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The Impact of Closed Captioning and Student Lexile Reading Levels

Jim L. Pruitt

In modern academia, today's English Language Arts (ELA) have established learning targets that require students to hone and develop academic skills in the specific area of reading. Teachers utilized a variety of best practices, including independent book reading, creating annotations, engaging in book talks, and taking standardized exams for districts to assess their knowledge (Gallagher, 2015). However, one major obstacle in modern classrooms that is preventing students from actualizing their reading achievement is the distraction that comes from technology (Moore & Richards, 2019). Today's students are just a notification away from losing focus in their book to respond to a text, play games, or watch shows and movies instead of engaging with their independently selected book. Researchers Garakouei et al. (2020) provided insight into the negative consequences regarding the constant time students spent on their devices. In their study, Garakouei (2020) wrote, "It is predictable that people who spend a lot of time on cell phones cannot afford enough time for their work assignments due to lack of concentration and fatigue, thereby facing academic failure and feeling lonely" (p. 128). The findings from this study reveal the consequences that come with cell phone addiction and the challenges that today's educators face when attempting to help students reach their learning goals, which in the case of English Language Arts (ELA) teachers, is improving student reading abilities.

Education today is similar to that of educational systems in the past. The goal of education historically has been to equip students with the skills they will need to navigate an increasingly complex society. Researchers Momanu et al. (2018) wrote that education serves to prepare students for "changing social conditions derived from urban development and

industrialization, and changes in women's social roles" (pp. 266-267). Thus, the focus on education has remained constant in that societies use education as a means to prepare their citizens for successful integration into their respective societies.

Author Reynar (1658) described the importance of ELA in the year 1658, in which Reynar wrote in the famous book, *Rules for the Government of the Tongue*, that "right words carry authority and efficacy in them; such a force, as none can stand against; for they have the strength of Reason, wisdom, truth, and righteousness in them; which are the sinews of invincible forces" (as cited in Mann, 2021, p. 61). If society is going to send out young adults into the world, then educators in the past and today must prepare students with these skills that students need to enter the world with a proficient degree of reason, wisdom, truth, and righteousness as Reynar wrote about in 1658.

What has changed though throughout the years of education is the technology used by both students and teachers. Gone are the days of having students write on primitive tools, such as papyrus paper (Sabar, 2021). Instead, today's classrooms are becoming increasingly tech-reliant and incorporating the use of the SAMR model to smoothly integrate technology and learning (Crompton & Burke, 2018). One such piece of technology that has emerged is the use of closed captioning. Since the 1980s, closed captioning use has been perceived primarily as a tool to assist the deaf or hard-of-hearing (Yuknis et al., 2017). However, researchers have also been using this form of technology in an attempt to increase reading scores, since its emergence in the 1980s (Goldman & Goldman, 1988).

What is different in this study is instead of having the researcher wheel in a TV and have all students watch the same pre-selected media for viewing, students utilized their modern devices to watch films and shows, while enabling the closed captioning tool. The idea of this

study was to tap into existing student interest to harness their technology into making meaningful gains in the areas of reading. This study required students to select independent TV shows and films, view this media using closed captioning and then measure how closed captioning influenced their areas of reading, through the use of the iReady reading exam that disseminated their growth scores into four areas; overall reading, vocabulary, comprehension of literary text, and comprehension of informational texts.

Methodology

In this mixed-methods study, the timing and design were intentionally crafted to meet the specifications and requirements on the part of the research site. Within this Midwest public school, there is an emphasis placed on the ELA department to improve student Lexile scores. To measure this progress, this school district has elected to require all freshman and sophomore students to complete the iReady reading exam by logging into the program using their designated Chromebooks to measure where students' reading abilities stand initially and then ultimately end up. The first testing window to measure student baseline Lexile levels occurred during the September/October testing period. After students completed this initial testing, students were required to complete the assessment again during the winter testing period. It was this testing cycle that inspired the timing and duration of this closed captioning research study.

For this study, the researcher compared two populations through the use of a two sample *t*-test using iReady pre- and post-test data. These iReady data were divided up into four areas of reading that are overall reading ability, vocabulary, comprehension of literary text, and comprehension of informational text. Before the start of the study, 88 prospective study participants were given a consent form that both they and their parents had to sign to be part of this study. Thirty-eight students returned their consent forms and agreed to be part of the study.

