? Constructions of achievement in prestigious higher education programmes. *Research Papers in Education*, 34(4), 465–482. <https://doi.org/10.1080/02671522.2018.1452964>
- Perry, K. E., & Weinstein, R. S. (1998). The social context of early schooling and children's school adjustment. *Educational Psychologist*, 33(4), 177–194. [https://doi.org/10.1207/s15326985ep3304\\_3](https://doi.org/10.1207/s15326985ep3304_3)
- Pope, N. G. (2019). The effect of teacher ratings on teacher performance. *Journal of Public Economics*, 172, 84–110. <https://doi.org/10.1016/j.jpubeco.2019.01.001>
- Redding, C. (2019). A Teacher Like Me: A Review of the Effect of Student–Teacher Racial/Ethnic Matching on Teacher Perceptions of Students and Student Academic and Behavioral Outcomes. *Review of Educational Research*, 89(4), 499–535. <https://doi.org/10.3102/0034654319853545>
- Robert Powell, S., & Parkes, K. A. (2019). Teacher evaluation and performativity: The edTPA as a fabrication. *Arts Education Policy Review*. <https://doi.org/10.1080/10632913.2019.1656126>
- Sandilos, L. E., Rimm-Kaufman, S. E., & Cohen, J. J. (2017). Warmth and Demand: The Relation Between Students' Perceptions of the Classroom Environment and Achievement Growth. *Child Development*, 88(4), 1321–1337. <https://doi.org/10.1111/cdev.12685>
- Sointu, E. T., Savolainen, H., Lappalainen, K., & Lambert, M. C. (2017). Longitudinal associations of student–teacher relationships and behavioural and emotional strengths on academic achievement. *Educational Psychology*, 37(4), 457–467. <https://doi.org/10.1080/01443410.2016.1165796>
- Thijs, J., & Fleischmann, F. (2015). Student-teacher relationships and achievement goal orientations: Examining student perceptions in an ethnically diverse sample. *Learning and*

*Individual Differences*, 42, 53–63. <https://doi.org/10.1016/j.lindif.2015.08.014>

- Van Der Schaaf, M., Slof, B., Boven, L., & De Jong, A. (2019). Evidence for measuring teachers' core practices. *European Journal of Teacher Education*, 42(5), 675–694. <https://doi.org/10.1080/02619768.2019.1652903>
- van der Wal, M. M., Oolbakkink-Marchand, H. W., Schaap, H., & Meijer, P. C. (2019). Impact of early career teachers' professional identity tensions. *Teaching and Teacher Education*, 80, 59–70. <https://doi.org/10.1016/j.tate.2019.01.001>
- Wang, S., Rubie-Davies, C. M., & Meissel, K. (2018). A systematic review of the teacher expectation literature over the past 30 years. *Educational Research and Evaluation*, 24(3–5), 124–179. <https://doi.org/10.1080/13803611.2018.1548798>
- Wentzel, K. R., Battle, A., Russell, S. L., & Looney, L. B. (2010). Social supports from teachers and peers as predictors of academic and social motivation. *Contemporary Educational Psychology*, 35(3), 193–202. <https://doi.org/10.1016/j.cedpsych.2010.03.002>
- Wind, S. A., Jones, E., Bergin, C., & Jensen, K. (2019). Exploring patterns of principal judgments in teacher evaluation related to reported gender and years of experience. *Studies in Educational Evaluation*, 61, 150–158. <https://doi.org/10.1016/j.stueduc.2019.03.011>

## Appendix

### Appendix A

Table 33 – Scientific Area – Students' Grades Vs Satisfaction with Teacher

Model Summary			Coefficients				
New_Sci_Area	R Square	Std. Error of the Estimate		Unstandardized Coefficients		t	Sig.
				B	Std. Error		
Acco	0.175	1.012678566	(Constant)	8.132	1.619	5.025	0.000
			Teacher_Satisfaction	0.669	0.208	3.221	0.002
Ant	0.000	0.783288498	(Constant)	14.050	0.856	16.414	0.000
			Teacher_Satisfaction	-0.001	0.106	-0.014	0.989
CP	0.101	1.286145148	(Constant)	9.979	1.397	7.141	0.000
			Teacher_Satisfaction	0.548	0.191	2.862	0.005
Dem/SRM	0.365	0.936572156	(Constant)	8.444	1.564	5.399	0.000
			Teacher_Satisfaction	0.700	0.202	3.471	0.002
DNSE/CAOS	0.378	1.043604752	(Constant)	2.832	2.839	0.997	0.330
			Teacher_Satisfaction	1.346	0.377	3.573	0.002
Econ	0.030	1.062592827	(Constant)	12.249	1.016	12.051	0.000
			Teacher_Satisfaction	0.226	0.134	1.683	0.096
Fin	0.111	1.266401055	(Constant)	8.983	2.036	4.413	0.000
			Teacher_Satisfaction	0.637	0.255	2.496	0.016
Hist	0.000	0.959537824	(Constant)	14.036	0.859	16.341	0.000
			Teacher_Satisfaction	0.004	0.111	0.036	0.971
HR	0.065	0.814253392	(Constant)	12.501	1.003	12.463	0.000
			Teacher_Satisfaction	0.253	0.128	1.981	0.053
L/EL	0.192	1.096535396	(Constant)	10.453	1.444	7.239	0.000
			Teacher_Satisfaction	0.475	0.203	2.336	0.029
M	0.005	0.966960410	(Constant)	13.888	1.836	7.565	0.000
			Teacher_Satisfaction	0.082	0.239	0.344	0.734
Mat/OR	0.126	0.624267531	(Constant)	11.392	0.780	14.606	0.000
			Teacher_Satisfaction	0.259	0.112	2.308	0.027
Mkt	0.002	1.133506022	(Constant)	14.127	0.990	14.277	0.000
			Teacher_Satisfaction	0.046	0.129	0.355	0.724
PP/PS	0.000	0.891567674	(Constant)	14.542	1.006	14.460	0.000
			Teacher_Satisfaction	-0.010	0.134	-0.075	0.940
Psy	0.016	0.920057401	(Constant)	13.031	0.853	15.277	0.000
			Teacher_Satisfaction	0.134	0.109	1.222	0.225
SDA/Scot	0.053	0.815382587	(Constant)	11.429	1.224	9.336	0.000
			Teacher_Satisfaction	0.288	0.160	1.799	0.077
Soc	0.017	1.254294087	(Constant)	11.901	1.698	7.009	0.000
			Teacher_Satisfaction	0.269	0.217	1.239	0.219
SW	0.017	0.974808164	(Constant)	16.306	2.068	7.886	0.000
			Teacher_Satisfaction	-0.192	0.256	-0.752	0.457
Tele	0.195	1.071131631	(Constant)	6.878	2.077	3.312	0.002
			Teacher_Satisfaction	0.855	0.272	3.147	0.003
TPO	0.055	1.121894040	(Constant)	12.429	0.829	14.988	0.000
			Teacher_Satisfaction	0.197	0.116	1.696	0.096
TS	0.051	0.956801839	(Constant)	12.691	0.855	14.841	0.000
			Teacher_Satisfaction	0.269	0.107	2.518	0.013

