

# The Relationship between Students' Study Time and Academic Performance and its Practical Significance

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**Abstract.** Students' study time and academic performance can reflect their learning status. This study investigates the relationship between study time and academic performance by analyzing the number of selected courses, study time, and grades provided by open-source data sites. The effect of study time on academic performance was studied using linear regression. Studies have observed a positive relationship between study time and academic performance. When the study time reaches a certain standard, the grade will no longer show a significant change. This paper can assess students' learning status and help them plan their study time reasonably.

**Keywords:** Academic Performance; Study Efficiency; Time Investment.

## 1. Introduction

### 1.1 Background

Nowadays, people have been increasingly competitive since their student days due to the vast population base when they apply for a higher-level school or better job. According to a survey of more than 200 employers by the American Association of Colleges and Employers, 67% of companies said they screen candidates by GPA (Davies & Hammack, 2005), which can reflect the importance of academic success on future careers. In order to achieve success, students not only have to use the appropriate skills, but also put in a lot of effort. Effort is central to strategy use which, in turn, results in improved academic performance (Meltzer, 2001). The effort can be reflected by the engagement of students in school and the levels of engagement can be estimated from the amount of time spent on academics (Ed, 1992).

Learning takes time and curricula are designed to provide students with opportunities to learn during classes and during time for self-study (Genesee, 2000). It is generally considered that, as more time is spent on learning, performance will be better. At the same time, students are full of confusion about their future career development during the student period. They may spend time on their hobbies to find future goals which could make them balanced the time allocation between hobbies and learning, resulting in problems such as grade decline due to unreasonable time allocation. Issues with school performance can lead to more problems, such as family conflicts or loss of interest on learning. The research shows that the social and emotional climate of family relationships is adversely affected by poor school performance; at the same time, family atmosphere is a mediating, factors problems which may result from school failure (Hurrelmann et al., 1988).

Whether the investment of study time is related to academic performance is a controversial issue. One the one hand, the research shows that academic performance has a positive relationship with the study time, and students with low performance especially increase their performances with increased study time (Spitzer, 2022). In this article, based on his conclusions, analyzing the further impact as the study time keeps increasing, trying to find the limitation of the time investment.

On the other hand, some people have an Opposite view on this conclusion. The total time students spent working during a given week did not directly affect academic performance (Sarath, 2006). The conclusion may be led by the method he collected samples. Distributing surveys to students may not feel comfortable providing answers that present themselves in an unfavorable manner. Also, since students may have different foundations in high schools, the result could be inaccurate.

All in all, this research will analyze the relationship between study time and academic performance based on the data collected from two Portuguese secondary schools. The marginal contribution of research lies in that school reports and questionnaires are used simultaneously to avoid some research

biases. Then, the grades of Portuguese can objectively test the students' academic performances, since the investment of student time will have more pronounced feedback on grades.

## 1.2 Literature Review

The SWQ's current field size shows that academic issues are the biggest concern for students, even more so than finances and health (Davey et al., 2021). Does the longer you study, the better your grades will get? This research problem may be concerned by many scholars and students.

In addition, further testing the impact of different educational methods on students' learning efficiency can help teachers discover the suitable educational methods for their students.

For students, self-awareness about study time means self-control of study state, and can compare their study state with others, to understand and adjust their study methods and better plan study time. Finally, this can make them no longer be confused about learning, increase their enthusiasm for learning and reduce their anxiety about learning. By leveling the study efficiency, it would lead to good grades.

## 1.3 Main Contents

This study aims to study the relationship between study time and academic performance. This research will be answered in following questions: (1) Whether the study time will affect the students' academic performance? (2) If it is, how does study time affect academic performance?

## 2. Data and Method

### 2.1 Data Source

Data for this study came from a survey in two Portuguese schools. The data includes student grades, demographic, social and school related features by using school reports and questionnaires. The dataset received questionnaires from 651 students. 386 of them are female students and 265 of them are male students.