Before the six-week study began, *Qualtrics* pre-surveys were disseminated to participants to gain insight into the research participants' experiences regarding the use of closed captioning. After the pre-surveys, iReady pre-tests were given to participants, as a district requirement for all freshmen and sophomore students enrolled in an English course, to get a baseline reading score for students in the areas of reading mentioned previously. Once the pre-surveys and pre-tests were completed, the six-week study commenced. Throughout the six-week study, observation logs were kept that were recorded daily, in which the researcher recorded quotes that stood out, on/off-task behavior, absences, technology issues, and quotes from participants that stood out. Interviews were also conducted twice per day until all participants had been interviewed. The researcher asked participants a series of questions and recorded their responses via a Google Docs form. At the end of the six-week study, the iReady post-test and *Qualtrics* post-surveys were completed by participants, as is required by the district, to measure their reading growth. Finally, once the data were collected, a two-sample *t*-test was conducted on the quantitative data and checked for significance and the qualitative data were analyzed and separated into themes and phenomenology that emerged.

Theoretical Framework

As our society continues to advance in the area of technology, being able to harness technology, such as closed-captioning tools, is imperative for society's young minds to maximize student learning within the classroom moving forward. An interwoven framework that should be within educators' classroom practices is the thoughtful use of the SAMR model, as seen in this study. Researchers Crompton and Burke (2018) wrote about the four levels of the use of the SAMR model in which they stated, "The four levels – substitution, augmentation, modification, and redefinition – begin with a very basic use of technology and at each level the use of

technology” (p. 3). The incorporation of this framework helps to move educators through the levels of increasing complexity concerning technology use in the classroom. The first level is substitution, in which the educator simply changes one classroom material, such as a textbook for a technological substitute, such as an iPad. The complex integration of technology continues to progress through the four levels that Crompton and Burk (2018) discussed until ideally, the educator reaches the final level of technology incorporation which is redefinition as discussed by the authors. The use of closed captioning to improve students’ reading is a step towards redefining what we think of when it comes to the classroom learning experience.

Results and Analysis of Quantitative Data

The quantitative data collected for this study was through the use of both a pre- and post-test exam called iReady. This program guides students through a series of multiple-choice questions that uses an adaptive system of choice architecture to adjust the questions presented to the student, based on the answers that they provide. The designers of the iReady (2022) exam stated on their website that the iReady is “for Grades K–12 covering Reading and Mathematics in a digital, adaptive form” (para. 1). The duration of the exam typically takes a full class period to complete. Once students have finished taking the exam, the system compiles the data on the student Lexile levels and Lexile ranges into a raw score in four areas of reading level. The four areas are overall reading ability, vocabulary, comprehension of literary text, and comprehension of informational text. The scores of the pre- and post-iReady exams were analyzed using a two-sample *t*-test in which the closed-captioned group comprised of 38 students and was compared to that of students across the district that took the same exam but did not use closed-captioned material throughout this study [n=810].

Results of the Overall Reading Scores Category: Quantitative Data

Research Question 1: What happens to Lexile scores when students use closed captioning?

Null Hypothesis 1: There is no difference in Lexile scores between those that use closed captioning and those that do not as measured by the iReady exam (Lexile score).

The researcher used a two-sample *t*-test to determine whether there was significance in the areas of students' overall reading scores, vocabulary, comprehension of literature, and comprehension of informational texts after using closed captioned media in this study. For the first area of quantitative assessment, overall Lexile reading growth, participants in the study had an overall reading score growth of 3.66 at the end of the six weeks. The recorded district reading growth over this same period that was not part of this study was 4.21. With an *Alpha* (α)-value of 0.05 and a *p*-value of 0.31 this finding was not significant. In answering Research Question 1, participants in the closed captioning study increased their overall Lexile reading scores by 3.66 points, but the increase was not enough to be statistically significant. Thus, Null Hypothesis 1 failed to be rejected.

Results of the Vocabulary Category Quantitative Data

Research Question 2: What happens to students' vocabulary levels when they use closed captioning?

Null Hypothesis 2: There is no difference in vocabulary levels between students that use closed captioning and those that do not as measured by the iReady exam (vocabulary results section), survey questions, and interview questions.