Table 34 - Scientific Area – Students’ Commitment Vs Satisfaction with Teacher

Model Summary			Coefficients				
New_Sci_Area	R Square	Std. Error of the Estimate		Unstandardized Coefficients		t	Sig.
				B	Std. Error		
Acco	0.644	0.268711388	(Constant)	2.914	0.429	6.785	0.000
			Teacher_Satisfaction	0.519	0.055	9.416	0.000
Ant	0.536	0.430141290	(Constant)	2.445	0.470	5.202	0.000
			Teacher_Satisfaction	0.576	0.058	9.859	0.000
CP	0.131	0.544251449	(Constant)	4.880	0.591	8.252	0.000
			Teacher_Satisfaction	0.269	0.081	3.322	0.001
Dem/SRM	0.385	0.387332720	(Constant)	4.918	0.647	7.604	0.000
			Teacher_Satisfaction	0.302	0.083	3.623	0.002
DNSE/CAOS	0.526	0.351355026	(Constant)	2.207	0.956	2.308	0.031
			Teacher_Satisfaction	0.613	0.127	4.831	0.000
Econ	0.278	0.354225438	(Constant)	4.837	0.339	14.275	0.000
			Teacher_Satisfaction	0.268	0.045	5.978	0.000
Fin	0.294	0.397169926	(Constant)	4.269	0.638	6.686	0.000
			Teacher_Satisfaction	0.365	0.080	4.561	0.000
Hist	0.394	0.422755363	(Constant)	4.458	0.378	11.781	0.000
			Teacher_Satisfaction	0.340	0.049	6.938	0.000
HR	0.185	0.570598253	(Constant)	4.835	0.703	6.879	0.000
			Teacher_Satisfaction	0.319	0.090	3.560	0.001
L/EL	0.662	0.449088574	(Constant)	2.646	0.591	4.474	0.000
			Teacher_Satisfaction	0.559	0.083	6.714	0.000
M	0.376	0.361015121	(Constant)	4.803	0.685	7.008	0.000
			Teacher_Satisfaction	0.346	0.089	3.879	0.001
Mat/OR	0.377	0.338848454	(Constant)	4.437	0.423	10.481	0.000
			Teacher_Satisfaction	0.288	0.061	4.730	0.000
Mkt	0.269	0.428042624	(Constant)	5.638	0.374	15.088	0.000
			Teacher_Satisfaction	0.219	0.049	4.498	0.000
PP/PS	0.347	0.436084903	(Constant)	4.263	0.492	8.666	0.000
			Teacher_Satisfaction	0.369	0.065	5.645	0.000
Psy	0.505	0.403805779	(Constant)	3.248	0.374	8.677	0.000
			Teacher_Satisfaction	0.465	0.048	9.683	0.000
SDA/ECOT	0.118	0.453318495	(Constant)	4.798	0.681	7.050	0.000
			Teacher_Satisfaction	0.247	0.089	2.779	0.007
Soc	0.150	0.467368036	(Constant)	4.691	0.633	7.415	0.000
			Teacher_Satisfaction	0.316	0.081	3.914	0.000
SW	0.150	0.421844510	(Constant)	5.498	0.895	6.145	0.000
			Teacher_Satisfaction	0.267	0.111	2.416	0.021
Tele	0.384	0.375726858	(Constant)	2.929	0.728	4.020	0.000
			Teacher_Satisfaction	0.482	0.095	5.060	0.000
TPO	0.563	0.532264409	(Constant)	3.789	0.393	9.632	0.000
			Teacher_Satisfaction	0.438	0.055	7.944	0.000
TS	0.310	0.450063499	(Constant)	4.245	0.402	10.554	0.000
			Teacher_Satisfaction	0.367	0.050	7.310	0.000

Table 35 - Scientific Area - Curricular Unit Satisfaction Vs Satisfaction with Teacher

