Impacts in the Classroom When Students Take Ownership Of Cellphone Usage Policies: An Investigation Using a Project-Based Learning Design

Melynda Elaine Diehl

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IMPACTS IN THE CLASSROOM WHEN STUDENTS TAKE OWNERSHIP OF CELLPHONE USAGE POLICIES: AN INVESTIGATION USING A PROJECT-BASED LEARNING DESIGN

by

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DEDICATION

To my loving, supportive husband. I want to thank you so much for supporting me as I completed this program and research study. Thank you for all your patience when I had to spend so many hours on my computer. Thank you for all your support when I would doubt myself and for helping me to believe that I could do this.

Thank you also to my wonderful daughters. You also had to put up with me being on my computer constantly. You all encouraged me to work hard and your support means everything to me! I couldn’t have accomplished this without knowing I had my supportive family behind me every step of the way!
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Thank you to my doctoral committee for agreeing to serve on my committee and review my research study. Several of you I have also had as professors over the last three years. You have all taught me so much and helped me to grow intellectually and professionally as I have studied under you.

To my dissertation chair, you have truly invested your time in helping me to complete this project. You were there for me believing in me in the final hour and I could not have done this without your support. Your encouragement and support along the way has meant everything. Thank you for all of your feedback and grace as I made my way through this process. I will always remember you as the teacher that pushed me the hardest, but as the one who I learned the most from! You truly are an inspiration to me, and I cannot thank you enough!
ABSTRACT

The purpose of this action research study was to investigate by using a PBL design if giving student more ownership in classroom cellphone policies has positive outcomes. This study looked at not only the behavioral aspect of classroom cellphone usage, but also the impacts of using a PBL design on student engagement, ownership, and knowledge construction. This study was also framed on constructivism. Students built on their own prior knowledge and worked collaboratively to solve a real-world problem. The research focused on answering three questions. The first question looked at how students synthesize and evaluate the literature to construct knowledge and create a cellphone policy. The second question asked how a PBL design engages students in that process. The third question asked how ownership impacted student distractibility, anxiety, and academic performance.

Both quantitative and qualitative data collection instruments were used and showed that student knowledge construction, and engagement increased as the study progressed. The instruments also revealed a high level of ownership as students were highly invested in their artifacts. Once the student created policy was in place there was a slight decrease in the number of cellphone related behaviors, and the number of warnings...
that I was giving to students. Importantly, half of the students in the study who were not turning in assignments and had other behavior concerns, had a decrease in the number of cellphone related incidents when the student policy was in place. Also, a larger decrease of three fourths of the types of behaviors that were observed during the trial period was recorded. Over half of the students reported a decrease in their own distractibility after the student policy was in place and felt that cellphones had a positive impact on their academic performance. When asked what they liked most about this intervention, several students reported that they liked having a voice in cellphone policies.

An action plan was developed to take the principles of student voice and ownership used in this study and apply them on a larger scale to help increase positive impacts related to student cellphone usage in the classroom.
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CHAPTER 1:
INTRODUCTION

It has become the norm for students in public middle school classrooms to use their cellphones or other devices during a lesson. This is especially true for school districts that have a Bring Your Own Device Policy (BYOD) in place. This is very different from just a few years ago when students were not permitted to have their cellphones in the classroom.

Along with a rise in cellphone usage in the classroom over the last few years, is a rise in the amount of screen time for teenagers in general. Researchers like Deweese (2014) agree that there are negative aspects of too much screen time for teenagers. Most teenagers are highly focused on socializing with their friends and are spending many hours a day on their cellphones to do so. According to research by Schaeffer (2019), “Nearly all U.S. teens (95%) say they have access to a smartphone – and 45% say they are ‘almost constantly’ on the internet” (p. 1). Additionally, teenagers are using their cellphones to connect with each other (83%) and to learn new things (84%), while nine out of 10 report that they use their cellphone to waste time (Schaeffer, 2019). By allowing cellphones in the classroom, teenagers’ attention may be directed away from active engagement and learning in the classroom.
The use of social media is on the rise for teenagers. Not only are students distracted by texting their friends, but they are also distracted by social media. Elciyar et al. (2019) conducted studies on students’ addiction to social media. The authors pointed out that this is the latest trend in technology addiction (Elciyar et al., 2019). The use of social media seems to have an addictive quality to students as well, which students access by using their cellphones.

A high level of anxiety is being observed in the classroom when students are not able to access their cellphones. According to Tams et al. (2018), this anxiety and stress that students are experiencing has been dubbed “nomophobia.” This fear causes students to think that they are losing access to information, connectedness, or communication. Students feel a loss of control or an uncertainty regarding when they can look at their phones again, which causes great distress (Tams et al., 2018). Schaeffer (2019) revealed that “more than half of teens (56%) associate the absence of their phone with at least one of three emotions: loneliness, being upset, or feeling anxious” (p. 1). Cellphones may be a contributing factor to the rise in these psychological issues for students.

As a middle school teacher, I have observed many of these behaviors. My students are very distracted by their cellphones. I became concerned when the attention span of my students would wane after approximately 10 minutes of instruction. I am curious if this is related to the format of some popular social media, such as TikTok and Snapchat. Additionally, I have become increasingly concerned about what seems to be a high level of anxiety that I have noticed in my students regarding cellphone usage. Even when students have been told the consequences of using their devices at inappropriate times in class, many cannot seem to resist the temptation to be on their phones. When
their phones are so accessible in class, it is seemingly too irresistible for students to resist using them despite the rules. Recently, with an observer in the room, I had to tell one student three times to stop texting and to put her phone away. I could not believe that even with two adults in the room and having been told not to, the student continued to use her phone. When I took the phone away, the student told me that she was answering a text from a friend. To this student, the impulse to return the text was seemingly stronger and more important than the consequence of having the phone confiscated. I find this incident, along with a pattern of similar behaviors around student cellphone usage in my classroom, rather concerning.

Although research supports the negative effects that I have observed regarding cellphone usage in the classroom, there are also many studies that support the positive impacts that cellphones can have if used appropriately. There are some important benefits to students having cellphones in the classroom. Having a cellphone is essentially the equivalent of every student always having a computer with them. There are many educational apps and useful study aids that can benefit students if cellphones are used appropriately in the classroom. According to Clayton and Murphy (2016), “If the push by education leaders nationwide is to incorporate technology into the classroom, the smartphone can serve as a partner with teachers to create engaging lessons that create global digital citizens” (p. 100).

Cellphones may be a positive tool for students in the classroom. Students having a cellphone with them always has an additional benefit of providing a means of communication in case of an emergency. Could students being allowed to have their cellphones in the classroom also reduce the anxiety known as nomophobia? Is there a
way to maximize these positive benefits of students having these devices while minimizing the negative impacts that cellphones in the classroom can have?

**Problem of Practice**

Over this past three years, I have seen a shift in the attention span and behavior of my students, which seems to be directly related to students having their cellphones in the classroom and the amount of time they are spending on social media. The school district for which I work has adopted the BYOD policy, which allows students to have their phones in the classroom with them. This new trend of students having their devices in the classroom seems to be one that is here to stay according to the administration at the school and the district in which I teach. Parents have also pushed for students to have their cellphones in the classroom due to the recent amount of school violence. Parents want to be able to communicate with their children and for their children to be able to easily communicate with them. Many parents want their children to be able to instantly communicate with them in case of an emergency.

As a teacher, I have observed that cellphones cause a distraction for students and lead to student misbehaviors. In 2012, 58% of American children aged 13 to 19 had cellphones (Graham, 2020). According to the Pew Research Center (2019), 85% of Americans own a smartphone. Students are spending more time on social media than ever before. According to Carels (2019), students spend approximately 8 hours a day on devices. In my classroom, I have noted that students not only seem to be more distracted but also exhibiting more anxiety and depression and what seems to be addictive symptoms. According to Tams et al. (2018), students are dealing with a modern phenomenon called nomophobia. Nomophobia is the fear of not being able to use one’s
phone or the many apps that these devices now offer. Further, Carels (2019) stated, “Nomophobia leads to other issues, including the inability to focus, stress and anxiety, and the inappropriate use of cellular devices” (p. 1).

**Theoretical Framework**

This study was grounded in the constructivist learning theory. Constructivist theory emphasizes that learning takes place when the learner is active, and not passive. According to Jotia (2007), “The constructivist regards learning as a give-and-take process where the learner is at the center of the learning activities” (p. 31). Learners need to be actively engaged in their world, such as conducting experiments or real-world problem solving (McLeod, 2019). Vygotsky (1978) introduced social constructivism, which encourages social interactions through guided learning activities. For this study, students worked collaboratively to come up with an action plan for cellphone usage in the classroom.

A project-based learning (PBL) instructional model was used in this study. This instructional model falls under the learning theory of constructivism. Students worked together to find strategies to try and decrease the negative aspects of cellphone usage in the classroom, while increasing the positive ones. PBL was the ideal model to address the problem of practice as it helped students engage with a real-world problem of interest to them. They actively constructed their understanding while working together to find a solution. They were investigating the topic, forming a hypothesis, and creating new ideas, which all fulfilled the aim of a PBL project (Blumenfeld & Krajcik, 2006).

The PBL instructional model is originally credited to the work of John Dewey. Dewey believed that students would be more invested in the learning if they engaged in
meaningful tasks that mimic real-world situations that experts deal with (Dewey, 1959). Providing students with the task of making a policy on cellphone usage that is effective in the classroom empowers students to help find a solution to a real-world problem. According to Liebtag (2017), part of the purpose of the PBL design is to build 21st century skills such as communication, critical thinking, collaboration, problem solving, and creativity/innovation. By utilizing this model in this study, students were given a sense of ownership while using all of these skills to try to help decrease the negative aspects of cellphone use in the classroom. Students created a policy to help solve this problem, which provided them with a sense of ownership as they were more engaged in the process. This sense of ownership helped them to buy in and become more engaged in classroom processes. As stated by Matthews (2019), “If students can formulate their own opinion on something and it’s connected to their life, then they’ll be engaged.”

A second theory that frames this study is self-determination theory. According to Deci and Ryan (2020), this theory has three components: autonomy, competence, and relatedness. All three of these components are crucial to engagement and motivation. In fact, Deci and Ryan (2020) remark that the absence of even one of these components “damages motivation” (p1). The PBL design of this study is grounded in constructivism, while the motivation for students to internalize their policy that they created is framed around these concepts that are key to self-determination theory.
Purpose of the Study

The purpose of the study was to investigate if providing students ownership of developing a classroom cellphone usage policy decreased the negative outcomes of cellphone use in the classroom, such as student distractibility and anxiety, and increased the positive ones, such as higher student engagement and perceived academic performance. I utilized a PBL instructional model that allowed students to work collaboratively to come up with a policy to help solve this real-world problem. This democratic classroom process allowed students to work collaboratively by sharing their ideas to make a policy on cellphone use in the classroom.

Research Questions

In this action research study, I answered the following questions:

RQ1: How do students synthesize and evaluate researched material to construct their knowledge and to create a classroom cellphone policy?

RQ2: How does using a PBL instructional model engage students in the process of making a cellphone usage policy for their classroom?

RQ3: How does ownership of classroom cellphone usage policies impact student self-reported distractibility, anxiety levels, academic performance, and teacher-observed cellphone behavior?

Positionality

I am a teacher in a public middle school setting. I teach over 100 students a day. The 2021-2022 school year will be my third year in this particular setting. I teach two to three sections of eighth grade U.S. History from colonization through reconstruction each day. I also teach two sections of seventh and eighth grade Theater Arts each day. Further,
during the 2020-2021 school year, I also taught a section of sixth grade Careers and one section of sixth grade Geography and World Cultures.

I have been a classroom teacher for over 16 years. When I was 27, I started my career in a sixth-grade classroom, in a private school in a small town in South Carolina. Although I spent most of my childhood in a small town similar to the one in which I first taught, I moved to a suburb of Washington DC in high school. I also attended college in Baltimore, so both my high school and colleges were extremely culturally diverse. This helped to prepare me for some of the more diverse settings in which I would teach during my career.

After earning my Master of Arts in teaching, I moved to the public-school setting. My first classroom was a fifth-grade classroom at a school that taught primarily African American students. This was a good experience for me after being in private school. I learned a lot about the culture of my students and the hardships that many of them and their families faced. After two years, I was moved to a middle school that was about 60% White and 40% African American. The middle school was also located in a small town and very similar to the town in which I had grown up. I taught there for seven years. I then moved back to Maryland and taught in Baltimore County. This felt like a culture shock at first because it was a very urban setting at a school that was primarily African American. After teaching there for two years, I was offered a job in a more suburban county between Washington and Baltimore at a middle school that feeds into the high school I attended. This is where I currently teach, and it is a very culturally diverse setting.
Although it is in the middle of a very affluent county, the school in which I teach is in a poorer section of that county. The school has a more urban feel although it is in a suburb of two major cities. The student body is made up of the following demographics: 49% African American, 21% Caucasian, 15% Hispanic, 9% Asian, and 6% two or more other race students. I mainly teach U.S. History in this setting, and my class sizes range between 20-26 students per class. My students range from having single parent households and living in subsidized housing to two parent households with a substantial income.

All of my experiences have allowed me to work with students from many different backgrounds. This has opened my eyes to many diverse situations and has given me an open mind, which has made me a more compassionate educator. My experiences assisted me in conducting this research as I worked closely with students in my current setting.

When I first started teaching, most of my middle school students did not have a cellphone. Over the years, as the popularity of cellphones increased, students were allowed to have them at school, but they had to be kept in their lockers. Beginning in the 2019-2020 school year, students were allowed to bring cellphones into my classroom. The students are allowed to have their cellphones in class, and they can be used at the teacher’s discretion. This BYOD policy has changed the classroom dynamic. Although it does provide students with more access to devices, it also causes distraction, as students are tempted to use their cellphones for non-educational purposes in class.

My schooling took place before cellphone usage became widespread. I can imagine that I would have been very distracted having a cellphone in class with me as a
middle school-aged student. Also, it is important to note that, as an adult, I struggle with wanting to look at my cellphone in meetings and even when I am working. I can only imagine this struggle is intensified by a teenager who is driven even more by wanting to be connected socially with peers. For 13 years, I taught in public schools where students were not allowed to have cell phones in the classroom, much like my experience growing up. I am now, however, in a school with a BYOD policy in place, and I am concerned about the impact this has on my students emotionally, socially, and cognitively.

When students first started bringing their devices into class, I was frustrated with the amount of time I was spending dealing with the negative effects that having devices were causing my students, such as distractibility and off-task behaviors. I have spent these last three school years researching the negative and positive effects of having cellphones in the classroom. At first, I was more focused on the negative effects that cellphones in the classroom have. I have, however, also observed the positives they bring, such as allowing my students to engage in the classroom when used appropriately. I have also been encouraged by the positive effects cellphones in the classroom can have, according to research. Because it seems like the cellphones are a permanent fixture in the classroom environment, my focus shifted to seeking out strategies to increase the positive impacts that cellphones in the classroom can have on learning, and to decrease the negative ones for my students.

All of these experiences have prepared me to work with all types of students from different cultural and ethnic backgrounds. This was helpful as I worked closely with the students in my current setting, which is also very culturally diverse. My experiences have caused me to be very open minded and open to the many diverse needs of my students.
Additionally, I have worked with middle school students for most of my teaching career and am very comfortable with this age group. They are old enough to have real conversations and can reason and debate on topics, which makes teaching social studies to this age group enjoyable. The students in this setting were able to take a hold of this research project and get excited about trying to find a solution to how to minimize the negative effects of cellphones in the classroom, while increasing the positive ones. I feel that this is a largely marginalized group; thus, giving them ownership over this research helped them to be invested, engaged, and excited about this project and their learning.

I chose action research because I wanted to improve my practice by having students less distracted by their cellphones in the hope of improving their learning. I was an insider studying my own practice. The students were the participants in the study. According to Efron and Ravid (2013), “Action research is usually defined as an inquiry conducted by educators in their own settings in order to advance their practice and to improve their students learning” (p. 2). Because I was the classroom teacher who also collected research, students felt more natural and comfortable. I was familiar to them as opposed to an outside researcher coming in to collect data. I was able to collect more authentic data because of being an insider in the classroom. I was in the classroom every day to observe the students’ behavior and note this information over the course of the study.

Although we use cellphones for structured activities, students were using the cellphones to text or exhibit other inappropriate behaviors, which led to question whether their distractibility and anxiety were inhibiting their learning and lessening their engagement in learning. Therefore, I wanted to put a policy in place that students were
invested in to try and reduce these negative effects. I also was concerned by the time I was losing from teaching by having to address inappropriate cellphone behavior, an additional reason to use action research study to improve my practice.

This was a mixed methods action research study in which both qualitative and quantitative data were collected. This study was based on a PBL design. The students involved worked together, made decisions, and voted on a classroom cellphone policy to put in place for a four-week trial period. Using this plan allowed students to feel empowered and to have a voice in their classroom.

**Participants**

The participants included a class of 20 eighth grade students. These participants were enrolled in a U.S. History course. I, the teacher, was the researcher. This was my third-year teaching at this school. Prior to teaching in this current setting, I had taught middle school students for 12 years and had taught for four years in an elementary setting.

**Setting**

This study was conducted in the Spring of the 2021-2022 school year. The middle school in which this study took place is located in a suburban county in Maryland situated halfway between Washington DC and Baltimore. The research took place in my own eighth grade classroom. Students worked on the PBL portion of the study two days a week for four weeks. The trial period took place over the following four weeks, during which I continued to monitor cellphone-related behavior.
Data Collection

There were several data collection methods. First, I collected data on a cellphone behavior checklist for two weeks prior to the PBL portion of the study. I then had students complete a pre survey with questions regarding how anxious and distracted they felt with their cellphones in class. Additionally, I asked them to list helpful apps that they were already using. Students also completed a post survey to rate their feelings after the trial period, and I compared the two sets of data.

After the pre survey, students worked in groups for the PBL portion of the study. They completed an interview asking a peer or an adult about their feelings on cellphone usage in the classroom. They looked at research and completed five annotations. They worked with their group and completed an important themes organizer. They then worked with their group to complete a cellphone policy presentation outline. Once they completed the outline, they then made their presentations to share with the class.

After the presentations, the class democratically voted on five rules and three consequences that should be used in their classroom for the trial period. The rules and consequences that receive the most votes were placed into a contract for students to sign. Students were more likely to buy into the policies because they came up with them and then signed a contract. According to Tams et al. (2018), including students in the planning process will alleviate stress because they feel more in control, which will help prevent nomophobia (Tams et al., 2018). I also reviewed the expectations for cellphones daily during the trial period.

Additionally, I completed the cellphone behavior checklist every day during the trial period. At the end of the four weeks, students completed a post survey asking them
how distracted or anxious they felt during the trial period. It also asked students how they felt about the PBL project in general. The data was compared with the pre survey.

**Data Analysis**

I analyzed the quantitative data descriptively and qualitative data through constant comparison. The findings were then shared with the administration. My hope was that by having the students help design a solution to the problem of practice, they felt empowered. I also hoped that the students helped uncover strategies that increased the positive aspects of cellphone usage in the classroom and decreased the negative ones.

Following the constructivist learning model and providing students ownership is important to this study on many levels. Providing students ownership over what policies should be put in place is empowering. Additionally, including students in the planning process alleviated stress because they felt more in control. My hope was that by giving students some power in making classroom decisions, there would be a decrease in anxiety and nomophobia. I also hoped to observe an increase in attentiveness and academic performance.

The final step in this study was for students to share their results with the administration. If positive results were found from students taking ownership of the cellphone usage policy, the findings would then be shared with the school faculty. My hope was also that this would empower students to be change makers not only in their classroom, but in their school and beyond.

**Limitations of the Study**

Some limitations came up as I was conducting this research study. First, initially I planned to collect data on the cellphone behavior checklist throughout the whole study.
During the PBL portion I was also recording student engagement on the teacher observation journal. I discovered that it was too difficult to record all of the information at once, and I decided to only use the teacher observation journal during the PBL portion. Only having one researcher to collect data was a bit of a limitation for this study that included so many instruments. Having another researcher to help collect observations would have been helpful.

Second, it was also hard for me to record as many conversations as I would have liked to during the PBL portion of the study. Being the teacher in the classroom there were many things going on that I also had to attend to. Again, having more than one researcher to collect the data would have been helpful for this reason as well. Also, making audio recordings at group tables and taking notes on them later could have helped with this limitation.

Finally, students were only able to use the policies they come up with in one 50-minute class a day. They could not practice the policies that they come up with throughout the school day, which limited the impact of using the policies. My plan is to have other teachers try this intervention and have it become a school wide policy which would help with this limitation. This will be discussed further in chapter five.

**Significance of the Study**

This study is significant because research has shown that there are many negative effects on students when having cellphones in the classroom such as increases in student distractibility and anxiety levels. There is not, however, a lot of research on whether giving students ownership over cellphone policies decreases these negative effects and increases the positive ones. There are many positive aspects to having cellphones in the
classroom if used appropriately. These positives, including decreasing anxiety, helping to differentiate instruction, and offering many valuable resources to students are critical.

Cellphones usage in the classroom may be here to stay; therefore, it would be a disservice to students to not help them to capitalize on the positive impacts that cellphones can have in the classroom. As a teacher, my aim for this study was to investigate whether using a PBL design encouraged students to get involved in the decision-making process over classroom cellphone policies, and increased the positive outcomes for having the cellphones in the classroom.

Definition of Terms

*Bring Your Own Device (BYOD).* BYOD is an increasingly popular policy in school districts where students are allowed to use their own cellphone, tablet, or a laptop in the classroom to easily access information (Afreen, 2014, p. 235).

*Nomophobia.* The term ‘nomophobia,’ refers to anxiety caused by not being able to use one’s cellphone (Cherry, 2020).

*Constructivism.* Constructivism is a learning theory that was first attributed to Piaget in which the learner is active and experiences their world firsthand to conduct meaning (Piaget, 1957).

*Project Based Learning (PBL).* PBL is a learning design originally credited to John Dewey, in which students work collaboratively together to investigate, make a hypothesis, and create new ideas to solve real world problems (Blumenfeld & Krajcik, 2006).
Organization of the Dissertation

In this first chapter, I introduced the research by explaining the problem of practice along with the research questions and design. I also summarized the theoretical framework along with my own positionality. I covered the significance and rationale for the research as well as key terms. Chapter two includes a review of related literature that was used to investigate other existing research and the theoretical framework of this study. Chapter three includes the research methodology. In Chapter four, I discuss the findings. Finally, in Chapter five, I will review the results and discuss recommendations and implications of the study.
CHAPTER 2

REVIEW OF THE LITERATURE

The problem of practice of this study arose from my own practice, as I have observed the negative effects such as an increase in student distractibility and anxiety levels related to having cellphones in the classroom. At the beginning of my teaching career over 16 years ago, most of my middle school students did not have a cellphone. Now, in 2022, not only do most of my students have a cellphone, but most of them have smartphones. In addition, my students are allowed to bring their phones into the classroom with them. This is due largely in part to the district in which I work, which has a BYOD policy in place. This was a drastic change, as I started teaching in this district in the 2019-2020 school year. Many districts now have this type of policy in place, which allows students to have their smartphones with them at their desks.

Currently, I teach 8th grade U.S. History in a culturally diverse setting. I teach in a middle school that is 39% reduced or free lunch and teach over 100 students a day. My classes range in size from 20 to 30 students. Most of the students served have a cellphone at their desk during class. Again, this is permissible at this school, as the district has a BYOD policy in place.

During my three years teaching in this district with a BYOD policy, I became more and more concerned about what seemed to be negative outcomes from students having their cellphones in the classroom. I began to notice that many students were
distracted and exhibited psychological issues, such as anxiety, as well as cellphone-related misbehaviors compared to districts in which I had worked that did not have this policy in place. These misbehaviors included more incidents of cheating and texting during class. I have noted many more cellphone-related office referrals in this setting with the BYOD policy. Furthermore, I have observed many students distracted by their cellphones and looking at them when they have not been given permission. Even when the students knew there would be a consequence from looking at their phone or texting at inappropriate times, many would do so anyway, regardless of the consequence.

Many of these negative behaviors that I have observed in my students seemed to be addictive in nature as well. The problem of practice for this study is my concern regarding students having their cellphones in the classroom. I am concerned about the many negative impacts cellphones in the classroom seem to cause, such as difficulties with attentiveness, anxiety, and a decrease in academic performance.

**Purpose Statement and Research Questions**

The purpose of this study is to investigate whether providing students more ownership of classroom cellphone usage will cause a decrease in distractibility and anxiety, and an increase in academic performance. In this action research study, I aim to answer the following questions:

**RQ1:** How do students synthesize and evaluate researched material to construct their knowledge and to create a classroom cellphone policy?

**RQ2:** How does using a PBL instructional model engage students in the process of making a cellphone usage policy for their classroom?
RQ3: How does ownership of classroom cellphone usage policies impact student self-reported distractibility, anxiety levels, academic performance and teacher-observed cellphone behavior?

**Literature Review Methodology**

To conduct the research for this literature review, I used the ERIC databases found in the University of South Carolina online library. I also utilized Google scholar initially to help locate articles, which I then researched further with the ERIC database. I located research studies in peer reviewed journals, websites, and books. I searched keywords such as *cellphone, student, classroom, policies, dependency, attention, anxiety, nomophobia, constructivism, ownership, BYOD, and PBL*. I reviewed recent studies on the positive and negative impacts of cellphones in the classroom. I also explored studies on PBL. Additionally, I used textbooks to research the constructivist theory along with other learning theories and ideologies which make up the theoretical framework for this study.

**Chapter Organization**

I begin this chapter with a discussion of the theoretical framework and historical perspectives that frame this study. Next, I cover a review of the literature that relates to the problem of practice. This will be comprised of two major themes: the negative and positive impacts of cellphone usage in the classroom.

**Theoretical Framework**

Two theories framed this research study, which are constructivism and self-determination theory. Both theories will be discussed in this section. I begin by discussing constructivism in the following section.
Constructivism

Constructivism was the main theory that frames this action research study. This is a learning theory that focuses on the learner experiencing their world firsthand to conduct meaning. The learners are active and not passive, and they learn by doing. The teacher acts more as a facilitator rather than just the instructor (Harasim, 2012). A constructivist holds the view that “people construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences” (Bereiter, 1994 as cited in Bada & Olusegun, 2015, p. 67). According to Scardamalia and Bereiter (2015), the learner constructs their own learning based on preexisting knowledge. The learner builds on what they already know as they experience their world. The learning is then scaffolded as the learner makes new rules with the new knowledge that is obtained.

