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Using Chromebooks for Collaboration in a Paperless Classroom

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Abstract

This qualitative action research, explored collaboration using Chromebooks in two paperless, seventh grade English classroom. Students were put into groups of two or more to complete class assignments and peer edit a paper. Data was collected using surveys, multiple class assignments, and observations of students. Students were able to choose the partner(s) they wanted to work with for each assignment. From observations, students either enjoyed working in groups, or loathed working with others. Depending on the dynamics of the class, students were completely engaged when working in pairs, on the Chromebooks rather than face to face. Based on class assignments and projects, most students received a higher grade when working with one other person, rather than multiple people.

Keywords: Engagement, Collaboration, Chromebooks, Paperless classroom,

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When students imagine an English class, they see multiple worksheets, handwritten essays, and long novels to read over a short period of time. Unfortunately, this causes them to believe that English is difficult and monotonous. The rise of technology has made an enormous impact on student life, and teachers are constantly finding themselves having to entertain students somehow. As new standards are being put into place on technology, teachers are learning how to integrate the use of computers into their classrooms. Laptops can be used to engage students and immerse them into the lesson. Students can collaborate and share information or ideas to their peers inside, and outside of class.

The need for technology integration in the classroom has been steadily increasing over time. Students are constantly connected through computers, phones, and tablets, so why not bring those tools into the classroom? Technology use can greatly influence collaboration and engagement. Students are not only face-to-face, but they can send links, share videos and even chat outside of class if need be. Computers can keep students connected in ways that were not possible years ago.

Students are so familiar with technology that the use of laptops may be beneficial. There are many different websites, and applications that teachers can implement in their class to enhance student learning by creating entertaining, but meaningful lessons. Some students may not be able to learn by sitting in a class and hearing a lecture. Some need stimulation, and having computers is one way to satisfy that need. The use of technology is easier on teachers because all the student information can be submitted into one place. There is no more grading papers by hand, technology can get the work done much faster.

Conceptual Framework

There are some schools that have computers for every classroom and sometimes, every student in that class. For schools that are lucky enough to have up to date technology, student learning can be taken to new levels. By using computers, students can interact with material in multiple ways. They can also be used for fun lessons that have students interacting with the material to better retain information. Using computers in the classroom can successfully aid in student collaboration. Students can be engaged face-to-face, or they can be in completely different rooms. In this paper, the role of technology in the classroom and its affect on student collaboration will be explored. Collaboration will be defined along with ways in which technology can be implemented within the classroom.

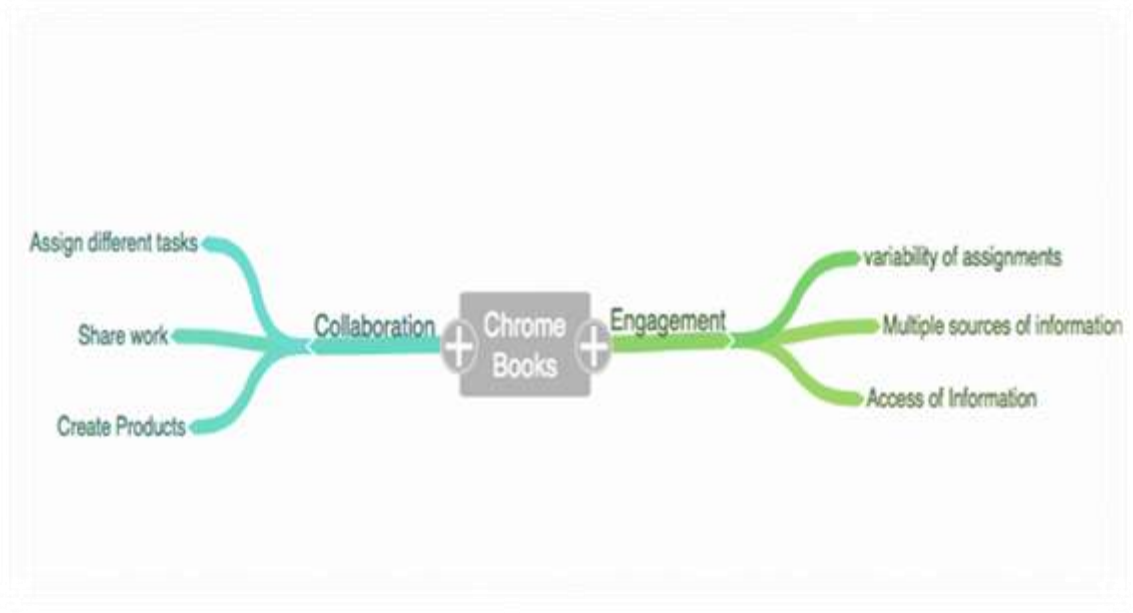

Figure 1: Conceptual Framework

Figure one above shows my conceptual framework surrounding the use of Chrome Books in a middle school classroom. Students can be assigned to different tasks during group work, so that each task can be done efficiently and quickly. Students are also able to share work with one another and create different products such as videos, essays, or visuals by using Chrome books.