Model Summary			Coefficients				
New_Sci_Area	R Square	Std. Error of the Estimate		Unstandardized Coefficients		t	Sig.
				B	Std. Error		
Acco	0.757	0.345139623	(Constant)	0.356	0.552	0.645	0.522
			Teacher_Satisfaction	0.875	0.071	12.353	0.000
Ant	0.815	0.365877973	(Constant)	-0.173	0.400	-0.432	0.667
			Teacher_Satisfaction	0.954	0.050	19.210	0.000
CP	0.564	0.473387968	(Constant)	1.696	0.514	3.297	0.002
			Teacher_Satisfaction	0.685	0.070	9.725	0.000
X   Dem/SRM	0.747	0.355917001	(Constant)	2.290	0.594	3.854	0.001
			Teacher_Satisfaction	0.603	0.077	7.868	0.000
DNSE/CAOS	0.575	0.405585412	(Constant)	1.089	1.103	0.987	0.335
			Teacher_Satisfaction	0.781	0.146	5.334	0.000
Econ	0.630	0.425467147	(Constant)	1.958	0.407	4.811	0.000
			Teacher_Satisfaction	0.678	0.054	12.596	0.000
Fin	0.633	0.300322507	(Constant)	2.950	0.483	6.111	0.000
			Teacher_Satisfaction	0.562	0.061	9.279	0.000
Hist	0.669	0.480190308	(Constant)	1.999	0.430	4.650	0.000
			Teacher_Satisfaction	0.682	0.056	12.242	0.000
HR	0.637	0.582544149	(Constant)	-0.017	0.718	-0.023	0.981
			Teacher_Satisfaction	0.908	0.092	9.916	0.000
L/EL	0.832	0.444217869	(Constant)	0.453	0.585	0.775	0.446
			Teacher_Satisfaction	0.877	0.082	10.659	0.000
M	0.834	0.301706389	(Constant)	0.810	0.573	1.415	0.169
			Teacher_Satisfaction	0.838	0.075	11.224	0.000
Mat/OR	0.540	0.347434612	(Constant)	3.765	0.434	8.674	0.000
			Teacher_Satisfaction	0.411	0.062	6.594	0.000
Mkt	0.783	0.424113838	(Constant)	1.890	0.370	5.106	0.000
			Teacher_Satisfaction	0.680	0.048	14.092	0.000
PP/PS	0.635	0.466643332	(Constant)	1.712	0.526	3.252	0.002
			Teacher_Satisfaction	0.715	0.070	10.223	0.000
Psy	0.648	0.542017822	(Constant)	0.684	0.502	1.362	0.177
			Teacher_Satisfaction	0.840	0.065	13.021	0.000
SDA/Scot	0.565	0.395462369	(Constant)	1.644	0.594	2.769	0.008
			Teacher_Satisfaction	0.673	0.077	8.683	0.000
Soc	0.633	0.360550858	(Constant)	1.314	0.488	2.693	0.009
			Teacher_Satisfaction	0.763	0.062	12.251	0.000
SW	0.698	0.353368893	(Constant)	1.139	0.750	1.520	0.138
			Teacher_Satisfaction	0.811	0.093	8.742	0.000
Tele	0.598	0.353623623	(Constant)	1.498	0.686	2.185	0.035
			Teacher_Satisfaction	0.700	0.090	7.810	0.000
TPO	0.844	0.451859708	(Constant)	1.528	0.334	4.575	0.000
			Teacher_Satisfaction	0.762	0.047	16.263	0.000
TS	0.626	0.506559040	(Constant)	0.694	0.453	1.532	0.128
			Teacher_Satisfaction	0.798	0.057	14.112	0.000



Table 36 - Scientific Area – Students’ Fail Rate Vs Satisfaction with Teacher

Model Summary			Coefficients				
New_Sci_Area	R Square	Std. Error of the Estimate	Unstandardized Coefficients		t	Sig.	
			B	Std. Error			
Acco	0.319	0.118529201	(Constant)	1.123	0.189	5.930	0.000
			Teacher_Satisfaction	-0.117	0.024	-4.793	0.000
Ant	0.020	0.115483011	(Constant)	0.417	0.126	3.302	0.001
			Teacher_Satisfaction	-0.021	0.016	-1.311	0.193
CP	0.000	0.214865986	(Constant)	0.303	0.233	1.296	0.199
			Teacher_Satisfaction	-0.004	0.032	-0.122	0.903
Dem/SRM	0.036	0.092233589	(Constant)	0.327	0.154	2.124	0.046
			Teacher_Satisfaction	-0.018	0.020	-0.892	0.383
DNSE/CAOS	0.243	0.132379153	(Constant)	1.305	0.360	3.624	0.002
			Teacher_Satisfaction	-0.124	0.048	-2.598	0.017
Econ	0.049	0.115957836	(Constant)	0.468	0.111	4.219	0.000
			Teacher_Satisfaction	-0.032	0.015	-2.180	0.032
Fin	0.010	0.121013645	(Constant)	0.361	0.195	1.853	0.070
			Teacher_Satisfaction	-0.018	0.024	-0.725	0.472
Hist	0.009	0.090476237	(Constant)	0.250	0.081	3.093	0.003
			Teacher_Satisfaction	-0.009	0.011	-0.837	0.405
HR	0.000	0.098290104	(Constant)	0.133	0.121	1.100	0.276
			Teacher_Satisfaction	3.513E-05	0.015	0.002	0.998
L/EL	0.073	0.107894084	(Constant)	0.338	0.142	2.379	0.026
			Teacher_Satisfaction	-0.027	0.020	-1.341	0.193
M	0.388	0.097127431	(Constant)	0.911	0.184	4.938	0.000
			Teacher_Satisfaction	-0.096	0.024	-3.980	0.001
Mat/OR	0.041	0.135859619	(Constant)	0.133	0.170	0.781	0.440
			Teacher_Satisfaction	0.031	0.024	1.265	0.214
Mkt	0.031	0.158388249	(Constant)	0.393	0.138	2.846	0.006
			Teacher_Satisfaction	-0.024	0.018	-1.333	0.188
PP/PS	0.004	0.077437460	(Constant)	0.115	0.087	1.312	0.195
			Teacher_Satisfaction	0.006	0.012	0.475	0.636
Psy	0.017	0.093154647	(Constant)	0.293	0.086	3.395	0.001
			Teacher_Satisfaction	-0.014	0.011	-1.246	0.216
SDA/Ecot	0.005	0.119553134	(Constant)	0.407	0.179	2.265	0.027
			Teacher_Satisfaction	-0.013	0.023	-0.546	0.587
Soc	0.016	0.119589608	(Constant)	0.403	0.162	2.487	0.015
			Teacher_Satisfaction	-0.025	0.021	-1.204	0.232
SW	0.001	0.049736230	(Constant)	0.063	0.105	0.593	0.557
			Teacher_Satisfaction	0.003	0.013	0.196	0.846
Tele	0.040	0.168570506	(Constant)	0.787	0.327	2.408	0.021
			Teacher_Satisfaction	-0.056	0.043	-1.309	0.198
TPO	0.141	0.112626187	(Constant)	0.351	0.083	4.217	0.000
			Teacher_Satisfaction	-0.033	0.012	-2.841	0.007
TS	0.029	0.111677340	(Constant)	0.038	0.100	0.381	0.704
			Teacher_Satisfaction	0.024	0.012	1.896	0.060



Table 37 - Scientific Area – Students’ Commitment Vs Curricular Unit Satisfaction