Cognitive constructivism was first attributed by Piaget (1957) who believed that knowledge is actively constructed by learners based on their existing cognitive structures. Vygotsky (1978) introduced social constructivism, which encourages social interactions through guided learning. Vygotsky felt that one’s social interactions and environment were the largest contributors to development. He coined the term Zone of Proximal Development, which refers to the idea that humans can only go so far on their own and need other people to help them learn (Vygotsky, 1978). Another key theme under constructivist learning theory is that students learn by working collaboratively. This applies to this action research study as students will work collaboratively in groups to make their own cellphone usage policy.

Constructivist theory emphasizes that learning takes place when the learner is actively involved. According to Jotia (2007), “The constructivist regards learning as a
give-and-take process where the learner is at the center of the learning activities” (p. 31). Learners need to be actively engaged in their world. For example, to be actively engaged, students may conduct experiments or real-world problem solving (McLeod, 2019). In constructivism, learning takes place when the learner is engaged with their world through experimentation and problem solving.

An important component of the constructivist learning theory is giving students ownership of their learning. According to Nichols (2006), giving students ownership over classroom procedures is empowering. Students feel motivated and empowered when they get to learn in an environment that includes self-regulatory activities. This study was designed around constructivist theory and providing students a sense of ownership. Specifically, students in this study were involved in the process of making a classroom cellphone policy which, according to Nichols (2006), should have an additional benefit of helping to alleviate some stress for the student by making them feel more in control.

Constructivism also involves other processes that apply to this study. According to Slavin (1995), constructivism involves top-down processing, cooperative learning, discovery learning, scaffolding, and self-regulated learning. In this study, students participated in learning activities that involve several of these elements, such as cooperative and discovery learning. This is discussed further in the section on project-based learning.

Finally, constructivism is learner-centered. According to Schiro (2013), students need to explore and interact with their environments. Learning takes place from these interactions. The teacher provides the environment and opportunities for students to learn without forcing the process or knowing the exact outcome (Schiro, 2013). This study was
designed around project-based learning that is learner centered, where students interacted with their environment and were involved in the process and outcome.

**Self-Determination Theory**

Self-determination theory is related to constructivist theory and was also important to this study. This theory was originally coined by Deci and Ryan (2012) and refers to each person’s ability to make choices and manage their own life, which impact motivation as well. When people feel that they have control over their choices and their actions that could influence outcomes, they are more motivated (Deci & Ryan, 2012, as cited in Cherry, 2021).

Deci and Ryan (2012) stated that self-determination theory involves three human needs: (a) competence, (b) autonomy, and (c) relatedness. First, competence is met when students feel a sense of success and mastery of skills to attain certain goals (Ryan & Deci, 2020). Giving students an explanation of the problem and tasks helps to fulfill the need for competence. Second, autonomy is met when students experience a sense of ownership over their actions and feel that they are part of making an impactful change of interest and value to them (Cherry, 2021; Ryan & Deci, 2020). In this study, students helped to solve a real-world problem which will help them to take ownership of the process. Third, relatedness is met when students feel connected to other people in a respectful and caring environment that promote belonging (Ryan & Deci, 2020) as they are working to find a solution to a problem (Cherry, 2021). Vygotsky (1978) also saw the importance of humans relating and connecting to each other in his social development theory. In this study, relatedness was met when students worked in groups collaborating to come up with a classroom cellphone usage policy.
Johnston (2017) added a fourth competency to self-determination theory: meaningful engagement. “When students are meaningfully engaged, many problematic behaviors disappear” (p.2). Giving students a voice in creating the policy allowed them to take ownership and become invested in it. Giving the students a problem to solve that impacts their daily routine aimed at helping them to be meaningfully engaged in the process and decreasing the undesirable effects of cellphone in the long-term.

This action research study addressed these basic needs for students, which according to self-determination theory, helped to motivate them (Guay, 2021). Under self-determination theory, motivation is autonomous, in other words it is intrinsic (Deci & Ryan, 2012). In fact, Deci and Gagne (2005) state that intrinsic motivation is an example of autonomy. Here, students are more engaged and have a higher performance level. Students are more motivated to be involved in the learning activity when they feel that their actions directly impact the outcome (Cherry, 2021). Deci and Gagne (2005) also add that people are intrinsically motivated when they complete an activity by their own will because it interests them, and they have a choice.

In this section, I reviewed the theories that framed the study. In the following section, I will discuss project-based learning. This instructional model was used in the intervention addressing the problem of practice. PBL is grounded in constructivism and connected to self-determination theory as well.

**Project-Based Learning**

PBL is originally credited to the work of John Dewey. Dewey believed that students learned best when they could construct their own meaning. He also believed they would be more engaged when they took place in meaningful tasks to solve real world
problems (Dewey, 1959, as cited in Blumenfeld & Krajcik, 2006). PBL enables learners to work through problems. Learners work collaboratively to investigate, make a hypothesis, and create new ideas to solve real world problems. The learner-centered nature of PBL is central to the themes of constructivism (Jong, 2019).

According to Adderley (1975) and Blumenfeld et al. (1991), the key elements of a PBL design are that there is a problem and an artifact to represent the learner’s solution to the problem (Adderley, 1975; Blumenfeld et al., 1991, as cited in Grant, 2011). Also important to the design of a PBL are the following elements: “(a) an introduction, (b) a task/process, (c) process of investigation, (d) resources, (e) scaffolding, (f) collaborations, and (g) reflections and transfer activities” (Grant, 2002, p. 1). This research study followed this design process, which was very beneficial for the students involved in this study. For example, explaining the problem and defining the learning task and procedures for investigation are just a few techniques that helped the learner to feel competent. Competence is one of the three needs discussed earlier in self-determination theory. The PBL design helped to fulfill this need in the students involved in this study and will be discussed further in Chapter 3.

By using a PBL instructional model, students were actively involved to help develop an action plan for the classroom around cellphone usage. Providing the students the task to find cellphone usage policies that were effective in the classroom empowered them to help find a solution to a real-world problem. This fulfilled the need for autonomy under self-determination theory (Cherry, 2021). Students were challenged to help design a plan that made a difference. Using a PBL model for this study helped students to feel
empowered, they were able to use their own ideas to design an action plan to solve a real-world problem.

Students also gained the benefits of discovery learning by using a PBL instructional model. According to Chen and Honomichl (2012), discovery learning “helps learners create and organize knowledge. Involving mindful participation and active inquiry, typically takes place during problem-solving situations” (p. 615). Again, using a PBL model provided students a real-world situation for which they discovered a workable solution.

According to Solomon (2003), PBL is “designed to engage students and empower them with responsibility for their own education” (p. 1). Additionally, according to Johnson (1991), students taking ownership in the classroom benefits students in many ways. Giving students a voice and ownership in classroom policies increases engagement and improves academic performance (Johnson, 1991). Students creating cellphone policies through a PBL design helped them to feel they have a voice and ownership. Researchers have suggested that giving students a voice and ownership in the classroom is beneficial (Johnson, 1991; Solomon, 2003). There seems to be a lack of research, however, on whether giving students ownership over cellphone classroom policies has a positive outcome, which is what I examined further in this study.

Working on real world problems is engaging to students (Jong, 2019). According to Solomon (2003), “When students understand that their work is ultimately valuable as a real problem that needs solving, or a problem that will impact others, they’re motivated to work hard” (p. 2). The PBL design was chosen for this study to have students involved in helping to solve a problem that could improve their classroom and school. By having
them involved in these decisions, students were more engaged in the process and in the classroom once the new action plan was in place. According to Matthews (2019), “If students can formulate their own opinion on something and it’s connected to their life, then they’ll be engaged.”

The PBL model for this study also aligns with social constructivist theory in that it provided students the opportunity to learn cooperatively. Students felt more in control of their environment by working through the planning and analyzing processes together (Chambers & Roessingh, 2011). The collaboration aspect of PBL aligns with the need for connection based on self-determination theory. The PBL project allowed students the opportunity to work with one another to solve real world problems,

**Using a PBL Model and Connections to Social Justice**

Through the years, the positive effects of student voice and ownership has been observed in the classroom. According to Warren and Marciano (2018), social justice is impacted when youth get to use their own voice in the classroom. This process gives attention to the thoughts and perspectives of young people in the community. This is very valuable, as the policies that are being reformed are going to affect these young people whose opinions are too often overlooked (Corbett & Wilson, 2001). Adding this element of social justice was another important rationale for using the PBL design for this study.

Cooperative learning allows students to work together to obtain social skills and knowledge that can be used beyond the classroom. The work of John Dewey supports cooperative learning, as he believed in the democratic classroom (Gibbon, 2020). Using a PBL model for this study helped students to build these skills as they worked cooperatively to come up with cellphone policies for the classroom. This democratic
classroom process also has a social justice element in that student voices are heard (Chapman, 2003). My hope was that giving students voice and power in making classroom decisions would have many positive outcomes, including an increase in student engagement.

Student engagement is vitally important. When students feel disengaged and/or that they do not have a voice, devastating outcomes can be observed. According to Curtis and McMillan (2008), students who are disengaged and want to leave school without finishing the 12th grade often state their reasons as being treated unjustly, disliking school, and feeling unheard. Increasing student engagement through student voice and ownership is an important rationale for using PBL. Janonsz et al. (2008) pointed out that there is a behavioral and motivational component to engagement. Both of these impact engagement, which is also shaped by the student’s overall school experience (Janonsz et al., 2008). Therefore, many factors affect student attitudes toward school engagement and their chances of dropping out. My hope was that using a PBL learning model would benefit students in their feelings of being connected and engaged.

**Historical Perspectives**

In this section, I discuss the rise in cellphone usage and the amount of screen time that has increased for students in recent years. The rise of attention deficit disorder (ADD), Attention deficit hyperactivity disorder (ADHD), and anxiety in teenagers over the years is also addressed. Background information on BYOD policies as well as the PBL instructional model is also examined.

Cellphone usage and screen time have been on the rise for teenagers over the last decade, according to the Pew Research Center (2020). Rideout (2016) stated that
teenagers are spending over 7 hours a day on screen time, not including the time they are looking at devices to complete schoolwork. Additionally, the amount of screen time has doubled in the last 4 years (Rideout, 2016). Teenagers are spending more time on devices now than any time before in history. Excessive time on devices may have negative impacts on teenagers. For example, many studies have shown that too much screen time may be associated with depression and anxiety. Excessive smartphone usage that leads to negative consequences is referred to as problematic cellphone usage (PSU). Symptoms of PSU can resemble behavioral addiction (Elhai et al., 2018). According to Elhai et al. (2017), PSU is linked to depression and anxiety.

With the rise in screen time for teenagers over the years, as well as the prevalence of anxiety, depression, and other psychological issues in teenagers, one has to wonder if there is a relationship between the two. Ives (2012) linked possible connections with too much screen time and ADD/ADHD: “Another negative risk of technology is the effects it is having on our attention span and is a potential source of the increasing ADD and ADHD in our culture” (p. 32).

The Centers for Disease Control and Prevention (2020) reported a 42% increase in the amount of ADD and ADHD cases in children from 2003-2011. Many factors could have contributed to this statistic; however, many researchers have attributed this rise to an increase in screen time. Cha et al. (2018), for example, attributed an increase in screen time to a rise in ADD and ADHD symptoms. The researchers sought to discover whether students with high digital media use also had a higher level of ADD or ADHD. The researchers studied 15 and 16-year-olds over a 24-month period. At the beginning of the study, the students involved showed no significant ADD or ADHD symptoms. Surveys
were used to collect information. After the study, when measured again, they observed a significant rise in symptoms in students who had a higher frequency of digital media use (Cha et al., 2018). Along with the rise in screen time over the years, there is also a rise in anxiety, depression, and other psychological issues such as ADD/ADHD. Although research suggests a connection between the two, more research should be conducted in this area.

One cellphone-related anxiety disorder that has gained a lot of attention by researchers over the years is known as nomophobia. Nomophobia refers to the fear experienced by students who think that they are losing access to information, connectedness, or communication. According to Durak and Seferoğlu (2018), “Nomophobia is considered as one of the main causes of smartphone addiction.” Nomophobia can affect youth and adults and results from a fear of missing out on something if one cannot look at their phone. According to Cherry (2020), the term was coined by a study conducted by the United Kingdom post office in 2008. The researchers came up with the term nomophobia as an abbreviated word from the words, ‘no more mobile phone’ phobia (Cherry, 2020). When students cannot look at their phones, they feel a loss of control or an uncertainty regarding when they can look at their phones again, which causes great stress (Tams et al., 2018). Furthermore, the term nomophobia is constructed on definitions described in the Diagnostic and Statistical Manual of Mental Disorders Fourth edition (DSM-IV; Bragazzi & Del Puente, 2014). The DSM-IV is a book by the American Psychiatric Association which classifies mental disorders.

Not only are students spending many hours a day on smartphones outside of school, but in recent years, smartphones and other devices are being used in the
classroom, adding even more hours of screen time for students per day. According to Jiang (2018), nine out of ten teenagers view the amount of time that teenagers spend online as problematic (Jiang, 2018). Historically, students have not been allowed to have cellphones with them in the classroom. Many schools, however, started adopting a BYOD policy several years ago. The BYOD policy is a large contributing factor to the rise of schools allowing cellphones to be in the classroom with students. Under this policy, students are allowed to bring their personal devices, including laptops, tablets, or smartphones (Akkoyunlu et al., 2020). Districts that may not have the funding to provide a device for every student have started using the BYOD policy in recent years, which helps to give students equal access to the many educational resources that can be found online. According to Afreen (2014), “With BYOD students can access them from anywhere easily. Teachers can share their knowledge easily with students in or out of classrooms” (p. 235).

It was once the norm for cellphones to be banned in the classroom. Over the years, however, there has been a push by parents to allow cellphones in the classroom, which has been due largely in part to an increase in school shootings and school violence. According to Sawchuk (2019), although there was a slight decline in the last decade in school violence, the numbers are rising again, and many schools are hiring police in their buildings (Sawchuk, 2019). The rise in school violence is, understandably, an area of concern for parents. Many parents desire easy communication with their children when inside a school building. In a survey conducted by Graf with the Pew Research Center (2020), after the mass shooting in Parkland Florida, 57% of teenagers aged 13 to 17 reported being worried about a school shooting happening in their school. One in four
reported being very worried. As many as Sixty-three percent of parents also reported being worried about the possibility of a shooting in their child’s school (Graf, 2018). This concern has caused many parents to push for students to have their cellphones in the classroom. In a study conducted by Johnson and Kritsonis (2007), A whopping 99% of surveyed parents showed that they want their children to have their cellphones in the classroom to be able to communicate with them in case of an emergency. These concerns were heightened by violent events such as Columbine High School and 9/11 (Johnson & Kritsonis, 2007).

As mentioned, cellphones have not been allowed in the classrooms in the past. Currently, schools are making the decision to ban or not to ban cellphones. In a study conducted by Gao et al. (2014), the researchers surveyed 245 elementary, middle, and high school teachers regarding their current cellphone policies. The researchers concluded that cellphone dependency was higher in middle and high school students, and some policies were effective. They also resolved that more research needs to be conducted to discover whether cellphones should or should not be allowed in the classroom.

In conclusion, cellphone usage has been on the rise in recent years. Students are spending more and more time on devices. There is also a rise in psychological issues, such as ADD, ADHD, and anxiety. More research needs to be conducted to find whether there is a definite correlation between these two increases. The BYOD policy has led to even more daily screen time for students. Because of school violence over the years, many parents want their students to have cellphones in the classroom for communication in case of an emergency. Due to the trends over the last decade regarding an increase in
screen time and students having cellphones in this classroom, for this study I aimed to use a PBL design to help lessen some of these negative effects that have been observed.

**Negative Impacts of Cellphone Use in the Classroom**

Research supports that there are many negative effects associated with cellphone use in the classroom. In this section, I discuss some of these negative impacts that cellphone usage in the classroom can have on students. First, I discuss the psychological impacts. Next, I discuss behavioral issues associated with cellphone usage in the classroom. Finally, I address concerns regarding social media and other social issues.

Cellphones in the classroom can have negative impacts on students, such as increased levels of anxiety and distractibility (Tams et al., 2018). Distractibility is a prevalent issue that many teachers feel many be attributed to cellphone usage in the classroom. Watson (2017) conducted a study in which students were randomly placed in three groups—one with cellphones on their desk, one with cellphones in a bag or pocket, and one with cellphones in the other room. The results showed that the students were more distracted by their phones if they were with them, even if they were out of site in a bag or a pocket. The students who left their phones in another room scored higher in working memory than the other two groups (Watson, 2017).

Kim et al. (2018) found similar results from their study, in which students were placed into two groups, some with phones and some without. After being randomly placed into a group, students listened to a 20-minute lecture and were quizzed at the end. Participants with their phones received distracting texts throughout the lecture and performed worse on material presented in the third quarter of the lecture. The researchers
found that attention to learning was most impacted 10 to 15 minutes into the lecture for the students who had their phones (Kim et al., 2018).

Other researchers have suggested cellphone usage also has different impacts on learning. Chen and Yan (2016) examined 132 studies on multitasking and attention related to cellphone usage. They classified multitasking as students attending to mobile devices to answer texts or emails unrelated to the content they were learning, while also trying to attend to the lesson. They found that multitasking takes up limited cognitive space for learning, and the learner then has insufficient space to learn new information. They noted negative effects on learning and on recall when students were multitasking with cellphones (Chen & Yan, 2016).

Many teachers have also observed behavioral issues related to cellphones. In a study by Nikolopoulou (2020), questionnaires completed by secondary education teachers revealed concerns regarding students’ abusive behavior with cellphones and difficulty in controlling their cellphone behavior. Teachers also reported concerns regarding cheating when students have cellphones. It is very easy for students to take pictures of material or look up information. According to Morin (2020), “It only takes a second to capture a picture of an exam when the teacher isn’t looking. That picture may then be shared with friends who want a sneak peek of the test before they take it” (p. 3). Moran (2008) reported incidents of cheating with cellphones at the university and college levels. Moran suggested that policies be put into place by teachers regarding cellphone usage in the classroom, as finding the answers to a test on the internet or asking a friend for help is very easy to do on a cellphone. Students having cellphones with them in the classroom can lead to behavioral concerns.
Additionally, many parents and teachers are concerned about other negative behaviors that cellphones in the classroom can lead to, such as cyberbullying. Cellphones in the classroom may increase the amount of texting as well as cyberbullying between students. Riley (2017) reported that in New York City public schools, cyberbullying increased by over three times the cases from 2015 to 2017. Some feel that having cellphones in the classroom provides students more opportunity to bully each other. Furthermore, cellphone use in classrooms has led to an increase in cyberbullying of students against teachers. Kyriacou and Zuin (2014) reported there has also been a recent rise in students making YouTube videos of teachers intending to bully and make fun of them.

Another negative behavioral concern with cellphones in the classroom is the material that students may try to access and/or share. Parents are concerned about their students looking at inappropriate material, such as pornography (Mullen, 2006). According to Tanner (2019), most schools have filters to block most of these sites. The students can get around these, however, by using their cellphones, either by data they have stored on their phones or the Wi-Fi networks that they use. It is very concerning that students are easily able to access and share this inappropriate material (Tanner, 2019).

Additionally, another negative impact relates to student academic performance. Bignotti et al. (2018) observed the effects of screen time and social media on academic performance. In their mixed methods study, the researchers had 72 participants fill out time logs for social media and compare the numbers with grades. They concluded that the more time a student spends on social media, the more negatively their academic performance is impacted (Bignotti et al., 2018).
Finally, some studies have also suggested that cellphones have social cognitive effects on teenagers. For example, in a mixed methods study by Ives (2012), which involved 46 teenagers and information gathered from a literature review, Ives revealed that one negative aspect of cellphone use with teenagers is the teens are interacting more with technology and less with each other (Ives, 2012). In another study from Korea, Kim et al. (2016) found that mobile phone dependency had a negative effect on social relationships with friends. The researchers also found a relationship between mobile phone use and decreased academic performance.

As mentioned in the theoretical framework, Vygotsky (1978) placed great emphasis on the importance of social interactions on student development. One of the negative aspects of the increase in student screen time is that students are interacting less with each other. They may be missing out on forming important social relationships due to spending so much time on devices. As Vygotsky’s theory (1978) supports, and as the above studies suggest, this can be detrimental to student learning (Ives, 2012; Kim et al., 2016; Vygotsky, 1978).

Cellphones can have many negative outcomes for students. Many teachers and parents feel that cellphones should not be brought into the classroom. Research supports an increase in psychological, behavioral, and social issues related to cellphone use. One of the psychological issues that has become more prevalent is student anxiety. In the following section, I provide a more in-depth discussion of this anxiety disorder related to cellphone use known as nomophobia.
The Negative Impact of Nomophobia on Students

Nomophobia is an anxiety disorder that is caused by being away from one’s cellphone. Students experience this when their cellphones are not allowed in the classroom or if they have to be kept out of sight (Leger et al., 2018, as cited in Carels, 2019). This did not fit neatly under negative impacts of cellphones in the classroom, as nomophobia occurs primarily in the absence of one’s phone. Reducing this anxiety by allowing students to have access to their phones in the classroom may be considered a positive impact. Additionally, teachers observe nomophobia in the classroom when cellphones are allowed. Teachers have noted that students cannot seem to stop looking at their phones at inappropriate times (Carels, 2019). For these reasons, the issue of nomophobia is covered separately in this section.

The amount of anxiety that teachers are observing in their students is concerning. In a study conducted by Deweese (2014), many teachers interviewed agreed that there seems to be an “epidemic of anxiety and depression along with an addiction to texting” (p. 8) in their students. Students are exhibiting additive behavior and are experiencing anxiety when they are away from their phones for a period of time.

Nomophobia is creating issues for students in and out of the classroom. Kim (2013) found that those with smartphone addiction showed lower academic performance. Participants also reported feelings of loneliness and anxiety in the absence of their cellphones. Similarly, in a study by Alosaimi et al. (2016), the author found that respondents had a lack of energy, lack of sleep, and 25% reported a drop in academic performance (Alosaimi et al., 2016, as cited in Davie & Hilber, 2017). With cellphones
here to stay, the aim of this study is to find a way to lessen nomophobia and the negative effects that it may have on students.

Leger et al. (2018) set out to control the amount of nomophobia experienced by teenagers by letting them know the time they would be without their cellphones. The researchers found less anxiety when the teenagers were given this information. They recommend managers tell their employees how much time they would be without their phones before a meeting to lessen nomophobia (Leger et al., 2018).

Nomophobia is a fairly new anxiety disorder that has been on the rise in recent years. In fact, according to Elmore (2014), nomophobia is especially abundant in high school and college students who even say they “shower with their cellphones” (Elmore, 2014). Students experience this anxiety when they are not able to use their phones. Carels (2019) strongly suggested that teachers find ways to allow cellphones to be a part of the classroom to decrease the anxiety and other negative effects that students struggle with in the absence of their phone. Decreasing nomophobia is a challenge, but it is one of the positive impacts of having cellphones in the classroom, which is discussed further in the following section.

**Positive Impacts of Cellphone Use in the Classroom**

In this section, I cover the many positive impacts that cellphones in the classroom can have on students. First, I discuss the educational benefits. Next, I discuss the psychological benefits. Finally, I discuss the benefits to students with language and special needs along with benefits to parents.

Allowing cellphones in the classroom can have positive effects on students (Bolton et al., 2013). Students having their cellphone in class offers a vast array of
educational apps and organizational tools that are helpful in the classroom. According to Clayton and Murphy (2016), “Smartphones at the students’ fingertips open up a world of engaging educational opportunities” (p. 100). Teachers can use these tools to enrich their lessons. Students can even play educational games to master material or compete with other students. There are also websites that teachers can use that provide formative assessments to help guide lessons. Students can use their calendars or other organizational tools to keep track of assignments. Having a cellphone is essentially the equivalent of every student having a computer with them at all times. There are many educational apps and useful study aids that can benefit students if used appropriately in the classroom. According to Clayton and Murphy (2016), “if the push by education leaders nationwide is to incorporate technology into the classroom, the smartphone can serve as a partner with teachers to create engaging lessons that create global digital citizens” (p. 100).

Several studies have shown that students and teachers support the educational benefits to cellphone use in the classroom. In a study conducted at a progressive middle school in India, Cady et al. (2017) concluded that 86% of teachers and 92% of students supported cellphone use in the classroom and saw the many educational benefits that this could provide. Similarly, O’Bannon and Thomas (2013) surveyed 92 preservice teachers regarding the use of cellphones in the classroom. Most teachers agreed that the use of the calculator, audio player, and internet access provided important instructional support for students. This study also highlighted the usefulness of cellphones in the classroom for differentiating instruction as well as increased communication, motivation, and student engagement (O’Bannon & Thomas, 2013).
In a qualitative study by Omaid and Wali (2020), 50 university lecturers were questioned about their feelings regarding cellphone usage in the classroom. Most of the lecturers allowed cellphones in the classroom for use as long as students did not engage in social media. The teachers reported many instructional supports that cellphones could be used for, including recording lectures. They felt this helped students to be successful and engaged in the classroom (Omaid & Wali, 2020). Asghar and Rashid (2017) found that cellphone usage in classrooms increased the amount of student engagement and had a positive impact on self-directed learning for college students. They did not, however, find any significant impact to cellphone usage improving academic performance.

Furthermore, Ehnle (2021) suggests several academic benefits for students having cellphones in the classroom. “When students are engaged in their learning — and they’re almost always engaged with their phones when given a choice — they are less likely to succumb to distractions” (p.1). Ehnle (2021) also mentions students can use cellphones as a quick dictionary or thesaurus and that cellphones allows students to be able to find answers to their questions immediately. Cellphones and their many instant resources used appropriately can be a benefit to students in the classroom.

