Study time analyzed on a per-semester basis
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STUDY ANALYSIS

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This paper is dedicated to the grind!

Abstract. This paper aims analyze the relationship between study time and academic achievement. It is based on data collected by the author for 17 weeks during the span of the first semester at the Faculty of Natural Sciences in Sarajevo. The aim of the paper is to prove that by studying, people can no doubt achieve their academic goals for the semester. It finds that motivation plays a big role in commitment to increasing study time.

1. Introduction and preliminaries

After recording data for approximately 17 weeks, my friend that goes by the initials N.K. (klix.ba reference) gave me the idea to write a paper based on the data, so I said "bet" and decided to write it using a LaTeX editor just for the hell of it. The data collected by me is real and has not been falsified, I tried to be as accurate as possible when recording it, but as you (the reader) will see later on in the paper, motivation will play a great role in how detailed the documentation stays over time.

1.1. **Data introduction.** The data was recorded using the popular note/management application "Notion" which is used by many in the tech industry to keep records and improve time management. After being introduced to the app by a friend, I was pleasantly surprised to see how easy it made managing my own time. The data was recorded manually, every day, for 17 weeks. In some cases the data was recorded the next day (or even days after), but the main goal was to record data the same day. The data was collected for the 4 subjects I had for that semester: Analysis I, Elementary Mathematics, Introduction to Mathematics and Programming I. The first three subjects respectively, are PMAT subjects (Pure Math), while the last one is a CS (Computer Science) subject. In total, the semesters load summed up is 25 ECTS (European Credit Transfer and Accumulation System) points. The reason for this is that I am retaking my first year of university due to academic negligence, but have passed one subject, Computer Systems which is a CS subject, that carries 5 ECTS points. In total, the semesters load should have been 30 ECTS, but during my 2023/2024 school year, it carried 25 ECTS points. For the first partial exams I had to prepare for

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Analysis I and Elementary Mathematics, while for the second partial exams and finals I had to prepare for all of the mentioned subjects.

The different types of data I collected is as follows:

(1) Total independent study time: The most important part of academic success, independent study.

(2) Total study time: This is the total time spent studying when adding classes and independent study.

(3) Physical workout time: I believe that physical workout impacts the mental state of students, thus it should be practiced.

(4) Reading time: I tried reading at night to calm my brain and fall asleep easier.

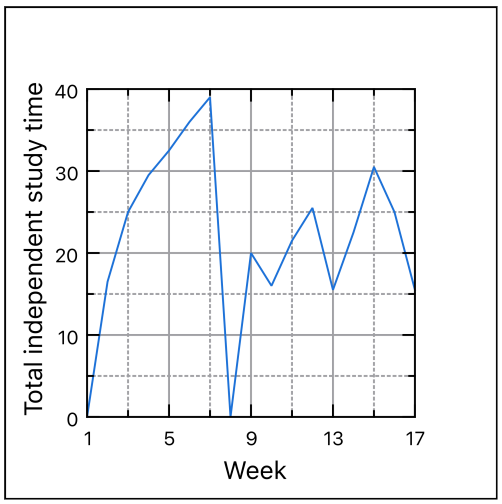
(5) Usefully spent time: This is the sum of all the time spent on matters I found beneficial (studying, working out, attending classes and reading).

(6) Remaining time after obligatory tasks: Calculated the remaining time left after every weeks obligatory tasks (Eating, sleeping, studying etc.). I counted the remainder mostly as wasted time, since I believe it could have been used better.

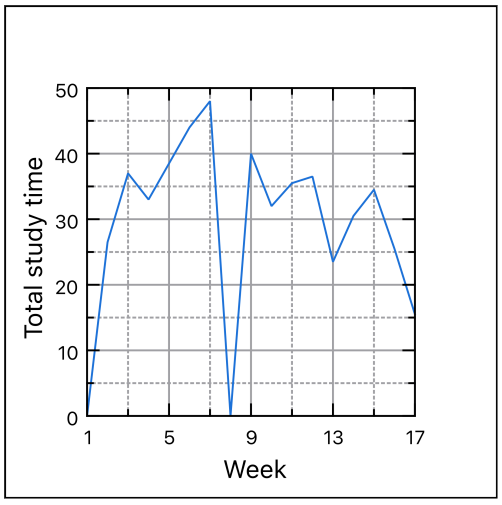
I think it is important to note that I did track more data, but I do not think it is necessary to present it here. The main data plot I am leaving out is the "Time spent in classes" data plot, as it basically brings nothing new to the table, and only shows how much time I spent in class, which can be deducted by subtracting the graphs for "Total study time" and "Total independent study".