Model Summary			Coefficients				
New_Sci_Area	R Square	Std. Error of the Estimate		Unstandardized Coefficients		t	Sig.
				B	Std. Error		
Acco	0.714	0.240724375	(Constant)	3.058	0.353	8.673	0.000
			UC_Satisfaction	0.544	0.049	11.070	0.000
Ant	0.678	0.358617630	(Constant)	2.484	0.346	7.175	0.000
			UC_Satisfaction	0.612	0.046	13.293	0.000
CP	0.467	0.426286413	(Constant)	3.122	0.467	6.692	0.000
			UC_Satisfaction	0.556	0.070	7.999	0.000
Dem/SRM	0.607	0.309641372	(Constant)	3.474	0.665	5.222	0.000
			UC_Satisfaction	0.544	0.096	5.692	0.000
DNSE/CAOS	0.739	0.260685598	(Constant)	1.904	0.638	2.984	0.007
			UC_Satisfaction	0.705	0.091	7.716	0.000
Econ	0.424	0.316195470	(Constant)	4.114	0.332	12.389	0.000
			UC_Satisfaction	0.388	0.047	8.280	0.000
Fin	0.540	0.320438383	(Constant)	1.972	0.679	2.902	0.005
			UC_Satisfaction	0.701	0.091	7.666	0.000
Hist	0.570	0.356020246	(Constant)	3.518	0.360	9.772	0.000
			UC_Satisfaction	0.491	0.050	9.910	0.000
HR	0.378	0.498421578	(Constant)	4.489	0.491	9.151	0.000
			UC_Satisfaction	0.402	0.069	5.832	0.000
L/EL	0.841	0.308346563	(Constant)	2.241	0.398	5.635	0.000
			UC_Satisfaction	0.654	0.059	11.019	0.000
M	0.539	0.310246584	(Constant)	4.188	0.606	6.910	0.000
			UC_Satisfaction	0.452	0.084	5.406	0.000
Mat/OR	0.653	0.252708940	(Constant)	1.951	0.537	3.634	0.001
			UC_Satisfaction	0.677	0.081	8.351	0.000
Mkt	0.412	0.383872633	(Constant)	4.812	0.404	11.918	0.000
			UC_Satisfaction	0.353	0.057	6.208	0.000
PP/PS	0.440	0.403943676	(Constant)	3.754	0.479	7.834	0.000
			UC_Satisfaction	0.463	0.067	6.861	0.000
Psy	0.672	0.328534535	(Constant)	3.152	0.271	11.610	0.000
			UC_Satisfaction	0.515	0.037	13.735	0.000
SDA/Ecot	0.500	0.341354849	(Constant)	2.827	0.509	5.558	0.000
			UC_Satisfaction	0.569	0.075	7.610	0.000
Soc	0.532	0.346700215	(Constant)	2.641	0.456	5.793	0.000
			UC_Satisfaction	0.621	0.062	9.947	0.000
SW	0.364	0.364983963	(Constant)	4.362	0.760	5.741	0.000
			UC_Satisfaction	0.429	0.099	4.345	0.000
Tele	0.666	0.276791674	(Constant)	1.814	0.531	3.413	0.001
			UC_Satisfaction	0.701	0.078	9.040	0.000
TPO	0.707	0.436069058	(Constant)	2.795	0.379	7.376	0.000
			UC_Satisfaction	0.592	0.055	10.864	0.000
TS	0.549	0.363670875	(Constant)	3.753	0.286	13.137	0.000
			UC_Satisfaction	0.485	0.040	12.046	0.000

Table 38 - Scientific Area – Students' Grades Vs Students' Commitment

Model Summary			Coefficients				
New_Sci_Area	R Square	Std. Error of the Estimate		Unstandardized Coefficients		t	Sig.
				B	Std. Error		
Acco	0.405	0.859781034	(Constant)	2.389	1.897	1.260	0.214
			UC_Commitment	1.575	0.273	5.777	0.000
Ant	0.030	0.771605428	(Constant)	12.532	0.944	13.275	0.000
			UC_Commitment	0.213	0.133	1.601	0.113
CP	0.527	0.933096330	(Constant)	2.436	1.282	1.899	0.061
			UC_Commitment	1.686	0.187	9.014	0.000
Dem/SRM	0.266	1.006539818	(Constant)	4.940	3.229	1.530	0.141
			UC_Commitment	1.227	0.445	2.759	0.012
DNSE/CAOS	0.490	0.944635777	(Constant)	0.583	2.757	0.211	0.835
			UC_Commitment	1.815	0.404	4.496	0.000
Econ	0.222	0.951422802	(Constant)	5.595	1.625	3.444	0.001
			UC_Commitment	1.219	0.237	5.151	0.000
Fin	0.385	1.053396481	(Constant)	1.408	2.265	0.622	0.537
			UC_Commitment	1.763	0.315	5.592	0.000
Hist	0.020	0.950116054	(Constant)	12.322	1.440	8.555	0.000
			UC_Commitment	0.247	0.203	1.215	0.228
HR	0.195	0.755718831	(Constant)	10.166	1.175	8.654	0.000
			UC_Commitment	0.589	0.160	3.683	0.001
L/EL	0.050	1.189052126	(Constant)	11.477	2.122	5.409	0.000
			UC_Commitment	0.352	0.321	1.096	0.285
M	0.036	0.951453326	(Constant)	11.503	3.107	3.702	0.001
			UC_Commitment	0.405	0.416	0.971	0.341
Mat/OR	0.483	0.479939313	(Constant)	6.231	1.183	5.267	0.000
			UC_Commitment	1.081	0.184	5.883	0.000
Mkt	0.147	1.048089724	(Constant)	8.131	2.065	3.937	0.000
			UC_Commitment	0.869	0.282	3.079	0.003
PP/PS	0.004	0.890037887	(Constant)	13.779	1.500	9.189	0.000
			UC_Commitment	0.098	0.213	0.461	0.647
Psy	0.000	0.927484871	(Constant)	14.018	1.158	12.100	0.000
			UC_Commitment	0.007	0.169	0.042	0.967
SDA/Ecot	0.112	0.789562259	(Constant)	9.742	1.439	6.768	0.000
			UC_Commitment	0.581	0.215	2.703	0.009
Soc	0.276	1.076625095	(Constant)	4.608	1.634	2.819	0.006
			UC_Commitment	1.312	0.228	5.759	0.000
SW	0.007	0.979873615	(Constant)	13.420	2.857	4.696	0.000
			UC_Commitment	0.175	0.373	0.468	0.643
Tele	0.163	1.091827686	(Constant)	6.747	2.357	2.862	0.007
			UC_Commitment	1.007	0.356	2.827	0.007
TPO	0.226	1.015675593	(Constant)	9.136	1.244	7.343	0.000
			UC_Commitment	0.681	0.180	3.781	0.000
TS	0.018	0.973185863	(Constant)	13.099	1.184	11.063	0.000
			UC_Commitment	0.242	0.165	1.469	0.145