Additionally, O’Bannon and Thomas (2014) found that teachers’ perceptions on cellphone use may depend on the age of the teacher. After surveying 1,095 teachers, the authors found that teachers over 50 were less likely to own a smartphone and less optimistic about the positive impacts of students using them in the classroom. These teachers were less familiar with the apps and educational tools that could be used on mobile devices, and therefore felt less favorably toward their use in the classroom (O’Bannon & Thomas, 2014).
One concern for having cellphones in the classroom is that some teachers feel they are distracting to students. Some studies, however, have found that appropriate cellphone usage may actually help students to be engaged in lessons. For example, Bolton et al. (2013) surveyed 78 teachers regarding their cellphone usage policies. Over 50% felt that having cellphones in the classroom helped student engagement (Bolton et al., 2013).

Another positive impact of cellphones in the classroom is anxiety reduction. According to Carels (2019), students having their cellphones with them may reduce nomophobia. Carrier et al. (2014) conducted a study with two groups of students who were placed in a room for 75 minutes, some with their phones and some without. The students then completed the STAI inventory every 20 minutes. There was a much higher rate of anxiety reported from the students who were without their phones (Carrier et al., 2014). When students experience anxiety from not having their phones, they can become distracted and disengaged from learning. Thus, having cellphones in the classroom with them may reduce their anxiety.

Not allowing cellphones in the classroom could also elicit emotional issues in students. Frey et al. (2018) found that limiting cellphones in classrooms can start a reactance process with teens, causing anger and noncompliance. This could also lead to negative classroom behavior, which could be reduced with policies allowing for cellphone use in the classroom. Allowing students to have their cellphones in the classroom could also lessen these negative emotional impacts for students.

Additionally, if there are clear and appropriate expectations in place for students, the students will know the rules and feel more secure in the classroom. According to
Engel and Green (2011), it is important for students to know the classroom expectations. When expectations are clear, students feel more secure (Engel & Green, 2011). In this study, students will have a say in the classroom cellphone usage policies. By allowing students to make decisions on cellphone policies, they will know the expectations, which will increase their comfort levels. This will hopefully also decrease any potential for anxiety regarding classroom cellphone usage.

Furthermore, smartphones in the classroom can be a huge benefit to English as a Second Language (ESL) learners. Houser and Thornton (2005) found that students preferred learning English language lessons on their phones over their PCs. As an educator, the researcher has observed ESL students using Spanish/American dictionary apps and translators on their mobile phones in class. This has been a huge benefit to these students who may not speak much English. Although paper Spanish/American dictionaries are available in the researcher’s classroom, these students often prefer to access these resources on their phones. One advantage to this is that the phone is able to read the word out loud to them. This can help students more than the paper copy, which does not allow them to hear the proper pronunciation.

According to Bouck et al. (2012), students with disabilities can also benefit from having their cellphones in the classroom to meet IEP accommodations. The researchers shared how cellphones can be used as assistive technology for students. The researchers also encouraged teachers to use technology in the classroom for students with disabilities, and to “capitalize on students’ natural interests” (Bouck et al., 2012, p. 47).

A final positive benefit of students having cellphones in the classroom relates to parents. One of the benefits to parents when their child can have a cellphone in the
classroom is peace of mind. Considering the increase in school shootings and violence, many parents are concerned about their students being able to communicate with them in an emergency situation. In a study conducted by Kim et al. (2013), surveys were given to students and staff after the Virginia Tech shootings. The researchers found that the main method of communication by students and faculty was through the use of cellphones. Other more recent school shootings involve K12 schools such as Sandy Hook Elementary in 2012, Marjory Stoneman Douglas High school in 2018, and Robb Elementary School in 2022. These incidents have made parents even more on edge for their student’s safety. Many parents are pushing for school districts to allow cellphones in the classroom after these horrific events so that students have a direct line of communication to their parents in the event of a shooting or other emergency in the school building. Having a cellphone in the classroom offers parents peace of mind and may also lower anxiety in students if they are experiencing any of the same concerns as their parents in light of recent cases of school violence.

There are many positive aspects of allowing students to have cellphones in the classroom. It can be argued that there are many educational and organizational tools that can increase rigor and help students in their lessons that are accessible with a smartphone. Cellphones can improve student engagement that can be defined as sustained behavioral involvement and intense effort in learning activities (Chapman, 2003). Cellphones may also help to decrease negative psychological impacts when used appropriately. Smartphones can also be a huge support to ESL students and other students who may need supportive technology accommodations in the classroom. Finally, cellphones in the classroom may also provide parents with peace of mind that their child can contact them
in case of an emergency. Having peace of mind is a huge benefit that many parents feel could be provided if cellphones are allowed in the classroom. When used appropriately, cellphones are undoubtedly beneficial to students.

Summary

The issues that I have observed over this past 3 years with students having cellphones in the classroom are not unique to my personal school. There is an extensive amount of research in which many educators have reported some of the same negative effects of cellphones across the United States. Many educators view cellphones in the classroom as a distraction to students and an interference to attentiveness and learning. Other teachers have reported a higher level of anxiety and depression in their students that seems to be related to cellphone use. There are also negative social and behavioral issues associated with students having their cellphones in the classroom. Unfortunately, these negative effects from students having cellphones in the classroom also seem to negatively impact academic performance.

There is also much evidence that when cellphones are used appropriately in the classroom, they can have several positive impacts for students. Students having their cellphones with them in the classroom can help decrease negative behaviors, distractibility, and the anxiety known as nomophobia. Additionally, there are many useful educational apps and organizational tools to support students in the classroom and enrich lessons. Cellphones are also beneficial to successfully differentiating instruction. For example, ESL students may benefit by being able to use language dictionaries or translators on their cellphones in class. Additionally, smartphones can offer support to students with disabilities.
In this chapter, I provided a review of the literature related to the problem of practice for this study. In the following chapter, I will discuss the methodology for this study, including the data collection and analysis methods, the participants of the study, and an in-depth look into the project-based learning instructional model.
CHAPTER 3

METHODOLOGY

In Chapter 2, I provided a literature review and discussed the theoretical framework for this action research study. In this chapter, I discuss the research methodology that will be used to answer the research questions. I also provide an in-depth look into the research design, participants, setting, instruments, timeline, procedures, and data analysis methods which frame this study.

Overview of the Study

This study was inspired by a problem that I noted in my classroom nearly three years ago, when I began teaching in a school district with a BYOD policy in place. This policy permitted my students to have their cellphones in the classroom. This was the first time I had experienced this in my 16-year teaching career, and I began observing several issues this seemed to cause. I began noticing that the cellphones were causing students to become distracted easily, which led to more student misbehaviors such as being off task, not completing classwork, and sometimes, even cheating. Additionally, I became concerned when my students seemed to exhibit anxiety regarding not having access to their phones. I also observed other addictive behaviors like when they knew they were not supposed to be using their cellphones but would use them anyway.

Nomophobia is the fear of not being able to use one’s phone, and missing out on
important information (Tams et al., 2018). According to Carels (2019), “Nomophobia leads to other issues, including the inability to focus, stress and anxiety, and the inappropriate use of cellular devices” (p. 1). With all these negative impacts that seemed to be related to cellphones in the classroom, I became increasingly concerned about these impacts on my students’ academic performance.

Although cellphones in the classroom can have negative impacts, I have also seen some positive effects as well. Students having a smartphone in the classroom is like every student having a personal computer at their fingertips. Smartphones offer great educational advantages for using online resources, educational apps, study aids, and more. Providing students equal access to these digital opportunities in the classroom helps move them toward taking their place in the global community in the future. Furthermore, students having their cellphones on them eases parental concerns. Considering recent school violence, parents feel reassured being able to communicate easily with their student during the school day. These positive outcomes are also a very important benefit of allowing students to have cellphones in the classroom.

After observing all of the impacts of cellphone usage in the classroom, I felt obligated to seek a way to decrease some of the negative effects on students while increasing the positive ones. I felt the need to investigate with my students, giving them ownership in the process, by using a PBL design. This action research study aimed to answer the following questions:

**RQ1:** How do students synthesize and evaluate researched material to construct their knowledge and to create a classroom cellphone policy?
RQ2: How does using a PBL instructional model engage students in the process of making a cellphone usage policy for their classroom?

RQ3: How does ownership of classroom cellphone usage policies impact student self-reported distractibility, anxiety levels, academic performance, and teacher-observed cellphone behavior?

Research Design

This study was a mixed methods action research design based on a constructivist intervention. According to Elliott et al. (2000), “Constructivism is an approach to learning that holds that people actively construct or make their own knowledge, and that reality is determined by the experiences of the learner” (p. 256). The use of a PBL design in this study allowed students to construct their own knowledge, make decisions, analyze data, and find their own solutions to help solve a real-world problem. Furthermore, using this instructional design allowed students to feel empowered by having a voice in their classroom.

Action research is defined by Efron and Ravid (2013) as “an inquiry conducted by practitioners in their own setting in order to advance their practice” (p. 9). Action research was the best approach for this study, where I, the teacher, investigated an issue that I have observed in my own classroom. According to Duesbery and Twyman (2020), “action research allows those that live the issue to be the main participant in systematically solving the issue” (p. 3). Action research is a fitting method for this study because the intervention designed to address the problem of practice allowed students to come up with a policy that they would feel invested in, which will ultimately reduce negative cellphone behaviors and improve the classroom learning
environment. Moreover, “[a]ction research is best done in collaboration with others who have a stake in the problem under investigation” (Anderson & Herr, 2015, p3). Through collaboration, the students attempted to find a solution to solve an issue that impacted their day-to-day routines in the classroom. They took ownership in developing their own policy to solve a problem that was affecting their daily lives. I was concerned that their distraction and anxiety from their cellphones was interfering with their learning, and my addressing this issue was impacting my ability to deliver instruction. This study takes the first step in improving my practice and student learning that cellphone behavior was interfering with. This action research study did not aim at measuring learning impacts nor long term cellphone behavior, but it represented the first cycle in addressing the problem of practice.

I chose a mixed methods design for this study to answer the research questions. This design seemed like the most effective design to use because I was interested in obtaining both quantitative and qualitative data. According to Creswell and Creswell (2018), a mixed method design combines both types of data and then uses the strengths of each to understand the research problem. I did not only want to obtain statistical information from this study but was also interested in collecting the student participants’ thoughts and interpretations to acquire a deeper understanding of the research problem and results.

According to Chapman (2003), “children who are engaged show sustained behavioral involvement in learning activities accompanied by a positive emotional tone” (p. 2). Taking action and showing intense effort are some of the characteristics seen in engagement. Chapman also suggested that engagement can be measured most
by students reporting themselves. For this reason, student engagement throughout the study was reported by exit tickets (See Appendix A) and the pre- and post-surveys (See Appendix B & C). Teacher observations is another way to measure student engagement (Chapman, 2003). I also made observations each day during the PBL project on the teacher observation journal and noted if students were taking action, showing effort, and were actively involved in the process (See Appendix D).

**Research Setting**

This study was conducted in the spring of the 2021-2022 school year. Students were returning from a virtual school year due to the COVID 19 pandemic in the fall of 2021. The middle school in which this study took place is in a suburban county in Maryland situated halfway between Washington DC and Baltimore. This is a public middle school and includes students that are sixth through eighth grade. The school was built 48 years ago and has been an important part of this community for some time. Some students come from families who have lived in this community long enough to have parents who also attended this same school.

This school is in a very affluent county in Maryland. However, it is situated in a poorer section of that county, and thus there is a number of subsidized housings in this particular school zone. The county is very diverse in general, with many families from all over the world moving to this area to commute to Washington or Baltimore for work. The school has a more urban feel, although it is in a suburb of two major cities. The student body is made up of the following demographics: 50% African American, 18% Caucasian, 16% Hispanic, 8% Asian, 7% percent other races, and 1% percent
Native American or unspecified. Although this school is not classified as Title One, 39% of the student body come from low-income families (Greatschools, 2021).

At the time of the study, I was teaching two sections of seventh grade Theater Arts and three sections of eighth grade U.S. History every day in this setting. My class sizes ranged between 20 to 26 students per class. The students ranged from having single parent households and living in subsidized housing to two parent households with a substantial income. Many students with whom I worked with daily were ESL or had an IEP or 504 plan in place.

Participants

The participants were all eighth-grade students enrolled in a U.S. History course. Culturally, this class was very diverse, which is representative of the diversity of the student body of the school. In this class, the students’ demographics were as follows: eight \( n = 8 \) Caucasian, seven \( n = 7 \) African American, three \( n = 3 \) Hispanic, one \( n = 1 \) two or more races, and one \( n = 1 \) Asian. Originally, there were 20 students involved in this study. However, two of the students never returned the parental consent forms and their data had to be left out of the study (See Appendix E). A third student’s data also had to be dropped out of the study due to severe behavioral issues, which were not related to cellphone use. I picked this class because it was my smallest class that seemed more manageable for this study. I also had observed less frequent behavioral issues in this class compared to my other classes. This was important because I wanted to focus on cellphone behavior mainly and did not want other misbehaviors to distract from collecting data or the students completing their tasks. This was a 50-minute class that met sixth period each day after lunch and was also a year-long course. This class was nearly even in the number of
males and females and consisted of eleven females and nine males. All of the students in this class were between 13 and 14 years old. Three students in this class had a 504 plan in place.

**Intervention**

This study was based on a PBL design. According to Grant (2002), a PBL design contains the following elements: “(a) introduction, (b) tasks, (c) process or investigation, (d) resources, (e) scaffolding, (f) collaborations, and (g) reflections and transfer activities” (p. 1). The PBL design used in this intervention was based on Grant’s model.

Before the PBL project was introduced to students, I had parents complete a consent form for the study (See Appendix E). Students also completed an assent form to participate as well (See Appendix F). Next, students were asked to complete a pre-survey which gathered both quantitative and qualitative data. (See Appendix B). I took the data collected from the pre-survey and provided it as a resource for students to use as they completed their annotations (See Appendix G).

**Introduction**

To introduce the study to students, I presented the problem of practice by talking about the return from a virtual setting this school year. This was due to the COVID 19 pandemic where students in my school district had been completely virtual from Match 2020 until March 2021. From March 2021 through the end of the 2020-2021 school year, a hybrid model was put into place, but many students remained completely virtual until the fall of 2021. I told the students that I was noticing many of them were having trouble not using their cellphones in the classroom. I pointed out that this problem has been ongoing in previous years, even before coming back from the virtual setting. Students
seem even more distracted by their phones since they had returned from virtual learning. This was a problem that I had observed, and the students were told that they would help find a solution. Students were told that during this project, they were going to look at resources and develop a plan to try and work on making the situation better.

**Tasks**

Students completed several tasks during the PBL project. These tasks included the following: annotations (See Appendices G & H), an interview (See Appendices I & J), an important themes graphic organizer (See Appendix K & L), cellphone policy outline (See Appendix M), cellphone policy presentation (See Appendix N), presentation notes (See Appendix O), and exit tickets (See Appendix P). These tasks are described in more detail below.

**Annotations.** One task that students completed during the research phase of the PBL project was taking notes on the literature on their annotation template (See Appendix G). The document had one box for summarizing, one for paraphrasing, and one in which to cite their source. Students could also add sections to record more information as needed.

**Interview Template.** For this task, students interviewed either a staff member, family member, or another student about their feelings regarding cellphones in the classroom. They were given the choice of who they would like to interview. They were provided with an interview template with five questions and told to also add their own questions as well (See Appendix I).

**Important Themes Graphic Organizer.** This task involved completing a graphic organizer with important themes from the student’s own research and as group
members shared their research with each other as well (See Appendix K). This helped students to start organizing themes that they and their group deemed important to include in later tasks.

**Cellphone Policy Presentation Outline.** Students completed the outline for their policy presentation from the information recorded on their important themes graphic organize (See Appendix M). Students made an outline for their policy presentation with the template, which helped groups to start planning out what information would be on each slide in their presentations.

**Cellphone Policy Presentation.** For this task, the students completed a slideshow for their group’s cellphone policy which they presented to the class. This was a Google slideshow that students made to create their policy presentation. I went over the guidelines for the presentations and gave the students the rubric (See Appendix N). The students needed to have at least 17 slides in the template. The first slide needed to be the title slide which included the policy title that each group chose as well as the group members’ names. The next 10 slides needed to include information regarding their classroom policy rules. There needed to be two slides for each rule. The first slide needed to state the rule, and the second slide explained the rationale for the rule. There also needed to be six slides for students to write their three policy consequences. There needed to be two slides for each consequence so that students could provide a rationale for each one as well. This gave the students even more ownership of the policy, by deciding the three consequences that should follow if the rules are not adhered to during
the trial period. Students were told to add images, backgrounds, different fonts, videos, charts, graphs, or interactive elements to their slideshows. Students then presented the cellphone policy slideshow to the class.

**Presentation Notes.** As groups were presenting, students recorded the rules and consequences, they liked the best on this document. These became the student nominations that would then be voted on (See Appendix O).

**Exit Tickets.** Exit tickets were completed each day that students worked on their PBL project. The exit tickets were placed in a Google document with one question regarding the content from that day. The students also answered two questions rating their participation and interest levels for that day. The exit tickets also had a place where students could add any questions that they still had after each day (Appendix A).

**Student Voting and Signing of Class Cellphone Policy.** After all the groups shared their presentations, the students nominated their favorite rules and consequences. The students then voted on their favorite rules and consequences for the new policy on their final exit ticket (See Appendix P). Once the votes had been tallied, I draw up a contract with the top five rules and top three consequences. The students then signed the contract for the new class cellphone policy on the first day of the trial period.

**Process**

Throughout the PBL project, students completed the above tasks which were placed on Google Docs and linked in a PBL module on the platform that they are familiar with, which is called Canvas. I gave students access to the module on the first day of the PBL project and explained that day’s task. New tasks for consecutive days were published as students needed them. I decided Canvas was the best platform to use
because the students log into it daily for all their classes and are familiar with this module-style delivery for coursework. Also, students could visually see an outline of the upcoming days and could go back and access material if needed from previous days. Furthermore, with Canvas, I felt that I could easily keep track of students who had completed work and those missing a task. Over the four-week PBL project, students used each of the tasks to create their artifact. The artifact for this PBL project was the final cellphone policy presentation that each group made.

Students used a 50-minute class period on Thursdays and Fridays for four weeks to work on the project. This was a total of 8 hours. Students came up with a plan regarding how to increase the positive effects of having cellphones in classrooms while decreasing the negative effects. Students were given rubrics for all tasks. They were given the freedom to put a plan together that involved interviewing school staff, students, and gathering more resources online or in the media center. They made their presentations using Google slides, where they could be as creative as they wanted with images, interactive elements, videos, or other resources.

Students worked with their groups to investigate the problem themselves. I choose the groups. The group selection process will be explained further under the “collaboration” section. The groups were introduced to the process that they would be using to make their policies. They were told that they would present their ideas one at a time to the class. After the presentations, they democratically voted on which policy should be used in our classroom for the trial period.

Groups were told that each group member would have a specific role. I told the students on the first day that they would all be involved in every task. Group members
decided who would fill each role in the group. The group member roles included the following: group manager, recorder, presentation designer, and organizer.

Because this is a U.S. History course, one of the topics that the students cover is U.S. government. Students learn about democracy and principles established in the constitution. This research project was connected to the curriculum, in that after the students presented their PBL project to the class, there was a vote for which rules would become policy. Students picked their top choices and cast their votes. I tallied the votes and put the rules and consequences that received the most votes into a classroom policy for the students to sign. The policy was then put into place for the trial period.

Students were more likely to buy into the policies because they helped create them and they also signed a contract. According to Tams et al. (2018), including students in the planning process will alleviate stress because they feel more in control, which will help prevent nomophobia. I also reviewed the expectations with my students for cellphones daily during the trial period.

At the end of the trial period, students completed a post-survey which also contained quantitative and qualitative questions (See Appendix C). I analyzed the results from the pre-and post-surveys. The research findings from this and all data collection instruments were then shared with the administration. The goal was that with administrative approval, the findings would be presented in a future faculty meeting. This would give the students even more ownership and voice over the policy that they created.
Resources

I collected resources prior to this study on the disadvantages/advantages of cellphones in the classroom. I compiled studies and articles for the students that were geared more toward students of this age group (See Appendix V). Students also had access to the online database through their school library to search for more information as needed. Another resource that the students used was the results from the pre-survey and the interviews that they conducted. Students used the resources individually and with their groups before creating their policies.

Students each had a school-issued Chromebook. On their Chromebooks, they had access to a Google account provided by the district which includes a G-suite. Each student was able to share the Google documents and slides easily with their group as needed. Students also have access to Canvas which is used to access their regular coursework. I made a PBL module for the students to access in their canvas course. This module contained all the templates and rubrics for each task, literature, and any other resources that I shared in class for students to access easily. The students also submitted completed assignments to me through Canvas.

Scaffolding

I used scaffolding throughout the PBL project. Vygotsky (1978) first came up with the term scaffolding as part of his Zone of Proximal Development theory. According to Kurt (2020), “Vygotsky outlined scaffolding as a tool for growth. Learners complete small, manageable steps in order to reach the goal. Working in collaboration with a skilled instructor or more knowledgeable peers help students make connections between concepts” (p. 1). Students worked on the PBL project in small steps with their peers.
I modeled each step as the students moved through the PBL process. According to Dennen (2013), Bandura is credited with the concept of modeling and suggested that modeling is more helpful to students than learning through “trial and error” (p. 816). In this study, modeling was used to help scaffold students to complete a step in the PBL process and move on to the next task.

First, following the introduction to the project, I went over and modeled the group roles for students. Students were then placed into their groups and delegated roles amongst themselves. I then went over the first tasks with students. I showed them how to get to the templates on Canvas and went over the rubrics. Next, I explained the exit tickets to students and how they should be completed each day. I showed students how to access the exit tickets in Canvas and modeled the expectations for students. Each exit ticket had a place for students to ask any questions. I answered any questions from the exit ticket on the following day (See Appendix A).

The next task for the students was to make annotations on the research articles, which I provided to them. Students also could search for additional articles on the school database. Before they began looking at the literature, I presented a mini lesson on making annotations. I modeled annotations by using the pre survey results and then went over the rubric (See Appendix G & H). I also showed students examples of good annotations on the following day from one of the students in the class to make sure they were on track as they collected research. I also looked at their annotations and addressed issues as needed.

After the annotations, I conducted a mini lesson on what constitutes a good policy. This helped students as they started compiling their research together as a group and started pulling out important themes to use in their cellphone policy presentations.
Once the research was collected, I went over the important themes graphic organizer and modeled how the groups should share their findings with each other and complete this task individually and then together (See Appendix K & L).

After the groups had completed the important themes graphic organizer, I modeled the cellphone policy presentation outlines (See Appendix M). I modeled how to take the important themes and place them in the presentation outline. Once the outlines were completed, I provided feedback to the students. The students adjusted their outlines based on the feedback received.

Before students began making their cellphone policy presentations, I conducted a mini lesson on what makes a good presentation. I modeled a high-quality presentation for the students and went over elements to avoid when making a slide presentation. I explained the format and what was expected on each slide of the presentation. I went over the rubric and encouraged students to pick their own backgrounds, images, videos, or any other element that enhances their presentations (See Appendix N).

Before students started to present their cellphone policy presentations, I reminded students that they would be nominating their favorite rules and consequences following all the presentations. The students were told to use the presentation notes to record policy components they liked (See Appendix O). I modeled how to use the document. Once the presentations were complete, students shared their favorite rules and consequences by submitting their presentation notes on canvas. I recorded all nominations on a slide and copied them onto their day eight exit ticket (See Appendix P). The next day, I asked students to complete the day eight exit ticket which is where they wrote down and voted for their favorite rules and consequences. I then tallied the votes and put the top five rules
and top three consequences into a class cellphone policy for students to sign on the first
day of the trial period. I reviewed the classroom policy with students on the first day of
the trial period and had students sign the policy.

Throughout the PBL project, strategies such as questioning to help guide students
in their thinking process, modeling, and breaking the topic into parts were used to help
scaffold the learning process. I conducted daily check-ins with groups to answer
questions and answered questions on exit tickets during the next class. I provided graphic
organizers such as the important themes sheet, presentation outline, and the presentation
notes. I provided students feedback on the outline and guided students throughout the
process by providing additional resources as needed. I recorded observation on the
teacher observation journal throughout the process as well as suggestions for scaffolding
for the next day (See Appendix D). I kept a cellphone behavior checklist to record
behaviors during the trial period as well (See Appendix Q).

Collaboration

Students worked collaboratively throughout the whole process. I placed students
into five groups of four students. I selected one student with strong leadership skills for
each group. This helped groups to run more efficiently by spreading out some of those
students who exhibit strong leadership skills into different groups. I then tried to pair
quieter students with more talkative students to make up the other three group members.
From small group experience in my own classroom, groups tend to function better by
mixing more outgoing with less outgoing personalities. I also tried to separate any
potential student behavioral issues. I divided the groups in this manner for the sake of
efficiency.
Students made decisions in their groups regarding important themes from the research and how to make policies to address those themes. They made decisions about how to present the information together to the class. They made decisions about who would present each slide. Students nominated their choices and then voted on their favorite rules and consequences from those nominations. A class cellphone policy was synthesized for students to sign from the rules and consequences that receive the most votes, and the policy was put into place for the trial period.

Reflection

The students reflected on the PBL project daily with their exit tickets. They were asked to respond on the content for that day, on their level of participation and interest, and with any questions that they still had. I kept a journal to write down observations, reflections, and next steps during the PBL process. At the end of the trial period, the students completed a post survey to measure their level of distractibility, anxiety, and academic performance during the trial period. The post survey also included two questions for students to reflect back on the PBL process as well (See Appendix C).

Procedure

The data collection process began on February 1, 2022 and concluded on April 8, 2022. Table 3.1 below details the data collection timeline.

Table 3.1: Data Collection Timeline

<table>
<thead>
<tr>
<th>Dates</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>February 1-5</td>
<td>• Researcher collected data on the cellphone behavior checklist.</td>
</tr>
</tbody>
</table>

62
February 16

• Pre-Survey.

February 17-18 (Week one)

• Introduction.

• Students placed in groups.

• Group roles chosen.

• Directions given for interviews, exit ticket, and annotations.

February 24-25 (Week two)

• Annotations.

• Important Theme Sheet.

• Cellphone policy presentation outline.