These three things can increase collaboration between students. Engagement can be increased because teachers can find fun and exciting assignments each day for students. There are multiple sources students can research, where students will find a wealth of information. Students also may have access to certain academic sites that they do not have access to at home. My hypothesis is that when each class has a set of Chrome Books for students to write, create, and produce work on, there will be an increase in collaboration and student engagement.

Literature Review

Using computers in the secondary classroom can impact student learning in a big way. Computers have slowly been integrated into secondary classrooms over time. Because of the increasing use of technology, Common Core has come up with standards to go by when using technology in the classroom. For schools that use common core, they require that students in an English Language Arts classroom to "thoughtfully and skillfully use digital media and technology to enhance their literacy skills." (Saine, 2013, p. 101). Using computers can engage students in ways that textbooks and worksheets cannot, giving students new ways to participate. There are many other ways that computers are used, which can affect the engagement and collaboration of students in the classroom.

Benefits

Engagement. Student behavior whether emotional or physical, can affect their engagement. There are influences inside, and outside the classroom that can affect student's success. Students need to "feel supported and that they are in a positive setting" (Chase Geldhof, Hilliard, Lerner, & Warren, 2014). If students are emotionally invested in school, and want to do well, they may be more likely to succeed. When teachers are involved in what students do in the classroom, students may feel the need to want to do well for that class. Donovan, Green, and Hartley found that there was a positive correlation between achievement and engagement in students, so students feel comfortable from having the support and ease from their teacher and classmates in the classroom, causing further achievement from students.

Students who are engaged with lessons and class work will also be more likely to understand and remember information. Donovan, Green, & Hartley (2010) note from Doyle (1986), that "Students actively seeking assistance relative to the task or persisting with the task

by completing assigned learning activities were exhibiting on-task behavior" (p. 426). This means the student is immersed and involved with an activity, asking questions, and thinking critically about information given from their teacher. According to the study, the more active students are in their own learning, the more they are likely to be successful in a course. (Chase et. al., 2014; Donovan, et. al., 2010). Students cannot be active by listening to lectures or simple note taking. Students can however, become more active by using technology in the classroom. Maninger and Holden (2009), discovered that "students showed improved engagement, interest, and involvement in both independent and collaborative work, and reported improvements in student problem solving, self-efficacy, work value" (p.18). Computers may be appealing to students, and cause them to work better both individually and collaboratively in the classroom. The more students are interested in what they are learning, the more likely they will work more efficiently.

Collaboration. When students are put into dyads (a pair) or small groups, they are more likely to explain their thinking so that their peers can understand (Marttunen & Laurinen, 2007). Students know how they think, but to explain ideas in their own heads to another student requires more thought. By vocalizing their thoughts or re-telling their ideas, not only are they expanding their own thinking, but they are also adding to their peer's thoughts and ideas. A mixed method study done in the Southwestern United States gave one hundred six students tablet computers. It was found that student and teacher use and integration of technology had a positive impact on collaboration between both students and their peers and teachers. It was found that students collaborate much better on laptops and seem to be on tasks more often than those who do not have laptops. Not just to research or do work, but students were also seeking each other for assistance on the computer when needed. (Maninger and Holden, 2009) These findings may be

due to an increase in student interest. Students may find more of a connection when reading information on a computer, rather than reading it from a textbook.

Access and variability. Using technology in the classroom can have a positive impact on student learning. Paula Saine (2013) believes it is important that "students gain access to technology in school, as this may constitute the single most important opportunity to enhance digital skills that could positively impact their English Language Arts performance on the next generation assessments (p. 103)." Teachers are able to not only use words, but also visuals such as pictures and video to keep students engaged in the lesson. Having access to computers, tablets and even phones gives students a wealth of information they cannot find in their textbooks. Some teachers find, "their students were able to access significantly more information and were exposed to more modes of communication via computer technology than the teachers could ever have provided on their own (Holden, 2009, p.14)." Chrome books or computers can add to texts and give teachers variability in the way they present and instruct their lessons. "Using technology to provide concrete examples or visual materials such as animated models and simulations for abstract concepts proved to be effective for student learning" (Li, 2007, p. 386). When students cannot understand something, they become frustrated and shut down. By seeing new technological strategies, students are able to comprehend an idea they may not have gotten with a textbook. They can see things in a whole new light and are much more interested in continuing the learning process.