Table 39 - Scientific Area – Students’ Grades Vs Students’ Fail Rate

Model Summary			Coefficients				
New_Sci_Area	R Square	Std. Error of the Estimate		Unstandardized Coefficients		t	Sig.
				B	Std. Error		
Acco	0.484	0.800968268	(Constant)	14.507	0.207	69.983	0.000
			Enrolled_Fail_Rate	-5.397	0.797	-6.776	0.000
Ant	0.024	0.773791119	(Constant)	14.301	0.201	71.301	0.000
			Enrolled_Fail_Rate	-1.042	0.724	-1.440	0.153
CP	0.400	1.051076476	(Constant)	15.050	0.198	75.843	0.000
			Enrolled_Fail_Rate	-3.990	0.572	-6.969	0.000
Dem/SRM	0.237	1.026362447	(Constant)	14.991	0.503	29.810	0.000
			Enrolled_Fail_Rate	-6.085	2.384	-2.553	0.019
DNSE/CAOS	0.590	0.847464366	(Constant)	15.435	0.486	31.768	0.000
			Enrolled_Fail_Rate	-6.680	1.215	-5.496	0.000
Econ	0.298	0.903554074	(Constant)	15.077	0.202	74.703	0.000
			Enrolled_Fail_Rate	-4.956	0.788	-6.288	0.000
Fin	0.069	1.296061971	(Constant)	14.682	0.377	38.937	0.000
			Enrolled_Fail_Rate	-2.893	1.507	-1.920	0.061
Hist	0.253	0.829114933	(Constant)	15.041	0.216	69.519	0.000
			Enrolled_Fail_Rate	-5.313	1.060	-5.011	0.000
HR	0.040	0.825195235	(Constant)	14.706	0.185	79.570	0.000
			Enrolled_Fail_Rate	-1.718	1.122	-1.532	0.131
L/EL	0.461	0.895700219	(Constant)	14.892	0.307	48.501	0.000
			Enrolled_Fail_Rate	-7.389	1.667	-4.433	0.000
M	0.043	0.948057564	(Constant)	14.809	0.330	44.824	0.000
			Enrolled_Fail_Rate	-1.624	1.527	-1.063	0.298
Mat/OR	0.286	0.564045597	(Constant)	14.067	0.248	56.753	0.000
			Enrolled_Fail_Rate	-2.575	0.668	-3.853	0.000
Mkt	0.027	1.119369380	(Constant)	14.230	0.248	57.485	0.000
			Enrolled_Fail_Rate	1.159	0.938	1.236	0.222
PP/PS	0.003	0.890449564	(Constant)	14.558	0.257	56.627	0.000
			Enrolled_Fail_Rate	-0.586	1.482	-0.396	0.694
Psy	0.148	0.856344372	(Constant)	14.773	0.198	74.653	0.000
			Enrolled_Fail_Rate	-3.793	0.950	-3.990	0.000
SDA/Scot	0.084	0.801751015	(Constant)	14.250	0.290	49.080	0.000
			Enrolled_Fail_Rate	-2.029	0.878	-2.310	0.024
Soc	0.417	0.965709406	(Constant)	15.410	0.206	74.779	0.000
			Enrolled_Fail_Rate	-6.780	0.859	-7.897	0.000
SW	0.314	0.814445774	(Constant)	15.677	0.274	57.179	0.000
			Enrolled_Fail_Rate	-11.065	2.849	-3.884	0.000
Tele	0.442	0.891428010	(Constant)	15.058	0.322	46.766	0.000
			Enrolled_Fail_Rate	-4.613	0.809	-5.700	0.000
TPO	0.241	1.005711094	(Constant)	14.363	0.199	72.215	0.000
			Enrolled_Fail_Rate	-4.662	1.182	-3.944	0.000
TS	0.008	0.978254074	(Constant)	15.004	0.200	75.051	0.000
			Enrolled_Fail_Rate	-0.753	0.791	-0.952	0.343

Table 40 - Scientific Area – Students' Grades Vs Curricular Unit Satisfaction

Model Summary			Coefficients				
New_Sci_Area	R Square	Std. Error of the Estimate		Unstandardized Coefficients		t	Sig.
				B	Std. Error		
Acco	0.203	0.995225472	(Constant)	8.201	1.458	5.627	0.000
			UC_Satisfaction	0.717	0.203	3.532	0.001
Ant	0.004	0.781833157	(Constant)	13.618	0.755	18.044	0.000
			UC_Satisfaction	0.056	0.100	0.560	0.577
CP	0.176	1.231494173	(Constant)	8.669	1.348	6.432	0.000
			UC_Satisfaction	0.793	0.201	3.944	0.000
Dem/SRM	0.332	0.959910627	(Constant)	0.508	1.753	0.290	0.002
			UC_Satisfaction	1.788	0.251	7.120	0.004
DNSE/CAOS	0.707	0.716206907	(Constant)	10.932	1.088	10.044	0.775
			UC_Satisfaction	0.428	0.154	2.786	0.000
Econ	0.077	1.036265786	(Constant)	4.395	2.498	1.760	0.000
			UC_Satisfaction	1.302	0.336	3.872	0.006
Fin	0.231	1.177944656	(Constant)	13.672	0.969	14.108	0.085
			UC_Satisfaction	0.055	0.133	0.410	0.000
Hist	0.002	0.958460121	(Constant)	13.162	0.810	16.254	0.000
			UC_Satisfaction	0.186	0.114	1.638	0.683
HR	0.046	0.822822862	(Constant)	11.329	1.485	7.628	0.000
			UC_Satisfaction	0.372	0.222	1.675	0.107
L/EL	0.109	1.151442025	(Constant)	13.802	1.888	7.311	0.000
			UC_Satisfaction	0.099	0.261	0.380	0.107
M	0.006	0.966455153	(Constant)	8.998	1.240	7.255	0.000
			UC_Satisfaction	0.633	0.187	3.380	0.707
Mat/OR	0.236	0.583645414	(Constant)	14.319	1.193	11.998	0.000
			UC_Satisfaction	0.022	0.168	0.132	0.002
Mkt	0.000	1.134626911	(Constant)	14.053	1.056	13.305	0.000
			UC_Satisfaction	0.059	0.149	0.394	0.896
PP/PS	0.003	0.890457096	(Constant)	14.618	0.764	19.129	0.000
			UC_Satisfaction	-0.077	0.106	-0.728	0.695
Psy	0.006	0.924835576	(Constant)	10.793	1.191	9.060	0.000
			UC_Satisfaction	0.417	0.175	2.384	0.469
SDA/Scot	0.089	0.799564272	(Constant)	9.931	1.605	6.188	0.000
			UC_Satisfaction	0.559	0.220	2.542	0.020
Soc	0.069	1.220782089	(Constant)	16.402	2.027	8.093	0.000
			UC_Satisfaction	-0.215	0.263	-0.815	0.013
SW	0.020	0.973382376	(Constant)	6.291	2.004	3.140	0.000
			UC_Satisfaction	1.039	0.292	3.556	0.421
Tele	0.236	1.043393700	(Constant)	11.443	0.943	12.137	0.003
			UC_Satisfaction	0.345	0.136	2.543	0.001
TPO	0.117	1.084982529	(Constant)	13.045	0.753	17.313	0.000
			UC_Satisfaction	0.254	0.106	2.389	0.014
TS	0.046	0.959230937	(Constant)	7.191	2.062	3.487	0.000
			UC_Satisfaction	0.958	0.296	3.234	0.018