March 3-4 (Week three)

• What is a policy?

• What makes a good presentation?

• Groups work on cellphone policy slideshows.

March 8-9 (Week four)

• Groups presented cellphone policy slideshows

• Students completed the cellphone policy presentation notes.

• Class discussion and students’ nominations to vote on favorite rules and consequences from presentations.

March 14-April 8 (Four Week trial period)

• Students signed class cellphone policy.

• New policy in place for four weeks.

• Researcher collected data on the cellphone behavior checklist.
Data Collection Instruments

I collected several pieces of data throughout the PBL process and trial period. Both quantitative and qualitative instruments were used to help gather information. Collecting both types of data helped to provide a more in depth look into the research findings.

Three data collection instruments contained both quantitative and qualitative questions. Both types of data were collected from the pre- and post-surveys, the cellphone behavior checklist, and the exit tickets.

Quantitative Instruments

A few quantitative instruments were used in this study to help determine whether there is a difference in student behavior, distractibility, anxiety levels, and academic performance once the student-created classroom cellphone policy was put into place. I used a behavior checklist to make observations at several points before and during the study. I also gathered quantitative information from the pre and post student surveys. Finally, I used rubrics to gather information from the student annotations, interviews, important theme graphic organizers, and cellphone policy presentations.

Cellphone Behavior Checklist. I noted on a daily checklist how many times I had to ask students to put phones away, take phones, or conduct a cellphone administrative referral both before the PBL project and during the trial period (See Appendix P).
Pre- and Post-Surveys. Students completed a pre-survey at the beginning of the study. Students answered nine questions and rated their level of distractibility, anxiety, and overall academic performance using a Likert scale. The pre-survey also asked close and open-ended questions related to cellphone use in the classroom (See Appendix B). Students also completed a post-survey at the end of the trial period. On the post-survey, students again rated their level of distractibility, anxiety, and overall academic performance using a Likert scale. They also answered closed and open-ended questions related to cellphone use in the classroom, and one question asking them to reflect on the PBL project (See Appendix C).

Interview Rubric. Students conducted an interview with another student, teacher, parent, or school staff member regarding the interviewee’s feelings related to having cellphones in the classroom. The students used the five guiding questions suggested by the researcher on the interview template (See Appendix I). Students followed the guidelines on the interview rubric (See Appendix J).

Annotations Rubric. Students looked at the literature and recording important data. Students were given a template to record their annotations (See Appendix G). Students were given a rubric to guide the annotations that they make while looking at the research (See Appendix H).

Important Themes Graphic Organizer Rubric. Students used the important themes template to collaborate on important themes that they wanted to include in their presentations (See Appendix K). Students were given the important themes rubric to guide them with what they needed to place on their organizers (see Appendix L).
**Cellphone Policy Presentation.** Students worked in groups to create a cellphone policy presentation, which contained of a title slide, and at least five rules and a rationale for each rule. The presentation also contained at least three consequences along with a rationale for each. These were presented to the class, and students groups received a score based on the cellphone presentation rubric (See Appendix N).

**Qualitative Instruments**

The following qualitative instruments were utilized in the proposed study:

**Teacher Observation Journal.** I made observations each day during the PBL project. I observed student interactions, behavior, engagement, and made reflections (See Appendix D).

**Exit Tickets.** Students responded to questions each day during the PBL project based on their engagement, process, and reflections. They answered three questions addressing these areas on each ticket. There were eight exit tickets in total (see Appendix A).

Table 3.2 lists all the data collection instruments, and their alignment with the proposed research questions.

*Table 3.2: Data Collection Instruments Alignment with Research Questions*

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Instrument</th>
<th>Type of data</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do students synthesize and evaluate researched material to construct their knowledge and to create a classroom cellphone policy?</td>
<td>• Interview Rubric</td>
<td>• Quantitative</td>
</tr>
<tr>
<td></td>
<td>• Annotation Rubric</td>
<td>• Quantitative</td>
</tr>
<tr>
<td></td>
<td>• Important Themes Graphic</td>
<td>• Quantitative</td>
</tr>
</tbody>
</table>
Data Collection Methods

Data collection began two weeks prior to the PBL project, with the Behavior Checklist in which I made observations and recorded any cellphone-related behavior that I noted daily in the classroom. During the PBL project and trial period, both
quantitative and qualitative data were collected. In this section, I provide more detailed information regarding this data collection process.

**Quantitative Instruments**

**Cellphone Behavior Checklist.** Before the PBL project began, I used a cellphone behavior checklist for two weeks to note student behavior around cellphone usage. I used the same checklist during the trial period. I circulated around the classroom and noted the behavior in regard to cellphone usage. These observations were made in a Google document (see Appendix P). I had originally planned to use this during the PBL project as well but found that it was too difficult to adequately work with both documents when also using the teacher observation journal during the PBL portion of the intervention. Thus, I decided to only use this instrument during the two weeks prior time frame and the trial period. I also decided I could add cellphone notes on the teacher observation journal itself if there were cellphone-related incidents during the PBL portion (See Appendix D).

**Pre- and Post-Surveys.** Pre- and post-survey were utilized in this study. To begin the study, I gave students 30 minutes to go on the Google form and answer the nine-question pre-survey before the PBL process began. The students could access the form from a link that I shared with them in their module on Canvas. Once they had completed the form, they clicked the submit button on the bottom of the form, and I was then able to access their answers online (See Appendix B). I gave a post-survey at the conclusion of the trial period in the same manner as the pre-survey (See Appendix C).

**Interview Rubric.** Students conducted an interview with another student, teacher, parent, or school staff member and collected data on that person’s feelings related to having cellphones in the classroom. The students used the five guiding
questions that I suggested on a template (see Appendix I) and were encouraged to add any other probing questions of their choosing. They were given the interview rubric as a guide for how this assignment would be scored, (See Appendix J).

**Annotations Rubrics.** Students were given a rubric to guide their annotations. They were given two days during the PBL project to select research provided, and to make annotations. They were given a template with a place to note the article title, author, year, participants, paraphrases, and a summarization of the findings (See Appendix G). They could also add more annotations and research on their own. They were given an annotation rubric as a guide (See Appendix H).

**Important Themes Graphic Organizer.** Students were given a Google document with a graphic organizer to place important themes that they and their group members recorded when they shared their research findings within their groups (see Appendix K). Students were given an important themes graphic organizer to help guide them on how the assignment would be scored (see Appendix L).

**Cellphone Policy Presentations Rubrics.** Students worked with their groups to make a cellphone policy presentation. They made their policy using Google Slides and were given the cellphone presentation rubric as a guide (See Appendix N). Students then presented their slide show to the class. Each group shared their slideshow presentation on the smartboard with the class. Group members took turns talking about each slide. They also answered questions from other students at the end of their presentation. The students recorded their favorite rules and consequences as groups presented.
**Qualitative Instruments**

**Teacher Observation Journal.** During the PBL process, I used a Google document to record observations. I recorded student engagement within groups. I walked around while groups were working and sat with groups for a few minutes to make observations. I listened to conversations and answered questions as needed (See Appendix J).

**Exit tickets.** Students completed four questions on a Google document at the end of each day during the PBL phase of the study. They were given 5 minutes before the end of class to complete the questions for that day. The questions focused on reflecting on that day’s task, student-reported participation and interest levels, and any questions that the students may have (see Appendix A).

**Data Analysis**

**Quantitative Instruments**

Descriptive statistics were used to analyze the quantitative data. These statistics measured the frequencies and the changes in behavior before and after the intervention.

**Qualitative Instruments**

According to Merriam and Tisdell (2016), data analysis for action research studies should be inductive and comparative. Additionally, “Data analysis is best done in conjunction with data collection” (Merriam & Tisdell, 2016, p. 204). The data analysis strategy for this study followed these principles. In vivo coding was used from which categories were created and themes emerged through constant comparison analysis. Constant comparison analysis reduces codes to develop themes (Onwueguzie, et al., 2015). Additionally, according to Manning (2017), In vivo coding
places importance on the exact words spoken by the research participants. “In vivo
coding is championed by many for its usefulness in highlighting the voices of
participants and for its reliance on the participants themselves for giving meaning to the
data” (Manning, 2017, p.1). Student voice was important to this study, and this type of
coding helped to capture some of the most meaningful ideas from the participants.

**Ethical Considerations**

Before the study, I obtained permission from the IRB at the University of South
Carolina. Once this was obtained, I sought permission from the district and the
administration of the school in which I teach. Once permissions were obtained from these
sources, I sent home the consent form to parents, as students are under the age of 18 (See
Appendix E). Students also signed an assent form on the day that I introduced the study
to them (see Appendix F).

I assured students that their names would be kept anonymous and that the findings
would be kept in a secure place. Students were also assured that the study was voluntary
and that their participation or nonparticipation would not impact their summative grades
in my History class. Students were given a formative participation grade as an incentive
to complete the PBL tasks. Finally, a pseudonym was also used for student names, the
name of the school, and the school district, to further protect student anonymity.

**Rigor and Trustworthiness**

This section will cover the steps that I took to ensure rigor and trustworthiness for
this study. Because this is a mixed methods study, both quantitative and qualitative
measures to ensure rigor and trustworthiness were put in place.
To ensure validity of instruments and rubrics, I aligned the instruments with the Maryland College and Career Readiness Standards. I also had two other teachers provide feedback on the rubrics and the checklists that were used for the study. I also had a focus group of same age students in another class provide feedback on the data collection instruments. Additionally, the following strategies were used to ensure rigor and trustworthiness for the data that was collected for this study (Creswell & Miller, 2000).

**Triangulation**

According to Creswell and Miller (2000), for triangulation to occur, researchers use multiple forms of data to form themes or categories. Triangulation was achieved through the many data sources that were gathered during this study. The instruments that were used for triangulation for RQ1 were the interview Rubric, annotation rubric, important themes graphic organizer rubric, cellphone policy presentation rubric, exit tickets, and the teacher observation journal. For RQ2, the instruments that were used for triangulation are the teacher observation journal, and the exit tickets. The instruments used for triangulation for RQ3 are the cellphone behavior checklist, and the pre- and post-surveys.

**Peer Debriefing**

I shared my Behavioral Checklist and rubrics with two colleagues within my school. These colleagues are familiar with the students and the behavior involved in this study and were able to provide helpful insight and feedback. I also shared the process and all the instruments with my university mentor who is very experienced in the research process and offered invaluable insight to support the validity of my study.
**Prolonged Engagement**

I was in the research setting for five months prior to the PBL project’s beginning and remained in the setting for nearly two months following. Therefore, prolonged engagement occurred naturally and is also a means to support validity for this study.

**Audit Trail**

I kept a teacher observation journal reflecting on the process as the study took place. I noted observations on student engagement, cellphone behavior, and wrote down my own reflections each day.

**Summary**

My hope for this project was that by asking students to help make a classroom cellphone policy, the students not only felt more empowered, but found strategies that increased the positive aspects on phones in the classroom and decreased the negative ones. Following the constructivist learning model and giving students ownership was important to this study on many levels. Providing students ownership over what policies should be put in place is empowering. Additionally, including students in the planning process helped alleviate stress because they felt more in control. The researcher’s hope was that by giving students some power in making classroom decisions, there would be a decrease in anxiety and nomophobia and, as

The final step in this study was for students to share their results with the administration of their school. After the study, the students debriefed with the principal. They discussed their policy and what they liked about this study. This also helped to give students' even more ownership over their policy. With many of the students being marginalized in this setting, having a voice in this project was very important. Several
students commented on feeling positive about having a voice on the post survey. Seeing that an administrator valued their opinions was impactful to many of them. These students have now graduated and moved on to high school so they will not get to see if any of their rules make it into one of this school’s policies one day. Hopefully they will be encouraged from this experience to get involved in policy making decisions and sharing their opinions on important matters in the future.
CHAPTER 4
DATA ANALYSIS AND FINDINGS

This chapter presents the findings from a mixed methods action research study that involved a PBL intervention. The problem of practice for this study was based on the negative impacts I was observing in my classroom with students related to students being allowed to have their cellphones in the room. I conducted this study to find if giving students more voice in classroom cellphone policies would cause students to be more engaged in the process and if there would be a decrease in some of the negative impacts cellphones can have, along with an increase in the positive ones. This chapter gives an analysis and findings from the data collected through the PBL intervention.

As mentioned, this study included a project-based learning design where students created their own classroom cellphone policy that was put into place for a trial period. To begin, Table 4.1 details the cellphone policy and contract that the students voted on and signed, since it is referenced throughout this chapter.
Table 4.1: Student Cellphone Policy & Contract

Rules

1. During tests and quizzes, all phones must be off and away. Phones will go into a safe box during tests.
2. During non-instruction times students should be able to use headphones with their phone as a source of music or a reading book.
3. For complete emergencies students may be able to step out and make parent/guardian phone calls.
4. Phones can be in the classroom but must be silent at all times.
5. Phones are only allowed when work is completed.

Consequences

1. Three warnings will be given if the rules above are not followed, then the phone will be confiscated until the end of class. Parents will be notified if a phone is confiscated three times.
2. If a student does not give the teacher the phone when asked, an administrator will be called to come and get the phone until the end of the day.
3. Phones should be confiscated if used inappropriately (no 3 warnings in this case).

I ____________   ______________ agree to abide by the above rules
(printed name)
and consequences of our class’s cellphone usage policy for the next four weeks.
Signed: ____________________________________

Interpretation of Findings

Next, the data will be presented from each instrument that was used in this study.

Some of the instruments were quantitative, some were qualitative, and some were mixed.

Pre- and Post-Surveys

Before the intervention, students answered nine questions on a pre-survey. The purpose of the pre-survey was to collect data on students’ current classroom cellphone behavior and other related cellphone information. Once the PBL project and trial period were complete, students then answered ten questions on the post-survey. Many of these were the same questions as the pre-survey, with two additional questions regarding the
PBL project. Both surveys had several Likert scale questions. Students chose a score from zero to five with zero being no impact and five having the highest impact. There were also several closed and open-ended questions. First the Likert scale results are discussed, followed by the close-ended questions, and then the open-ended questions. Data were collected from seventeen respondents and the results from both surveys are shared below.

**Likert Scale Questions**

*How anxious do you feel if you are not allowed to use your cellphone during class?*

![Anxiety Levels Pre & Post Survey](image)

*Figure 4.1: Anxiety Levels Pre & Post Survey*

As shown in Figure 4.1 above, before the intervention 53% of students felt not anxious as shown by the scores of zero and one combined, and 12% reported that they felt very anxious as shown by the scores of four and five combined. Additionally, 36% of students did not feel strongly either way, and rated themselves as a two or a three on the pre-survey. On the post-survey, 77% of students reported not anxious as shown by the score of zero and one combined, while 18% reported very anxious, as shown by the score of four and five combined. Additionally, 35% of students did not feel strongly either way and rated themselves as a two or a three on the post-survey.
There was a 24% increase in the number of students who did not feel anxious after the intervention. This could be explained by one of the policy rules that students created. With the policy in place students could look at their phone once they had completed their work. This could have reduced nomophobia, the anxiety that students can have when not getting to use their phones. Students knew that when they had finished their work, they could look at their phones and this might have helped them to not feel as anxious during class time. There was also a 6% increase in the number of students who felt very anxious after the intervention. During the intervention, students learned about nomophobia. Gaining this knowledge could have caused several students’ anxiety levels to increase after becoming more aware of the anxiety that exists in the absence of one’s cellphone.

**How distracted do you feel by having your cellphone in class with you?**

![Distractibility Pre & Post](image)

*Figure 4.2: Distractibility Pre and Post*

As shown in Figure 4.2 above, student-reported distractibility ratings. Before the intervention, 53% of the students rated themselves as not distracted at all as shown by the scores of zero and one combined, and 6% of students said that they were very distracted as shown by the scores of four and five combined. Additionally, 41% of students did not feel strongly either way, and rated themselves as a two or a three on the pre-survey. On
the post-survey, 97% of the students rated themselves as not distracted at all as shown by the scores of zero and one combined, while 0% said they were very distracted as shown by the score of four and five combined. Additionally, 23% of students did not feel strongly either way, and rated themselves as a two or a three on the post-survey. These findings are important because they show a 6% decrease in the number of students who reported very distracted on the post-survey, and 44% increase in the number of students who felt not distracted at all by their cellphones after the intervention. Similarly, to the rationale for decreasing anxiety levels, distractibility decreases could also have been impacted by the policy rule that allowed for the use of cellphones once work was completed. With this rule in place students may have felt less distracted by their cellphones during class time because they knew they could look at their phones when their work was completed.

*How much do you feel cellphones in the classroom impact your academic performance in a negative way?*

![Figure 4.3: Negative Impacts Pre & Post Survey](image)

As shown in Figure 4.3 above, students rated negative effects of cellphones on student academic performance. Before the intervention, 64% of students felt that cellphones had no negative impact on their academic performance as shown by the scores
of zero and one combined, and 0% of students felt that they had a strong impact as shown by the scores of four and five combined. Additionally, 36% of students did not feel strongly either way, and rated themselves as a two or a three on the pre-survey. On the post-survey, 42% of students reported that cellphones had no negative impact on academic performance as shown by the scores of zero and one combined, and 0% of students said there was a strong impact as shown by the scores of four and five combined. Additionally, 59% of students did not feel strongly either way, and rated themselves as a two or a three on the post-survey. Both pre- and post-survey results indicate that no students felt that cellphones in the classroom have a strong negative impact on academic performance. There was a decrease in 22% of the students who thought that cellphones had no negative impact on academic performance after the intervention. This shows that after the PBL project and trial period, some students may have realized that cellphone in the classroom could have a negative impact on academics. This result indicates that students may have become more aware of some of the negative impacts that cellphones in the classroom can cause after reading the literature, collaborating with their groups, and making their policies.
How much do you feel having cellphones in the classroom impact your performance in a positive way?

As shown in figure 4.4 above, students rated the positive effects of cellphones on student academic performance. Before the intervention, 18% of students felt that cellphones had no positive impact on their academic performance as shown by the scores of zero and one combined, and 29% of students felt that cellphones had a strong impact, as shown by the scores of four and five combined. Additionally, 53% of students did not feel strongly either way, and rated themselves as a two or a three on the pre-survey. On the post-survey, 18% of students felt that cellphones had no positive impact on academic performance as shown by scores of zero and one combined, while 53% reported that they felt there was a strong impact as shown by scores four and five combined. Additionally, 39% of students did not feel strongly either way, and rated themselves as a two or a three on the post-survey. The findings show an increase in the number of students who felt cellphones have a strong positive impact on academic performance by 24%. The data that the students analyzed during the PBL project alerted them to the many positive impacts.
that cellphones in the classroom can have. This may have caused these students to increase their score.

The findings from the Likert scale responses indicate that students’ scores were influenced by the student made policy and the amount of knowledge construction that occurred during the PBL project. For instance, students knew that they could look at their phones once work was completed, with the student policy in place. This contributed to a 24% decrease in anxiety and a substantial 44% decrease in distractibility scores on the post-survey. Students also learned about nomophobia and may have become more aware of the anxiety that they were feeling when they couldn’t use their phones. This may account for the 6% increase that was seen in anxiety on the post-survey.

After the intervention, there was a 24% increase of students who felt that cellphones in the classroom had strong positive impacts on academic performance. This could have also been impacted by the knowledge that the students had attained while completing the PBL project on the positive impacts of cellphone use. Likewise, 22% of students decreased their score for there being no negative impact on their academic performance after the intervention. This awareness of the positive and negative impacts that cellphones in the classroom can have that the students gained during the PBL project seems to have impacted these findings on the post-survey.
Close-ended Questions

Do you carry your cellphone into class with you daily?

As shown in figure 4.5 above, 88% of students answered that they carry a cellphone into class daily on the pre-survey, while twelve percent answered, “no.” On the post-survey, one student changed their answer to “yes,” which accounts for a 6% increase from pre- to post-survey overall. This student had previously answered “no,” on the pre-survey. Possibly this student was not bringing her phone to school at the time of the pre-survey, but then started to carry it daily by the post-survey, or she may have answered incorrectly on the pre-survey. Overall, by the post-survey 94% of the students were reporting that they carry their cellphone into class daily.

Do you think that students should be allowed to carry cellphones in the classroom?

As shown in figure 4.6 above, 75% of students answered that they think students should be allowed to carry cellphones in the classroom, while 25% answered, “no.” On the post-survey, there was no change in the percentage of students who think students should be allowed to carry cellphones in the classroom.
As shown in figure 4.6 above, on both the pre- and post-surveys 100% of students answered that they felt they should be allowed to have their cellphones in class. All students felt that cellphones should be allowed before the intervention and there were no changes on this response from pre- to post-survey.

*If cellphones are allowed in the classroom should there be rules and consequences for their usage?*

![Figure 4.7: If cellphones are allowed in the classroom should there be rules and consequences for their usage?](image)

As shown in figure 4.7 above, 84% answered that they thought if cellphones are allowed there should be rules and consequences in place. This increased to 94% answering, “yes” on the post-survey. This shows that most of the students in the class already felt that rules and consequences should be in place before the PBL study. However, two students changed their opinion on this after the PBL project and trial period. This accounts for the 10% increase from pre- to post-survey. These students may have found more value in having rules and consequences in place after working on the PBL project. Also, important to note, both students were students who had recorded cellphone related behavior incidents on the cellphone behavior checklist, and frequently do not complete assignments in class which was recorded on the rubrics.
For these close-ended questions, the data gathered showed that by the post survey 94% of students carry their cellphone to class and 100% of the students felt they should be allowed in class, while 94% felt that rules and consequences should be in place. An important finding that revealed that two students who had incidents of cellphone related behavior and not completing assignments throughout the intervention, changed their answers to, “yes” on the post-survey when asked if there should be rules and consequences in place regarding cellphone usage in the classroom. This shows that these students may have been impacted by the information that they learned during the PBL project. They also may have felt more comfortable with rules and consequences being in place when they had a voice in creating them.

**Open-ended Questions**

In this section, the open-ended questions are reported. First, the open-ended questions from the pre-survey will be given. This will be followed by the results of the post-survey open-ended questions.

**Pre-Survey Open-ended Questions** Several open-ended questions were also asked of students on the pre- and post-surveys. On the pre-survey students were asked if there were any helpful apps or tools that students used their cellphones to access in the classroom. Below are the student responses.

- Seven students responded that they use Kahoot.
- Seven students responded that they use the Calculator.
- Five students responded that they use Canvas.
- Five students responded that they use the Google Drive.
- Three students responded by saying “I don’t know.”
- Two students responded that they use Pear Deck.
- Two students responded that they use Safari.
- Two students responded that they use Blooket.
- Two students responded that they use Youtube.
Two students responded that they use the Camera.
Two students responded that they use the Notes.
One student responded that they use Wattpad.
One student responded that they use Webtoon.
One student responded that they use Translate.
One student responded that they use Photo math.

The majority of these were apps that are used frequently at our school. Apps such as Kahoot, Canvas, Google drive, and the calculator, were among some that were listed most frequently. Kahoot is a site where many teachers from this school make review games on content for students to play in class. It is highly competitive, and students can login to play with their device. Canvas is a platform used by this school district. On this site students can check their grades, access assignments and resources that the teachers place in modules. Google drive is where students have access to Google slides, Google docs, and others that they often use to complete assignments. These are all frequent, familiar resources that are used in lessons at this school. Students often ask if they can login with their phone and seem to prefer it to apps like Kahoot. They can respond quickly on their phones, which is part of the strategy when using this resource where students earn points based on their accuracy and how quickly they answer. Students also mentioned that they liked using the calculator on their phones. This is helpful for them in math class to not have to carry a separate calculator and to be able to conveniently pull up the one on their cellphone. These student answers reflect the positive ways their cellphones could be used in class.

On the pre-survey, students were asked if they had any other comments that they wanted to share about students using cellphones in the classroom.

- Eleven students responded that they did not have a comment.
- Three students commented that they should be allowed to use cellphones during free time if their work was finished.
• One student said that they should be allowed to use cellphones.
• One student commented that cellphones should be allowed if they are used responsibly.
• One student responded that she has a severe anxiety and not having her cellphone with her anywhere causes a large amount of stress. She also mentioned that she has separation anxiety from her mother, and likes being able to check her cellphone constantly to see if she has a message from her family.

These comments revealed how strongly some students felt about having their cellphones with them in the classroom. The idea of being able to use their cellphones once their work is completed is mentioned here, which was also an idea that came up on other pre- and post-survey questions and mentioned on the exit ticket comments as well. This was important because eventually students end up voting for this as one of their policy rules.

**Post-survey Open Ended Questions.** On the post-survey, students were asked what they enjoyed most about the PBL project.

• Five students commented that they enjoyed working with their group.
• Three students commented that they liked getting to have a say in the rules.
• Three students commented that they liked getting to use their phones in the classroom.
• Two students commented that they enjoyed coming up with rules to use cellphones in the classroom.
• Two students note that they enjoyed having a break from their regular curriculum to work on the PBL project.
• One student commented that they enjoyed making slides.
• One student commented that they enjoyed interviewing the principal.

The answers that students gave about how much they liked having a voice in the policies of the classroom were extremely important. One student said, “It was great that we had a say in the rules and were not just disregarded.” This research study was framed around the constructivist learning theory. These findings show how several students felt
impacted by the PBL design which enabled them to have a voice on a classroom policy. Several students felt positive about this aspect of the study.

On the post-survey students were also asked what they enjoyed least about the PBL project.

Nine students responded with saying “nothing.,” or “I don’t know.”

- Two students put each other’s name as something they thought was negative about the study, as a joke to tease each other.
- One student commented that they did not like the exit tickets.
- One student responded that they didn’t enjoy having to read articles.
- One student said that they didn’t like having to record parts of the research.
- One student commented that they didn’t get to use their phone as much as they thought they would get to.
- One student commented, “I did not like working in a group and having to complete assignments.”
- One student commented “not using phones.”

Some of these responses reflected the age and maturity level of this group of students. The researcher noted throughout the school year that this group would often put “I don’t know” responses when asked open ended questions. These responses increased as the study progressed on the exit tickets as well, as seen in many responses on this question.