### 2.2 Measures

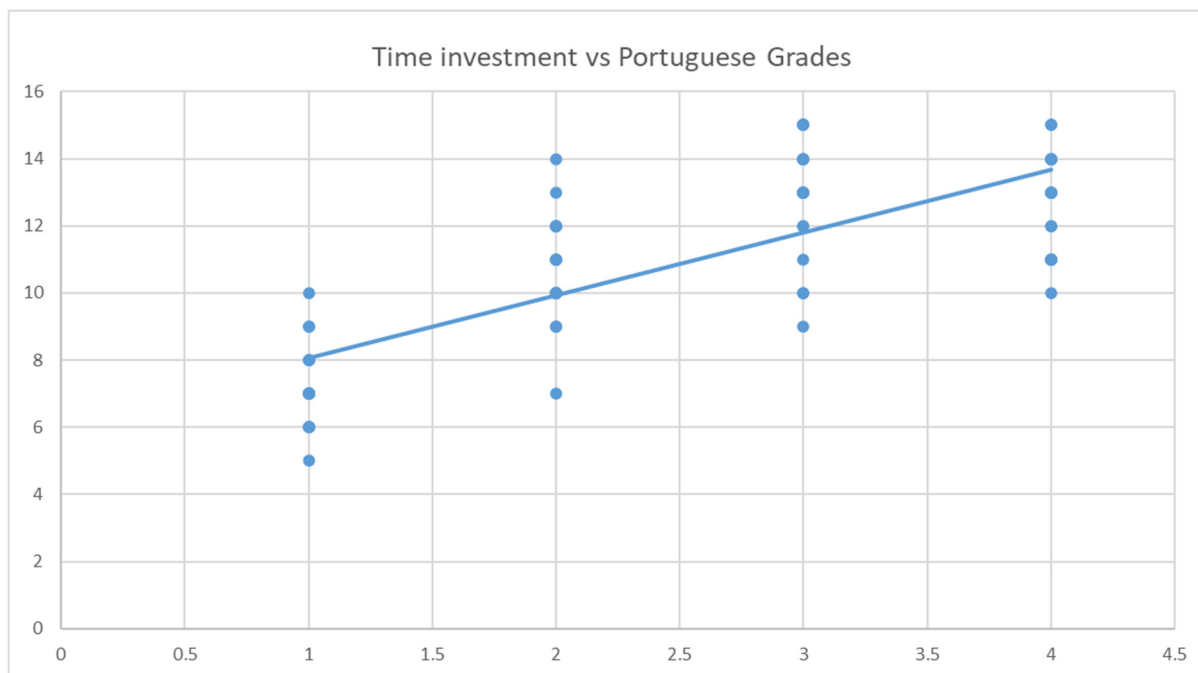
The academic performance of a student can be reflected by the grades of the student which was discussed in this research. In this case, firstly, students' performance was measured by the test in a subject: Portuguese language (por). The grade of the test was out of 20.

Secondly, the study time was measured by 1-4 scale (1 = less than two hours of study time per week, 2 = 2 to 5 hours of study time per week, 3 = 3 and 4 = 5 to 10 hours and more than 10 hours). For each set, 20 students were chosen (10 boys and 10 girls) which are used to control variables, and to facilitate and find patterns.

### 2.3 Method

The primary method of the study is called linear regression. By plotting the study time of each student and its corresponding grades. The linear regression model aims to find the best fit line of the plot diagram. The best fit line is relating to the formula  $y = mx + c$ . For this study, the variable X represents the students' study time and Y represents the Portuguese grades. m and c are the gradient and constant values defining the straight line. To compute the linear regression, the approach introduced is called the least-square method which minimizes the squared difference between the actual data points and a straight line. In this case, the values of m and c seeked is to minimize the squared difference SD.

## 2.4 Result and Discussion



**Figure 1.** The Portuguese Grades of Student in Each Time Period

	Slope	SE	t	p
Intercept	6.2	0.485422	12.77239	8.33E-21
X variable	1.87	0.177251	10.55001	1.12E-16

**Figure 2.** Result of Time Investment on Study

## 3. Result

From the Figure 1, it can be seen that there's a positive linear relationship between the time investment on study and students' grades which can indicate the more study time, the better academic performance. However, there's a limitation which can be seen from the Figure 1. When the study time reaches 3 (5-10 hours), the student's grade has no significant change compared with 4 (over time hours). As we see from Table 2, the coefficient of variable X is 1.87 which also indicates the positive relation between X and Y.

## 4. Discussion

Study time was recognized as an important factor for students' grade. Students need different levels of effort based on their knowledge difficulty, learning ability, and career goals. Firstly, students should invest the necessary study time if they want to get better grade. Secondly, academic performance does not need to make further requirements on the amount of study time, and the main point is to improve the learning skills. For example, they can make good use of the time and find suitable learning methods. Otherwise, it will not make much difference no matter the time invested more or less. Students should not blindly pursue the length of learning time, but should focus on the learning quality in each hour. Reasonable improvement of study efficiency can not only save learning time, but also allow students to have extra time to explore extracurricular interests. All in all, it is essential to spend enough time, but it is even more critical to get learning benefits during this period.

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