Enhancement of learning. Efficiency is increased and time spent searching for topics can be reduced when both students have access to information through technology. This enhances their learning, by gaining results in a quick and efficient way. Having computers in the classroom may be able to "promote study skills, student attendance, and increase student interest

in continued education" (Donovan, Green, & Hartley, 2010, p.427). Students may not be as interested in the traditional way of learning using pen, paper, and textbooks. Computers can peak their interest and create a feeling of excitement. Another positive to having computers in the classroom is that students can become experts in any subject by researching on their own. Maninger and Holden (2009), write that teachers saw themselves as "guides" and students as "leaders" when finding information on the web. If students feel they can be a leader of their own learning, they may be motivated to teach themselves more in the future. Learning to be responsible for information also increases the chance of students continuing that behavior in the future.

Ways to use Chrome Books

Project based learning. Using computers makes it flexible for teachers to plan something new and engaging for students each day, rather than a worksheet or reading a long text, which does not seem as appealing to students. Project based learning is a way to get students to problem solve and interact with each other in ways they would not have been able to without technology (Asan and Hallıloglu, 2005; Holden, 2009). Students can use computers to look up information they will not find in a textbook, and take responsibility for their own learning. Collaboration is a big part of project based learning as well, because students can share the information they find with each other in a fun and interesting way. Students also get to see the bigger picture. This way, teachers are not just listing off things for students to remember and students are actively learning. During the learning process "The teacher acts as facilitator, designing activities and providing resources and advice to students. The students collect and analyze information, make discoveries, and report their results (2005, p. 68). All the teacher must do is help students when they are in need of help finding information. The quality of student

collaboration has been found to greatly improve, when using computers in the classroom. (Asan and Hallıloglu, 2005). Students do not have to rely on receiving information from the teacher and can gain information themselves. Students were able to find the answers on their own and present their findings to the class. Because students are finding their own information, they are also able to increase knowledge, which was found to be true in a study conducted by Cuevas, Russell, and Irving using online modules.

Online modules and web-based learning. Cuevas and Russell's study was between an instructional technologist and a high school literature teacher trying to increase student-reading comprehension in an urban high school through online modules. Online modules are just another way to actively engage students, which increases their interest and success in the classroom (Chase et. al., 2014; Cuevas & Russell, 2014; Donovan et. al., 2010; They found that the group of students, who were given online modules, outperformed the group of students that were given text-based lessons, student comprehension was boosted, and reading skills improved. Students can learn much more information by going through different modules and learning about a topic step by step. "The computer reading package, with its various cognitive tools, did appear to help students to better understand each specific assignment they read" (Cuevas & Russell 2014, p. 459). Modules may be able to help students who need more time learning a certain subject. Modules can further increases student knowledge on a subject by having students synthesize information they have learned. Students can access these modules in class or at home, so if they missed something there are chances to go back over the missed information.

Web-Based Learning tools are a way for students to explore online resources for information. A study by Robin Kay (2010) looked at web-Based Learning tools in secondary math and science classrooms and how they affect student performance. It was discovered to have

a positive impact on students. Kay (2010) writes, “survey data strongly indicated that secondary school teachers thought the WBLTs they used were good quality, engaging tools that supported learning, with average ratings over six on a 7-point Likert scale” (p.78). Students seem to enjoy using Web-Based Learning tools and have and growth in their learning. These tools were reportedly easier to use and interact with by students. By using online tools, students are more likely to be engaged with the information because it is a new way to learn, rather than staring at a textbook. Each of the tools mentioned are a few out of the many that students can utilize to learn, share, and talk about information with their peers.

Student and Teacher Perceptions

Student and teacher perceptions vary in literature found. Many teachers have difficulty in using computers in their classroom because they do not feel confident on using them. They also feel that students do not know how to utilize tools on the computers, and that computers might actually hinder their learning (Saine, 2013). Computers can be hard to understand for someone who is not familiar with how to use it. In a mixed methods study, researchers determined that students felt technology successfully helped aid in their learning (Li, 2007). The more computers were used in the classroom, the more students felt comfortable with navigating the technology. On the other hand, “Nine teachers claimed that they would use technology only for strong students. They believed that the use of technology demands time and certain skills” (p. 389). Some teachers believed that if students were at a low level in their class, they would not use technology. Students had to be knowledgeable of a subject before searching for information. If students are not comfortable with the subject, they may not be able to find appropriate resources to help increase their understanding. Their may be students who are not as familiar with lap tops

and teachers do not have the time to teach both lessons and directions on how to navigate a laptop.