Finally, as they were previously asked on the pre-survey, students were asked if they had any other comments about cellphone usage in the classroom on the post-survey. Students did not record any other comments aside from, “no.” I noted a decrease in answers aside from, “no” on a similar question on the exit tickets throughout the PBL project. The students seemed less likely to respond to this question as the study progressed. This could have something to do with the age of the students, and their
maturity level. Sometimes it was clear to the researcher that many students just wanted to complete the assignment as quickly as possible and wanted to write as little as possible.

The open-ended questions revealed several important findings. First, on the comments from the pre-survey, some students mentioned they thought they should be able to use their phone when their work was completed. This ended up becoming one of the student policy rules. Another important finding that came from the post-survey was that many students liked that they had a voice in making a cellphone policy. This was meaningful since the study was designed around giving students a voice in classroom policies. It also demonstrated that several students felt they had a voice and took ownership over their policy, which aligns with self-determination theory. Students’ needs for autonomy were met through the PBL process where they took ownership of their policies and felt that they had a voice in them. These student comments showed that several were highly impacted by being given ownership of the rules. Finally, there was a decline in students responding on the last two open-ended questions from the post-survey. This is a pattern I observed on open-ended questions throughout this study and throughout the school year as well.

Rubrics

Quantitative data was also collected from several tasks that were part of the PBL project. Students completed interviews with another student or adult, made annotations from research, recorded important themes from the research, and put together a cellphone policy presentation with their groups. The students received a rubric for each of these tasks which was scored. The following section details the findings from these tasks and rubrics.
**Interview Rubric**

Students were given directions to select someone to interview to find out their perceptions on the use of cellphones in the classroom. Students were told they could select another student, faculty member of the school, or a family member. Students were given a template (see Appendix F), with five questions that they needed to ask the person they selected. They were told to write down their answers and that they could also ask any of their own questions and record those responses as well. Students were given the interview rubric (see Appendix G) as a guide. Students could earn a total of ten points on the rubric. Interviews were scored on three criteria. First, the student could earn up to three points for recording information about their interviewee such as name, age, job title, etc. For the second category, students could score up to five points by asking all the questions on the interview template and recording the interviewee’s answers. For the third category, students could earn up to two points for asking other probing questions and encouraging the interviewee to elaborate. Students were given the rubrics when introduced to the assignment along with the template and all the criteria for this assignment were explained.

Only one student earned the full ten points because she gave full details about the interviewee, asked all the questions with elaborations, and added a question of her own. Eleven students scored a nine out of ten because they met all the criteria but did not ask any additional probing questions. Two students gave very little detail about the interviewee and did not ask any additional questions and scored an eight. One student scored a seven by giving little detail about the interviewee and not having much elaboration nor did they ask any additional probing questions. Two students earned a zero.
on this assignment for not completing the interview at all. One of these students also did not complete the annotation assignment. The students who did not complete this assignment often do not complete course work outside of the PBL project and have earned several zeros throughout the school year. The student who did not complete this assignment or the annotations, had several missing assignments throughout the year. He has not held a passing average for this class for any semester. He is very social in class and seems to have an attitude that his grades and schoolwork are not a priority to him.

The findings from the interviews showed that most students were not inclined to go above and beyond asking their interviewees the questions on the template, which is a pattern I observed on other assignments. Although the rubric required to ask probing questions, many students only followed what was on the template. Moreover, these students may have lacked the skills to ask probing questions due to their age and limited interviewing experience. For example, one student only recorded very short responses from her interviewee. This student interviewed someone her own age and did not ask additional probing questions to try and get the student to elaborate more.

Several examples of full cellphone interviews can be seen in Appendix Q. Table 4.2 shows some of the questions the students asked from the template, and a few responses along with some data on who the interviewee was:
Table 4.2: Interview Questions with Responses

<table>
<thead>
<tr>
<th>Question</th>
<th>Responses</th>
<th>Interviewee</th>
</tr>
</thead>
<tbody>
<tr>
<td>What negative impacts do you think there may be from students having cellphones in the classroom?</td>
<td>“Not paying attention, putting their volume all the way up so you can hear EVERYTHING.”</td>
<td>Student</td>
</tr>
<tr>
<td></td>
<td>“A negative effect would be students sending negative messages to each other throughout the school day.”</td>
<td>Administrator</td>
</tr>
<tr>
<td>If students are allowed to have their cellphones in the classroom, what are the rules and consequences that you think should be in place?</td>
<td>“Depending on the action if they are fooling with other kids they should definitely get an office referral.”</td>
<td>Teacher</td>
</tr>
<tr>
<td></td>
<td>“Only using it when instructed to.”</td>
<td>Student</td>
</tr>
<tr>
<td>Can you please share any additional thoughts with me that you have about students using cellphones in class?”</td>
<td>“While I think cellphones are a big distraction, students need to know how to use them appropriately because when they are adults they need to know the appropriate time to be on their phones.”</td>
<td>Teacher</td>
</tr>
<tr>
<td></td>
<td>“Teachers should be mindful that phones can be used as weapons and as tools. Similar to a hammer can be used as a weapon or a tool.”</td>
<td>Administrator</td>
</tr>
</tbody>
</table>

The above table gives a few examples of some of the responses that students obtained from their interviews. I noticed that if the interviewee was a student, then they gave shorter responses without much elaboration. Although students could have asked more probing questions to get the interviewee to elaborate more, the interviews provided
students with interesting feedback to help them get started on gathering their research on
the positive and negative impacts of cellphone use in the classroom.

Annotation Rubric

Students were given a template to make annotations as they reviewed articles and
research studies on the positive and negative impacts of cellphones in the classroom (see
Appendix I). The students were also given a rubric that explained the three areas of
criteria to earn a full 15 points on the assignment (see Appendix J). First, the title, author,
year, and participants (if applicable), needed to be included in all annotations. Second,
the students needed at least one sentence paraphrased from the study, and a few sentences
that summarized the results. Third, students needed to have made at least five
annotations.

On this assignment, fourteen students showed annotations that met most of the
criteria of the rubric. The content showed that students were synthesizing and evaluation
the data from the literature. Below are some statements shared in the student summaries:

- “this will help familiarize teachers with technology, eliminate their
worries about irresponsible usage of phones in class, and engage students
more in their education.”

- “students will use many methods with their cellphones to cheat so they
could keep up with their school work and not disappoint their parents”.

- “the people who disagree believe having a cellphone could be an issue in
case of a lock down because we try to be quiet but if a ringer goes off it’s
a safety issue. I never thought of but now I see this could definitely be an
issue.”
• “there are both pros and cons to having cellphones in school, but to have a correct balance is important, to not take the phones away completely but to have rules in place for when to use phones.”

• “This study shows that students cannot concentrate in class with their phones near them. The further away the better”.

Three students earned a zero. Two of the students who earned a 14 only turned in four annotations. The other two were missing either a paraphrased sentence or had an incomplete summary on one of their annotations. The student who earned 13 points had two annotations that were missing and was missing a paraphrased sentence or had an incomplete summary. Three students who received a zero never turned in the assignment.

Many students did not seem very enthusiastic about this part of the PBL project. Several expressed they did not like doing research and may have been trying to hurry through the assignment to get it turned in. This is indicated by some students leaving parts missing or incomplete. I reminded the students who did not submit the work at all that this would affect their PBL participation grade. One of the students who did not complete the work was the student mentioned above that also did not complete the interview. He has shown a pattern of not submitting work throughout the school year. The other two students are very distracted in class and do not consistently complete assignments in class. They did not complete this annotation assignment or the important themes rubric. Not completing portions of the PBL project is consistent to what I have observed throughout the school year with all three students who did not complete the annotations. Overall, the annotations reflected that most of the class had completed a high standard of work and quality research.
Several examples of the annotations can be viewed in Appendix R. Figure 4.8 shows a student example of an annotation which met the rubric criteria.

<table>
<thead>
<tr>
<th>Annotations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title of the article:</strong> Changing Our Mindset in regards to cell phones in the classroom.</td>
</tr>
<tr>
<td><strong>Author(s):</strong> Breanna Carels</td>
</tr>
<tr>
<td><strong>Year of the article/study:</strong> 2019</td>
</tr>
<tr>
<td><strong>Age of participants in the study:</strong> Teenagers and adolescents</td>
</tr>
<tr>
<td><strong>Paraphrase important sentences:</strong></td>
</tr>
<tr>
<td>• Students tend to experience a phobia known as nomophobia, which causes them anxiety when they are not using or are not near their phones.</td>
</tr>
<tr>
<td>• Teachers can account for nomophobia by incorporating cell phones into their lessons and the education of students.</td>
</tr>
<tr>
<td>• Teachers are reluctant to allow cellphone usage in the classroom, because they are unfamiliar with the technology and/or are worried about whether or not students can use them responsibly.</td>
</tr>
<tr>
<td><strong>Summarize findings:</strong></td>
</tr>
<tr>
<td>In order for the best learning experience for students, teachers should take time to learn and understand cell phones and how they can be used to help students learn better. This will help familiarize teachers with technology, eliminate their worries about irresponsible usage of phones in class, and engage students more in their education.</td>
</tr>
<tr>
<td><strong>Other notes:</strong> none</td>
</tr>
</tbody>
</table>

*Figure 4.8: Annotation Example*
Important Themes Rubric

Students were given a graphic organizer (see Appendix K) to record important themes from the research articles that I gave them and their interviews. Once completed, students then shared their graphic organizer data with their group and recorded common themes from their group. This graphic organizer was scored using the important themes rubric (see Appendix L) where students could earn a total of 15 points. Students were given a maximum of five points in three different categories. First, they needed to have three positive impacts that cellphones can have in the classroom from the literature and interviews. Second, they needed to have three negative impacts that cellphones can have in the classroom from the literature and interviews. Third, students listed three common themes that they heard as they listened to their group members share their own positive and negative impacts from their individual organizers. Eleven students scored full marks and earned all 15 points on the assignment by meeting all the criteria on the rubric. Four students earned 13 out of 15 points, because they were missing two of the elements required in the rubric. Two students earned a zero on this assignment by not completing the work at all. Both of those students also did not complete the annotation assignment.

Out of the seventeen students, fifteen students turned in high quality work that met the expectations set forth in the rubric. Students showed that they were synthesizing and evaluating the data from the literature, their interviews, and the positive and negative themes that their group shared. For example, below are some student statements recorded on their organizers:

- “Students should be able to use their phone to contact a parent or guardian about possible medical issues or emergencies.”
• “From research from the articles people who have higher expectations to complete work are more likely to cheat.”
• “Using the calculator app was also something everyone said.”
• “Phones have more positive impacts than negative ones.”
• “From my interview a negative she said was not paying attention, putting their volume all the way up and others can hear EVERYTHING.”

These findings show that most of the students were engaged and completed the work. Four of the students turned in the work with two elements missing. This happens on other assignments frequently. Students sometimes forget to complete a part of an assignment and the researcher is often returning work back to them and asking them to finish. Another common trend that the researcher has seen throughout this school year is students not submitting assignments at all. This was the case on this assignment as well, even though the researcher strongly encouraged students to submit all work involved in the study and let students know that work not submitted would be a zero in the gradebook. The same two students who received a zero on this assignment also received a zero on the annotations, as mentioned above. Overall, even though there were a few students who did not complete work, most of the class recorded important themes that they had found in their own research and from their group discussions. This showed that students were starting to synthesize the data, which would later aid them in putting their cellphone policies together.

Several complete examples of the important theme graphic organizer can be seen in Appendix S. Figure 4.9 shows a student example of an important themes graphic organizer that met the rubric criteria:
<table>
<thead>
<tr>
<th>Negative impacts</th>
<th>Positive impacts</th>
<th>Common Themes</th>
<th>Additional Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students can use their cell phones to cheat on classwork, tests, quizzes, assessments, and exams.</td>
<td>Students can contact their parents, the police, 911, the fire department, etc. in case of an emergency at school using their phone.</td>
<td>Students should be able to use their phone as a calculator for math related classes and activities.</td>
<td>A three strike system may work, where if a student breaks the rules surrounding cell phone use three times, their phone is taken away and must be picked up by a parent.</td>
</tr>
<tr>
<td>Students can cyber bully other students in school using their cellphones.</td>
<td>Students can use educational apps to help them do classwork or study.</td>
<td>Students should not be allowed to cheat using their phones in class, and there should be consequences for using a cell phone to cheat.</td>
<td></td>
</tr>
<tr>
<td>Cellphone ringtones and notifications can be distracting to students in a classroom setting.</td>
<td>Knowing how to use a cellphone to complete work can be a helpful skill for students to practice early, so students being able to appropriately use cellphones can help them prepare for times when they may need to use them for work.</td>
<td>Students should be able to use their phone to contact a parent or guardian about possible medical issues or emergencies.</td>
<td></td>
</tr>
</tbody>
</table>
After researching and collaborating with their groups, students made a Google slide presentation to share with the class that included the policy rules and consequences that they thought should be in place for their classroom. Students were given a rubric that explained how the presentations would be scored (see Appendix N). The rubric included several different criteria. First, the presentation needed to include a title slide with the group members names and title to their presentation. Second, the presentation needed to include five slides with a rule on each slide. Each slide must also be followed by an explanation slide for each rule, totaling ten slides in all for rules and explanations. Third, the presentation must include three consequences on three separate slides. Each consequence slide must be followed by an explanation slide for that consequence, totaling six slides in all for consequences and explanations. Fourth, the presentations must be neat, clear, and with no spelling or grammatical errors. Finally, students received points for the presentation being visually appealing. They could include backgrounds, images, videos, or any interactive elements of their choosing. Students could earn a total of 25 points on this assignment.

Mainly, I observed that students were very engaged in making their presentations. Many groups created well thought out rules and explanations that were supported by the literature. For example, the following student examples from different presentations show good examples of synthesizing and evaluating as students explain their rules or consequences.
• “Rule #1: Students should not be allowed to use their cellphones during tests, quizzes, assessments, and exams. Explanation: During our research we found that 35% of teens admit to using their smartphones to cheat on homework or tests and 65% have seen others use their phones to cheat in school (Morin, 2020).”

• “Rule #3: No non-school approved app usage. Explanation: Students will be able to keep track of their devices while using them as a proper learning tool so they don’t experience FOMO.” (FOMO, or the Fear Of Missing Out was found in Carels, 2019).

• “Rule 2: Explanation: The vice principal wants parents be more involved and to have more parental outreach” (from student interview with the vice principal).

• “Consequence #3: If a student has their phone taken away for a school day multiple times and their parents need to be contacted, then they temporarily lose the privilege to use their phone during school hours. Explanation: The research mentions how schools must find rules for cellphone usage based on circumstances of each unique school.”

• “Rule #3: Cellphones cannot be taken into the bathroom or to get water. Explanation: Students can take video tape, take pictures of, and use phones to bully other students outside of the classroom using cellphones. Our research shows that cyberbullying is a big concern when it comes to cellphones in school, but if rules and regulations are put in place, cyberbullying can be controlled and cellphones may still be allowed.”
These examples show where students used the previous data they had collected as explanations for their choices for rules and consequences. Examples of three full presentations are given in Appendix T.

Students created visually pleasing presentations by utilizing backgrounds and images. Three groups met all the criteria on the rubric and scored all 25 points on the assignment. One group scored a 22 because they had all the information, but they combined some of the rule and consequence slides with their explanations, instead of separating them into separate slides as the rubric specified. One group scored a 21 because they had some grammar mistakes and had also included many images that were unrelated to the content on the slides. The group that scored 22 points simply did not follow the directions. The layout for the presentation was explained in class and the students had the rubric to make sure they were on track. Due to the age and maturity level and as I observed on the other assignments, students had a tendency throughout the school year to rush through assignments and not follow directions. The group that scored 21 points added some pictures of feet, eggs, and other unrelated content to their presentation. This got a laugh from their classmates as they presented, but they lost a few points since the pictures were not related to cellphones in the classroom. This group also lost a few points for grammar but had sound rules and explanations.

Most students were very invested in their policies, and I observed their engagement while making their presentations. I heard many conversations about rules and explanations and how to display their policies. For example, the following are a few statements made by students showing their engagement in the process while making the presentations:
• “I like three strikes, that is what my mom said in the interview, the student should get three warnings then the phone is taken.”

• "Oh, that one study talked about students cheating on tests with their phones, let’s use that one.”

• “Where do we find the research for these?”, “look in your annotations.”

• “How do I change the color?”, “Click on the 6 dots”, “Can I changed the back part?”, “yes, click the dots again.”

• Let’s use the reason cellphones are distracting for rule #1.”, “Can you find an image?”, ”ok I am looking.”

Figure 4.10 shows slide examples from the group that had an artistically inclined member who drew some of the images for their slide show. This group also did a great job explaining their rules and following the format.
Rule 3:

Cell phones cannot be taken into the bathroom or to get water.

Reasoning for rule 3

Students can take video tape, take pictures of, and use phones to bully other students outside of the classroom using cell phones. Our research shows that cyberbullying is a big concern when it comes to cell phones in school, but if rules and regulations are put in place, cyberbullying can be controlled and cell phones may still be allowed.

Figure 4.10: Cellphone Policy Example I

Several groups picked images and backgrounds that made their presentations very visually appealing. Figure 4.11 shows slide examples from two different group presentations that had nice backgrounds and images and correct formatting.

Rule #5:

Phones need to go into a safe box during tests.
Figure 4.12 shows a slide from a group that did not follow the formatting of having a separate slide for rules, and a separate slide with an explanation. However, the group did have well thought out rules and explanations.
Finally, Figure 4.13 shows a slide from the presentation of the group that lost points for having unrelated images. However, the group did have the correct formatting. The rules and explanations were also well thought out.

Overall, I noted most students did complete the elements of the PBL project at a high level. There were some instances of not following directions, leaving work incomplete, or just not completing and submitting the work at all. However, the number of students who were not completing work was low. Most of the students did follow directions and completed the work to a high standard.

One of the reasons I decided to use a PBL project in this study was because I wanted to investigate the students’ level of knowledge construction, engagement, and
student ownership of the cellphone policy. This study was theoretically framed on constructivism. According to Shah (2019), “The constructivist teacher helps the students through problem-solving and inquiry-based learning activities with which students formulate and test their ideas, draw conclusions and inferences, and pool and convey their knowledge in a collaborative learning environment” (p.5). Completing the PBL project with students making their own cellphone policy presentations at the end, incorporated several of these components that are central to constructivism.

The annotations, important theme organizer, and the cellphone presentations showed students synthesizing the data from their interviews and research. This was seen in student comments such as “our research shows”, or “from my interview.” Students also collaborated with their groups to make their cellphone policies. According to Amines and Asi (2015), in constructivism, learning is also not passive, and the learner stays active through the whole process. I observed my students actively working together to take ideas from each other, their interviews, and the literature, and put them together into something meaningful to help solve a problem.

The students were highly invested in making their presentations not only visually appealing, but also informative and meaningful. Constructivism allows students to put their knowledge into practice (Amineh & Asi, 2015). Giving students ownership enabled them to explore the literature and to try and solve the problem at hand. Students were invested in their work. I observed their high level of engagement in this process as they had discussions with their group and worked together on their presentations. Students also took ownership of their policies, which was revealed in the quality of these presentations and the pride that they took in their work.
Furthermore, I observed students’ learning increase throughout the project as they used critical thinking skills to come up with a policy to try and find the solution to a real-world problem. Students gave examples from the articles they had read and their interviews, which they mentioned on the important themes graphic organizers and in their cellphone presentations. According to Akpan and Beard (2016), “Approaching instruction from the constructivist continuum reaches a broader range of students and increases comprehension and self-confidence in all students, teaching students to think for themselves, ask questions and seek answers” (p.397). Developing and practicing these skills during this study will benefit the students on many of their future projects as well. According to Bell (2010), PBL teaches a variety of skills that are crucial for students to be successful in the twenty-first century.

Finally, many of these tasks show that students were meaningfully engaged. According to Deci and Ryan (2020) three competencies must be met for students to be engaged. These are autonomy, competence, and relatedness. Giving students a problem to solve that directly impacts their daily lives and a voice fulfills the need for autonomy. Explaining the tasks helped to fulfill the need for competence. Students working to develop a common policy fulfilled the need for relatedness. The PBL process supported these theoretical constructs of self-determination theory.

**Cellphone Behavior Checklist Pre and Post PBL**

For two weeks prior to the PBL project and during the trial period, I used the Cellphone Behavior Checklist to record cellphone related behaviors, the actions that I took, and any related comments. I had originally planned to keep recording on the cellphone behavior checklist during the PBL project. However, I had to prioritize the
teacher observation journal during the PBL project. By the second day of the PBL project I realized to adequately record data on the teacher observation journal, it was too difficult to try and record on the cellphone behavior checklist simultaneously. I noted this on the teacher observation journal and continued to collect data on the cellphone behavior checklist during the trial period. Figure 4.14 represents the number of times that the researcher observed cellphone related behavior before (blue bar) and after (red bar) the PBL project.

![Cellphone Behaviors Pre and Post PBL](image)

*Figure 4.14: Cellphone Behaviors Pre and Post PBL*

The data revealed that four students had fewer cellphone related behaviors after the PBL project compared to before the PBL project. This is important because it is a third of the total number of students who I observed having cellphone related behaviors before the PBL project. These findings indicate that with the student policy in place, a third of the students were better able to control inappropriate use of their cellphones. When I analyzed that data from the rubrics, I mentioned that four students did not complete some of the PBL assignments. These students were Ben, Justin, Paul, and Jeff.
Ben had three instances of cellphone behavior before the intervention, Justin had six instances, Paul had four, and Jeff had two. After the PBL project when the student policy was put into place, Ben and Justin had the same number of cellphone incidents as they had before the PBL project. However, Paul and Jeff’s incidents of cellphone behavior decreased, which showed that Paul and Jeff may have been less distracted by their phones with the student made policy in place since they had less incidents. This was a decrease in half of the students who perpetually do not complete assignments.

Interestingly, four students had the exact same number of cellphone related behaviors before and after the PBL project. One student had an increase in cellphone related behavior after the PBL project, and three students had an incident of cellphone related behavior post PBL who did not have any incidences before the PBL project. Even though not all behaviors improved with the student created cellphone policy in place, I think it is important that there was a decrease in a third of the students overall.

Additionally, I also looked at the types of cellphone related behavior occurring and their frequency. I first coded the cellphone related behaviors into these categories, off task, playing video games, phone not off and away, sharing screens with other students, texting, music, watching videos, and social media. Figure 4.15 below looks at the frequency of these behaviors pre and post PBL.
Although only four students decreased their cellphone related behavior pre verses post PBL, the above chart shows that 75% or 6 out of 8 types of cellphone related behavior decreased from pre to post PBL project. In the student cellphone policy, students made a consequence that they would receive three warnings if their cellphone was being used inappropriately. In the current school policy only one warning was given. The decrease in the types of cellphone behavior seen during the trial period could be attributed to the fact that students were given more warnings with the student classroom cellphone policy in place.

Off task behavior, phones not being off and away, sharing screens, playing music, watching videos, and social media all decreased. The only behaviors that did not decrease were playing video games and texting. These increased slightly during the trial period. This shows that the student policy did not fix everything. Some behaviors such as students texting with their cellphones are very difficult to control when students have their phones in the classroom. However, I was encouraged that there was an overall decrease in behaviors after the student policy was put into place.
Students taking ownership of the classroom policies could have impacted this decrease in cellphone behaviors overall. The decrease suggests that there was more buy in from the students to the student created cellphone policy that was in place post PBL. For instance, students came up with the rule that cellphones could be used when work was completed. This could have helped students not use their cellphones as much during class, since they knew that they could use them once their work was completed. I saw students more focused on completing their work during the trial period, knowing that they would get cellphone time once their classwork was finished.

I also made other observations on the cellphone behavior. For example, the number of second warnings that were given to students decreased slightly once the student policy was in place. I recorded five instances of giving more than one warning about a cellphone being used inappropriately before the PBL project, and four instances were recorded after. This shows that even though students were allowed to have more warnings with the student policy in place, they actually received slightly less warnings post PBL. Additionally, before the PBL intervention, there were seven incidents of a cellphone being confiscated. However, after the student policy was in place, no students received more than two warnings that resulted in phone confiscation. This is important because it shows that with the student policy in place not only were there slightly less warnings given, but no student progressed to the point of having their cellphone confiscated. Therefore, this shows that there was a decrease in negative cellphone related behavior when the students took ownership of the classroom policy.

Overall, the cellphone behavior checklist data revealed that 75% of the types of cellphone behavior that I was observing before the PBL project decreased with the
student cellphone policy in place. The data also exhibited that less warnings were given to students once the policy was in place and no student cellphone had to be confiscated. Additionally, a third of the students who were observed having inappropriate cellphone use before the PBL project decreased after the intervention with the student policy in place. This was not as high a number as I was hoping, but I was encouraged when I saw that half of my students who perpetually do not complete assignments showed a decrease in inappropriate cellphone behaviors. These students were often off task and using their phones instead of completing their classwork. Having a voice in the policies may have caused them not to be as distracted by their cellphones. Hence, having a student made cellphone policy in place, could benefit these students who were not completing assignments. If they are spending less time off task on their phones, they might complete more classwork and improve their grades.

**Exit Tickets**

During the PBL project students completed an exit ticket at the end of each day, and a student example from each day is included in appendix U (see Appendix U). Students were given five minutes to record their take aways from that day, rate their participation and interest on the topic, and to ask any questions. Both quantitative and qualitative data were collected from these exit tickets. I will first share the quantitative data that was gathered from the student-reported participation and interest levels. This will be followed by the qualitative data which was collected each day with open-ended questions.
**Quantitative Exit Ticket Data**

Quantitative data were gathered from two questions on the exit tickets that the students completed on days two through seven only. One of the quantitative questions asked students to self-report how much they felt they participated that day to show their level of engagement in the activities on a given day. Students rated their participation level on a Likert scale of one through five. One represented "I did not participate,” and a five represented “I participated a lot.” Figure 4.16 below shows student participation ratings on days two through seven.

![Participation Levels](image)

*Figure 4.16: Participation Levels*

No students reported a level of one on any of the days, and only two students rated themselves as a level two on day two. I noted that some students reported a lower level of participation in the beginning of the study. As the days went by, student participation ratings increased and remained high through day seven. Over time, the number of students that recorded themselves as having low participation decreased. For example, only two students recorded their participation as high on day two, compared to ten students reporting a high level of participation on day seven. Similarly, five students reported their participation as low on day two, while zero reported their participation as
low on days six and seven. Over time, the data collected from the exit tickets showed that students reported higher participation as the study progressed.