2. Main results

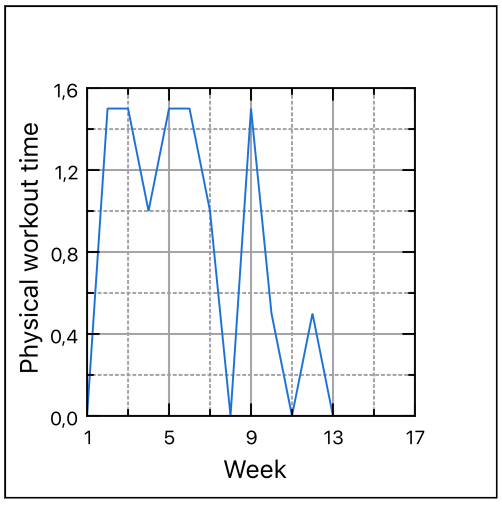
The results will be divided into sections. First, I will plot the following data in order: the "Total independent study" data, the "Total study" data, the "Physical workout time" data, the "Reading time" data, the "Usefully spent time" data, and the "Remaining time after obligatory tasks" data. Following those plots I will discuss what the data shows which might be of interest. An important thing to note about the data collected is that there are two dips in all the following data plots. The first one is in the first week of the semester, while the second one is in the eighth week of the semester. Those two dips happened due to me not recording the data for those weeks. The lack of data for the first week of the semester is because I was still figuring out what I wanted to do. The lack of data for the eighth week of the semester is due to the fact that I was under great study load, and I disregarded my data collection. I will analyze the following data disregarding those two weeks, because I have no data to base any conclusions from. I did not have classes any way for the duration of the eighth week, and the first week I was injured so I was unable to attend classes. I did study during those two weeks but I will not falsify data so I prefer to leave them blank.



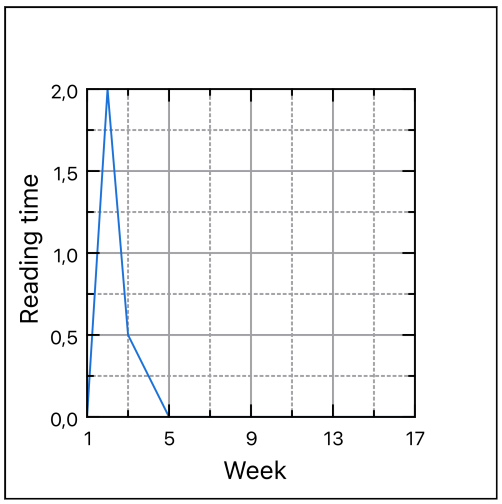
Looking at Figure 1 (Non-captioned), we can notice that we have a couple of dips in the graph line. The first one happens in the first week and the second one happens in the eighth week, as noted earlier. It is obvious that as the semester progressed, that the Total independent study time increased. The graph peaks in the sixth week. The seventh and eighth weeks were the exam weeks for the semester, which might explain why I studied less during that time, as I was tired from taking the exams. Naturally, motivation to study does not last long enough to last the full semester, so it is miraculous that it lasted for the seven weeks that it did. Looking at the data, we can see that after the first exam period that the graph stayed relatively low, compared to the weeks before, and the graph does not rise as fast as it did at the beginning. That could be interpreted as burnout, which is hard to counter, and is not easily curable without a longer break. In my personal experience, what follows burnout is a lack of motivation, which could be detrimental to ones academic success if it happens at the wrong time. It happened to me during my final exams, but due to the fact that I prepared very well previously, I was not caught off-guard and I managed to pass all my exams. It could be concluded that with preparation beforehand, loss of motivation can be mitigated and success can still be achieved.



Now, observing Figure 2 (Non-captioned), we can notice the same trend. There are two dips in the graph, in week one and week eight. In essence, this graph (which includes time spent in classes in addition to including time spent studying independently) follows much of the same trend up to the eighth week, as did the previous graph (Figure 1). The graph is only elongated along the y-axis due to more time being spent productively. But after week eight, we can notice that the graph in Figure 2 is in decline, while in Figure 1 it was increasing. That is due to the fact that less classes were attended after week eight, even tho I had more subjects to study for. I attended all the classes that I had to, which means that we were cut short on classes due holidays and other planned breaks.



