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Using Technology and Collaboration to Support Reading Comprehension

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Abstract

The purpose of this action research study was to determine if there is a connection between using technology and collaboration to help increase reading comprehension skills. A combination of research-based instructional strategies infused with technology was used over a ten-week period. Quantitative data was collected through weekly assessment scores. Analysis of the data concluded that students who were involved in an intervention program infused with technology and collaboration would have better knowledge of the story. After further analysis of the data it is concluded that students who were involved in this action research study improved their academic scores.

Using Technology and Collaboration to Support Reading Comprehension

Reading comprehension is a critical skill for students to learn at an early age. Some students are able to analyze the pictures, fluently read the text, and recognize certain words but students are not able to fully understand the text. Comprehension is a critical lifelong learning skill because students will need this skill to understand text in future schooling and use the skill for future career opportunities. Technology has had much advancement in the last decade. There is a large push to integrate technology into the classroom setting. Some educators feel technology in the classroom is the future and other educators feel as if technology is consuming the minds of students in the wrong ways.

Through action research, this study was completed to determine if using technology based strategies and collaboration will enhance the reading comprehension skills of third grade students and improve their overall academic success. Technology sources used in this research included access to various applications on a tablet device, Internet access to various websites, and, access to a computer based comprehension program. The different technology avenues are provided to determine if the technology options offer equal or greater benefit to the students. If proven to be beneficial, technology tools could soon take the place of the traditional classroom strategies for aiding students with reading comprehension.

Literature Review

Reading comprehension is critical to understanding written communication in the work place, in the school environment, and in daily life. Teachers and other researchers have spent countless hours examining strategies in hopes of building students' comprehension skills. Many of these strategies have been around for decades. Reading comprehension is a lifelong skill that students need to acquire at an early age. One way for teachers to build lifelong learning is to

provide students with important tools. When teachers provide students with vital tools, learning will truly be lifelong. Learning comprehension while using tools, at an early age will benefit students for the rest of their lives. Educators sometimes forget how much work it is for a little brain to comprehend so many new things. Giving students tools to succeed will help them retain the information for longer periods. Reading comprehension is a necessity in order to succeed academically.

Building background knowledge for students is a key tool in building reading comprehension. In order for readers to make meaning of the text they are reading they have to connect with the text. Making connections with the text will force readers to retain the information. Readers will need to have an abundance of knowledge about the topic. Having domain-specific knowledge or topical knowledge allows the reader to make meaningful mental representations about the text. Background knowledge is very important when it comes to reading comprehension; it allows students to choose from different meanings of words, pick and choose pertinent details, and make inferences about the text. In order for students to understand the text and fully comprehend, they must have a strong foundation of background knowledge about the topic prior to reading (Neuman , Kaefer, & Pinkham, 2014).

A second key tool in building reading comprehension is the use of vocabulary. Vocabulary is important because in order to retain the information being read, students must fully understand the vocabulary. All students that are part of a classroom environment benefit from the explanation of vocabulary, but it is the struggling readers who benefit the most. Context clues can be used to determine difficult vocabulary. “Context clues are very important for broadly comprehending text as well as for specifically learning new words” (Flanigan & Greenwood, 2007, p. 249). In order for context clues to aide reading comprehension educators must model

how to figure out familiar and unfamiliar words. For educators this means teaching students the words that are relevant in the text and teaching the words that do not have direct connections using context clues. Vocabulary and reading comprehension go hand in hand and when paired together correctly using context clues, this tool is beneficial to many students (Robb, 2015).

Reading aloud is another great tool to build reading comprehension. Reading comprehension can sometimes be stressful for smaller minds; reading aloud helps them also think aloud. Thinking aloud allows teachers and parents to hear how the students are processing the story, discovering the details, analyzing the vocabulary, and allows adults to hear the strategies they are using to comprehend. Whether the teacher is reading the text or the parent is reading the text, the students are able to hear an excellent model of fluent reading. Students can listen to a story at a higher thinking level. When they are being read to they can process the information and in return hold a deep discussion about the text (Gold & Gibson, 2017). In order for comprehension skills to build, educators need to set aside time for planning and setting up. The learning environment must be filled with thinking, listening, and discussion. Reading aloud is another great tool to build reading comprehension for all students.