The next set of quantitative Lexile data that the researcher analyzed was the area of growth of vocabulary. Using a two-sample *t*-test comparing the participants in the closed

captioning group and the students taking the iReady test without closed captioning, the growth of the closed captioning group comprised of 38 students had an average vocabulary growth score of -2.42, while the 810 students across the district had a vocabulary growth score of 6.16. Using an α -value of 0.05 and a p -value of 0.047 in the two-sample t -test revealed that there was moderately adverse significance in the area of vocabulary growth. In answering Research Question 2, the result of participants' vocabulary scores when they used closed captioning was that their vocabulary scores declined -2.42 points, while the overall district scores increased 6.16 points. The two-sample t -test data results in the rejection of Null Hypothesis 2.

Results of the Comprehension of Literature Category Quantitative Data

Research Question 3: What happens to the reading comprehension of literature scores for students that use closed captioning and those that do not?

Null Hypothesis 3: There is no difference in reading comprehension of literature scores between students that use closed captioning and those that do not as measured by the iReady exam (reading comprehension of literature score results section), media viewing questions, survey questions, and interview questions.

The third set of quantitative data collected and analyzed was the iReady Lexile data in the area of comprehension of literature. In this area of Lexile growth, the closed-captioned participants had a growth score of 10.79, with the district average growth in this area being 5.42. Using a two-sample t -test with an α -value of 0.05 and a p -value of 0.29, the researcher discovered that there was no significance in this area, which means that Null Hypothesis 3 failed to be rejected. In answering Research Question 3, when participants in this study used closed captioning, their comprehension of literature scores increased, but not enough to be statistically significant.

Results of Informational Text Category Quantitative Data

Research Question 4: What happens to students reading comprehension of informational text when they are exposed to closed captioning?

Null Hypothesis 4: There is no difference in reading comprehension of informational text between students that use closed captioning and those that do not as measured by the iReady exam (comprehension of informational text score results section).

The last quantitative data that the researcher analyzed in the area of Lexile growth was comprehension of informational texts. At the conclusion of this study, the closed-captioned group had a growth score of 3.42, with the districtwide students had a growth score of 9.03. Using an α -value of 0.05 and a p -value of 0.26, the researcher determined that there was no significance in this area, which means that Null Hypothesis 4 failed to be rejected. This quantitative data addresses Research Question 4, in that participants' reading comprehension of informational text scores increased, but not enough to show statistical significance.

Differences Between TV Shows & Films

Research Question 1: What happens to Lexile scores when students use closed captioning?

Null Hypothesis 1B: There is no difference in Lexile scores between those that use closed captioning and those that do not as measured by the iReady exam (Lexile score), when only considering differences in viewing TV shows versus films.

The researcher analyzed the quantitative data collected from the participants' iReady scores and compared the data to see if there was any statistical significance between those that watched films during this research and those who watched TV shows. The researcher discovered that there was no statistical significance in the areas of overall reading growth (p -value=0.667),

vocabulary (p -value=0.906), and comprehension of informational text (p -value=0.906).

However, the researcher determined that there was moderate statistical significance in the area of comprehension of literary text. Students that chose to view TV shows with closed captioning enabled had an average growth score of 21.31, while those that viewed films had an average growth score of 0.26 for an overall p -value of 0.038, which is statistically significant when using an α -value of 0.05. Hence, the Null Hypothesis 1B was rejected.

Results and Analysis of Qualitative Data

The qualitative data collected throughout this study were through the use of *Qualtrics* pre-and post-surveys, personal interviews, and observational logs. Upon collecting the data after utilizing these methods, the researcher analyzed the collected information to determine themes that emerged, according to the received responses on the part of the participants. The total number of participants in the closed-captioned group was 38, while the total number of students in the district to which their data was compared was 810.

Results of Pre-Survey

At the start of the study, the researcher provided participants with a pre-survey created through the *Qualtrics* software program. The pre-survey contained three questions that are the following:

1. Do you use closed captioning when you normally watch your shows/movies?
2. What are your general thoughts regarding closed captioning?
3. Are you looking forward to watching shows/movies using closed captioning?

Of the 38 participants in this study, 33 participants completed the pre-survey. Frequent reminders and prompting on the part of the researcher yielded no results on the remaining five participants to complete the pre-survey.

