

## A10 Survey Analysis

Name: Max Hodgen

Grade: /23

The following is:

- an example of a research question,
- the survey used to gather data, and
- the tabulated results of the survey.

In this case, all the tests required to answer the research question have been specified. You must do the statistical tests and explain the results of those tests. After all tests have been run and explained, you must then answer the research question from the accumulated test results.

**Research Question:** Does the completion of the faculty development program of 10 technology intensive seminars/workshops occurring over one year significantly change the frequency of a teacher's technology integration in his/her classroom and is there a relationship between the age of the teacher and the integration of technology in his/her classroom?

The following five question survey was administered to all twenty participants of the program.

### Technology Integration Survey

1. Current teaching assignment? (Elementary, middle school, or high school)
2. Gender? (Male, Female)
3. What was your age during the time of this program ? \_\_\_\_\_
4. The number of technology integrations in your instruction per week prior to the workshops?  
\_\_\_\_\_
5. The number of technology integrations in your instruction per week in the third year after the workshops? \_\_\_\_\_

Tabulated Survey Results

Copy table and paste it in MiniTab.

ID Number	Level	Gender-alph	Age entering program	Tech Use/week Prior	Tech Use/week After
1	High	M	24	1	4
2	Elementary	F	36	2	4
3	High	F	54	1	1
4	Elementary	M	36	1	3
5	High	M	27	2	2
6	Middle	F	32	3	4
7	High	M	24	4	6
8	High	F	39	1	2
9	Elementary	M	27	2	5
10	Elementary	F	44	1	2
11	Middle	F	32	1	4

12	Middle	F	39	2	4
13	High	M	30	2	3
14	Middle	F	42	1	3
15	Middle	F	37	0	2
16	Elementary	M	36	1	1
17	Elementary	F	39	1	2
18	Elementary	F	44	0	4
19	High	F	43	2	4
20	Elementary	M	25	3	4

3. Using Minitab:

- a) For the three *measured* responses, calculate the descriptive statistics and paste the results of the Session Window in the box below (1 point)

Sessions Window:									
Descriptive Statistics: Age, Tech Prior, Tech After									
Variable	N	N*	Mean	SE Mean	StDev	Minimum	Q1	Median	Q3
Age	20	0	35.50	1.78	7.94	24.00	27.75	36.00	41.25
Tech Prior	20	0	1.550	0.223	0.999	0.000	1.000	1.000	2.000
Tech After	20	0	3.200	0.296	1.322	1.000	2.000	3.500	4.000
Variable	Maximum	Range							
Age	54.00	30.00							
Tech Prior	4.000	4.000							
Tech After	6.000	5.000							

- b) Explain what the descriptive statistics tell us about the three measured variables. (4 points)

The average age of the 20 teachers was 35.5 years old which is just slightly less than the median, which indicates that the average of the lower half of ages is farther away from the median than the average of the upper half of ages. The standard deviation of the ages is 7.94 meaning that it is expected that around 2/3 of the teachers should be between the ages of 27.5 – 43.5. The mean of the weekly integration of technology prior to the faculty development program was 1.55 compared to a mean of 3.2 after the program. The standard deviation is higher for the technology group after the faculty development indicating a larger spread of the data. This can be expected because the mean and the range of the ‘prior’ group is less the ‘after’ group.

- c) Do a correlation for each of the three sets (pairs of variables) of measured variables and paste the results of the Sessions Window in the box, below. (1 point)

Sessions Window:
Correlations: Age, Tech Prior
Pearson correlation of Age and Tech Prior = -0.554

P-Value = 0.011

**Correlations: Age, Tech After**

Pearson correlation of Age and Tech After = -0.536  
P-Value = 0.015

**Correlations: Tech Prior, Tech After**

Pearson correlation of Tech Prior and Tech After = 0.590  
P-Value = 0.006

- d) Explain the results of each correlation, above. (6 points)

There is a moderate negative correlation for both correlations done when comparing age to technology integration prior and after, meaning, as the age of the teachers increases the amount of weekly technology integration decreased in both situations. There is a moderate positive correlation for the technology use prior and the technology use after, as the frequency of the technology integration prior to the lessons increased so did the frequency of the technology integration after the lessons. In all three correlations the p-value was very low, less than 5% indicating that there is a low probability that the results were due to random variation.

- e) For each categorical variable tally the responses and place in a table that you make. **To tally categorical variable in Minitab, Go to “Stat,” then “Tables,” then “Tally Individual Variables.”** Place a copy of the table below: (2 points)

Sessions Window:

Level		Gender	
Elementary	8	Male	8
High	7	Female	12
Middle	5		

- f) From looking at the descriptive statistics, the average number of uses of technology prior to the workshops was lower than the average number of uses after the workshops. To determine if the change was significant, run the paired t-test on the two variables and paste the results of the Sessions Window in the box below.

(1 point)

Sessions Window:

Paired T for Tech Prior - Tech After

	N	Mean	StDev	SE Mean
Tech Prior	20	1.550	0.999	0.223
Tech After	20	3.200	1.322	0.296
Difference	20	-1.650	1.089	0.244

95% CI for mean difference: (-2.160, -1.140)  
T-Test of mean difference = 0 (vs not = 0): T-Value = -6.77 P-Value = 0.000

g) Explain what the paired t-test indicates. (2 points)

The paired t-test indicates that there is a significant statistical difference between the means because of such a low p-value.

4. Summarize the test results, in paragraph form, to answer the research question. (6 points)

**Research Question:** Does the completion of the faculty development program of 10 technology intensive seminars/workshops occurring over one year significantly change the frequency of a teacher's technology integration in his/her classroom and is there a relationship between the age of the teacher and the integration of technology in his/her classroom?

According to the data provided by the surveys one can conclude by performing a paired t-test that there is a significant statistical difference between the frequencies of a teacher's technology integration into their classroom. Looking at the descriptive statistics and the mean in particular, we see over a 100% increase in the amount of technology integration after the faculty development program. The p-value of 0.000 of the paired t-test confirms that these results are not due to random variation. In summary, I would say that the program was successful.

There is moderate negative correlation between the age of a teacher and the amount of integration into their classroom, the younger the teacher the more technology integration into their classrooms. These results are not surprising; most young educators have been trained on how to incorporate technology through their educational training. The correlations tests both revealed low p-values confirming that this relationship has a low probability of being due to some random variation.