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Facebook or Not? A Study of the Affect on Test Scores when Studying on Facebook

Acknowledgments

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Introduction

The researcher has noticed during her two years of high school while Facebook has been popular, that many of her fellow students often study while chatting on Facebook. The researcher wondered if test scores changed when the students were multitasking by chatting on Facebook while studying. The researcher's hypothesis was that if a student had studied while chatting on Facebook, then that student would not study efficiently and would therefore get a lower test score than another student who had studied without chatting on Facebook. For this study, the independent variable was whether or not the student was chatting on Facebook while studying the given material before the test. The dependent variable was the score that the student received on the test over the information.

Research shows that if you were to try to learn something new without any distractions, the part of the brain called the hippocampus is mainly used. The hippocampus stores conscious memories. When Professor Polanski conducted an experiment to see what part of the brain was used when learning something new while multitasking, he found that the section called the basal ganglia is in use, which stores more "flexible" memories. ("Research news," 2007). Other researchers have found that the brain is not multitasking when you pay attention to the radio, talk on the phone, and drive a car. Instead your brain is switching its attention on each task at lightning speed (Hamilton, 2008).

This generation has grown up multitasking. In the past fifteen years, so much technology has been invented that children can easily do several things at once. Even by seventh grade students are distracted by instant messages, music, and movies on the internet while studying. (Wallis, 2006). Students in this generation think that multitasking actually helps their ability to concentrate; for example listening to music while reading a text book. From this study, the

researcher hoped to learn if studying was actually more or less efficient when a student studies with distractions.

Method and Materials

For materials, the researcher needed an online survey site in which to create the tests that the students would take. The researcher used the website Zoomerang.com (“Zoomerang,”). The researcher also need 56 volunteer high school students with a variety of GPAs, ages (from 14-18), and an equal number of boys and girls. The researcher recruited 28 students to study while chatting on Facebook and then take the online test over the material, and 28 students to study without Facebook and then take the same test. These students were all friends of the researcher on Facebook, and when they took the test some were located halfway across the world.

First the researcher found the material that the students would use to study for the test. The researcher used a PSAT practice reading comprehension passage for the study material (see **Appendix A** for the sample). Then to create the test that the students would take, the researcher created questions about the passage using five of the six Bloom’s Taxonomy levels of questioning (“Levels of questions,”). She also used some of the questions that were on the PSAT practice website (“Reading Comprehension Practice,”). Once the researcher had made the questions dealing with knowledge, comprehension, application, analysis, and synthesis, based on the passage, she created the test (See **Appendix B** for the test questions). The researcher set up the test by putting the passage as well as the instructions for how to take the test on the first online page. Then on the next page, the researcher put the five multiple choice and short answer questions. On the last page, the researcher asked questions about the student’s grade point average, grade, age, and gender.

The researcher created two tests with the same questions and same passage; one for the group that was studying the passage while chatting on Facebook, and one for the group that was studying without Facebook as a distraction. The researcher did this in order to keep the results

separate. Then the researcher divided the group of 56 volunteers to have the same number of males and females, and to have roughly equivalent grade point averages. The 28 students that were to study the passage while chatting on Facebook were told to start a chat conversation with one or more people on Facebook, then set a timer for five minutes. They had five minutes to study the passage while chatting with their friends. The other group of 28 students were told to log out of Facebook, and avoid other distractions as they studied the passage for five minutes. Then, both groups were told to direct their attention solely on the test, and to answer the questions as best they could. Once all 56 students had taken the test, the researcher put all of their answers into a spreadsheet and scored the answers.

Results

This is a list of the scores that each student received on the test after studying the passage without Facebook.

Student	Score (%)
1	30
2	90
3	50
4	70
5	70
6	40
7	40
8	30
9	90
10	60
11	50
12	30
13	70
14	50
15	50
16	80
17	60
18	50
19	10
20	50
21	50
22	70
23	30
24	70
25	90
26	50
27	30
28	50

This is a list of the scores that each student received on the test after studying the passage while chatting on Facebook.

Student	Score (%)
1	70
2	30
3	20
4	70
5	50
6	20
7	70
8	50
9	90
10	50
11	90
12	70
13	70
14	70
15	70
16	30
17	70
18	40
19	10
20	70
21	90
22	80
23	70
24	70
25	80
26	60
27	10
28	50

Figure 1 is a scatter plot of the test scores from the students that were studying without Facebook.