The results of Question 1 revealed that, when students watched TV shows and movies in their independent time at home, 14 respondents replied that they normally watch their independent media using closed captioning. Of the 33 respondents, 13 replied that they did not normally use closed captioning while viewing their media content, while six participants responded that they did not have an opinion or that their use of closed-captioned material was circumstantial.

While analyzing the responses from Question 1, several themes emerged. The first theme that emerged was that of comprehension. Eleven of the 33 participants responded to Question 1, stating that when they do use closed captioning, they use it to improve their comprehension of the media that they are viewing. The second theme that emerged in the pre-survey results was that of disruption. Twelve of the 33 respondents wrote in the pre-survey that they did not use closed captioning when watching TV shows and movies, normally due to the disruptive impact that closed captioning had on their viewing experience. The third theme that emerged in the first pre-survey question was that of situational usage. Five of the 33 respondents wrote that their closed-captioned usage was dependent on the situation. Three of these respondents wrote that the use of closed-captioned usage was dependent on what type of show or movie was being shown, while the other two wrote that, if they needed to comprehend the information being presented in the show they would use it, but not for a casual viewing experience.

Upon examining the results of the second pre-survey question, a theme of hearing disability emerged. Eleven of the 33 respondents to the survey mentioned that their general thoughts regarding closed captioning were that it is an assistive tool that can be of aid to those with a hearing impairment. The other three themes that emerged from Question 2 were over

favorability, indifference, and non-favorability when it comes to the respondent's general thoughts regarding closed captioning.

Eighteen students responded that they had favorable views of closed captioning, eight participants were indifferent, and seven students responded with an unfavorable response when asked about their general thoughts over closed captioning.

Pre-survey Question 3 asked, "Are you looking forward to watching movies/shows using closed captioning?" and three themes emerged from this question. The three themes that emerged were that of excitement, indifference, and non-eagerness, to which the students responded 21, six, and six respectively. These emerging themes are in alignment with the results from Question 2, in which 18 students held favorable views towards closed captioning, eight students were indifferent, and seven students held non-favorable views. The results from these pre-survey questions helped the researcher understand the pre-existing bias the participants held before engaging in the closed captioning process.

Results of Post-Survey

After the six-week study, the 38 participants were sent a *Qualtrics* post-survey to write about their closed-captioned experience. Of the 38 participants, 26 completed the survey. The researcher sent frequent reminders to participants via email (once per week) to complete the survey, but 12 students still did not complete the post-survey given to them. The post-survey sent to them contained the following five questions:

1. How was your closed captioning experience when viewing your selected TV shows/movies?
2. Do you plan to continue using closed captioning in the future? Why/Why not?

3. Have your thoughts changed regarding the use of closed captioning when viewing TV shows/movies?
4. Do you believe using closed captioning enhanced or hindered your comprehension of your TV show/movie? Explain.
5. Do you believe closed captioning enhanced or hindered your reading level? Explain.

Once the 26 participants completed the post-survey, the researcher compiled their responses and identified notable themes and responses that became apparent. The themes that emerged from these questions, along with an analysis of the themes that emerged, are in Chapters Four and Five of this study. The original surveys are in the Appendix section of this study.

Upon analyzing Question 1 of the post-survey, the three themes that emerged centered around that idea of enjoyment. Twenty-two of the 26 respondents wrote that they enjoyed their closed captioning experience. Two participants did not enjoy the experience and two students were indifferent to the experience. It should be noted that while the survey results were anonymous, two students in the sixth-hour class did not actively participate in the closed-captioned experience and instead decided that they wanted to read an actual book. These two students were constantly forgetting to bring their phones, laptops, and other technological devices to view their media, which resulted in them reading most of the time. Thus, the researcher suspects that these two students were indifferent to the closed captioning experience, due to their experience being inconsistent, which was recorded in the observational logs and discussed later in this chapter. The results from post-survey Question 1 suggested that participants overwhelmingly enjoyed their closed-captioned experience compared to the minority

of their peers.

The themes that emerged in Question 2 of the post-survey focus on the idea of the continued use of the closed captioning tool after the conclusion of the study. Fifteen of the 26 respondents wrote that they would continue to use closed captioning after the conclusion of the study. This represents an increase of four students that plan to use closed captioning regularly, when compared to the results of Question 1 in the pre-survey in which 11 students responded that they used closed captioning regularly. Nine students replied that they did not plan to continue using closed captioning, while two students were noncommittal.