## Annexes

### Annex A

Table 41 - Curricular Units and respective Scientific Areas

<b>Curricular Unit</b>	<b>Sci. Area</b>
<b>Auditoria Financeira</b>	Acco
<b>Complementos de Contabilidade Financeira</b>	Acco
<b>Contabilidade de Gestão I</b>	Acco
<b>Contabilidade de Gestão II</b>	Acco
<b>Contabilidade Financeira I</b>	Acco
<b>Contabilidade Financeira II</b>	Acco
<b>Controlo de Gestão</b>	Acco
<b>Ética e Deontologia em Contabilidade</b>	Acco
<b>Fiscalidade</b>	Acco
<b>Fraude e Contabilidade Forense</b>	Acco
<b>Fundamentos de Contabilidade de Gestão</b>	Acco
<b>Fundamentos de Contabilidade Financeira</b>	Acco
<b>Gestão e Contabilidade Empresarial</b>	Acco
<b>Projecto Empresarial em Contabilidade</b>	Acco
<b>Reporte Financeiro</b>	Acco
<b>Tributação para Não Residentes</b>	Acco
<b>Inteligência Artificial</b>	AI
<b>Tecnologias para Sistemas Inteligentes</b>	AI
<b>Abordagens Antropológicas do Crime</b>	Ant
<b>Antropologia da Índia</b>	Ant
<b>Antropologia Depois do Colonialismo</b>	Ant
<b>Antropologia do Turismo</b>	Ant
<b>Antropologia e Arte</b>	Ant
<b>Antropologia e Imagem</b>	Ant
<b>Antropologia Marítima</b>	Ant
<b>Antropologia Urbana</b>	Ant
<b>Ciência, Sociedade e Cultura</b>	Ant
<b>Crise e Catástrofe - Leituras Antropológicas</b>	Ant
<b>Culturas: Identificações e Diferenciações</b>	Ant
<b>Debates Teóricos Contemporâneos</b>	Ant
<b>Epistemologia e Conhecimento Antropológico</b>	Ant
<b>Etnografia Portuguesa</b>	Ant
<b>História da Antropologia</b>	Ant
<b>Introdução à Antropologia</b>	Ant
<b>Israel/Palestina: História, Antropologia, Política</b>	Ant
<b>Leituras Etnográficas</b>	Ant
<b>Mapas Etnográficos 1: Américas e África</b>	Ant
<b>Mapas Etnográficos 2: Ásia e Oceania</b>	Ant
<b>Marginalidade, Dependência e Comportamentos de Risco</b>	Ant
<b>Métodos Biográficos</b>	Ant

<b>Métodos Etnográficos e Práticas de Investigação</b>	Ant
<b>Minorias do Sudeste Asiático</b>	Ant
<b>Museus e Coleções</b>	Ant
<b>Pesquisa Documental e Análise de Texto</b>	Ant
<b>Poderes: o Económico e o Político</b>	Ant
<b>Práticas de Trabalho Universitário</b>	Ant
<b>Práticas Profissionais de Antropologia</b>	Ant
<b>Problemáticas Centrais da Reflexão Antropológica</b>	Ant
<b>Raízes Históricas e Escolas - Paradigmas</b>	Ant
<b>Relações: Género, Famílias, Parentesco</b>	Ant
<b>Ritual e Performance</b>	Ant
<b>Símbolos: Linguagem, Ação e Cognição</b>	Ant
<b>Símbolos: Significados Culturais</b>	Ant
<b>Sociedade e Nação na África Lusófona</b>	Ant
<b>Sociedades Mediterrânicas</b>	Ant
<b>Tecnologia, Cultura e Quotidiano: Exercícios de Observação</b>	Ant
<b>Informática de Gestão</b>	ApI
<b>Projecto Empresa Digital</b>	ApI
<b>Fundamentos de Arquitectura de Computadores</b>	CAOS
<b>Microprocessadores</b>	CAOS
<b>Sistemas Operativos</b>	CAOS
<b>Demografia</b>	Dem
<b>Introdução à Demografia</b>	Dem
<b>Multiplexagem, Comutação e Integração de Serviços</b>	DNSE
<b>Processamento de Sinal Multimédia</b>	DNSE
<b>Redes Digitais I - Fundamentos</b>	DNSE
<b>Redes Digitais II - Sistemas, Aplicações e Serviços</b>	DNSE
<b>Redes Digitais III - Segurança, Multimédia e Gestão</b>	DNSE
<b>Segurança em Redes e Sistemas de Informação</b>	DNSE
<b>Economia</b>	Econ
<b>Economia Comportamental</b>	Econ
<b>Economia da Cultura</b>	Econ
<b>Economia da Educação e das Competências</b>	Econ
<b>Economia da Inovação e do Conhecimento</b>	Econ
<b>Economia da Saúde</b>	Econ
<b>Economia de Recursos Humanos e de Emprego</b>	Econ
<b>Economia do Ambiente e dos Recursos Naturais</b>	Econ
<b>Economia do Trabalho e dos Recursos Humanos</b>	Econ
<b>Economia do Turismo</b>	Econ
<b>Economia e Estratégia da Propriedade Intelectual</b>	Econ
<b>Economia e Finanças Públicas</b>	Econ
<b>Economia e Políticas de Desenvolvimento</b>	Econ
<b>Economia Financeira</b>	Econ
<b>Economia Internacional</b>	Econ
<b>Economia Monetária</b>	Econ
<b>Economia Política e Globalização</b>	Econ