Let's look at Figure 3 (Non-captioned), where we can see the total time spent working out. My goal was to spend about thirty minutes, three days a week, working out. Once again, we have the same dips as in the previous graphs. It is visible that every week up until week eleven, there was some type of activity. After week eleven there was short activity and week twelve and after that the graph stagnates. My personal analysis shows that as the final exams approached, my motivation to workout took a nose-dive, which resulted in less gains. Working out did not affect my academic success noticeably, but the fact remains that working out would have benefited me. Another thing to note is that it is impossible that I did not have enough time to devote at least thirty minutes for three days a week to improve my physical prowess. It is interesting to see how much studying can affect ones motivation to workout regularly. I also noticed a dip in how tired I was during the day after neglecting working out. Before week thirteen I would come home and do a quick workout on the days I designated, but after week thirteen I would often come home and take a longer nap, usually between an hour and two hours, which would be understandable if I was not getting eighth hours of sleep a night most of the time.



Looking at Figure 4 (Non-captioned), we have the plot of the total reading during the semester. Sadly, there is not much to be seen here. The graph shows I spent a very small amount of time reading during the semester. This data does not include reading related to classes, only reading that I did for my own enjoyment. There is a huge dip after week two and a total stagnation after week 5. I wish I had read more during the semester but it is what it is. I do not think it has anything to do with motivation, and has everything to do with addicting devices taking my attention away from things I think would benefit me more in the long run.

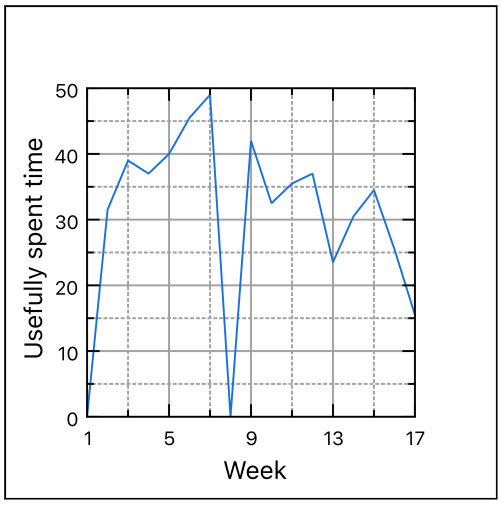


Figure 5 (Non-caption) presents the total time spent usefully during the semester (in my opinion). As stated earlier that data includes studying, working out, attending classes and reading. Once again, we can notice a very rapid increase in the graph before week eight, but after week eight we can notice a significant decline. The graph roughly follows the same trends as the graphs in Figures 1 and 2 (Which are not captioned), so there is not much to comment on here.

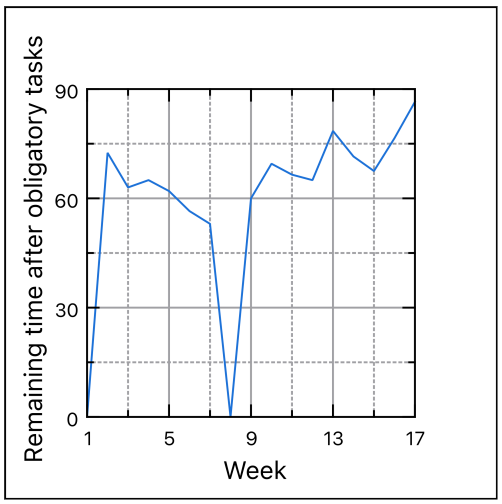


Figure 6 (Non-captioned) where the remaining time after all the obligatory tasks is shown, is the only graph where it is preferable to have a declining slope. The way I calculated the total remaining time is by adding the times for the usefully spent time during the week, then subtracting it from the total time a week has (189 hours), then subtracting the total time sleeping (56 hours approximately) and finally subtracting the commute time (10 hours approximately). As previously, there are dips in week one and week eight. This graph roughly follows the opposite trend of the graph in seen in the previous Figure (Figure 5).

3. Conclusion

As seen in the previous six graphs, there is an obvious correlation between the time passed and the amount of motivation an individual could have to commit to studying. I think it also important to note that even though motivation is lacking, that does not mean that one can not do well academically, if the work has been put in beforehand. In my case, because I studied diligently during the first half of the semester, my results later did not suffer because I did the bulk of the work beforehand. The apparent work put in during the weeks 1 - 8 obviously paid off and balanced out the decline in work being put in during weeks 9 - 17. If one would want to maximize and keep increasing their productive time, I believe it is key to find creative ways to motivate oneself. In other words, once one notices a dip in motivation, it is time to find a new reason to motivate oneself. One final thing I noticed when studying is that when I feel like I know enough to pass, I will lose motivation, even though it might still not be enough to pass. That fact also contributed to my decline in study time towards the end of the semester. Thanks for reading, until the end of the next semester!

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