The pre-survey given to participants at the beginning of this study asked them what their general thoughts were concerning the use of closed captioning (see Appendix C). Eighteen students responded in the post-survey that they held favorable views concerning the use of closed captioning, while nine students responded that they did not care for closed captioning and nine students were indifferent. The findings from Question 3 on the post-survey revealed that no students remained indifferent regarding the use of closed captioning. This response was inconsistent, since 16 students said that they did not have a change in thinking, while 10 students replied that they did have a change of thinking. This leaves nine students unaccounted for, since they responded that they were indifferent towards closed captioning at the start of the study. It is possible, but unlikely, that these nine students did not complete a post-survey.

When asked about how closed captioning affected their comprehension of the media that they were viewing, an overwhelming majority of participants (20) responded that they believed that the use of closed captioning enhanced their levels of comprehension. This finding is in alignment with the final iReady exam results, in which both comprehension of literary text and comprehension of information text scores were two to three times greater than that of the district

average. Five students reported believing that the use of closed captioning did not affect their comprehension, while one student believed that their comprehension regressed.

The final question on the post-survey asked students if they believed that their closed captioning experience enhanced their reading abilities or hindered it. Fifteen of the 26 respondents believed that closed captioning enhanced their reading abilities, while 11 students responded that they believed closed captioning had no effect. After completing the post-test iReady exam, participants in the study had an overall reading ability improvement of 3.66, which is in correlation to the majority of students that believed that the use of closed captioning enhanced their reading. Students that responded with “no effect” did not elaborate as to why they believed there was no effect on their reading. The 3.66 reading score growth was not statistically significant.

Results of Personal Interviews

After the first week of the study, the researcher interviewed participants in a one-on-one format and asked a series of interview questions. The researcher recorded responses using *Google Docs* and then categorized the responses into themes that emerged. The researcher used a phenomenological approach when evaluating the participants' responses, when applicable.

Over the course of the six-week study, the researcher met with students and asked them a series of questions pertaining to their closed captioning experience. The first question asked students what type of media they were viewing, a film or show? The results were an almost 50/50 split, with 17 students responding that they were watching a film compared to 21 students that decided to watch an episodic show.

Question 2 asked participants whether or not they used the closed captioning feature during the allotted time to view their media. No students answered that they viewed their media

with closed captioning less than 50% of the time or 50% of the time. Instead, an overwhelming majority of students responded that they viewed their media using closed captioning more than 50% of the time. Within this category, one student replied that they used closed captioning 70% of the time, another said 75% of the time, two students responded by stating they used closed captioning 90% of the time, while the other 34 students stated that they watched their media with closed captioning enabled 100% of the time. This finding suggests that the students participated in the study as intended, which enhances the validity of the data in this research.

The third question of the interview required participants to answer the question, “Has using closed captioning while viewing the show/movie helped your comprehension of the movie/show?” Three themes emerged from this question and they were active reading, distractions, and indifference. Twenty-eight of the respondents stated that they felt that their comprehension of their media increased due to some form of active reading while viewing their content. Five students responded that they did not believe that their comprehension was improving, due to the closed captions being distracting, while five students believed that their comprehension was neither improving nor declining, due to the use of closed captioning.

Question 4 of the interview asked the participants to answer the question, “Have you learned any new vocabulary words while using closed captioning, or have the vocabulary words been words you are already familiar with? Explain.” The first theme that emerged from this question was word familiarity. Twenty-six of the 38 responded by saying that they did not believe that their vocabulary was growing as a result of the use of closed captioning. This finding is in alignment with the significance found with the iReady vocabulary scores, in which participants in this study had a negative vocabulary score growth of -2.42, while students across the district had a growth score of 6.16.

The second theme that emerged from Question 4 was new vocabulary that students learned using closed captioning. These words were mostly foreign words that students were unfamiliar with. Four students responded by saying that they were unsure of their vocabulary growth or declined from participating in this study.