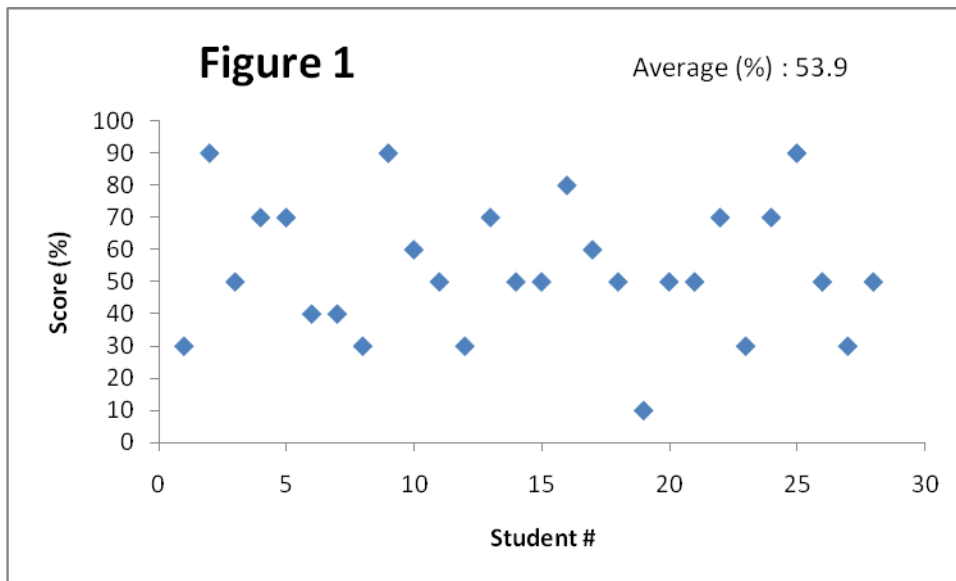
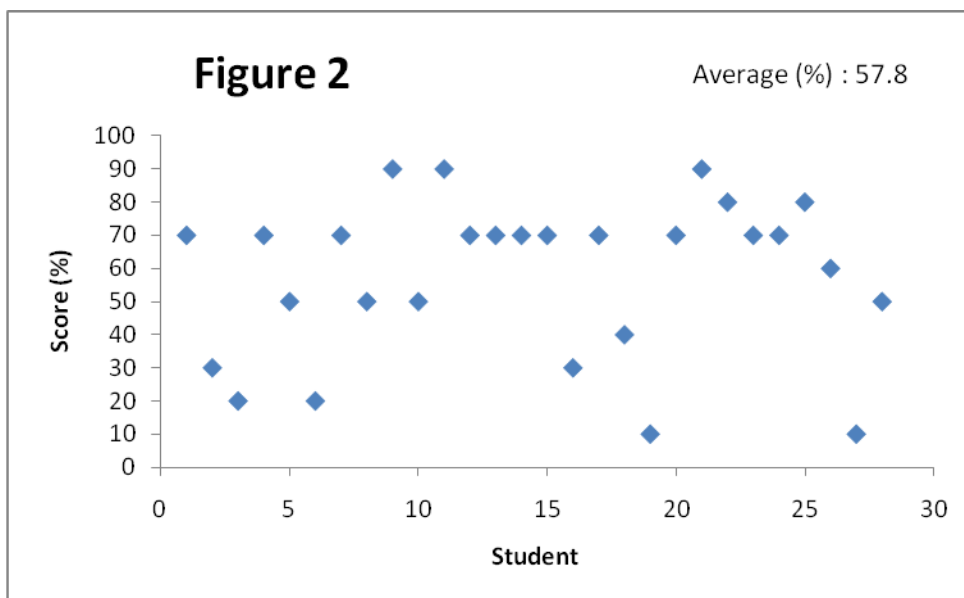


Figure 2 is a scatter plot of the test scores from the students that were studying while chatting on Facebook.



Discussion

Based on **Figure 1** and **Figure 2**, both groups had scattered test scores. The test scores from the group that studied without chatting on Facebook were not generally higher than that of the test scores from the group that studied while chatting on Facebook, like the researcher had thought that they would be. Both groups also had a wide range of data; from 10% to 90%. But the majority of test scores for the group that was studying without Facebook were within 33.5%-74.3% and the majority of the test scores for the group that was studying while chatting on Facebook were within 34.0%-81.6%, based on the standard deviations of each. **Figure 3** shows the averages of each group. The error bars represent where the majority of the test scores were based on the standard deviation. **Figure 4** shows all of the calculated values that were used.