<b>Economia Portuguesa e Europeia</b>	Econ
<b>Economia Sectorial</b>	Econ
<b>Economia Social e Solidária</b>	Econ
<b>Estudos em Economia Aplicada</b>	Econ
<b>Introdução à Ciência Económica</b>	Econ
<b>Introdução à Economia</b>	Econ
<b>Macroeconomia</b>	Econ
<b>Macroeconomia I</b>	Econ
<b>Macroeconomia II</b>	Econ
<b>Macroeconomia Internacional</b>	Econ
<b>Microeconomia</b>	Econ
<b>Microeconomia I</b>	Econ
<b>Microeconomia II</b>	Econ
<b>Políticas de Competitividade e Coesão</b>	Econ
<b>Teoria dos Jogos Aplicada à Economia</b>	Econ
<b>Econometria I</b>	Ecot
<b>Econometria II</b>	Ecot
<b>Direito das Sociedades Comerciais</b>	EL
<b>Direito do Trabalho</b>	EL
<b>Direito dos Negócios</b>	EL
<b>Direito Económico</b>	EL
<b>Electrónica Programada e Processamento Digital de Sinais</b>	Ele
<b>Fundamentos de Electrónica</b>	Ele
<b>Teoria dos Circuitos</b>	Ele
<b>Análise e Finanças de Empresa</b>	Fin
<b>Análise e Modelos de Dados Financeiros</b>	Fin
<b>Avaliação e Reestruturação de Empresas</b>	Fin
<b>Cálculo Financeiro</b>	Fin
<b>Finanças de Empresa</b>	Fin
<b>Finanças Internacionais</b>	Fin
<b>Fusões, Aquisições e Avaliação de Empresas</b>	Fin
<b>Gestão de Activos Financeiros</b>	Fin
<b>Gestão Financeira de Empresas e Projectos I</b>	Fin
<b>Gestão Financeira de Empresas e Projectos II</b>	Fin
<b>Gestão Financeira I</b>	Fin
<b>Gestão Financeira II</b>	Fin
<b>Introdução às Finanças</b>	Fin
<b>Investimentos</b>	Fin
<b>Modelização Financeira e Plano de Negócios</b>	Fin
<b>Projecto Empresarial em Finanças</b>	Fin
<b>Introdução à Geografia Humana</b>	Geo
<b>A Economia Mundial nos Séculos XIX e XX</b>	Hist
<b>A Europa e o Mundo Após 1945</b>	Hist
<b>A Europa e o Mundo Entre as Guerras</b>	Hist
<b>A Europa e o Mundo no Século XIX</b>	Hist
<b>As Revoluções Liberais em Portugal</b>	Hist



<b>Colonialismo e Descolonização na Época Contemporânea</b>	Hist
<b>Colonialismo, Pós-Colonialismo e Antropologia</b>	Hist
<b>Formação do Portugal Moderno</b>	Hist
<b>Guerras e Revoluções na Europa Contemporânea</b>	Hist
<b>História Contemporânea da Energia</b>	Hist
<b>História da Construção Europeia</b>	Hist
<b>História da Cultura Moderna</b>	Hist
<b>História da Europa Moderna</b>	Hist
<b>História da Expansão Portuguesa</b>	Hist
<b>História da Guerra-Fria</b>	Hist
<b>História dos Estados Unidos da América</b>	Hist
<b>História Económica e Social</b>	Hist
<b>História Moderna Comparada</b>	Hist
<b>História Política Contemporânea</b>	Hist
<b>História Política Contemporânea de Portugal</b>	Hist
<b>História Urbana</b>	Hist
<b>Introdução à História Contemporânea</b>	Hist
<b>Laboratório de História</b>	Hist
<b>Marginalidade e Controlo Social</b>	Hist
<b>Metodologia do Trabalho Historiográfico</b>	Hist
<b>Portugal Após 1974</b>	Hist
<b>Portugal da Regeneração à I República</b>	Hist
<b>Portugal no Antigo Regime</b>	Hist
<b>Portugal no Estado Novo</b>	Hist
<b>Sistemas de Informação: Bibliotecas e Arquivos</b>	Hist
<b>Teorias da História</b>	Hist
<b>Avaliação de Desempenho</b>	HR
<b>Comunicação Organizacional</b>	HR
<b>Deontologia e Competências Profissionais em Grh</b>	HR
<b>Desenho de Sistemas de Recompensa e Carreiras</b>	HR
<b>Desenho de Sistemas de Trabalho</b>	HR
<b>Desenvolvimento do Potencial e Gestão da Formação</b>	HR
<b>Diagnóstico e Mudança Organizacional</b>	HR
<b>Factores Humanos na Gestão</b>	HR
<b>Gestão Administrativa de Pessoal</b>	HR
<b>Gestão de Conflitos e Negociação</b>	HR
<b>Gestão de Equipas</b>	HR
<b>Gestão de Recursos Humanos</b>	HR
<b>Gestão Internacional de Recursos Humanos</b>	HR
<b>Higiene e Segurança</b>	HR
<b>Liderança e Governança Organizacional</b>	HR
<b>Métodos de Investigação</b>	HR
<b>Modelos Organizacionais</b>	HR
<b>Recrutamento e Selecção</b>	HR
<b>Relações Laborais</b>	HR
<b>Técnicas de Desenvolvimento Pessoal</b>	HR