Question 5 for the interview was, “Do you believe using closed captioning while viewing your show/movie is increasing or decreasing your Lexile level? Explain.” The biggest theme that emerged from this question was that of reading while watching. Nineteen of 26 responded to this theme, while 26 of 28 participants replied that they believed using closed captioning was increasing their reading levels. Eleven students replied that they believed the use of closed captioning did not have an impact on their reading ability, which correlated with using the quantitative data collected from the iReady exam. The results of the exam were not statistically significant when it came to closed captioning and the participants’ reading level results. One student believed that their reading level was decreasing. Upon reviewing this student's iReady data, the data showed that this individual participant increased their reading level in all four areas of reading. Their overall reading score went from a 635 to a 669, their vocabulary score increased from 622 to 650, their comprehension of literary text score increased from 665 to 690, and their comprehension of informational text score increased from 619 to 667.

The design of Question 6 was to intentionally elicit a phenomenological response to gauge students' feelings towards the concept of using closed captioning in place of an independently chosen book. The results of Question 6 revealed that overwhelmingly students enjoyed (26 participants) or strongly enjoyed (four participants) using closed captioning in place of an independently chosen book. Eight students responded with a neutral reply. While the students may have overwhelmingly enjoyed the project, the results found in the quantitative

section of this study revealed that there was no statistical significance when it came to closed captioning impacting reading abilities, with the only exception being vocabulary scores to which participants in this study demonstrated a negative growth score of -2.42.

Interview Question 8 asked participants “What does closed captioning look like for you in the future? Do you plan to use closed captioning in the future? Will you not use this feature? Explain.” Out of the 38 participants in the study, 20 stated that they planned to use closed captioning in the future when viewing media independent of this study. Fourteen responded that they did not plan to use closed captioning in the future while four participants were unsure if they would use closed captioning in the future or that it was circumstantial for them to use it.

The final question of the interview asked participants if they had any final thoughts that they wanted to share with the researcher. Eleven of the 38 participants interviewed had more information that they wanted to share at the end of the interview. There were no noticeable themes that emerged nor did their responses contribute anything more to the results of the study.

Observation Logs Analysis

Throughout the six-week study, the researcher created entries into an observational log each day that the study took place. The researcher dated the observational logs, noted the behaviors, and observations deemed relevant to the study, recorded and analyzed by the researcher for themes that emerged along with a phenomenological approach to ascertain the impact that closed captioning had on the participants’ reading levels.

After the study, the researcher reviewed the recorded behavioral observations that occurred in the log and a series of themes emerged. The first theme that emerged was that of reminders. During the first two weeks of the study, the frequency of reminding students to turn

on their closed captioning was high. Once enabling became more ingrained into the participants though, the reminders to enable closed captioning became more of a rarity.

The second theme that emerged was the noticeable responsibility of students remembering to bring their media devices to class. The researcher observed only six instances throughout the six-week study that students forget to bring their devices to class. This theme was not surprising since it is common in our society today for both students and adults to have a phone, tablet, or some other form of technology on their person at all times.

The third theme that became apparent when analyzing the observational logs was that of internet issues. Over six weeks, only four times did students have difficulties getting their media to load. The cause of this theme is due to the reliable internet connection that exists within the school district of this study. Also, several students remarked that they were afraid that they would not be able to get their show to load at school so they downloaded it directly onto their device so that they could have direct access to their media for when it was time to access it.

The final theme that emerged from the researcher's observations was that of off-task behaviors. The researcher only created six entries in the observational logs regarding students engaging in off-task behaviors. The researcher noted these off-task behaviors and are in the qualitative results section of this study.

Major Themes That Emerged

The researcher in this study recorded and collected qualitative data from the use of pre- and post-*Qualtrics* surveys, observational logs, and personal interviews. After the researcher finished collecting this data, a review of the data was conducted and several major themes emerged.

Major Theme One: Closed Captioning & the Hearing Impaired

The first theme was associating closed captioning with that of deaf individuals. This theme that emerged in this study of assuming closed captioning is typically thought of as an assistive tool for the deaf or hearing impaired is found in the research by Ellis et al. (2017), in which they wrote, “Much of the literature focuses on the provision of captions – a vital accessibility feature for people who are Deaf or hard of hearing” (p. 885). This theme of connecting the concept of closed captioning to a hearing disability is also supported by researchers Schafer et al. (2021): “As stated previously, closed captioning, transcripts/notes, recordings, and sign language interpreters, when applicable, should be considered for all students with hearing loss in all learning situations. This helps to provide clarity for understanding for those with hearing disabilities” (p. 8). Research participants associating closed-captioning with being a tool only applicable for deaf individuals was surprising given that this particular theme emerged from the collected students' responses during the interview phase of this research.