In Florida, because of National Educational Technology Standards (NETS), Teachers in a large district were able to attend workshops on technology regularly. Researchers were trying to find if teachers were using technology for four elements, “research, communication, productivity and problem-solving” in the classroom (Barron, Harmes, Kalaydjian, & Kemker, p. 489). Computers in the study were used both in the classroom and in the computer lab. Researchers believe that all teachers should use technology for the purpose of the found elements above, so that students can learn at an early age how to find and synthesize information before they go into secondary grades. When the same technology can be used across the curriculum, students will see the importance of each element. This also helps students to see that technology is important across the curriculum and will continue to be important even when they go on to college and out into the workforce. The biggest limitation of the study was that teachers were given training to technology use, and not all schools offer this type of training.

Students felt that it was much easier finding information using technology because of the speed in which information was given to them. These students were able to find reliable and up to date information that may not have been in their textbooks. Technology was a way to enhance learning of material so that students could become much more engaged and successful. There was also an increase in confidence and motivation by students to learn and enjoy the information that they found. In another study done by Christensen (2002) on sixty elementary school teachers, were given needs based instruction in the use of introducing technology in their classrooms. As the use of technology increased, teachers started to have positive perceptions, causing them to utilize the technology even more (Christensen, 2002). Teacher perceptions can

be impacted in a positive way if they become comfortable with technology. When well acquainted with the tools they are given, teaching and learning experiences are enhanced. Technology can aid and strengthen lessons. teachers who took technology training also saw benefits in teaching using digital tools (Perrotta, 2013). Teacher perceptions can be impacted in a positive way if they become comfortable with technology.

Conclusion

Integrating computers or Chromebooks into the classroom and using them to collaborate is a very recent trend. There is not much literature on how it can best be implemented or its affects on students. As laptops and handhelds become part of the daily curriculum, teachers and students need to be prepared on how to best utilize technology they are given, so they are not afraid to use it. Using laptops help students prepare for future careers since it is becoming more and more prevalent within the workplace. Laptops engage students by immersing them into the abundance of information that they cannot get in traditional textbooks. Students can become experts in something that even their teacher knows little about. Technology also gives students the independence of being in charge of their own learning, and actively seeking information. There are many different ways students can share and work together to gain a certain goal by collaborating using Chromebooks. Much of the literature on technology is with use in college courses. There is not much literature on the use of technology for student collaboration within the secondary classroom and further research on collaboration using chrome books or laptops to increase student engagement will be done in the following study.

Methods

This study reports the findings of collaboration using Chromebooks in a paperless, seventh grade English classroom. This qualitative study was implemented to further understand how Chromebooks have an impact on how students collaborate with each other face-to-face or through the computer screen. Students were observed in collaborative groups of two or more using the class set of Chromebooks. All lessons observed were considered collaborative and used power points, videos, worksheets, and Google Docs that I created or that students created themselves.

Participants and study site

This study took place in a 7th grade class at a rural middle school in Virginia. There were 4 classes each day, A1, A2, A3, and A4, and B days are B5, B6, B7 and B8. There were a total of 33 students studied from two English classes. In total, there were 11 males and 22 females. Within the participants, there were only two Asian students, two Black students, and the rest Caucasian. Each class is called a Scope class, meaning that each student is an honor student. It does not mean that they are honors in just English, but can also be honors in Math or Science. There was one student with an extensive IEP and one with a 504 plan in the B8 class. All classes are taught by the same teacher and on the same pacing guide. There Chromebooks for each student to use in all classes.

Procedures

Observations. For two weeks, I took field notes on students while they were working in groups of two or more. I observed their behaviors and interactions with each other, and if they were staying on task and engaged with the material. I also walked around to listen to their conversations and asked questions about what they were working on in their groups. Engagement

during my observations means that students were completing the task that is assigned to them, and they were actively working with their partner to finish the assignment. I looked at student body language. Students were considered unengaged if they are playing video games or looking at something that does not have to do with their assignment on the computer, such as looking at homework for other classes or checking email. If students were talking to their partners about something other than the assignment, or talking to peers who are not in their group, along with not facing their partners and looking at other people, I also considered this behavior unengaged. I took handwritten notes on each student, and mark if they were engaged, or unengaged. Students had to be engaged for at least five minutes straight, and were able to have short breaks in between.

