

How does a student's time spent at work affect the amount of
credit-hours he/she takes per semester?

Devika Lalsinghani, Principle Investigator

Taylor Malott, Co-Investigator

11/21/14

ABSTRACT

The existence of a correlation between credit-hours and hours at work was studied and tested. Random students of the Lonestar College system, particularly those attending the University Park campus, were surveyed. They were each asked how many credit-hours they took each week, and how many hours they worked each week. This data was analyzed using a linear correlation coefficient, and it was found that there is a weak negative correlation between credit-hours and hours worked for Lonestar UP students.

Null Hypothesis: The correlation between hours spent at work per week and credit-hours taken per week is not negative. $H_0: r \geq 0$

Alternative Hypothesis: The correlation between hours spent at work per week and credit-hours taken per week is negative. $H_a: r < 0$

STUDY DESIGN AND EXECUTION

It's important for students just starting college to be informed of the challenges and changes it will bring. As a high school senior preparing for college, I wanted to know whether or not there is a correlation between the time most students spend at work and the time they spend in class, because it would help me plan my work and class schedules before starting the semester.

An article on the University of Michigan–Flint website (which can be found at this link: http://www.umflint.edu/advising/surviving_college) offers the following table as a guideline:

Employment Obligations: Course Load if Working

40 hrs per week — 3-5 credit hours

30 hrs per week — 3-9 credit hours

20 hrs per week — 6-12 credit hours

Less than 20 hrs — 12-18 credit hours

According to this table, in an ideal situation there should be a negative correlation between the number of hours worked per week and the number of hours spent in class per week. In other words, as the number of credit hours increases, the number of work hours decreases. The alternative hypothesis represents this, and so it is the claim that I tested.

Since I am attending a class at Lonestar College's University Park campus, it made sense that the population of interest would be students attending that campus. With the help of the Principle Investigator, 40 surveys were distributed to random students enrolled in the Principle Investigator's statistics classes. They were asked both how many credit hours they take each week, as well as how many

hours they work each week. Finally, I organized the data into a table, and constructed a scatter plot to find the r -value.

ERRORS AND POSSIBLE IMPROVEMENTS

There are several data pairs that, while not technically outliers, do influence the data so that the correlation is weaker. It's possible that with a greater sample size, these data pairs would be balanced out, and the r -value would become stronger (increase). With more time, collecting a larger sample could have been possible.

STATISTICAL TEST

I chose the linear correlation coefficient to test my hypothesis, because I wanted to see how the two variables (hours at work and hours in class) affect each other, if at all. I used a calculator to find the r -value (below), and Apple Numbers to produce the scatter plot and other graphs; doing so by hand would have been difficult since I gathered more than 30 values.

$$r = -0.287$$

There is a weak negative correlation between the two variables

$$H_a: r < 0$$

Alt. hypothesis: The correlation between hours spent at work and credit-hours taken per week is negative.

CONCLUSION

There is enough evidence to support the claim, or alternative hypothesis, since the r -value, and thus the correlation, is negative. As a result of this, I reject the null hypothesis.

APPENDIX A: Table and Summary Statistics

Data-1

#	Credit Hours	Work Hours
1	8.0	37.5
2	12.0	40.0
3	13.0	17.5
4	17.5	0.0
5	13.0	35.0
6	12.0	0.0
7	13.0	40.0
8	13.0	36.0
9	11.0	0.0
10	14.0	30.0
11	16.0	18.0
12	14.0	0.0
13	10.0	16.0
14	10.0	20.0
15	14.0	0.0
16	7.0	20.0
17	3.0	40.0
18	9.0	45.0
19	22.0	4.0
20	12.0	30.0

Data-1-Continued

#	Credit Hours	Work Hours
21	10.0	20.0
22	5.0	50.0
23	7.0	30.0
24	9.0	37.5
25	12.0	75.0
26	12.0	30.0
27	12.0	25.0
28	13.0	0.0
29	12.0	4.0
30	13.0	40.0
31	12.0	20.0
32	6.0	51.0
33	6.0	25.0
34	13.0	15.0
35	15.0	0.0
36	9.0	0.0
37	16.0	30.0
38	8.0	5.0
39	9.0	18.0
40	3.0	4.0

For Credit hours column:

Sample Mean: 11.138**Sample Standard Deviation:** 3.838**Mode:** 12**Min:** 3**Q1:** 9**Med:** 12**Q3:** 13**Max:** 22

Because of the small standard deviation, and the similarity between the mean, median, and mode, I can conclude most Lonestar UP students take about 8-16 credit-hours per week.