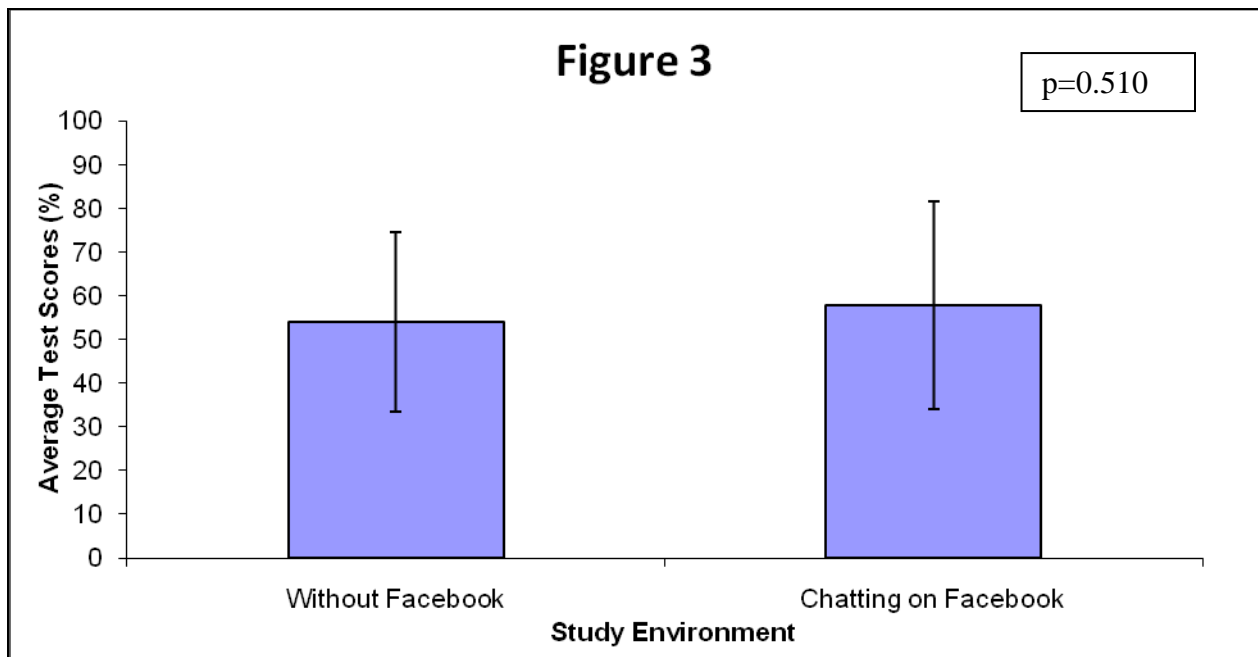


Figure 4			
Group	Average (%)	Standard Deviation	T-test (p=)
Studying while Chatting on Facebook	53.9	20.4	0.510
Studying without Facebook	57.8	23.8	

From the data that the researcher collected, she used a two sample t-test to derive whether or not the difference in the averages for each test group was significant. The average test score for the group that studied while chatting on Facebook was 57.8% while the average test score for the group that studied without Facebook was 53.9%. Though the test score average was higher, as you can see in **Figure 3**, for the group that was chatting on Facebook while studying, the t-test, based on the alpha level of $p=0.05$, shows that it is not significantly different. The p-value that the researcher calculated was $p=0.510$, and because this number is higher than 0.05, studying on Facebook while chatting does not have a significant effect on test scores.

Conclusion

Based on p-value that the researcher found, the hypothesis that if a student had studied while chatting on Facebook, then that student would not study efficiently and would therefore get a lower test score than another student who had studied without chatting on Facebook, was not supported. The null hypothesis that if a student had studied while chatting on Facebook, then that student would study more efficiently and would therefore get a higher test score than another student who had studied without chatting on Facebook, was also not supported. However, the null hypothesis that if a student had studied while chatting on Facebook, then that student would study as efficiently and would therefore get about the same test score as another student who had studied without chatting on Facebook, was supported.