I also observed students on how they collaborated. Students were considered collaborative, if they were working in a pair or group to finish a certain task or if I saw them communicating with each other about the task throughout the class period. If students were not talking to partners and working on the task separately, they were marked as not collaborative. If students did not want to work with a partner and wanted to work alone, they were also considered not collaborative.

Google docs. Students created a number of projects, write-ups, and presentations collaboratively, which I formally assessed using Google classroom, and Google Docs to create and turn in work. Student performance was assessed from the work they turned in and grade received. Students were able to edit these documents at any time before the assignment was due. Some examples of assignments will be, a “pop” quiz, on figurative language, in which I asked students to write down as many examples, and definitions of figurative language as they can for ten minutes on their own. After, they opened up a new Doc, to do the same thing but with a

partner for ten minutes. They were able to use the same, or different examples and definitions. I checked for accuracy on their definitions and examples, how many examples they had typed onto the Google Doc, and or if they attempted to write anything at all. Students were assigned a persuasive paper on which they chose their own topic. After writing a rough draft, students had to peer edit each other's papers. The way this was done was that students would open up their essay and a form, (see appendix E), on Google Docs. They had to switch computers with a partner, and fill out that form. I explained this thoroughly with students to make sure they understood what to do. Students, who did not finish their papers from last class, were able to finish and could trade with someone later in class.

Surveys. The pre-survey, (see Appendix A), have questions asking their experiences with group work, using technology in the classroom, and their likes or dislikes about working on the computer. The post-survey, see (Appendix B), included questions that asked about their new likes or dislikes with working on the computer, how they enjoy working with groups on technology, and what their feelings are after using technology to collaborate with each other. I was able to compare the similarities and differences of student perceptions before and after the study, and if students found collaboration on technology helpful, not helpful, or if it did not make a difference. The post survey showed how their perceptions had changed over time from the pre survey, and they were able to include comments or suggestions at the end of the survey.

Data Analysis

Each of these methods further helps to analyze how collaborating with technology, makes a difference in a middle school classroom. This data shows if students are really engaged and if they are getting more work done than in groups, than individually. The data shows if collaborating really is beneficial for students in the long run. The goal was to see in what ways could we maximize engagement and collaboration by using technology. Student work shows the affects of collaboration and what can possibly be done in the future to keep students engaged in a mostly paperless English classroom.

I have come up with themes for my observations, which are engaged, unengaged, collaborative, and not collaborative. I have counted up the amount of times students have demonstrated these behaviors after each observation. The surveys are in the form of a basic Likert-Scale of absolutely agree, agree, I'm not sure, disagree, and absolutely disagree. I will code these one through five, one being absolutely agree, five being absolutely disagree, and three is I'm not sure.

After making observations, I marked where students were engaged, or what type of body language they had. If students were facing each other, they were considered engaged but if not, they were marked as unengaged. If students were facing other partners or peers in their class, they were also considered unengaged and not collaborative. I also made note of when students seemed satisfied with working in groups, and when students felt unsatisfied. For instance I would note when students would complain about group work, or they would seem unhappy with the person or group they were working with. There were also times when students wanted to change partners or asked to work alone, in which I marked them as unsatisfied with collaborating.

Results

Pre-Survey/ Post-Survey

In these results, one means absolutely agree, and five is absolutely disagree. Taking the biggest themes which were engagement, collaboration, and student interest of working in groups, it was found, as shown in figure two, that there was a mean of 2.3 for the students that believe Chromebooks aid in collaboration, a mean of 2.3 for students that believe collaboration benefits success, and a mean of 1.8 for the amount of students that believe they are more engaged with partners rather than working independently in the pre-test. Post results were exactly the same except a mean of 1.9 for the amount of students that believe they are more engaged with partners (as shown in Figure 2).