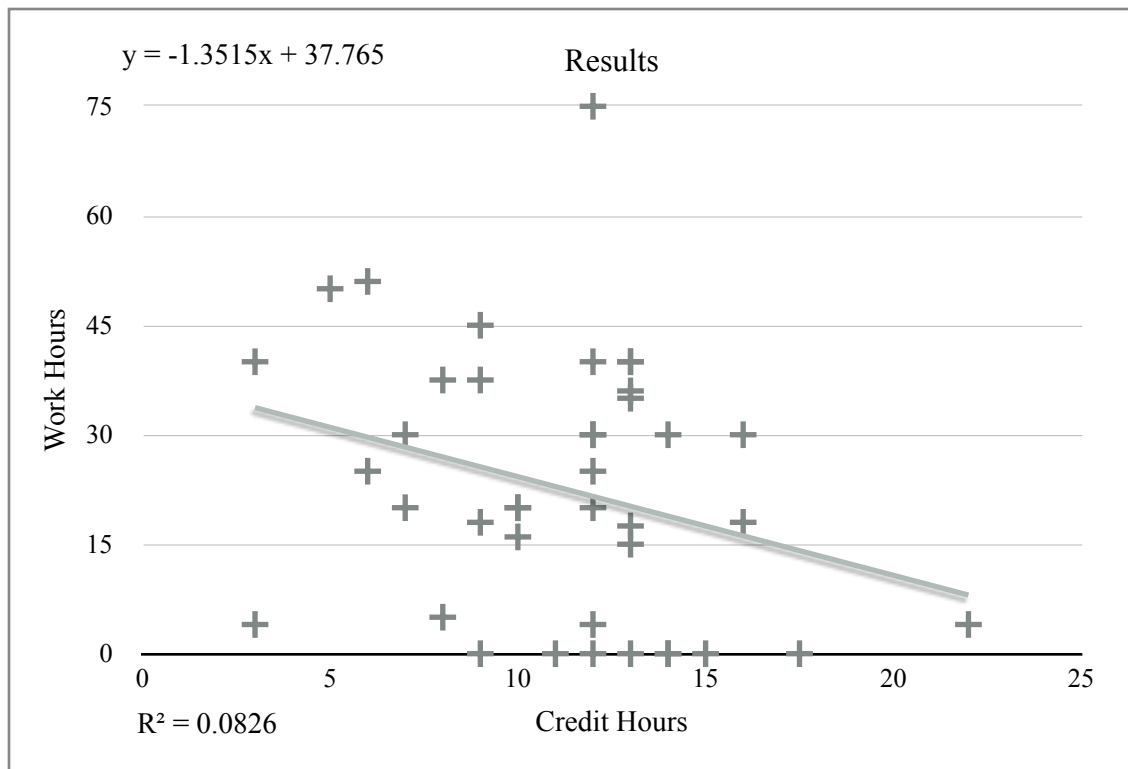
For Work hours column;

Sample Mean: 22.713**Sample Standard Deviation:** 18.052**Mode:** 0**Min:** 0**Q1:** 4**Med:** 20**Q3:** 36.75**Max:** 75

I can also conclude that the work load per student at Lonestar UP varies consistently within the range of 0-40 hours per week.

APPENDIX B: Graphs

In the scatter plot below, you can see the negative trend line. The fact that most of the dots do not fall on the line is why the correlation is so weak. There is still a slight correlation because most of the dots loosely follow the line.



The bar graph below shows how the credit-hours stick around the median of 12, while the work hours vary more.