Reading Comprehension can develop through another tool such as collaborative learning environments. Students who work together can learn together. Collaborative learning environments are spaces within a classroom where students can work together. "The term collaborative learning refers to an instructional method in which students at various performance levels work together in small groups toward a common goal" (Gokhale, 1995, p. 1). In a collaborative learning environment, students are responsible for their own learning as well as their group members. When peers work together, they are able to feel successful together. As a peer team, students are able to use critical thinking skills at a higher level, they are confident in

numbers. In a collaborative setting students can use higher level thinking skills such as analyzing, synthesizing, and evaluating (Gokhale, 1995). Working as a collaborative peer team will allow students to build understanding of the text and increase their comprehension skills because of the top-level thinking. Collaborative learning can help build reading comprehension.

Lastly, technology can be used as a tool to enhance reading comprehension. Technology plays a large role in the lives of educators and students. Technology has evolved so much over the last decade and it is making its way into classrooms all over the world. When technology is implemented correctly, it can enhance many aspects of curriculum (Edutopia Team, 2008). Using technology in the classroom can be very beneficial to increasing reading comprehension. Technology is effective when it is embedded in the curriculum and is routine in classrooms. Many technology avenues today are made to enhance students learning abilities, extend their learning, or support their learning (Edutopia Team, 2008). Research has proven that technology applications can help with reading comprehension when used as a tool. Students are motivated by the technology devices and want to use a tool that is part of their daily lives. "After all, technology is a tool, and as such it should be selected because it is the best tool for the job. Technology can be a particularly effective tool for English language learners and can enhance the participation of children with disabilities" (Murphy, DePasquale, & McNamara, 2003, p. 12). Students need a chance to use and learn with a tool that provides them motivation. Providing opportunities with repetition for students to build their reading skills through available technology tools starts by allowing students to direct their own learning and choose materials they would like to read (Jeffs & Castellani, 2001). Technology can be used to enhance students' reading comprehension abilities if the tool is consistently and effectively embedded into the curriculum. Technology provides students with applications that provide them with background

knowledge of a text. Applications can also help determine the meaning of vocabulary terms and technology has the ability to read text aloud to students, all of which have been proven to build comprehension skills. Technology proves to be a successful tool in helping build students' reading comprehension.

The demands for educators to bring every child up to grade level in reading are rather high. Reading comprehension is a skill that all students need in order to be successful academically. Teachers can provide students with multiple tools in order for them to feel successful in the classroom environment. Comprehension is a critical skill that students must have in order to be successful in the work place, the school environment, and in daily life. Without comprehension the reading that students are doing is pointless, meaningless, and frustrating (Texas Education Agency, 2002). The demands are high to create great readers, but with the correct tools, reading comprehension skills can grow effectively.

Methods

Participants

In this action research study, there were twenty third-grade students who participated. The class is made up of eight girls and twelve boys who range in ages from 8-10. This class includes students who come from mostly predominately white families, who are above the low-socio economic status. Of the twenty students in the classroom, three students receive special education services for reading, six students receive Title I services for reading, and three students receive services from the English Language Learner (ELL) teacher for vocabulary. In December students were given an assessment to assess how their reading skills have progressed since the beginning of the school year. In the winter term the students were administered the MAPs (Measures of Academic Progress) test to determine their comprehension of reading and

knowledge of reading skills. On the MAPs assessment, this particular class of twenty students

was 60% proficient in the subject of reading comprehension and skills. On the weekly

assessments, 55% of these third-grade students were scoring above 80% on their weekly

comprehension assessments. Using this data the teacher decided to implement an intervention

plan to help boost students comprehension skills as third graders.

Data Collection

For this action research study data was collected for ten consecutive weeks. The data was

collected from students' weekly reading comprehension assessments. The data was then

recorded on an Excel spreadsheet and analyzed weekly by the teacher. During the ten weeks ten

third-grade students participated in a reading intervention program, while the other ten third-

grade students attended whole group reading as normal.

For the particular study all students were administered a reading comprehension pre-

assessment. After the pre-assessment, ten third-grade students were involved in a weeklong

intervention that was designed to improve their comprehension skills. The weeklong intervention

consisted of five different small group activities: **R**ead with the teacher, **E**njoy vocabulary,

Answer questions, **D**ive into story, and **I**ndependent reading. For the intervention process

students were grouped according to their MAPs scores. Students were placed into learning

groups with peers that had similar comprehension skills. The grouping was done in this way so

students could collaborate with one another if necessary. The intervention process took place for

a half hour each school day. On the fifth school day, the students were assessed on their reading

comprehension and vocabulary skills. The students who did not participate in the weeklong

intervention completed reading comprehension worksheets, a vocabulary foldable, and other

interactive notebook pages.