The second quantitative question on the exit tickets asked students to self-report their level of interest in the activities each day. With a Likert scale, students could rate their interest in activities from one through five. A one represented “I did not find them interesting,” and a five represented “I found them very interesting. Figure 4.17 shows student interest ratings on days two through seven.

![Interest Levels](image)

Figure 4.17: Interest Levels

Like participation levels, no student recorded an interest level of one on any of the days. There were several students who reported an interest level of two or three on day two and three, at the beginning of the study. However, as the days went by, students who reported a lower interest rating decreased. More students reported a rating of four or five as the study progressed. For example, only one student rated their interest as high on day two, while eight students rated their interest as high on day seven. This increase in interest levels over time was similar to the increase seen in participation levels.
Looking at the student reported levels of participation and interest, I noted that both levels increased as the study progressed. Interestingly, I also observed and recorded on the teacher observation journal that students were more engaged in the project when they were working on their presentations. Some students were less engaged in the beginning phases of the study when they were researching the literature. This coincides with what I found from the quantitative data gathered from the exit tickets where students were self-reporting about their participation and interest levels. Both sources of data support that students participated more, had higher interest levels, and were more engaged as the PBL project progressed.

**Qualitative Exit Ticket Data**

The day one exit ticket that the students completed aimed at making sure the students were on track as we began the PBL project. First, I asked students to tell me what roles they had picked for each group member. Second, I asked students to tell me who they would be interviewing. Third, they could ask any questions that they had as well. The day one tickets helped to make sure the students were on track with the PBL process but was not included in the data analysis because it was just administrative data. Similarly, the day eight exit ticket was also not included in the data described in this section because it was used as a place for students to submit their votes for our classroom cellphone policy. It had a place for students to submit questions, but there were no questions submitted. Therefore, only day two through seven exit ticket data are presented.

The exit tickets for days two through seven were divided into three different types of questions. Students were asked the quantitative questions that were reported above. Second, students were asked a question that was related to that day’s activities. Third
students were asked if they had any additional questions about the PBL project. Table 4.3 below shows the questions that were related to each day from day two through seven with selected student responses.

*Table 4.3: Questions related to each day*

<table>
<thead>
<tr>
<th>Exit Ticket</th>
<th>Question</th>
<th>Student Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 2</td>
<td>List two important ideas from your research today.</td>
<td>• “Some people have nomophobia which causes them to miss their phone.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “People in my group have some of the same ideas about cellphones.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “People can be anxious from being away from their phone too long.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Phones should be allowed when work is done.”</td>
</tr>
<tr>
<td>Day 3</td>
<td>List two important ideas from your research today.</td>
<td>• “Many students are experiencing nomophobia, or the fear of being away from one\’s phone too long and not being up to date on information.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “Students can be stressed without their phones in class.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “Teachers can help with nomophobia by incorporating cellphone use into students\’ education.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “Students are facing a variety of problems with cellphone dependency such as inability to focus, stress and anxiety, and the inappropriate use of cellphones.”</td>
</tr>
<tr>
<td>Day 4</td>
<td>Did your group come up with any important themes today?</td>
<td>• “Having phones in school makes students more comfortable”</td>
</tr>
</tbody>
</table>
Day 5 How did the outline help you organize your themes and presentation today?

- “To get organized”
- “To see the big picture”
- “It helped my group to start working on their consequences”
- “We were able to identify the most prevalent topics to use in our presentation and organize our research in the best way possible.”

Day 6 How do you feel about your group’s policy and presentation so far?

- “Good.”
- “I like it so far.”
- “Pretty good.”
- “We are making good progress.”

Day 7 List at least two important ideas that you heard from the presentations today.

- “Phones should go in a safe box during testing.”
- “Students should receive three verbal strikes or warnings to put their phones away.”
- “Students should be allowed to use their phone in case they need to call a parent for medical purposes.”
- “Students should be able to listen to music on their cellphones through headphones during non-instructional time.”

I noted interesting trends in the data collected from the above questions. I observed that student knowledge grew around the concept of nomophobia which is key in this study. I could see more detailed responses as study progressed. Additionally, many of the concepts that students recorded early in the study became part of their presentations. I
also observed some of the ideas from the open-ended questions on the exit tickets being used again when the students nominated rules and consequences for their cellphones policies. This shows that not only were students growing in their knowledge construction as the study progressed, but the exit tickets also helped students to pinpoint important ideas early in the study that they then utilized later on.

The third type of question on the exit ticket each day asked students if they had any additional questions. These questions had a decreasing number of responses throughout the PBL project. After day three students did not ask any additional questions on the exit tickets.

Overall, students only reported minimally on the qualitative questions. Students had the tendency to only give the required information. However, when I asked more probing types of questions, student answers grew in depth of knowledge as the study progressed. The increase observed in the students’ knowledge construction supports my rationale for using a constructivist theory that this study. By using a PBL intervention, my hope was that students would actively build their own knowledge and understanding. The information recorded on the exit tickets also included important ideas that the students came back to later in the study. The results from the exit tickets show that the PBL process helped students to use critical thinking skills, synthesize, and evaluate the data, as they worked together to find a solution to the problem of practice. Student statements such as “Many students are experiencing nomophobia, or the fear of being away from one’s phone too long and not being up to date on information.”, or “we were able to identify the most prevalent topics to use in our presentation and organize our research in the best way possible” exhibited knowledge construction on the exit tickets”.

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Both the quantitative and qualitative data findings from the exit tickets show that the PBL project was successful in students building many of the skills that are key to constructivist theory. Students reported themselves as having increasing levels of participation and interest as the study progressed, which was also supported by my observations. Students also reached deeper levels of knowledge construction and engagement as was seen in students’ responses to the exit ticket questions each day. Motivation levels in students increased as the study progressed because their needs for autonomy, competence, and relatedness were met as supported by self-determination theory. Students took more ownership and became more invested as they started working on their policies. This was shown by the increase in their own self-reported interest and participation levels. Their need for competence was met by the explanation of each task during the PBL process. The need for relatedness was fulfilled by students working together in groups to make a classroom cellphone usage policy.

**Teacher Observation Journal**

During the eight days of the PBL project, I kept a journal recording my observations on students’ activities, engagement with their groups, and their conversations. I also made notes daily of any adjustments that needed to be made and how to scaffold the learning for the next day. The data were then coded and the themes which emerged were redirection, group dynamics, scaffolding, and student ownership.

**Redirecting Students as Needed**

The first theme I will discuss is redirection. Redirection was something I found myself doing many times during the PBL project. These were instances when students were either off task, not following behavior expectations, not having as many
conversations, or asking me to clarify directions. In these instances, I would intervene to guide them back to where they needed to be.

In the first few days of the study, I observed several off-task behaviors. For example, one day instead of looking at research articles, two students were playing video games on their computer. I addressed this and told them that they needed to get to work. On another day early in the study, I had a student who was drawing instead of looking at research articles. I had to ask him to put his tablet away and work on annotations. As the study progressed, I noted that these off-task incidences that needed redirecting decreased. As students started working on their presentations, I saw more engagement and less incidences of this type of behavior.

Moreover, I redirected students several times during the study about behavioral expectations. For example, I spoke to several students about texting or looking at videos on their phones during the PBL project instead of working. After a few of these instances, I reminded students as a class that their phones needed to be off and away while they were working. We were not under the new student policy yet while they were working on this PBL portion, so I gave them reminders about the school cellphone policy that was still in place.

Additionally, students needed redirection about behavioral expectations during their presentations. When the first group started, some students were talking. I stopped the first group and reminded the class that they needed to show respect while a group was presenting. I reminded that they would want people to be listening and respectful as they present so they should also act accordingly. Then, I had the first group begin again. I also encouraged students to clap after the first group and to ask any questions about the
presentation to the group presenting. This redirection established the standard for presentations and allowed students to ask questions. For example, one student asked about images in one of the presentations, “Elliot did you draw that?” Another student asked, “Can I see the first consequence slide again?” As the groups presented, students enthusiastically cheered each other and gave positive feedback and asked questions. My redirection helped students stay focused on their tasks, which allowed them to take pride in their work, pull together, and support each other in this project.

*Positive Group Collaboration*

Throughout the PBL project, students worked in groups. Groups worked together to accomplish many tasks. For example, they developed common themes by discussing their interviews and research findings. They also put together an outline and cellphone policy presentation. Sometimes I had students working at different paces, even within the same group. When this would happen, I would allow students to go ahead and work on the next part of the study until all their group mates had completed the assignment they were on. For example, in the beginning of the study, when I had two students finish their annotations while the rest of their group was still working, I allowed them to go conduct their interviews with someone in the building.

When observing groups, I sometimes noticed a decrease in conversation amongst group members. Here, I would do a check-in to make sure students were focused. I might ask “Are you getting your annotations done?”, or “How is your presentation coming along?”. Sometimes students were just focused on what they were doing and quiet, but other times they were distracted by looking at their phone or something else on their computer. For example, I got concerned on day five of the study when I was not hearing
as many conversations. However, I felt reassured when I saw the quality of the work that they turned in. Their organizers showed that they were synthesizing and evaluating the data from the interviews and annotations. The students included statements such as “from my interview”, or “from our research”, that suggested that they were using the data that had gathered from earlier tasks in their policies. I realized that sometimes the group members were more focused on the work they were completing and having less conversations out loud, but they were submitted a high quality of work.

Additionally, I recorded how groups worked together. For instance, some groups would divide up the work into different parts and each complete their own part. They would then come together and share. Some groups would have one person record as group members shared their ideas. Also, while making the presentations, some groups had different members working on each slide. Other groups completed each slide together. Some groups had one person working on images, while others worked putting text on slides. Groups came up with many ways to divide up the labor. This showed a high level of collaboration, as groups had to figure out a plan that worked best for their group to accomplish each task. I observed groups taking ownership of the process through all of these varying group dynamics. Furthermore, students working together in groups helped to fulfill the need for relatedness as they developed a common policy which is important in self-determination theory.

**Scaffolding to Facilitate the PBL Process**

Throughout the PBL project, I gave feedback to support students. For example, a student let me know that they could not get a video clip into their presentation because the district had blocked YouTube on their chrome book. I let them know that they could
search the video on my computer, and we could still show it during their presentation if they so desired. I wanted to support the students in their endeavors. Students also asked me questions like “what if there isn’t an author?” on their annotations. I answered questions as they came up and was supportive to all their ideas, offering suggestions if needed.

As the study progressed, I felt that students needed more than just my verbal directions on how to complete tasks. I came up with a slideshow to which I added slides each day as we talked about each part of the project, and I projected it on the smartboard. This helped to support the students so that they could see a quick visual of what they were working on. For example, slides I projected might have something that I had taught students during the minilesson that day like the elements of a good policy, or what should be included in their presentation. These slides offered a quick visual to support students with additional guidance.

Around day six, an increase in questions arose. Students were working vigorously on their presentations at that point, and many questions started to come up. For example, a student wanted to know how many slides they had to have in all. I had explained this in the directions, but I made a slide to add to the slideshow and present on the smartboard to visually remind them how many slides they needed. Other students asked if the first consequence only went with the first rule. I explained that the consequences could be for all the rules. As questions came up, I explained and helped to support the students. Clarifying directions helped to facilitate the process for them.

As students worked on the project each day, I would help them to build on their learning by teaching a short minilesson, giving them a visual aid, or by modeling an
example. For instance, I modeled an annotation for them with the presurvey results so they could see how to take the research and make an annotation. Furthermore, these explanations and the modeling that I would give to students helped them to feel more competent in the tasks. This fulfilled the need for competence under self-determination theory.

As the days progressed, their conversations revealed their knowledge construction. One student told her group, “I didn’t realize there was an anxiety caused by not having your cellphone.” As they were putting their policies together, another student commented, “cellphones should be allowed because they reduce anxiety, we should use that.” I saw student knowledge build as they synthesized the data. For example, one student commented to his group, “In my interview he talked about parent involvement- I think one consequence should be that the teacher calls parents.” These conversations demonstrated that students were starting to synthesize and evaluate their findings with their groups. Moreover, the scaffolding aided students to eventually complete their presentations.

**Increased Student Ownership**

The final theme that emerged from the teacher observation journal was the level of student ownership that I observed. As the study progressed, the level of ownership that students took of the project increased. For example, when the same student was drawing again instead of working on his group’s presentation, I asked him, “why are you not working with your group?”. He responded, “I am drawing the images for our presentation.” I told him, “That sounds like a very interesting idea!”. I wanted to support his creativity and the desire of his group to use his talents for their images. This incident
also showed a high level of investment on his part and his group. This was the same student who had been drawing instead of working at the beginning of the study but was now caring about the project so much that he wanted to add his personal touch to it. This shows a sense of ownership that he now had for his project, that he hadn’t demonstrated previously.

As groups presented, I also observed that the conversations showed ownership. Several students asked if they could look at a slide again to complete their presentation notes or ask for clarification of a rule. For example, one student told the group presenting that he thought it was a good idea to not have phones during testing. He asked, “Why do they have to be in a lockbox though?” One of the group members explained that their group had talked about this. She said, “If the phones are just on [the teacher’s] desk, people may worry someone will mess with their phones and not want their phone to be taken up. So, it’s better if we lock it up.” This showed that the students had had put a great deal of consideration into rules such as this one that reveals that the students were taking ownership of their rules by thinking through the details.

As students presented, it was very apparent that students were invested in their presentations. Their slideshows were very visually appealing, with eye catching backgrounds and images. The rules and explanations were well thought out and supported. Thus, the presentations themselves showed a high level of student ownership. Students were meaningfully engaged in creating the cellphone presentations that they took ownership of. This fulfilled the need for autonomy as defined in self-determination theory.
On the teacher observation journal, some similar patterns that I had seen on other data collection instruments emerged. For example, I observed that students were more engaged as the study progressed, which was something that also was revealed on the exit tickets. Similarly, the teacher observation journal showed a higher level of participation and less off task behaviors when students were working on their presentations.

Additionally, student ownership became even more evident when looking at the student presentations themselves. This is something that I noted on the cellphone presentation rubric as well. The quality of the presentations demonstrated the high level of knowledge construction and showed how much the students were invested in their policies.

Therefore, the PBL process was successful at engaging students based on the level of data synthesis, evaluation, and student investment that was evident in the cellphone presentations.

**Triangulation**

The data collected from all the instruments helped me to identify some prevalent trends that confirmed the importance of using a PBL design for this study. First, on the pre- and post- surveys students reported less anxiety and distractibility in their classroom with the cellphone policy in place. This coincides with the data I collected from the cellphone behavior checklist where I saw a decrease in the instances and types of cellphone related behavior such as students being distracted and off task. Having the student cellphone policy in place had some positive impacts in these areas.

Second, from the pre- and post- survey open ended questions, I noted that several students commented on how they liked having a voice in the classroom policy. Students taking ownership of their learning is a key component of constructivist theory and why I
selected a PBL design. The students in this study are highly marginalized. I know that giving these students a voice is extremely meaningful to them. From their responses, I saw how positively they felt about having a voice in this study, which fulfilled their need for autonomy, a crucial aspect of self-determination theory that framed this study.

Third, findings also showed that as the study progressed and students began making their cellphone policy presentations, students became more engaged in the process. Students self-reported that their participation and interest levels increased on the exit tickets as the days went by. This was also supported with the observations that I made on the teacher observation journal. I noted more conversations and engagement as students worked on their presentations. I also noted that the depth of knowledge increased on comments made from the exit tickets and the teacher observation journal as the study progressed. This also shows that students were not only taking ownership but felt competent in the tasks they were completing, including their presentations, which is also significant in self-determination theory.

Fourth, after the PBL project, I saw there was a decrease in the incidents and types of cellphone behaviors. Less warnings from me were also recorded once the student cellphone policy was in place, and no phones were confiscated. This demonstrates that students took ownership of their policy as a class and tried to abide by it. This did not completely prevent incidents of cellphone related behavior once the policy was in place, but there were some improvements. A decrease in the number of cellphone related behavior from some of my most distracted students, was a particularly meaningful finding from this study.
Fifth, the data collected from this study showed that having a PBL design helped students have an increased level of knowledge construction through the process. Conversations recorded on the teacher observation journal, and comments on the exit tickets revealed a deeper understanding of the concepts as the study progressed. The rules and rationales that the students included in their policies also revealed a high level of data synthesis and evaluation. Through the PBL process students developed critical thinking skills such as knowledge construction, synthesis, and evaluation of the information they collected. This was evident as students referred to their interviews and research as they worked through the tasks. These skills are beneficial for students to learn for future use both inside and outside of the classroom.

Additionally, student ownership increased as the students moved through the PBL intervention. Students became very invested in their policies. The cellphone presentations showed a high standard of student work. The presentations revealed how invested the students were and that they took pride in their policies. Students worked collaboratively to put their presentations together, which aligned with social constructivism and self-determination theory.

Using the PBL model was an important part of this action research study. It structured the process through which students developed a cellphone policy in which they were invested. On the other hand, the policy was the product that is now the steppingstone for creating a school wide cellphone policy to address my problem of practice.
Summary

Chapter four analyzed the findings from all of the data collection instruments involved in this study. I used both quantitative and qualitative data collection instruments throughout this study because I wanted to gain a deeper understanding of the effectiveness of giving students more voice in classroom cellphone policies. The quantitative instruments used in this study included the rubrics, pre- and post-surveys, cellphone behavior checklist, and the exit tickets. The qualitative instruments included some of the pre- and post-survey questions, exit ticket questions, cellphone behavior checklist questions, and the teacher observation journal.

The quantitative instruments such as the pre-and post-survey and the exit tickets provided data on student distractibility, participation, and interest levels. The data collected from these instruments gave insight on the level of student engagement throughout the intervention. The qualitative instruments such as the teacher observation journal and the exit tickets provided more in-depth information on students’ construction of knowledge, and how they were synthesizing and evaluating information. I heard student conversations demonstrating this where they would ask each other “where can I find that research”, or “which article was that from?”. The final presentations that students made revealed the high level of critical thinking skills that they developed through this process and demonstrated the high level of investment that they had put into this artifact. This was observed by the researcher in statements such as “from our research”, or “the vice principal wants more parent involvement”.
CHAPTER 5

IMPLICATIONS AND RECOMMENDATIONS

This chapter begins with an overview of the study which will discuss the research questions and their connection to the intervention. An action plan will then be discussed followed by suggested research. This chapter will conclude with a few final reflections for this research study.

Overview of the Study

This study included a PBL intervention based on the benefits of students taking ownership of classroom cellphone usage policies that took place over four weeks. This was followed by a four-week trial period with the student policy in place. I collected data two weeks prior to the PBL, and during both the intervention and trial period. Before and after the PBL intervention, I collected data on student cellphone behavior. During the intervention, I collected data on student engagement and knowledge construction as they worked on the PBL project. I came to this study with a concern that I was seeing in my classroom around students being allowed to have their cellphones with them. I was observing distractibility and other negative behaviors that seemed to relate to students having cellphones with them in class. Knowing that there are many positive benefits to students having cellphones in class as well, I wanted to find a solution to decrease the negative impacts. My aim for this study was to investigate if giving students more
ownership in classroom policies surrounding cellphone use could decrease some of these negative impacts and increase the positive ones.

I collected data from the pre- and post-surveys, the rubrics, the cellphone behavior checklist, the student exit tickets, and the teacher observation journal. These findings provided me with insights on student engagement, knowledge construction, and impacts of ownership on student behavior. I reflected on these throughout the study and on improvements that could be made for next time, which I will address later in this chapter.

**Research Question Findings**

The research questions aimed to measure the level of knowledge construction and engagement during the PBL process. Additionally, they aimed to measure the impact of giving students more ownership of classroom policies on behavior. In this section, I will use the findings from chapter four to answer each of the research questions.

**RQ1**: How do students synthesize and evaluate researched material to construct their knowledge and to create a classroom cellphone policy?

Several pieces of data exhibited that students had a high level of knowledge construction as the study progressed. Quantitative data such as the rubrics showed that students gained in depth knowledge as they worked on the tasks of the PBL project. This study was based on constructivist theory which says that the teacher is more of a facilitator (Harasim, 2012). Through the PBL process, I gave students the directions for the task that needed to be accomplished, but then stepped back and let them complete the project on their own. They then synthesized their research materials within their groups to create their presentations and to find a solution to the problem.
The cellphone policy presentations showed a high level of understanding of the content, which students were able to support with their data which they had collected from the literature, their interviews, and from discussions with their groups. Vygotsky (1978) believed that students can only go so far on their own and need to collaborate with others to help them learn. Similarly, my findings also supported this idea. As students collaborated with their groups there was a higher level of knowledge construction as the study progressed. As groups worked together on their presentations, I saw an increase in the depth of knowledge, data synthesis, and evaluation, compared to the beginning of the study when students were researching and making annotations.

Qualitative data were also collected from the exit tickets and the teacher observation journal. The exit tickets asked daily open-ended questions. As the study progressed, I saw a deeper level of knowledge in the student responses on those. I observed conversations on the teacher observation journal which also showed that the students were understanding the content and task on a deeper level as the study progressed. This coincides with Scardamalia and Bereiter (2015) who believe that learners build on their preexisting knowledge. They then must scaffold the new learning to make new rules. The work the students submitted, their responses to the open-ended questions, and their conversations, revealed that they were building on their knowledge as the study progressed and were using these critical thinking skills in putting the presentations together. Conversations that I recorded such as “which article is that from”, or “where can I find that research”, let me know that students were using data they had collected from earlier tasks in their policy presentations.
**RQ2:** How does using a PBL instructional model engage students in the process of making a cellphone usage policy for their classroom?

Based on the exit tickets and the teacher observation journal, I was able to observe that students were very engaged in making their cellphone usage policy. According to Mcleod (2019), to be actively engaged, students may conduct experiments or real-world problem solving. From my observations I noted that groups were engaged in their conversations throughout the PBL project and worked together to complete the tasks.

According to Johnson (1991), giving students a voice and ownership in classroom policies increases engagement and improves academic performance. This was also the case in this study. For instance, on the exit tickets several students mentioned that they felt positively about having a voice in this study. Students having a voice in the cellphone policies increased their engagement as shown by the data.

On the exit tickets, students self-reported their participation and interest levels. According to Chapman (2003), both are indicators of engagement. As the study progressed, students reported higher participation and interest levels as they worked toward their presentations. In my teacher observation journal, I recorded that more conversations happened amongst groups as the study progressed. The presentations also showed a deep investment that the students had in their work. The presentations were very informative, visually appealing, and one even included student made artwork. This high level of engagement was seen in the quality of the cellphone presentations. This data indicates that using the PBL design encouraged student engagement in the process of making cellphone usage policies.
According to Johnston (2017) students psychological needs of self-determination theory must be met for students to be meaningfully engaged. Using the PBL process fulfilled the three competencies outlined by Deci and Ryan’s (2020) self-determination theory. Students’ needs for autonomy, competence, and relatedness were met in this study by using a project-based learning design.

**RQ3:** How does ownership of classroom cellphone usage policies impact student self-reported distractibility, anxiety levels, academic performance and teacher-observed cellphone behavior?

Based on the data collected from the pre- and post-survey, I was able to see student-reported levels of distractibility, anxiety, and impacts to academic performance before and after the PBL project. On the post-survey, 24% of students decreased their anxiety score and 44% of the students reported a decrease in distractibility. This was while the student policy was in place. The rules that the students created gave students the ability to use their phones as soon as their classwork was completed. Knowing this, some students felt less anxious about not using their phones and many students were not as distracted. In one study a similar result was found. When students were told the time they would be able to use their phones, they reported to have less anxiety (Leger et al., 2018).

Based on student self-reported scores on if they felt their academic performance was affected in a negative way by cellphones in the classroom, 22% of students decreased their scores on the post survey from no impact to a slightly higher rating. While working on their presentations, students explored negative impacts of cellphones
in the classroom. Learning more about these impacts could have caused some students to shift their rating to a higher score than no impact on the post survey.

When asked if they felt their academic performance was affected in a positive way, 24% of students increased their rating after the PBL project. This shows that students felt that cellphones had a positive effect on their academic performance after the PBL project. A study by Cady et al. (2017) also had similar findings. After surveying teacher and students, they concluded that 86% of teachers and 92% of students supported cellphone use in the classroom and saw the many educational benefits that this could provide. During the PBL project, students learned about the many positive impacts of having cellphones in the classroom while researching for their presentations, and this could have caused their increase in rating to the positive impact that cellphones can have on academic performance on the post-survey.

Another data source that was important to answering this research question was the cellphone behavior checklist. When I analyzed these observations, I found that there was still some cellphone related behavior noted after the PBL project, but the types of cellphones behavior that I was observing decreased by 75%. Six out of eight of the types of the behavior that I had observed before the PBL project decreased. Also, a third of the students who were showing cellphone related behaviors before the PBL project decreased the amount of these behaviors. Additionally, two of the students who decreased their behaviors while the student policy was in place are noted to be very distracted in class and do not complete all their assignments. Although small, this shows that students taking ownership over cellphone policies did have some impact on some of my students who may struggle the most with being distracted by their cellphones in class.
**Action Plan**

Since completion of the study, I have reflected on the findings and will share the action plan I developed for the direction I would like to go next. This will be followed by some reflections that I have on improvements that I would make for the next time I do this project. This chapter will then conclude with future research recommendations.

The first step of the plan is to talk to my principal to get permission to share with the faculty about the study I conducted in the spring and the results that were found. My principal already knows about this study. I met with him several times over the 2021-2022 school year and discussed the project and gave him updates. At the end of the study, I also gave him a summary of the findings. He also visited my classroom at the end of the study and had a discussion with the students who were involved. He asked them for takeaways from their experience with the research study. Many shared that they liked having a voice in the policy. A few others shared that they liked their rules that they made. When he asked them which rules they thought were the best, one student said, “I liked that we got to use our phones once our work was completed.” Another student responded, “I liked having three warnings.” This summer I will set up a meeting with him once we are back in the building in August to get his approval to present the findings at the September faculty meeting.