What this theme suggests is that students may not believe that closed captioning is for them if they do not possess a hearing impairment. In the practical sense, individuals that do not have a hearing impairment would exhibit avoidance when it comes to enabling closed captioning and neglecting the benefits that come from its usage (Yavuz et al., 2016, p. 1792). While the theme of associating closed captioning with the hearing impaired emerged, it was surprising the number of students who responded in the *Qualtrics* pre-survey that stated that they already used closed captioning in their spare time, due to none of the participants possessed a hearing impairment. Eleven students responded that they regularly used closed captioning on their own before the study began. This suggests a shifting of attitude towards the perception of closed captioning as a tool only for the hearing impaired, but that there is still room for improvement in

terms of its perception. This finding is supported by Taylor (2018) who wrote about the gaining popularity of platforms, such as Twitch which provides its audience access to entertainers that has both a seamless chat option and closed-captioning tools for users to use to improve their experience and comprehension of the show.

Major Theme Two: Comprehension

Another theme that emerged from the personal interviews was of comprehension. Eleven of the 33 participants responded to interview Question 1 stating that when they do use closed captioning, they use CC to improve their comprehension of the media that they are viewing. This theme supports the research of Dragojevic (2021) in which the researcher measured student attitudes towards content and instructors that appeared foreign to them. In Dragojevic's (2021) work, he wrote the following concerning comprehension in the classroom, "Foreign-accented instructors are often evaluated more negatively than native-accented instructors, students often cite comprehensibility concerns, and consequences for misunderstanding can be significant (e.g., class performance)" (p. 175).

Dragojevic's (2021) finding suggested that when students enable closed captioning that they view this tool as a means to increase their comprehension, just like the research that found Dragojevic's work in which slides, outlines, and other interventions (in this case closed captioning) will help to build comprehension on the part of the student. Redford (2020) also supported this idea in the article, "For Reading Comprehension, Knowledge is POWER." Redford (2020) argued that it is simply not enough to teach 21st-century skills to students, but that students must also have exposure to engaging content that they can then practice these skills with (pp. 52-56). The participants' high engagement in this study revealed that the use of closed captioning in the ELA classroom is a viable tool that teachers can use opportunity to engage with

high-interest content, while simultaneously developing 21st-century skills, such as critical thinking, reading/writing stamina, and synthesizing content that students will need when they enter the workforce (Redford, 2020).

Major Theme Three: Device Responsibility

Observational logs in this study also yielded themes that became apparent to the researcher. A theme that emerged from the observation logs was the noticeable responsibility of students remembering to bring their media devices to class. This theme was not surprising, since it is common in our society today for both students and adults to have a phone, tablet, or some other form of technology on their person at all times. This emergent theme correlates to the research conducted in Østergard (2017), “Facebook, the largest social media network, currently has approximately 2 billion monthly users (1), corresponding to more than 25% of the world’s population” (p. 439). Østergard’s (2017) research revealed not only the prevalence of technology in our society today, but also supports this emergent theme of student responsibility in that it is not surprising that students mostly had direct access to their shows and films during this study because they prioritize having their technology on them at all times.

This theme that emerged from the observation logs and personal interviews is also reflected in the work of researcher Nedal (2017). Nedal (2017) wrote “Riding the next TECH WAVE,” in which the researcher discussed the current tech climate at public schools across the country and where they believe technology is headed. According to surveys conducted by Nedal (2017), when asked “Regarding technology, which of the following areas will see the most significant growth in your district in 2017?” 44% of respondents said that tablets or other portable devices would see the most growth. Thirty-four percent believed that the internet and WIFI would grow the most and 24% of respondents said that cloud computing and storage would

see the most growth within the district surveyed (p. 68). This research shows that students are expected to increasingly be connected to their devices and will increasingly have access to material via cloud storage in the near future. In the observational logs in this study, when students did forget their device or had trouble accessing their media content due to internet issues, students were recorded as being able to access their media via the cloud or accessing material from another readily available device. The observational logs in this study were in alignment with Nedal's (2017) research and revealed that researchers and teachers that decide to incorporate closed captioning in future studies will be able to rely on multiple access points for students to use in the event they do forget their respective devices.