The READ intervention program was designed by the teacher to improve students'

reading comprehension skills using a research-based intervention plan. The READ intervention

program is made up of instructional strategies and instructional tools that are research-based. The

R portion of the intervention is read aloud with the teacher. This strategy has students working

directly with the teacher in a small group setting. First, the students read the story aloud in a

small group and then students are guided through the story while the teacher is asking higher-

level thinking questions to build their comprehension skills. The students are summarizing the

story with guided questions from their teacher. The **E** portion of the intervention program is

enjoying vocabulary. This strategy has students individually using a flash cards application to

build their skills on the stories vocabulary. Students build their skills by matching the vocabulary

to the correct definition. The **A** portion of the intervention is answer questions. This strategy

sends students on a scavenger hunt through their textbook. Students use a Google doc forum to

answer comprehension questions about the weekly story. For this portion of the intervention,

students are working together in a collaborative learning setting. Students are encouraged to

work with one another to answer the comprehension questions. The **D** portion of the intervention

is to dive into the story. This strategy allows students to make connections to the text and build

background knowledge of the stories topic. The students use the Internet or teacher required

websites to build their background knowledge. Students are prompted to make text-to-text, text

to world, and text to self-connections. Lastly, the **I** portion of the intervention program was to

have students independently read the story at their seats.

When the week was ending the teacher administered the post-assessment to the students.

The post-assessment consisted of ten multiple- choice vocabulary questions and ten multiple-

choice comprehension questions for a total of 20 total points. The teacher administered the test to

all students. The assessment was read aloud so every student had an equal chance to comprehend

the reading question. The students were allowed to ask questions throughout the assessment if

need be. The assessment was then graded and recorded to the spreadsheet.

Findings

Data Analysis

The quantitative data that was collected shows that the students who received the

weeklong intervention appeared to be performing better on their weekly comprehension

assessments. Specifically the data shows that students who were part of the intervention had an

average post -assessment score of 86.1%. The students who did not receive the intervention

scored an average of 80.9% on their post-assessment. Overall, the students who completed the

intervention program had an average gain of 67.9% from their pre-assessment to their post-

assessment. Students who did not complete the intervention program had an average gain of only

60.3%.   The students were able to use the knowledge they gained throughout the week and carry

it over to the assessment. The intervention process helped students comprehend the story,

remember the vocabulary, and build background knowledge about the stories topic.

Table 1
Intervention Grouping

Intervention Grouping				
Group 1	Group 2	Group 3	Group 4	Group 5
Student 109 {169}	Student 107 {180}	Student 103 {188}	Student 102 {195}	Student 108 {200}
Student 104 {179}	Student 100 {186}	Student 119 {192}	Student 106 {197}	Student 105{208}

Note. This table demonstrates how the students were grouped according to their MAPs scores.
The student identification numbers are present with their final reading MAPs score in
parenthesis.

Intervention grouping was completed in this manner so students could work with others

who are at the same instructional level. Students were able to collaborate better when they were

grouped alike. Students needed a score of 190 to be considered proficient on their MAPs reading

assessment. In this group, 50% were not proficient on the assessment. Specifically the intervention group was made up of one special education student, three title students, and one English language learner (ELL). Grouping the students enabled them to ask questions and receive answers that were on their instruction level. The students enjoyed working in only groups of two and students showed confidence when completing the reading tasks.

In the following tables, the data is recorded for each student's individual score. In the table the teacher recorded the names of the ten stories, the pre-assessment score, the post-assessment score, and the individual gain of each student. The students are listed on the left side of the table, while the story titles are listed along the top. The data was then entered into the document as a percentage. The teacher then averaged the percentages for each individual's scores and then averaged the group as a whole. The findings are evident when the tables are analyzed. The reading stories used in this intervention came from the districts chosen reading curriculum. The reading curriculum is *Journeys* by Houghton Mifflin Harcourt. The assessments that were used came directly from the *Journeys* reading series. The stories correlated perfectly with the comprehension and vocabulary assessments. Below, the tables show the results of the findings.