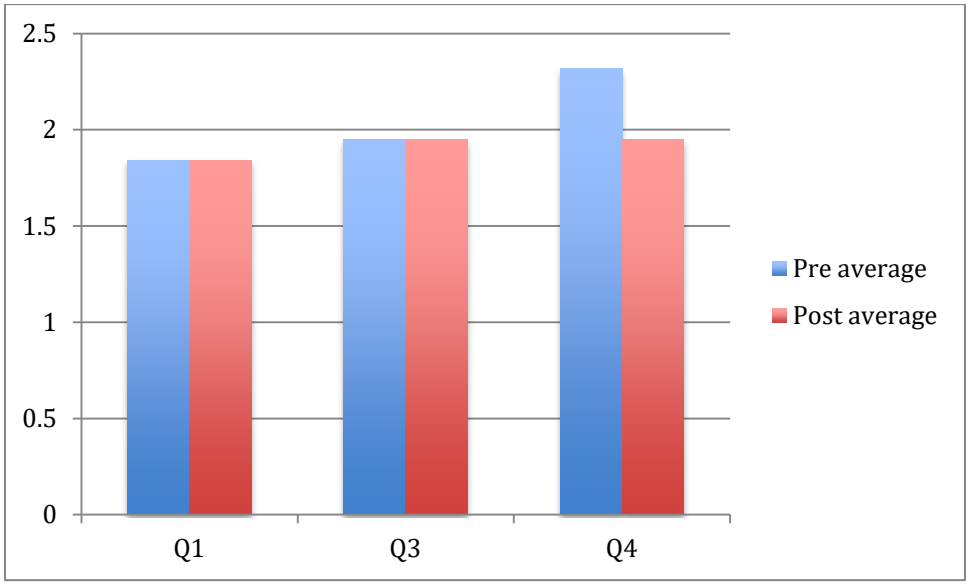

Figure 2: Survey Question Averages

Observations

During my observations, of the timed figurative language assignment, I noticed that when students were working on their own, they were all engaged, quiet, and I did not see any students working on other task, playing video games. There were two students who started to ask each other about their examples, but once I told them to stay on task, they got back to work right

away. During the ten minutes of collaboration, I saw that each student began the classwork engaged, and on task. They were all talking to each other, and only about the assignment. After about five minutes, I started to observe students becoming less engaged. One group I observed, who was not engaged, and only had two examples for each figurative word they were given after ten minutes, while most other groups had about seven or more examples after ten minutes. During my observations, they looked to be on task, but were really playing video games upon further examination. Another group I observed to be not collaborative and unengaged, were talking to a group next to them about other classes and schoolwork. There were about three groups who were not collaborative, but engaged. They decided to write their own definitions and examples on the Google Doc without speaking to each other.

During their peer review student were facing each other, and I found that there were only three groups I had to redirect once to stay on task when working independently. The rest of the class was on task, engaged with the assignment. Towards the end of class, some students were still behind on the assignment, and were unable to work face to face with their partner. They were only able to share their written comments on the Google form. Towards the end of class there were a few groups who finished their peer review very quickly, and spent less time face-to-face talking. I noted during one period, that one student was unsatisfied with working with his partners. He asked to work on his own so he was also marked as not collaborative. He was however, engaged with the task, even though unhappy about working with people.

Discussion

The surveys do not show a difference between student's pre and post thoughts on student's collaboration and engagement, but there was a very slight difference in student perceptions on collaboration benefitting success. It is clear that more students believe that technology and using Chromebook's helps them to achieve more than just pencil and paper. They seem to favor having everything online and digitally.

From my observations, students in my study were engaged for shorter periods of time when working in groups on Chromebooks. They were most engaged and collaborative when working in pairs, rather than large groups as well. When students were in pairs, each student felt they had a responsibility to do their work, and they stayed engaged and collaborative. Others did not distract them as much when in pairs. If students were in groups for more than five to eight minutes, they became unengaged and started to either play video games, look up other assignments or homework, or talk to other groups. Groups became unengaged when there were more than four or five in a group. If there were more students in one group, they were more likely to start socializing, and or excluding other people from the conversation in their group. Students were also more likely to let one person do all the work if there were more than four or five in the group.

While observing students doing their peer reviews, it seemed that they were eager to tell each other their corrections before they were supposed to get with each other face to face. If students were partnered together and sitting near each other, they were more likely to start whispering what they thought about student papers. Students, who wrote extensive reviews, are the ones who would be best off working on their own longer than in groups, because they can better express themselves through writing. Other students gave better feedback vocally and did

not write much. Depending on certain students, it is best to figure out if they can give better feedback verbally, or written down, and then determine if students should have more face to face time while using Chromebooks, or more time to share results through the computer to each other through the web or email.

Themes

Throughout my research there were some reemerging themes. I noticed that students worked harder when they were satisfied. They were engaged with the task at hand and did not go off task as much as if they were unsatisfied. Students also worked harder when there was a task given to each person in the group. Students need to know that they hold a responsibility within the group, and if they do not stay on task, they are not collaborating well, and therefor they are ultimately receive a lower grade. When students each have a task they are more likely to understand they will be held accountable for anything that does not get done, which in turn makes them work harder not only for themselves but for their group members.

Satisfied and or engaged. When students were working hard, quiet, and seemed to be enjoying themselves or satisfied with their work, they were much more engaged. When students were engaged, I noticed that they took longer to finish a task because they were writing more detail or going over their work for any mistakes. When students slow down, and really look at what they have produced, or they take the time to edit their work, they always received a higher grade than those who took a short time, rushed through the task, and did not pay attention to the details. Students being engaged led to higher grades and better quality work. It also led to a higher satisfaction in students, because they know they received a grade reflecting their hard work. Engagement therefor, from this study goes hand in hand with success.