There are several elements that would be beneficial for other teachers to learn about from this study. First, when I share with faculty I will share the benefits of project-based learning. I would spend some time explaining the research on the benefits of using a constructivist design such as PBL, on critical thinking skills, student engagement, and student ownership. I would talk about the research that supports it and then what I
observed in this study. Second, I would also want to talk about the benefits of giving students more voice in the classroom. I observed how this led to students being excited and more invested in the policies that they came up with. It was hard for me as a teacher to give up some of the control of my classroom, and I would talk about that too. I was scared that they would come up with outrageous rules at first and I wanted to put limits on it. However, I did not put restrictions on it and was presently surprised!

When they were presented with the data and told that they needed to help solve this problem, I was pleased with the results.

Third, I would want to tell them about the rules that the students came up with and the decreases in behavior that I saw. Particularly, I would talk about letting students use their phones once their work was completed and giving students more warnings. I would let them know about the research study by Leger et al (2018), that also found that students experience less anxiety when they know at a certain time, they can use their phones. I found this to be true as well. I will also tell them that with more warnings there was not a drastic increase in the number of warnings that I was giving after the PBL, and I never got to the point of having to take a phone. Fourth, I would share with them that the results did not completely solve the negative cellphone behaviors, but there was some improvement.

I would highlight that I saw improvement in some of my students with the most difficult behavior which I thought was extremely significant. There are a lot of behavioral incidents in this school, and I feel that other teachers would also be on board with trying something that seems to have an impact on some of our hardest to reach students. Finally, I would encourage other teachers to try the study in their own classrooms and I would
offer to work alongside them. I would let them know that I am planning on doing the study again with my new students, if they would like to do it in their classroom at the same time.

After sharing with the staff, I will make myself available to assist anyone who wants to try this in their classroom. I will start the new study in the beginning of October and will conduct it at the same time in my own classroom with any teachers who also want to do it.

The students who were involved in my original study were in eighth grade and will have gone to high school in the fall of 2022. Therefore, I need to conduct the intervention again with new students in the fall. I will need students who were involved in the intervention present in the building to help with presenting and putting together the new school policy. Additionally, conducting a new intervention will also allow me to look at two sets of data by the end of the new intervention. I am excited about doing the intervention again in the beginning of the school year because I felt that I did not have enough time to see the long-term impacts on students. The original research ended around spring break, so I only had the students for about two months until school ended afterwards. I would like to do this again in the fall and see how it impacts cellphone behavior over a larger portion of the school year. I think it would be great if another teacher or two also joined me and did this in their classroom as well so that we could look at impacts across more than one classroom.

Once the new intervention is completed, I will then have students help put together a presentation of the findings. I will have the students present those at a School Improvement Counsel meeting in November. This will allow students to feel even more
ownership of the policy and will provide the SIC committee with the findings from the study. The SIC committee is pivotal at our school for making any policy changes. At this meeting, I will ask for support from the SIC committee members to join a new cellphone policy committee that will be formed by teachers and students who have been a part of the study, SIC members, and parents. This committee will come together to develop a new cellphone policy based on the study results.

In the month of December, I will have scheduled meetings with the new cellphone policy committee. We will develop a new cellphone policy and present it to administration for approval before the winter break. Once approval is given, we will have committee members present the new policy to the school at the faculty meeting in January. This will ensure that the policy is put into place at the beginning of the second semester which starts at the end of January 2023.

Through the remainder of the school year, I will send monthly surveys to the faculty to find out how the policy is working in their classroom and if they want to provide additional feedback. The surveys will also have a place for them to rate the amount of negative cellphone behavior they are observing in their students. I will have monthly meetings with the cellphone policy committee. We will review the surveys and adjust as needed. We will prepare and provide a final report to the principal at the end of the year with findings from having the schoolwide policy in place and recommendations from the committee for the next school year. The action plan and timeline are detailed in Table 5.1 below.
### Table 5.1: Action Plan Overview and Timeline

<table>
<thead>
<tr>
<th>Action Plan Steps</th>
<th>Procedures</th>
<th>Expected Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>August/September 2022 Sharing results</td>
<td>Set up a meeting with the principal in August. Share results and with the principal. Obtain permission from the principal to present during a faculty meeting. Presentation of the research study to the staff in September.</td>
<td>Faculty and administration will learn about the advantages and benefits of using PBL and giving students voice in the classroom. Findings from the study will also be shared. Staff will be encouraged to try intervention in their classrooms.</td>
</tr>
<tr>
<td>October 2022 Assist other teachers in conducting this project in their own classrooms</td>
<td>Meet with individual teachers that want to participate. Share any resources that the teacher needs from the study. Meet with teachers throughout the intervention. Provide any other support needed. Select groups. Conduct project. This will coincide with Action Step 2.</td>
<td>The students in this classroom will take ownership of a classroom cellphone policy. Debrief with teachers. Decreased cellphone related behavior. The teacher and I will work together on data analysis and findings. Student involvement and ownership. Decreased cellphone related behavior in my classroom.</td>
</tr>
<tr>
<td>October 2022 Repeat project in the fall in my own classroom with new students.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### November 2022

**Students share results**
- Students make a presentation with the finding results.
- I review with students and help them to make sure they are representing data clearly.
- Students share findings with SIC committee.

**Students take more ownership of policy**
- Students build more critical thinking skills.
- Students earn experience in public speaking.
- Committee learns results.
- Committee members commit to working on making a new policy in Step 5.

### November/December 2022

**Committee formation/Develop a Schoolwide Policy**
- Select student members.
- Ask for parents to serve on committee.
- Recruit SIC members.
- Notify staff members who conducted study in step 2.
- Meet to collaborate on a new policy.
- Present to Administration.

**Administration gets on board with creating new policy.**
- Members from all groups are represented on committee, i.e., students, SIC, teachers, and parents.
- Administration approves new policy.
- Members from committee present at January faculty meeting.
- Students take even more ownership.
- New policy put into place by second semester.

### December 2022/January 2023

**Present new policy to faculty**
- Committee members present new policy to staff at January faculty meeting.

**Second semester begins with new policy in place at the end of January.**
meeting. New schoolwide policy in place beginning of second semester. Teachers observe a decrease in negative cellphone behavior and record it on surveys.

February-June 2023 Schoolwide Trial Period

Monthly Surveys sent to teachers during second semester. Committee meets monthly in the spring to go over feedback from teacher surveys/make changes if needed. Committee puts all data findings from Spring semester together to present to the principal in final summary.

Committee provides final summary at the end of the school year. Committee meets monthly in the spring to go over feedback from teacher surveys/make changes if needed. Committee puts all data findings from Spring semester together to present to the principal in final summary.

Committee provides final summary at the end of the school year.

Committee puts all data findings from Spring semester together to present to the principal in final summary.

Improvements

There are a few changes I will make when I conduct this intervention again. First, I will shorten the timeline to six weeks for the whole intervention. This will be more doable for the fall timeline and will be less of a time commitment for teachers who want to participate. The intervention will be done for six weeks in the fall. The teacher can observe behaviors for one week prior. The PBL portion can be done over two weeks with a three-week trial period afterwards to observe behaviors.

Second, before the intervention, I will spend some time working on interviewing skills. Students of this age do not seem to have this prior knowledge. So, before I would have students interview again, I would spend more time making sure they knew how to get a little more information from their interviewees by asking probing questions.

Third, I would ask students questions that are more detailed, so that they can’t just respond with a simple, “yes” or, “no.” I would also interview students so that I could write down what they are saying, this would give me richer data. I found that some
students would only write short answers, but they might have more they would tell me out loud in an interview. This would give more valuable feedback from students.

Fourth, I felt that it was too hard to keep up with the cellphone behavior checklist and the teacher observation journal at the same time. Next time I would consider recording student conversations so that I could get more quality data there I felt that I was not hearing everything or able to record everything that was happening as groups collaborated. This would help with that.

Additionally, for some of the tasks I will let students use their cellphones to complete their work. For instance, students could complete the pre- and post-surveys, interviews, and the exit tickets on their cellphones. According to Ehnle (2021), this might help engage students even more since they enjoy using their cellphones. Furthermore, there are many resources that students can use to look up answers to questions immediately, which is a benefit for students using cellphones in the classroom. Students could also use the cellphones in the process of looking up data to use as they complete their tasks. Finally, using cellphones more during the study would also provide the benefit of modeling a way to use cellphones appropriately in the classroom.

Finally, I would make my Likert scales with less choices for this age group. For instances, I had zero through five on the surveys with zero being no impact, and five meaning strongly impacts. This gave a lot of range in choices for numbers. If I had done zero through three instead, I think this would have been easier for students to rate themselves. I also would have more labeling. Instead of just on the highest and lowest numbers I would also have a labeling for the middle numbers. I think this would have made these questions clearer and more precise for students, but also for analyzing data.
These are some changes I would like to put into place for the next time I do this study. As I conducted this intervention the first time I made these reflections when I saw parts of the study that could run a little smoother.

**Recommendations for Future Research**

There are some new directions that I would like to go from this intervention. First, as detailed above, in the fall of 2022 I plan to conduct the same research with a new group of students. There will be some adjustments and changes that I will make that I reflected on during the first intervention. I also detailed those above, but since the students have graduated who were involved in the first study, I want to do this intervention again with a group of students who I will have in the building this fall.

Second, In the spring I will also be creating a survey for teachers to gain data about the effectiveness of the new school wide policy that we put into place. I plan to analyze these findings and present them in a final report to the principal. The surveys will be a place for teachers to rate the amount and types of cellphone related behavior they are seeing each with the new school wide policy in place. They will also be able to provide feedback that will help the committee to make any adjustments as needed.

Third, since this study focused on the impacts of giving students ownership over classroom cellphone usage policy, I would like to investigate its long-term effects. Once the policy has been in place for at least a year, I would like to examine its impacts on academic performance. I would be very interested to see if the data show improved academic performance over a longer period with the student created policy in place and if the policy in place decreases student distractibility, anxiety, and the amount of time the teacher is losing from delivering instruction.
Finally, I would like to do more research on nomophobia because I found that was one of the most interesting aspects to this research study. As a recent phenomenon I would like to do more research on this anxiety disorder itself. Then, I would also like to develop an intervention where I would survey students, other educators, and parents to find out about the levels of anxiety middle schoolers experience regarding cellphone use. I think this would provide interesting data on the prevalence of nomophobia, and how educators can effectively support student in this area.

**Summary**

In chapter five, I answered the research questions and went over my action plan. I also reflected on some improvements I would like to make to this study for next time, and I discussed future research. As this chapter ends, and this dissertation comes to a close, there is one comment that a student made during this experience that I will never forget. On the post-survey when asked what they enjoyed most about the PBL project, one student wrote, “it was great that we had a say in the rules and not just disregarded.” Disregarded. That word has stuck with me since. This is a very marginalized group of students. From comments such as this and the engagement and ownership that I saw these students take on for this project, I know that being given a voice in their classroom meant a lot to many of them. This statement sums up just how meaningful giving students a
voice really is. My hope is that if these students remember nothing else from their eighth-grade year, they will remember that they were invested and cared about trying to make a problem in their classroom better. Their voice mattered and they made a difference.

“It only takes one voice,
at the right pitch,
to start an avalanche.”

-Dianna Hardy
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## Day 1 Exit Ticket PBL Project

**1. List your Group member names and their roles (list yourself for #1):**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1.</td>
<td>Name: __________________  Role: __________________</td>
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<tr>
<td>2.</td>
<td>Name: __________________  Role: __________________</td>
</tr>
<tr>
<td>3.</td>
<td>Name: __________________  Role: __________________</td>
</tr>
<tr>
<td>4.</td>
<td>Name: __________________  Role: __________________</td>
</tr>
<tr>
<td>5.</td>
<td>Name: __________________  Role: __________________</td>
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</tbody>
</table>

**2. Who will you be interviewing and what is their job, or are they a student?**

**3. Do you have any questions that you would like to ask?**
### Day 2 Exit Ticket PBL Project

1. List at least two important ideas from your research today:
   1. 
   2. 

2. Please rate how much you feel that you participated in today’s activities:
   
   I did not participate  1  2  3  4  5 I participated a lot

3. Please rate how you felt about the activities that you worked on today:
   
   I did not find them interesting  1  2  3  4  5 I found them very interesting
4. Do you have any questions that you would like to ask?

<table>
<thead>
<tr>
<th>Day 3 Exit Ticket PBL Project</th>
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<tbody>
<tr>
<td>1. List at least two important themes that your group discussed today:</td>
</tr>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>2. Please rate how much you feel that you participated in today’s activities:</td>
</tr>
<tr>
<td>I did not participate</td>
</tr>
<tr>
<td>3. Please rate how you felt about the activities that you worked on today:</td>
</tr>
<tr>
<td>I did not find them interesting</td>
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<td></td>
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<tr>
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<tr>
<td><strong>4.</strong> Do you have any questions that you would like to ask?</td>
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<tr>
<th><strong>Day 4 Exit Ticket PBL Project</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>1.</strong> Did your group come up with any other important themes today?</td>
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<tbody>
<tr>
<td><strong>2.</strong> Please rate how much you feel that you participated in today’s activities:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I did not participate</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
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</table>

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<tbody>
<tr>
<td><strong>3.</strong> Please rate how you felt about the activities that you worked on today:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I did not find them interesting</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

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<tbody>
<tr>
<td><strong>4.</strong> Do you have any questions that you would like to ask?</td>
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</tr>
</tbody>
</table>
**Day 5 Exit Ticket PBL Project**

1. How did the outline help you to organize your themes and presentation today?

2. Please rate how much you feel that you participated in today’s activities:

   I did not 1 2 3 4 5 I participated

   participate a lot

3. Please rate how you felt about the activities that you worked on today:

   I did not find 1 2 3 4 5 I found

   them interesting them very interesting

4. Do you have any questions that you would like to ask?

**Day 6 Exit Ticket PBL Project**

1. How do you feel about your group’s policy and presentation?
2. Please rate how much you feel that you participated in today’s activities:

<table>
<thead>
<tr>
<th>I did not</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>I participated a lot</th>
</tr>
</thead>
</table>

3. Please rate how you felt about the activities that you worked on today:

<table>
<thead>
<tr>
<th>I did not find</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>I found them very interesting</th>
</tr>
</thead>
<tbody>
<tr>
<td>them interesting</td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>

4. Do you have any questions that you would like to ask?

---

**Day 7 Exit Ticket PBL Project**

1. List at least two important ideas that you heard from the presentations today.

   1. 
   2. 

---

165
2. Please rate how much you feel that you participated in today’s activities:

<table>
<thead>
<tr>
<th>I did not</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>I participated a lot</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>I did not find</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>I found them very interesting</th>
</tr>
</thead>
</table>

3. Please rate how you felt about the activities that you worked on today:

4. Do you have any questions that you would like to ask?

### Day 8 Exit Ticket PBL Project

1. List your top five favorite rules from the nominations:

   1.
   2.
   3.
   4.
   5.

2. List your top three favorite consequences from the nomination:

   1.
   2.
3.

Do you have any comments or questions about the rules or consequences?

Figure A. 1: Exit Ticket Templates
APPENDIX B: PRE-SURVEY

Cellphone Classroom Usage Pre-Survey

Form description

Email *
Valid email

This form is collecting emails. Change settings

How anxious do you feel if you are not allowed to use your cellphone during class? *

0  1  2  3  4  5
Not anxious at all   Very Anxious

How distracted do you feel by having your cellphone in the classroom with you? *

0  1  2  3  4  5
Not distracted at all Very Distracted
How much do you feel cellphones in the classroom impact your academic performance in a * negative way?

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Strongly impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>No impact</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How much do you feel cellphones in the classroom impact your academic performance in a * positive way?

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Strongly impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>No impact</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Do you carry your cellphone into class with you daily? *

- [ ] yes
- [ ] no

Do you think that students should be allowed to have their cellphones in the classroom? *

- [ ] Yes
- [ ] No
7. What are some apps and/or other useful tools that students could use their cellphone to access in the classroom?

8. If cellphones are allowed in the classroom should there be rules and consequences for usage?*
   
   Mark only one oval.
   
   □ Yes
   □ No

9. Do you have any other comments that you want to share about students using cellphones in the classroom? *

Figure B. 1: Pre-Survey
APPENDIX C: POST-SURVEY

Cellphone Classroom Usage Post-Survey

Form description

This form is automatically collecting emails for Howard County Public School System users. Change settings

How distracted do you feel by having your cellphone in the classroom with you? *

0 1 2 3 4 5
Not Distracted at all  ⬜  ⬜  ⬜  ⬜  ⬜  ⬜  Very Distracted

How anxious do you feel if you are not allowed to use your cellphone during class? *

0 1 2 3 4 5
Not Anxious at all  ⬜  ⬜  ⬜  ⬜  ⬜  ⬜  Very Anxious
5. Do you carry your cellphone into class with you daily? *

*Mark only one oval.*

☐ yes

☐ no

6. Do you think that students should be allowed to have their cellphones in the classroom? *

*Mark only one oval.*

☐ Yes

☐ No

7. If cellphones are allowed in the classroom should there be rules and consequences for usage? *

*Mark only one oval.*

☐ Yes

☐ No
8. What did you enjoy the most about the PBL project?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

9. What was your least favorite part of the PBL project?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

10. Do you have any other comments that you want to share about students using cellphones in the classroom? *

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Figure C. 1: Post-Survey
APPENDIX D: TEACHER OBSERVATION JOURNAL

<table>
<thead>
<tr>
<th>Date:</th>
<th>Engagement: (How did students take action/show involvement)</th>
<th>Important themes: (Any important conversations/thoughts that students shared with each other)</th>
<th>Other Observations:</th>
<th>Notes for next day:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

*Figure D. 1: Teacher Observation Journal*
APPENDIX E: PARENT CONSENT FORM

UNIVERSITY OF SOUTH CAROLINA
CONSENT TO BE A RESEARCH SUBJECT

Impacts in the Classroom when Students Take Ownership of Cellphone Usage Policies:
An investigation using a Project-Based Learning Design.

KEY INFORMATION ABOUT THIS RESEARCH STUDY:

Your child is invited to be a part of a research study conducted by Mrs. Melynda Diehl who is a doctoral candidate in the Department of Education, at the University of South Carolina. The purpose of this study is to investigate if giving students ownership over creating a classroom cellphone policy decreases some of the negative issues related to students having cellphones in the classroom. This study is being done at Harper’s Choice Middle School and your child is being asked to participate due to their enrollment in Mrs. Diehl’s US History course.

The following is a short summary to help you decide whether to allow your student to be a part of this study. More detailed information is listed later in this form.

The purpose of this study is to investigate if giving students’ ownership over a classroom cellphone policy decreases some of the negative issues and increases some of the positive impacts that cellphones in classrooms can have. Students will complete a pre-survey where they will be asked about their current levels of distractibility, anxiety, and academic performance related to having their cellphone in the classroom. The participants will then be involved in a project-based learning design where they will put together a classroom cellphone usage policy presentation in a small group. Students will learn about some of the negative impacts of cellphones in the classroom such as student distractibility, anxiety, and decreased academic performance. They will also learn about the positive benefits such as access to useful educational apps, educational and organizational supports, communication in emergencies, and more. Groups will share their policies with the class and the class will vote on a classroom policy to put into place in our classroom.
for a four-week trial period. Students will complete a post-survey at the end of the study to note their level of distractibility, anxiety, and impacts on academic performance during the trial period.

PROCEDURES:
If you agree for your child to participate in this study, your child will take part in the following:
1. Students will complete a pre and post survey online.
2. Students will work with a small group in class to research and create a cellphone usage policy for our classroom.
3. Students will conduct a short interview with another student, or adult and ask them five questions about their feelings about student cellphone usage in the classroom.
4. Students will help present the cellphone policy that their group creates to the class.
5. Student behavior in regard to cellphone usage in the classroom will be observed and noted over a four-week period.
6. All identifying information will be kept located in password protected digital files, in further password protected devices (essentially a minimum of two-levels of password protection will be in place.

DURATION:
Participation in the study involves eight class periods where students will work with their small group.

RISKS/DISCOMFORTS:
There are no identifiable risks.

BENEFITS:
Taking part in this study could have positive benefits on the student directly. Additionally, this research may help future students in a similar situation.

COSTS:
There will be no costs to you for participating in this study.

PAYMENT TO PARTICIPANTS:
Students will not be paid for participating in this study.

STUDENT PARTICIPATION:
Participation in this study is voluntary. Students are free not to participate, or to stop participating at any time, for any reason without negative consequences. Your participation, non-participation, and/or withdrawal will not affect your grades or your relationship with your teacher, school, or school district.

CONFIDENTIALITY OF RECORDS:
Information obtained about you during this research may be published, but you will not be identified. Information that is obtained concerning this research that can be identified
with you will remain confidential to the extent possible within State and Federal law. The investigators associated with this study, the sponsor, and the Institutional Review Board will have access to identifying information. Study information will be securely stored in locked files and on password-protected computers.

**VOLUNTARY PARTICIPATION:**
Participation in this research study is voluntary. Your child is free not to participate, or to stop participating at any time, for any reason without negative consequences. In the event that you do withdraw from this study, the information you have already provided will be kept in a confidential manner. If you wish for your child to withdraw from the study, please call or email Melynda Diehl.

I have been given a chance to ask questions about this research study. These questions have been answered to my satisfaction. **If I have any more questions about my child’s participation in this study, I am to contact Melynda Diehl at: (410)313-6929 or email: Melynda_diehl@hcpss.org**

Concerns about your child’s rights as a research subject are to be directed to, Lisa Johnson, Assistant Director, Office of Research Compliance, University of South Carolina, 1600 Hampton Street, Suite 414D, Columbia, SC 29208, phone: (803) 777-6670 or email: LisaJ@mailbox.sc.edu.

I agree for my child to participate in this study. I have been given a copy of this form for my own records.
If you wish to participate, you should sign below.

______________________________  __________________________
Signature of Subject / Participant               Date

______________________________  __________________________
Signature of Qualified Person Obtaining Consent               Date
APPENDIX F: STUDENT ASSENT FORM

Dear Student,

My name is Melynda Diehl. I am a doctoral candidate in the Department of Education at a. I am conducting a research study as part of the requirements for my Doctor of Education degree, and I would like to invite you to participate.

For this study I am interested in finding out if student voice helps to increase the positive benefits of students having their cellphones in the classroom, and decreases the negative impacts associated with that. If you decide to participate, you will be working in a small group to help come up with a classroom cellphone policy that we will put into place in our classroom for four weeks.

In particular, you will be learning about the positive and negative benefits for students having cellphones in the classroom. You will be asked to create a Google Slide presentation with your group based on that information, which will include rules and consequences for our classroom cellphone usage policy. All the groups will share their presentations with the class, and you will get to take part in voting on which rules you think should be part of our classroom cellphone policy.

Participation is confidential. Study information will be kept in a secure location. The results of the study may be published or presented at professional meetings, but your identity will not be revealed.

Participation, non-participation, or withdrawal will not affect your grades. If you begin the study and later decide to withdraw, no ill-effects will occur in any way.

I will be happy to answer any questions you have about the study. You may contact me at (410)313-6929 or Melynda_diehl@hcpss.org or my faculty advisor, Dr. Suha Tamim at tamims@mailbox.sc.edu. If you would like to participate, please sign your name below. Thank you for your consideration!

Warm Regards,
Melynda Diehl
(410)313-6929
Melynda_diehl@hcpss.org

Yes, I will participate in this study ______________________________

___________________________________________. Today’s Date: ___________

(printed name)

(signed name)
### APPENDIX G: ANNOTATIONS TEMPLATE

<table>
<thead>
<tr>
<th>Title of the article:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td></td>
</tr>
<tr>
<td>Year:</td>
<td></td>
</tr>
<tr>
<td>Participants:</td>
<td></td>
</tr>
</tbody>
</table>

**Paraphrase important sentences:**

**Summarize findings:**

**Other notes:**

*Figure G. 1: Annotations Template*
## APPENDIX H: ANNOTATIONS RUBRIC

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Ratings</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>All annotations include the title, author(s) year, and participants.</td>
<td>5 pts</td>
<td>0 pts</td>
</tr>
<tr>
<td></td>
<td>Full Marks</td>
<td>No Marks</td>
</tr>
<tr>
<td>All annotations have at least one important sentence paraphrased, and a few sentences summarizing the research findings.</td>
<td>5 pts</td>
<td>0 pts</td>
</tr>
<tr>
<td></td>
<td>Full Marks</td>
<td>No Marks</td>
</tr>
<tr>
<td>At least five annotations are included.</td>
<td>5 pts</td>
<td>0 pts</td>
</tr>
<tr>
<td></td>
<td>Full Marks</td>
<td>No Marks</td>
</tr>
</tbody>
</table>

Total Points: /15

*Figure H. 1: Annotations Rubric*
APPENDIX I: INTERVIEW TEMPLATE

Directions: Interview another student outside of this class, a parent, a teacher, or other school staff member. Ask them the guiding questions below and any other questions that you would like to add.

1. Thank you for agreeing to take part in this interview. Can you please tell me what grade you are in if you are a student, or what your job is (if the person is an adult)?

2. What negative impacts do you think there may be from students having their cellphone in the classroom?

3. What positive impacts do you think there may be from students having their cellphones in the classroom?

4. If students are allowed to have their cellphones in the classroom, what are the rules and/or consequences that you think should be in place?

5. Can you please share any additional thoughts you would like to share with me about students having their cellphones in the classroom?
### APPENDIX J: INTERVIEW RUBRIC

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Ratings</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student included pertinent information, ie. the interviewee’s name, title, etc.</td>
<td>3 pts</td>
<td>0 pts</td>
</tr>
<tr>
<td></td>
<td>Full</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Marks</td>
<td>Marks</td>
</tr>
<tr>
<td>All five probing questions were covered.</td>
<td>5 pts</td>
<td>0 pts</td>
</tr>
<tr>
<td></td>
<td>Full</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Marks</td>
<td>Marks</td>
</tr>
<tr>
<td>Students asked other questions and/or encouraged the interviewee to elaborate on their answers.</td>
<td>2 pts</td>
<td>0 pts</td>
</tr>
<tr>
<td></td>
<td>Full</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Marks</td>
<td>Marks</td>
</tr>
</tbody>
</table>

Total Points: /10

*Figure J. 1: Interview Rubric*
APPENDIX K: IMPORTANT THEMES GRAPHIC ORGANIZER TEMPLATE

Directions: As your group members share their annotations from their research, use the column on the left to write down at least three important ideas about the negative impacts of cellphones in the classroom. Use the second column to write at least three important ideas about the positive impacts of cellphones in the classroom. Use the third column to record at least three common themes that you hear between your group members and your own research. Use the fourth column for any additional notes.