Recently, a similar study has been performed on college students and their grade point averages. Paul A. Kirschner and Arlyn C. Kapinskib together did a study on students, ages 19-54, who studied with social networking websites running, and those that didn't. They found that the GPAs of the group that did not have them running were 20% higher than those who did (Chorney, 2010). But, Kapinskib said that they did not have enough data to determine whether the social networking sites did cause student's GPAs to decrease (Young, 2009). The data that the researcher collected supports that it does not matter whether or not the student studies while chatting on Facebook, that the student will still get the same grade, but there is also not enough data in this case to determine whether this is true.

Though the students may have gotten about the same test scores, the amount that they learned from studying may be different. If the students that were studying on Facebook were using the basal ganglia part of their brain while they were studying the new material, it means that they will probably not remember as much of what they learned in the long term. If the

researcher were to try this experiment again, she would change the method in a way so that she could test this affect. The researcher would have one group of students who first studied the material without any distractions in a controlled environment for a period of time. Then in a number of days, the researcher would administer a test to find what each student would get if they studied without distractions. Next, the same students would be given different material of the same difficulty to study while chatting on Facebook. Then in the same number of days as before they would take a test of the same difficulty to determine how well they remember the material that they had studied while they were chatting on Facebook. The researcher believes that this would be a more effective way to determine the efficiency of studying while chatting on Facebook.

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Appendix A

The passage that students studied to prepare for the test:

“Marie Curie was one of the most accomplished scientists in history. Together with her husband, Pierre, she discovered radium, an element widely used for treating cancer, and studied uranium and other radioactive substances. Pierre and Marie's amicable collaboration later helped to unlock the secrets of the atom.

Marie was born in 1867 in Warsaw, Poland, where her father was a professor of physics. At the early age, she displayed a brilliant mind and a blithe personality. Her great exuberance for learning prompted her to continue with her studies after high school. She became disgruntled, however, when she learned that the university in Warsaw was closed to women. Determined to receive a higher education, she defiantly left Poland and in 1891 entered the Sorbonne, a French university, where she earned her master's degree and doctorate in physics.

Marie was fortunate to have studied at the Sorbonne with some of the greatest scientists of her day, one of whom was Pierre Curie. Marie and Pierre were married in 1895 and spent many productive years working together in the physics laboratory. A short time after they discovered radium, Pierre was killed by a horse-drawn wagon in 1906. Marie was stunned by this horrible misfortune and endured heartbreaking anguish. Despondently she recalled their close relationship and the joy that they had shared in scientific research. The fact that she had two young daughters to raise by herself greatly increased her distress.

Curie's feeling of desolation finally began to fade when she was asked to succeed her husband as a physics professor at the Sorbonne. She was the first woman to be given a professorship at the world-famous university. In 1911 she received the Nobel Prize in chemistry for isolating radium. Although Marie Curie eventually suffered a fatal illness from her long

exposure to radium, she never became disillusioned about her work. Regardless of the consequences, she had dedicated herself to science and to revealing the mysteries of the physical world.” (“Reading comprehension practice,”)

Appendix B

The questions that the students answered for the test:

1. Even though she became fatally ill from working with radium, Marie Curie was never ____.

- A. troubled
- B. worried
- C. disappointed
- D. sorrowful
- E. disturbed

2. Marie ____ by leaving Poland and traveling to France to enter the Sorbonne.

- A. challenged authority
- B. showed intelligence
- C. behaved
- D. was distressed
- E. answer not available in article

3. What element did Marie Curie and Pierre discover?

4. How did Marie Curie's discoveries impact the world as we know it today? (More than one answer may be correct)

- A. The element that she discovered helped to lead to the model of an atom.
- B. The element that she discovered was used with paint to make it glow in the dark.
- C. The element that she discovered is used to aid with glass blowing.

5. Why would Marie Curie continue to work with the element that she discovered if it made her fatally sick?

- A. She thought that discovery was worth her death.
- B. She felt that if she died from it, but discovered all that she could first, she would be the only one that would have to die from poisoning.
- C. She did not know that working with the element would make her fatally sick.

Statement of Humane and Supervised Research

Research involving non-human vertebrates or human subjects was conducted under the supervision of an experienced teacher or researcher and followed state and federal regulatory guidance applicable to the human and ethical conduct of such research.