Collaborative and or distracted. When students collaborated with each other, they were either more engaged and satisfied, or less engaged and satisfied. Students, who were considered collaborative and engaged, were usually completely immersed in the task at hand. There were no distractions and they normally got the work done in a timely manner. Collaboration however, worked much better when there were only two in the group. It was much easier for students to talk to one other person, rather than to four other people. It was hard for students to communicate all their ideas in such a short period of time, especially when there are other group members who need time to share their ideas. Collaboration also worked better when students were sharing their work on the Chromebooks. They weren't distracted by a bunch of groups talking because everyone was writing, commenting or chatting through the computer. This did, however, create some problems with engagement at times. Students were more likely to play video games, and do other homework on the computer when they were not working face-to-face. This was because there was not someone to monitor everything they were doing throughout the class period. They also expected that the other person might get the work done, and they did not have to do much.

Challenges

Because of snow days, my research was pushed back by a week. Some students, who were given parent/guardian consent and assent forms, (see appendix C and D), needed extra copies because they had been lost over break. Many students were still absent the day we took our pre-survey because of the weather.

I found for the pre-survey that some students did not realize there was one question on the back. The question was collaboration increases my engagement. This would have an effect on the number of student perceptions on engagement. There were also two students in the A4

class, and eight students in the B8 class who were absent the day students took either the pre or post survey.

At times, students were unable to turn in certain documents, share documents, or the computer programs would delete their work if not submitted properly. This caused assignments to be turned in late by many students, or not done at all. We also had to stop and take time to learn how to turn things in or double check work to make sure everything was saved. Sometimes it was student error, but other times it was machine error. This caused students to turn in work that was most likely lacking in effort, because it had to be redone.

Educational Implementations

Collaborating on Chromebooks can be tricky. Students need at least a week to understand the basics of programs that might be used in the classroom. During the study, there was valuable teaching time taken away because students did not know how to share documents, or turn in assignments on Google Classroom from Google Docs. Students need the time to get to know the computer programs, and to also learn to collaborate on computer programs before starting. There were times when students would comment or delete work off of other student documents that were shared to multiple people. Setting rules before hand could eliminate this problem. It would be beneficial to assign each student a task no matter what type of group work is assigned. That way, students all have a responsibility, and if something does not get done they can be held accountable.

Additionally, A big problem with group work is too many people. When assigning groups, there should be no more than two or three to a group. If there are too many people students cannot share as many ideas, and not everyone may be heard or seen in the final product. Along with this, students should not always have the choice to pick their own partner. The

teacher or researcher, should either randomly assign, or assign partners of varying levels. By randomly assigning, this could eliminate the problem of students not getting work done due to talking with friends in their group. This can also help when there are students who are usually chosen last, or who cannot find a partner. By assigning students of varying levels, students who are at the lower level can understand the process of higher-level students. They can change their thinking and possibly increase their chance of success by working with a student who can help them. Collaboration on Chromebooks can be beneficial concluding the results of this study, however, students need structure, and small group sizes to work to their full potential and be successful.

Appendix A

Student survey

Name_____

1. Chrome Books aid in collaborating with peers

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

1. I like to work alone

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

2. Collaboration benefits my success

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

3. I work better with a partner

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

4. I frequently use a Chrome book / lap top / computer at home

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

5. Technology aids in my success

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

6. I do not understand technology

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

7. I like using Chrome books in class

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

8. It is better to work in groups than alone

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

9. Collaboration increases my engagement

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

Appendix B

Student survey

Name_____

1. Chromebooks aid in working in groups (collaboration)

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

2. I like to work alone

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

3. Collaboration has benefited my success

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

4. I am more engaged when working with one or more partners

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

5. I am more engaged when working alone

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

6. I work better with **more** than one other person

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

7. Technology has aided in my success

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

8. I get distracted when working on Chromebooks

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

9. I like using Chromebooks in class

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

10. I get more work done when working in groups

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

11. I get distracted when working in groups

A**bsolutely Agree Agree I'm not sure Disagree Absolutely Disagree**

12. I work better with **only** one other person

Absolutely Agree Agree I'm not sure Disagree Absolutely Disagree

13. Comments or suggestions on working in groups with more than one person on Chromebooks?

14. Comments or suggestions on working in pairs on Chromebooks?

Appendix C

Consent Letter

Dear Parent or Guardian,

My name is Samantha Robinson, and I am currently student teaching in your child's classroom. I am a graduate from the University of Mary Washington and I am currently finishing my student teaching to receive my masters in Secondary Education. One requirement is to conduct an action research study during my student teaching. I am asking for the participation of your child in my research study. All involvement is voluntary, so if you choose, your child *does not* have to participate.