<b>Concepção e Desenvolvimento de Sistemas de Informação</b>	IS
<b>Fundamentos de Bases de Dados</b>	IS
<b>Gestão de Projectos de Tecnologia e Sistemas de Informação</b>	IS
<b>Gestão de Sistemas de Informação</b>	IS
<b>Sistemas de Informação Distribuídos</b>	IS
<b>Sistemas de Informação em Estruturas Organizacionais</b>	IS
<b>Sistemas Informáticos de Apoio à Decisão I</b>	IS
<b>Sistemas Informáticos de Apoio à Decisão II</b>	IS
<b>Direito da Família e da Criança</b>	L
<b>Direito Social</b>	L
<b>Empreendedorismo</b>	M
<b>Estratégia Empresarial</b>	M
<b>Estratégia Organizacional</b>	M
<b>Gestão Comparada Internacional</b>	M
<b>Introdução à Gestão</b>	M
<b>Negociação</b>	M
<b>Projecto Empresarial</b>	M
<b>Álgebra</b>	Mat
<b>Álgebra Linear, Geometria Analítica e Análise Vectorial</b>	Mat
<b>Análise Matemática</b>	Mat
<b>Análise Matemática I</b>	Mat
<b>Análise Matemática II</b>	Mat
<b>Complementos de Matemática</b>	Mat
<b>Matemática</b>	Mat
<b>Matemática I</b>	Mat
<b>Matemática II</b>	Mat
<b>Comportamento do Consumidor</b>	Mkt
<b>Comunicação Integrada em Marketing</b>	Mkt
<b>Direcção Comercial</b>	Mkt
<b>Distribuição e Merchandising</b>	Mkt
<b>Estudos de Mercado</b>	Mkt
<b>Gestão do Marketing</b>	Mkt
<b>Marketing de Serviços</b>	Mkt
<b>Marketing Internacional</b>	Mkt
<b>Marketing Operacional</b>	Mkt
<b>Marketing para as Tecnologias</b>	Mkt
<b>Marketing Pessoal</b>	Mkt
<b>Metodologias de Marketing e Negociação Comercial</b>	Mkt
<b>Projecto de Marketing Empresarial</b>	Mkt
<b>Sistemas de Informação de Marketing e Apoio à Decisão</b>	Mkt
<b>Web Marketing e Comércio Electrónico</b>	Mkt
<b>Computação Gráfica</b>	MVCG
<b>Interacção Pessoa-Máquina</b>	MVCG
<b>Multimédia e Computação Gráfica</b>	MVCG
<b>Direito Constitucional e Administrativo</b>	NEL
<b>Investigação Operacional</b>	OR

<b>Investigação Operacional I</b>	OR
<b>Investigação Operacional II</b>	OR
<b>Circuitos para Comunicações</b>	PE
<b>Electromagnetismo</b>	PE
<b>Mecânica e Electricidade</b>	PE
<b>Ondas e Ótica</b>	PE
<b>Ciência da Administração</b>	PP
<b>Esfera Política e Opinião Pública</b>	PP
<b>Estado e Políticas Públicas</b>	PP
<b>Metodologias de Avaliação</b>	PP
<b>Metodologias de Planeamento</b>	PP
<b>Modernidade e Questão Social</b>	PP
<b>Sociedade e Políticas Sociais</b>	PP
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<b>Instituições e Políticas Europeias</b>	PS
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<b>Laboratório de Elaboração de Projectos em Ciência Política</b>	PS
<b>Laboratório de Política Comparada</b>	PS
<b>Laboratório de Relatório de Projecto em Ciência Política</b>	PS
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<b>Política e Relações Internacionais</b>	PS
<b>Sistemas e Comportamentos Eleitorais</b>	PS
<b>Sistemas Políticos Comparados</b>	PS
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<b>Teoria Política: Contemporânea</b>	PS
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<b>Avaliação Psicológica</b>	Psy
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<b>Competências Académicas II</b>	Psy
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<b>Epistemologia e Fundamentos do Pensamento Crítico</b>	Psy
<b>Género, Emoções e Poder</b>	Psy
<b>Grupos e Relações Entre Grupos</b>	Psy
<b>História da Psicologia</b>	Psy
<b>Introdução à Psicologia Social</b>	Psy

<b>Métodos de Investigação Qualitativos</b>	Psy
<b>Métodos de Investigação Quantitativos</b>	Psy
<b>Métodos e Áreas de Aplicação da Psicologia</b>	Psy
<b>Neuropsicologia</b>	Psy
<b>Percepção de Pessoas e Relações Interpessoais</b>	Psy
<b>Percepção, Atenção e Memória</b>	Psy
<b>Psicofisiologia e Genética</b>	Psy
<b>Psicologia da Educação</b>	Psy
<b>Psicologia da Personalidade</b>	Psy
<b>Psicologia da Saúde e Clínica</b>	Psy
<b>Psicologia das Organizações e do Trabalho</b>	Psy
<b>Psicologia do Desenvolvimento da Criança e do Adolescente</b>	Psy
<b>Psicologia do Desenvolvimento do Adulto</b>	Psy
<b>Psicologia Social</b>	Psy
<b>Psicologia Social e das Organizações</b>	Psy
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<b>Análise de Dados em Ciências Sociais: Descritiva</b>	SDA
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<b>Análise de Dados em Ciências Sociais: Modelos de Dependência</b>	SDA
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<b>Estatística e Análise de Dados I</b>	SDA
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<b>Introdução à Sociologia</b>	Soc
<b>Laboratório de Elaboração de Projectos em Sociologia</b>	Soc
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<b>Laboratório de Relatório de Projecto em Sociologia</b>	Soc
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<b>Sociologia da Ciência, Tecnologia e Inovação</b>	Soc
<b>Sociologia da Comunicação</b>	Soc

<b>Sociologia da Cultura</b>	Soc
<b>Sociologia da Educação</b>	Soc
<b>Sociologia da Família</b>	Soc
<b>Sociologia da Informação e das Redes</b>	Soc
<b>Sociologia da Saúde</b>	Soc
<b>Sociologia da Vida Quotidiana</b>	Soc
<b>Sociologia das Migrações Internacionais</b>	Soc
<b>Sociologia das Organizações</b>	Soc
<b>Sociologia do Ambiente</b>	Soc
<b>Sociologia do Consumo e dos Estilos de Vida</b>	Soc
<b>Sociologia do Direito</b>	Soc
<b>Sociologia do Género</b>	Soc
<b>Sociologia do Trabalho</b>	Soc
<b>Sociologia dos Média</b>	Soc
<b>Sociologia Económica</b>	Soc
<b>Sociologia Rural</b>	Soc
<b>Sociologia Urbana</b>	Soc
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<b>Teorias Sociológicas Contemporâneas</b>	Soc
<b>Teorias Sociológicas: as Grandes Escolas</b>	Soc
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<b>Intervenção Social com Pessoas Idosas</b>	SW
<b>Laboratório de Ética e Profissão em Serviço Social</b>	SW
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<b>Metodologias do Serviço Social na Saúde</b>	SW
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