Major Theme Four: Engagement

Another theme that emerged from the researcher's observation logs was that of engagement. Historically, when English Language Arts (ELA) teachers have their students read an independent book of their choosing, it is not uncommon to witness students engaging in some form of off-task behavior, such as drawing, sleeping, or playing on their phones. Researchers Shinoda et al. (2021) support this notion of classrooms naturally having off-task behavior in their study of visual processing. "Teachers need to be sensitive to student behaviors and respond accordingly because there are students who follow the teacher's instructions and those who do not in every classroom" (p. 1). The implication from this theme, along with the observational logs suggests that the use of closed captioning can help alleviate, but not eliminate, off-task behaviors during reading time in the ELA classroom. In today's modern classrooms, ELA teachers are waging a constant battle for student attention. The noticeable absence of off-task behaviors during the participants' media viewing time suggests that teachers can harness this

technology by having students use these devices that they love as a tool used to help them reach their academic goals.

Researcher, Hansil (2021) supports the incorporation of technology into the classroom and advocates for the use of gamification in the classroom setting. While this study did not utilize gamification in the design of the research, there were similar overlaps between the gamification and the use of closed captioning in this study. According to Hansil (2021), gamification “can create emotional responses from our learners, inspire competitive spirits, and help students engage with the subject matter in unexpected ways” (p. 64). Participants in this study also expressed high engagement behaviors, such as loudly proclaiming, “Oh my god, this is my favorite class!” and “This is the class I look forward to the most!” Participants were also overheard saying, “I have never done something like this before in school” which is in alignment with Hansil’s (2021) work with gamification. Allowing students to utilize their personal devices to develop their Lexile reading levels produced high engagement and low numbers of off-task participants in this study.

Implications Regarding the Use of Closed Captioning

After analyzing the data that were collected during this study, it became clear that while there was no statistical significance in students' overall reading comprehension, comprehension of literature, and comprehension of informational text, the growth in these areas of reading were comparable and even exceeded the average scores across the district in these areas of reading. This finding suggests that statistically there was no difference in these areas regarding whether or not students were reading a traditional book or watching media with closed captioning enabled. This finding is in correlation with the findings of researchers Islam et al. (2020), in which they discovered in a study on Australian school children that read media on screens, such as what is

found in text-based videogames, saw an increase in their reading scores, which correlates to the increase in reading comprehension scores in this study (p. 1)

In addition, in the area of vocabulary growth the researcher discovered that there was moderate, adverse significance. This finding also correlates with the qualitative data that the researcher collected through interviews and *Qualtrics* surveys, in which a majority of participants stated that they did not believe that their vocabulary was growing and that they had little exposure during this study to new vocabulary words in their selected media. The collected data from the iReady exam revealed that vocabulary levels for students in this study were negatively affected by solely relying on the use of closed captioning without any additional vocabulary-building resources. The implication of this finding suggests that if classroom teachers decide to adopt this close-captioning approach to increasing student Lexile levels and reading comprehension, they will need to provide additional resources for students to help improve their vocabulary levels.

Conclusion

The significance of this study was to see what happens to students' Lexile levels when they use closed captioning. Through the use of personal interviews, *Qualtrics* pre-and post-surveys, observational logs recorded on *Google Docs*, and pre and post-test Lexile assessments through the use of the iReady system that the qualitative and quantitative data were collected for this study. The results of this study revealed that there was no significance when it came to the impact of closed captioning on overall Lexile levels, comprehension of literature, and comprehension of informational text. However, this study revealed that there was significance in the vocabulary levels of students that used closed captioning in that they had an overall growth

score of -2.42, compared to their peers that did not use closed captioning and had a vocabulary score of 6.16.

The main takeaway from this study is that student Lexile scores grew at a similar rate, and in the areas of reading comprehension of informational/literary text at a greater rate compared to their peers reading traditional independent books. However, teachers utilizing media in place of books need to provide vocabulary support to prevent a decline in student vocabulary, as measured in this study. Closed captioning is a powerful tool that if incorporated into ELA instruction, has the potential to not only get students actively engaged in their learning, but also help them to become better readers.

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