For my study, I am interested in finding out the effect of Chrome book use on student collaboration and engagement in a paperless classroom. I plan on giving students group work, and assignments that include collaborating with either one or more partners through Google classroom, Google docs, and other appropriate resources that can be used on the Chrome books. I will observe student behaviors and responses. Student work will be assessed and graded normally with a rubric they will be able to see before handing in work. I will also have students share some of their work with the class. I hope that by having students collaborate with each other, their engagement can increase within the classroom. Students will not be doing anything extra from their daily routine.

All students in the class will take the surveys and do the same work. The only difference is that I will only use survey data from students who have parental consent to participate in the study. There are no extra benefits to any students for participating or not participating in the study. Whether your child participates in this research or not, the decision will have no effect either positive or negative on the student's grades on any assignment.

All responses will be kept confidential and your child's name will not appear on any papers. After my research is done, surveys and work students do not keep will be destroyed. You do not have to let your child participate in the study if you do not want to do so. Your child's responses are all voluntary. If you do choose to let your child participate, you will help add to my understanding of collaboration and the use of technology in the classroom, and how it can best benefit students.

If you have any questions, comments or concerns, you may contact me at srobins3@mail.umw.edu or my University Supervisor Dr. Causarano, (pcausara@umw.edu)

The research described above has been approved by the University of Mary Washington IRB which is a committee responsible for ensuring that research is being conducted safely and that risks to participants are minimized. For information about the review of this research, contact the IRB chair, Dr. Jo Tyler at jtyler@umw.edu.

I am excited to begin my research and work with students in the classroom!

Thank you,
Samantha Robinson

EFFECTS OF CHROME BOOKS

I have read the above letter and give my child, _____, permission to participate in this project.

_____
(Parent/Guardian Signature)

Date_____

I, _____ agree to keep all information and data collected during this research project confidential.

_____
(Researcher Signature)

Date_____

Appendix D

Student assent letter

Dear Student,

As you know, I will be teaching many of your classes during the spring! We will be doing many projects using the Chrome books, and you will be collaborating much more with your peers.

While you are collaborating, I will be observing you for a research project I must complete during my teaching. I want to know your perceptions on group work, and how you feel working with partners or alone. I also want to know how you feel using Chrome books in a paperless classroom. I will give survey questions for you to answer about these perceptions. All your responses are confidential and your names will not be shared with anyone, except Mr. Pirnat. There will be no extra work required from you, all you have to do is show up to class!
If you are willing to be in this study, I would like to use your survey answers and my observation notes about you in my study data. Participation in the study is completely voluntary, so it is up to you whether you agree or not.

Your parents were given a letter about taking part in this study. If your parents did not allow you to participate in this study, you will not be asked to sign this form. However, if your parents did allow you to participate, I encourage you to participate in this study.

If you do not wish to participate that is okay. You will not be down graded or reprimanded for choosing to do so. You will still do the same work and take the same survey as your peers, but I will not include your work, or surveys in my study.

If you decide to be in the study, I will keep your information confidential. This means that I will not use your names or the name of the school in anything I write and I will not reveal any personal, identifying information about you.

Signing this form means that you have read it or have had it read to you, and that you are willing to be in this study. If at any point you have any questions, please ask me!

Thanks you,

Ms. Robinson

I have been read the above letter, all my questions have been answered, and I agree to participate in the project.

_____ _____

(Student Signature) (Date)

EFFECTS OF CHROME BOOKS

I, _____ will keep your names confidential.

_____ _____

(Student Teacher/Researcher Signature) (Date)

Appendix E

Student example

Is this essay persuasive?
Yes

Is there a clear thesis? Is the introduction effective? (hook + background + thesis) Why or why not? What could the author write?
Yes the introduction is effective, it definitely showed her opinion! I didn't really see a hook, but the thesis is really good!

Is the paper well organized?
The essay was organized very well, and I don't see where she could add anymore transitions! She did very well in that section!

Strengths of paper
Strengths of this paper include, good transitions, great job getting the point across, rich language!

Weaknesses of paper
There wasn't a strong hook at the beginning of the paper!

Anything the author can add or change? (word choice, sentence structure)
I think I named everything that I thought she should change!

Any extra comments?
it was a great paper, and I definitely agree with your point! :)

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