<table>
<thead>
<tr>
<th>Negative impacts</th>
<th>Positive Impacts</th>
<th>Common Themes</th>
<th>Additional Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Figure K. 1: Important Themes Graphic Organizer Template*
APPENDIX L: IMPORTANT THEMES GRAPHIC ORGANIZER RUBRIC

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Ratings</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>At least three negative impacts from students having cellphones in the classroom are listed.</td>
<td>5 pts</td>
<td>Full Marks</td>
</tr>
<tr>
<td></td>
<td>0 pts</td>
<td>No Marks</td>
</tr>
</tbody>
</table>

At least three positive impacts from students having cellphones in the classroom are listed.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Ratings</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 pts</td>
<td>Full Marks</td>
</tr>
<tr>
<td></td>
<td>0 pts</td>
<td>No Marks</td>
</tr>
</tbody>
</table>

At least three common themes are listed.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Ratings</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 pts</td>
<td>Full Marks</td>
</tr>
<tr>
<td></td>
<td>0 pts</td>
<td>No Marks</td>
</tr>
</tbody>
</table>

Total Points: /15

*Figure L. 1: Important Themes Graphic Organizer Rubric*
APPENDIX M: CELLPHONE POLICY OUTLINE TEMPLATE

Directions: Use your Important Themes Graphic Organizer to start making your presentation outline with your group.

I. Rule #1
   a. What is the reason for this rule?
   b. What does the research say?
   c. Other justifications…

II. Rule #2
   a. What is the reason for this rule?
   b. What does the research say?
   c. Other justifications…

III. Rule #3
    a. What is the reason for this rule?
    b. What does the research say?
    c. Other justifications…

IV. Rule #4
    a. What is the reason for this rule?
    b. What does the research say?
    c. Other justifications…

V. Rule #5
   a. What is the reason for this rule?
   b. What does the research say?
   c. Other justifications…

VI. Consequence #1
    a. What is the reason for this consequence?
    b. What does the research say?
    c. Other justifications…
VII. Consequence #2
   a. What is the reason for this consequence?
   b. What does the research say?
   c. Other justifications…

VIII. Consequence #3
   a. What is the reason for this consequence?
   b. What does the research say?
   c. Other justifications…

IX. Other important information
   a. Any other important themes your groups wants to share…
   b. Any other important information that you want to add to your presentation from your research.
APPENDIX N: CELLPHONE POLICY PRESENTATION RUBRIC

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Ratings</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation includes a title slide as the first slide with a title and</td>
<td>2 pts</td>
<td></td>
</tr>
<tr>
<td>group member names listed.</td>
<td>0 pts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Full Marks</td>
<td>No Marks</td>
</tr>
<tr>
<td>Presentation includes at least five rules on separate slides and five</td>
<td>10 pts</td>
<td></td>
</tr>
<tr>
<td>explanations for each rule on separate slide. (At least 10 slides in all)</td>
<td>0 pts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Full Marks</td>
<td>No Marks</td>
</tr>
<tr>
<td>Presentation includes at least three consequences on separate slides and</td>
<td>6 pts</td>
<td></td>
</tr>
<tr>
<td>at least three explanations for each consequence on separate slides.</td>
<td>0 pts</td>
<td></td>
</tr>
<tr>
<td>(At least 6 slides in all).</td>
<td>Full Marks</td>
<td>No Marks</td>
</tr>
<tr>
<td>Presentation is neat, clear, and with no grammatical or spelling errors.</td>
<td>3 pts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Full Marks</td>
<td>No Marks</td>
</tr>
<tr>
<td>Presentation is visually appealing with images, videos, or other</td>
<td>4 pts</td>
<td></td>
</tr>
<tr>
<td>interactive elements.</td>
<td>0 pts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Full Marks</td>
<td>No Marks</td>
</tr>
</tbody>
</table>

Figure N. 1: Cellphone Policy Presentation Rubric
Directions: As groups share their policies, keep in mind that we will vote on our favorite ideas. Record your favorite rules and consequences in the table below, so you can make nominations after the presentations.

<table>
<thead>
<tr>
<th>Rules that I like....</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Consequences that I like....</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Figure O. 1: Presentation Notes Template
APPENDIX P: CELLPHONE CLASSROOM BEHAVIOR CHECKLIST

<table>
<thead>
<tr>
<th>Date:</th>
<th>Cellphone related Behavior:</th>
<th>How was it addressed?</th>
<th>Did it reoccur during the same class period? If so how was it addressed?</th>
<th>Other comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

*Figure P. 1: Cellphone Classroom Behavior Checklist*
APPENDIX Q: STUDENT CELLPHONE INTERVIEWS

Student Cellphone Interviews

Student interview example:

1. Thank you for agreeing to take part in this interview. Can you please tell me what grade you are in if you are a student, or what your job is (if the person is an adult)?

8th Grade

2. What negative impacts do you think there may be from students having their cellphone in the classroom?

Not paying attention, putting their volume all the way up and others can hear EVERYTHING

3. What positive impacts do you think there may be from students having their cellphones in the classroom?

being able to communicate with parents/ family!!! If something happens being able to reach the other person, using as a positive resource for class work.
4. If students are allowed to have their cellphones in the classroom, what are the rules and/or consequences that you think should be in place?

Volume 0. A big concern is students not paying attention but if they aren’t paying attention then they’ll fail, and that’s their fault not teachers. Of course not being able to use phones during tests is reasonable, but the failing part is their fault and they’ll have to learn from it.

5. Can you please share any additional thoughts you would like to share with me about students having their cellphones in the classroom? I think it should be okay for people to have their cellphones out during class I don’t see a dire reason for them to be banned

6. (own question) If you could be in charge of creating the phone rule, what would it be?

Please use cell phones responsibly.
Teacher interview example:

1. Thank you for agreeing to take part in this interview. Can you please tell me what grade you are in if you are a student, or what your job is (if the person is an adult)?

   English teacher at [blank] and aspiring administrator.

2. What negative impacts do you think there may be from students having their cellphone in the classroom?

   A distraction to students; they sometimes add to social conflict. They can cause emotional damage, like on social media, messages. It's addicting; we feel like we must always be on it doing something.

3. What positive impacts do you think there may be from students having their cellphones in the classroom?

   When students don't have their chromebook, they can use cell phones for class activities. A not very popular option is group studying; English group chat, etc.

4. If students are allowed to have their cellphones in the classroom, what are the rules and/or consequences that you think should be in place?

   No social media, messaging, calls. Guided access.

5. Can you please share any additional thoughts you would like to share with me about students having their cellphones in the classroom?

   Like the idea, students need accountability and responsibility. There is no way to manage reach though, so it might not be a good choice.
Assistant principal interview example:

1. Thank you for agreeing to take part in this interview. Can you please tell me what grade you are in if you are a student, or what your job is (if the person is an adult)?

   Assistant Principal [Redacted]

2. What negative impacts do you think there may be from students having their cellphone in the classroom?

   Social media, and texting during the school day which is creating a lot of anxiety and tension, and cyberbullying.

3. What positive impacts do you think there may be from students having their cellphones in the classroom?

   No positive impacts, causes power struggles between students and teachers.

4. If students are allowed to have their cellphones in the classroom, what are the rules and/or consequences that you think should be in place?

   If they violate cell phones in the classroom I mean honestly I would like to start with you know I’m telling the kid to put it away. When they don’t do that I have to tell the student “hey can you put the phone away” because I don’t want the parents to sound so surprised when we just need them off and away. Then if
1. Thank you for agreeing to take part in this interview. Can you please tell me what grade you are in if you are a student, or what your job is (if the person is an adult)?

(Principal)

2. What negative impacts do you think there may be from students having their cell phone

A negative effect will be students sending negative messages to each other throughout the school day.

3. What positive impacts do you think there may be from students having their cellphones in the classroom?

• A break to watch a video or play a game
• Being able to use it for research

4. If students are allowed to have their cellphones in the classroom, what are the rules and/or consequences that you think should be in place?

One rule would be teacher have a specific time for phones

Not having a cell phone out during teaching time (when instructed)

Having them during independent time (when allowed)

5. Can you please share any additional thoughts you would like to share with me about students having their cellphones in the classroom?

Always have been in agreement with children about having phones in school but are against the children who use them incorrectly/not for good a purpose.

Figure Q. 1: Interviews Student Examples
### Annotation 3

<table>
<thead>
<tr>
<th>Title of the article: How Teen Use Technology to Cheat in School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s): Amy Morin, LCSW</td>
</tr>
<tr>
<td>Year of the article/study: 2021</td>
</tr>
<tr>
<td>Age of participants in the study: Teens</td>
</tr>
<tr>
<td>Paraphrase important sentences: 35% of teens use their phones to cheat. They are cheating because they want to succeed. Most children also cheat so that they do not disappoint their parents. Students have many ways of cheating by texting, storing notes, copying and pasting, through social media, and using homework apps and websites.</td>
</tr>
<tr>
<td>Summarize findings: Students will use many methods with their phones to cheat so that they could keep up with school work and not disappoint their parents.</td>
</tr>
</tbody>
</table>
Title of the article: Should you let your kids have a cellphone in school?

Author(s): Edward C. Baig

Year of the article/study: February 5, 2020

Age of participants in the study: kids

Paraphrase important sentences:
- Some teachers see a phone as an asset and try to let phone usage be included in class.
- Safety reasons are sometimes a good reason to have phones in school.
- People against cell phones in school believe that access to phones will lower grades, promote cyberbullying and increase the likelihood of teenage anxiety, depression and suicide.
- People also believe having a cell phone could be an issue in case of a lock down, because we try to be quiet but if a ringer goes off it could be a safety issue.

Summarize findings: I learned that some teachers actually believe a cell phone is an asset and try to include cell phone usage in class. But, the people against cell phones in school believe that access to phones will lower grades, promote cyberbullying and increase the likelihood of teenage anxiety, depression and suicide. Which can potentially be true. Some people say safety reasons are sometimes a good reason to have phones in school. But again the people who disagree believe having a cell phone could be an issue in case of a lock down, because we try to be quiet but if a ringer goes off it could be a safety issue. Which I never thought of but now I see that could definitely be an issue. Overall there are downsides and some upsides I learned from this article.

Other notes: I have no additional notes to add.
### Annotations 4

**Title of the article:** Cell Phones at School: Should They Be Allowed?

**Author(s):** Charise Rohm Nulsen

**Year of the article/study:** Last updated on February 18, 2022

**Age of participants in the study:** Teenagers

#### Paraphrase important sentences:

These are some examples of pro's that the article gives. Expert Blaire Lent also explained how this aspect of cell phone use specifically benefits some students: “Allowing students to bring their phones to school has another benefit as well—many students with acute anxiety manage this condition by frequently checking in with their caretakers about daily plans. For example, "Who is picking me up?" is the type of question a student with anxiety might text several times during the traditional school day. Not because they keep forgetting, but because repetition of

the routine helps them assuage anxieties and navigate through the day.” “According to a 2019 study, “More than 12,000 13- to 16-year-olds in England found that using social media more than three times a day predicted poor mental health and well-being in teens.” these are some cons

#### Summarize findings:

There are both cons and pros in having cell phones at school, but to have a correct balance is important, to not take the phones away completely but to have rules in place for when to use the phone.
### APPENDIX S: STUDENT IMPORTANT GRAPHIC THEMES ORGANIZERS

Student Important Graphic Themes Organizers

<table>
<thead>
<tr>
<th>Negative impacts</th>
<th>Positive Impacts</th>
<th>Common Themes</th>
<th>Additional Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being distracted by phones during class.</td>
<td>Reducing stress or anxiety, or stopping nomophobia.</td>
<td>Risk of being distracted by phones in class.</td>
<td></td>
</tr>
<tr>
<td>Cheating on tests or exams.</td>
<td>Can be used for school related things such as research.</td>
<td>Access to different apps that could help with school.</td>
<td></td>
</tr>
<tr>
<td>Lower productivity rate and can lead to less work being done.</td>
<td>Can be a good break from the work you are doing in class.</td>
<td>Using the calculator app was also something almost everyone said.</td>
<td></td>
</tr>
<tr>
<td>Negative impacts</td>
<td>Positive Impacts</td>
<td>Common Themes</td>
<td>Additional Notes</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------------</td>
<td>---------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Students can use their cell phones to cheat on classwork, tests, quizzes, assessments, and exams.</td>
<td>Students can contact their parents, the police, 911, the fire department, etc. in case of an emergency at school using their phone.</td>
<td>Students should be able to use their phone as a calculator for math related classes and activities.</td>
<td>A three strike system may work, where if a student breaks the rules surrounding cell phone use three times, their phone is taken away and must be picked up by a parent.</td>
</tr>
<tr>
<td>Students can cyber bully other students in school using their cellphones.</td>
<td>Students can use educational apps to help them do classwork or study.</td>
<td>Students should not be allowed to cheat using their phones in class, and there should be consequences for using a cell phone to cheat.</td>
<td></td>
</tr>
<tr>
<td>Cellphone ringtones and notifications can be distracting to students in a classroom setting.</td>
<td>Knowing how to use a cellphone to complete work can be a helpful skill for students to practice early, so students being able to appropriately use cellphones can help them prepare for times when they may need to use them for work.</td>
<td>Students should be able to use their phone to contact a parent or guardian about possible medical issues or emergencies.</td>
<td></td>
</tr>
<tr>
<td>Negative impacts</td>
<td>Positive Impacts</td>
<td>Common Themes</td>
<td>Additional Notes</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------------</td>
<td>---------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>It might be a distraction and using social media to fool other kids and possibly cyber bully.</td>
<td>Looking up information, it'd be nice not to pass out calculators because that's what we do in everyday lives, look things up.</td>
<td>Making students feel more comfortable</td>
<td>phones have more positive impacts then negative ones</td>
</tr>
<tr>
<td>Not paying attention, putting their volume all the way up and others can hear EVERYTHING, maybe use headphones then</td>
<td>being able to communicate with parents/family!!! If something happens being able to reach the other person, using it as a positive resource for class work.</td>
<td>making the students feel safer and more comfortable</td>
<td></td>
</tr>
<tr>
<td>Not paying attention, playing games when their not supposed to, and sending negative messages to each other</td>
<td>Using it to take breaks (when allowed), using it to do research, and other classroom tools like</td>
<td>It can make students more comfortable with the environment that their in and make the less anxious/</td>
<td></td>
</tr>
<tr>
<td>during the school day</td>
<td>peardeck, kahoot, and blocket.</td>
<td>stressed</td>
<td></td>
</tr>
<tr>
<td>Phones will not be much more helpful than computers, They will distract students from learning.</td>
<td>Students are more used to them. They can also help, but they won't be as good as computers.</td>
<td>They are distractions, They are helpful.</td>
<td>There might be some good ways we could use them in class, but I believe that using computers are better than using phone Academically.</td>
</tr>
</tbody>
</table>
APPENDIX T: STUDENT CELLPHONE POLICY PRESENTATIONS

Student Cellphone Policy Presentations

Cell Phone Policy

Rule #1 - Phones are off and away unless the teacher allows students to use phones.

Explanation

- Should hopefully prevent distractions and getting off task during class.
- Research has shown that phones are big distractions during class to the user and one classmate’s phone going off can disrupt an entire class.

Rule #2 - Parents will decide if their students are permitted to use phones.

Explanation

- Parents can decide what their children can use on their phones.
- Students would be able to learn without distractions from certain apps and parents won’t be surprised by what their children do.
- The vice-principal wants parents to be more involved and to have more parental outreach.

Rule #3 - No non-school approved app usage.
Rule #4 – During tests and quizzes, all phones must be off and away. **NO EXCEPTIONS.**

- Less distractions from games and apps and less inappropriate usage.
- Students will be able to keep track of their devices while using them as a proper learning tool so they don’t experience FOMO.

Rule #5 – Phones can be allowed in pockets and bags but will not be used unless given permission.

- So they are in control of their own learning when preparing for a test.
- So that students don’t cheat or feel tempted to cheat.

Consequence #1 – A warning from the teacher.

- Students will have less anxiety knowing where their phone is and will not be distracted by using it.
- Students will have less FOMO and fewer distractions.
Explanation

Consequence #2 – Phone taken away and given back at the end of class.

Explanation

Consequence #3 – Phone taken by an administrator and parents called.

Explanation

Students are caught using their phones when they are not supposed to be.

Students are caught again still using their phones when they are not supposed to.

Students are caught for a third time still using their phones when they are not supposed to.
Cell Phone Usage in the Classroom

Rule 1:

Students should not be allowed to use cellphones during tests, quizzes, assessments, and exams. (unless the phone is required for medical purposes)

Reasoning for rule 1

Students might use cellphones to cheat on tests by searching up answers on an internet browser, using their cellphones to communicate test questions, answers, or other information about a test that should not be disclosed to other students or by accessing notes/resources they should not have access to during a test. During our research, we found that 1... a whopping 33% of teens admit to using their smartphones to cheat on homework or tests. 63% of the same surveyed students also stated they have seen others use their phones to cheat in school. (From "How Teens Use Technology to Cheat in School" by Amy Morin)

Rule 2:

Cell phones should only be used after work is completed.

Reasoning for rule 2

If students have a reward after completing the assignments in class, they will be less distracted while working and more motivated to complete classwork.

Rule 3:

Cell phones cannot be taken into the bathroom or to get water.

Reasoning for rule 3

Students can take video tape, take pictures of and use phones to bully other students outside of the classroom using cell phones. Our research shows that cyberbullying is a big concern when it comes to cell phones in school, but if rules and regulations are put in place, cyberbullying can be controlled and cell phones may still be allowed.

Rule 4:

Headphones should be allowed to be used with a phone if a student is doing independent work.
Reasoning for rule 4

For some people, listening to music can help them work. Students can also use headphones to listen to videos for coursework. In “Changing Our Mindset in regards to cell phones in the classroom” by Dhruva Corelli it is said that teachers should incorporate cell phones more into their lesson in order to engage students, and allowing students to use headphones and earbuds to listen to music during class or to listen to videos for class is one way to accomplish this.

Rule 5:

Students should be allowed to have their phones on them (i.e. pocket, bag).

Reasoning for rule 5

Students should be allowed to keep their phones on them in case of emergencies. “This generation of children has grown up with mass shootings, and specifically school shootings, being part of the news headlines that they see every year of their lives. We are now also living through a pandemic, where school districts and families have heightened anxiety and true health and safety concerns on a regular basis. Knowing that you can reach loved ones in a heartbeat thanks to mobile phones during school hours can feel more important than ever in the current climate.” From “Cell Phones at School: Should They Be Allowed?” By Charlie Rohn Helmer. Also, students should be allowed to have their phone if it is required for medical purposes.

Consequence 1:

If given three warnings to put your phone away during instructional time for one class, the phone will be confiscated until the end of the class.

Reasoning for consequence 1

If students are only giving warnings without any other consequence, they could continue to disregard some of the cell phone rules previously listed, and would decrease productivity in the classroom.

Consequence 2:

If someone is caught using a phone for cheating or using their phone after it has already been confiscated once, the device should be taken away and a parent should be contacted (detention if necessary).

Reasoning for consequence 2

Cheating on a test takes away from the learning part of class and could make a teacher think a student understands a subject the student really does not. If a student doesn’t pay attention in class then they should just be looking for shortcuts. It may seem easier to cheat rather than look up the answers, figure things out in their heads, or study for a test. Plus, it can be rationalized that they are studying on their phone rather than actually cheating.” From How Teens Use Technology to Cheat in School by Amy Morris.

Consequence 3:

If a student has their phone taken away for a school day multiple times and their parents need to be contacted, then they temporarily lose the privilege to use their phone during school hours.
Reasoning for consequence 2:

Cheating on a test takes away the learning part of class and could make a teacher think a student understands the lesson the student really doesn’t. If a student doesn’t pay attention in class then they should be punished for trying to cheat. “Other students may just be looking for shortcuts. It may seem easier to cheat rather than look up the answers, figure things out on their own, or study for a test. Plus, it can be rationalized that they are studying on their phones rather than actually cheating.” (From How Teens Use Technology to Cheat in School by Amy Morin)

Reasoning for Consequence 3:

If a student cannot demonstrate proper cell phone usage during school hours and has been given multiple chances to correct their behavior, then losing their phone for a long period of time would be the next step. The research mentions how schools must find rules for cell phone usage based on circumstances of each unique school. Giving chances to correct behavior would be a circumstance that could be unique to a school and therefore rules should be based around it.

Consequence 3:

If a student has their phone taken away for a school day multiple times and their parents need to be contacted, then they temporarily lose the privilege to use their phone during school hours.

Rule #1:

Students should have cellphones in class but should be off and away unless instructed otherwise.

Reasoning:

Students usually become distracted by their phones, if they are away from their phones they will be more focused.

Rule #2:

Students should have their phones silenced during school hours.
Reasoning:

Students will easily get distracted by their phones or even by other students' phones going off during class.

Rule #3:

For complete emergencies students may be able to step out of the classroom to make parent/guardian phone calls.

Reasoning:

Parents and guardians were worried that they wouldn't be able to contact their children during school hours, so the problem was solved.

Rule #4:

During non instructional time students should be able to use their phones as a source of music or a reading book.

Reasoning:

Music helps students concentrate and most students don't happen to like the books provided by the school so they have a chance to read books that they actually like.

Rule #5:

Phones need to go into a safe box during tests.

Reasoning:

There could be little to no chances of cheating.

Consequence 1:

If students use their phones during class without permission they will be given 3 verbal warnings/strikes to put away their phones.
Figure T. 1: Cellphone Policy Presentations Student Examples
APPENDIX U: STUDENT EXIT TICKETS

Day one student example:

<table>
<thead>
<tr>
<th>Day 1 Exit Ticket PBL Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. List your Group member’s name (list yourself for #1):</td>
</tr>
<tr>
<td>1. Name: [redacted] Role: Organizer</td>
</tr>
<tr>
<td>2. Name: [redacted] Role: Group manager</td>
</tr>
<tr>
<td>3. Name: [redacted] Role: Presentation Designer</td>
</tr>
<tr>
<td>4. Name: [redacted] Role: Recorder</td>
</tr>
</tbody>
</table>

2. Who will you be interviewing and what is their job, or are they a student?

I may interview my mom, who is a professional organizer, my dad, who is a data analyst, or my sister, who is a student in college.

3. Do you have any questions that you would like to ask?

How long is this research study going to go on? Will we still be doing our regular history curriculum?

Figure U. 1: Day One Exit Ticket Student Example:
Day two student example:

Figure U. 2: Day Two Exit Ticket Student Example:
Day three student example:

Day 3 Exit Ticket PBL Project

1. List at least two important themes that you found in your research today:
   1. Students can be stressed without their phones in class
   2. Some students suffer from nomophobia without their phones.

2. Please rate how much you feel that you participated in today's activities:
   I did not participate
   
   I participated
   
   a lot

3. Please rate how you felt about the activities that you worked on today:
   I did not find them interesting
   I found them interesting
   I found them very interesting

4. Do you have any questions that you would like to ask?
   No.

Figure U. 3 Day Three Exit Ticket Student Example:
Day four student example:

<table>
<thead>
<tr>
<th>Day 4 Exit Ticket PBL Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Did your group come up with any other important themes today?</td>
</tr>
<tr>
<td>Having phones in school makes the students feel more comfortable.</td>
</tr>
<tr>
<td>2. Please rate how much you feel that you participated in today's activities:</td>
</tr>
<tr>
<td>I did not 1 2 3 4 5 I participated a lot</td>
</tr>
<tr>
<td>3. Please rate how you felt about the activities that you worked on today:</td>
</tr>
<tr>
<td>I did not find 1 2 3 4 5 I found them very interesting</td>
</tr>
<tr>
<td>4. Do you have any questions that you would like to ask?</td>
</tr>
<tr>
<td>Nope.</td>
</tr>
</tbody>
</table>

*Figure U. 4  Day Four Exit Ticket Student Example:*
Day five student example:

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How did the outline help you to organize your themes and presentation today?</td>
<td>It was quite helpful.</td>
</tr>
<tr>
<td>2. Please rate how much you feel that you participated in today’s activities:</td>
<td>I participated a lot</td>
</tr>
<tr>
<td>I did not participate</td>
<td>1</td>
</tr>
<tr>
<td>3. Please rate how you felt about the activities that you worked on today:</td>
<td>I found them very interesting</td>
</tr>
<tr>
<td>I did not find them interesting</td>
<td>1</td>
</tr>
<tr>
<td>4. Do you have any questions that you would like to ask?</td>
<td>Nope.</td>
</tr>
</tbody>
</table>

Figure U. 5: Day Five Exit Ticket Student Example:
Day six student example:

1. How do you feel about your group’s policy and presentation so far?
   I feel good about my group’s presentation because we have made good progress.

2. Please rate how much you feel that you participated in today’s activities:
   I did not participate a lot
   1 2 3 4 5 I participated a lot

3. Please rate how you felt about the activities that you worked on today:
   I did not find them interesting very interesting
   1 2 3 4 5 I found them very interesting

4. Do you have any questions that you would like to ask?
   No

Figure U. 6: Day Six Exit Ticket Student Example:
Day seven student example:

Figure U. 7: Day Seven Exit Ticket Student Example:
Day eight student example:

Figure U. 8: Day Eight Exit Ticket Student Example:
APPENDIX V: LITERATURE RESOURCES FOR STUDENT ANNOTATIONS

**Article 1** Challenging Our Mindset in Regard to Cellphones in the Classroom.

**Article 2** Cellphones in the Classroom: Expected and Unexpected Effects.

**Article 3** How Teens Use Technology to Cheat in School

**Article 4** Cellphones at School: Should They be Allowed?

**Article 5** Cellphones in the Classroom: Learning Tools or Distraction?

**Article 6** Schools Say No to Cellphones in the Classroom, but is it a Smart Move?

**Article 7** Should You Let Your Kids have a Cellphone in School?

**Article 8** 15 Big Pros and Cons to Cellphones in Schools.