Results

Table 2
Non-Intervention Students

Scores = % correct				3rd Grade Students Who Did NOT Receive Intervention																													
Student ID Number	AVERAGE PRE	AVERAGE POST	AVERAGE GAIN	The Harvest Birds			Tops and Bottoms			Yonder Mountain			Kamishibai Man			Extra-Good Sunday			Judy Moody Saves the World			Aero & Officer Mike			Young Thomas Edison			Two Bear Cubs			Life on the Ice		
				Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain
Student 110	20	92	72	20	100	80	20	70	50	20	100	80	20	90	70	30	70	40	20	100	80	20	100	80	20	100	80	20	100	80	10	90	80
Student 111	21	87	65	20	90	70	20	90	60	40	90	50	30	90	60	10	70	60	30	100	70	20	90	70	20	100	80	10	70	60	10	80	70
Student 112	23	84	61	30	70	40	30	70	40	30	90	60	40	90	50	20	80	60	10	100	90	30	90	60	10	100	90	10	80	70	20	70	50
Student 113	27	77	50	30	100	70	30	50	20	20	70	50	20	100	80	30	100	70	30	80	50	30	50	20	30	100	70	20	50	30	30	70	40
Student 114	22	83	61	20	100	80	10	50	40	30	90	60	10	80	70	20	80	60	30	100	70	40	50	10	20	100	80	30	100	70	10	80	70
Student 115	25	73	48	30	90	60	10	80	70	10	70	60	20	80	60	30	40	10	20	100	80	50	70	20	10	90	80	40	60	20	30	50	20
Student 116	20	80	60	30	80	50	20	80	60	10	80	70	10	80	70	10	100	90	10	70	60	50	60	10	20	80	60	20	100	80	20	70	50
Student 117	16	78	61	10	70	60	30	90	60	10	60	50	20	100	80	0	70	70	0	80	80	30	70	40	30	70	40	10	80	70	20	90	60
Student 118	11	71	60	10	100	90	10	60	50	10	80	70	20	40	20	0	40	40	10	70	60	20	90	70	10	100	90	10	60	50	10	70	60
Student 119	19	84	65	30	90	60	30	70	40	30	80	50	10	90	80	20	70	50	20	90	70	10	80	70	10	80	70	10	90	80	20	100	80
GROUP AVERAGE	20.4	80.9	60.3																														

Note. The table represents the data that was recorded for the non-intervention students. The teacher recorded pre-assessment scores, post-assessments scores, and student gain.

Table 3
Intervention Students

Scores = % correct Student ID Number	AVERAGE PRE	AVERAGE POST	AVERAGE GAIN	The Harvest Birds			Tops and Bottoms			Yonder Mountain			Kamishibiai Man			Extra-Good Sunday			Judy Moody Saves the World			Aero & Officer Mike			Young Thomas Edison			Two Bear Cubs			Life on the Ice		
				Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain
Student 100	23	84	61	20	80	60	20	70	50	80	100	20	10	90	80	20	70	50	20	80	60	30	80	50	10	100	90	10	80	70	10	90	80
Student 101	18	90	72	30	100	70	20	90	70	10	80	70	10	80	70	40	80	40	10	90	80	10	90	80	20	100	80	20	100	80	10	90	80
Student 102	22	92	70	10	100	90	10	80	70	20	80	60	20	100	80	30	100	70	10	100	90	20	80	60	30	90	60	40	90	50	30	100	70
Student 103	21	90	69	30	90	60	30	80	50	30	90	60	20	100	80	20	100	80	0	80	80	30	100	70	10	80	70	20	80	60	20	100	80
Student 104	23	81	58	30	100	70	20	60	40	10	60	50	30	90	60	30	70	40	20	100	80	20	60	40	30	90	60	20	90	70	20	90	70
Student 105	19	91	74	20	90	70	10	90	80	10	90	80	10	100	90	10	90	80	20	100	80	30	90	60	40	90	50	10	80	70	10	90	80
Student 106	19	89	70	10	90	80	20	100	80	20	70	50	20	100	80	10	80	70	10	90	80	10	80	70	20	90	70	30	90	60	40	100	60
Student 107	13	94	81	0	90	90	30	90	60	20	80	60	20	100	80	10	90	80	0	100	100	10	90	80	10	100	90	10	100	90	20	100	80
Student 108	21	94	73	10	100	90	10	100	90	20	90	70	30	100	70	10	80	70	40	100	60	20	80	60	20	90	70	10	100	90	40	100	60
Student 109	7	56	51	20	80	60	10	50	40	0	70	70	0	40	40	10	30	20	0	70	70	20	40	20	0	60	60	10	60	50	0	80	80
GROUP AVERAGE	18.6	86.1	67.9																														

Note. The table represents the data that was recorded for the <u>intervention</u> students. The teacher recorded pre-assessment scores, post-assessments scores, and student gain.

Discussion

Summary of Findings

Reading comprehension is a lifelong skill and with the right tools reading comprehension can change a child's future. This action research study suggested that when students are given the right tools for success their academic skills could improve. This ten-week action research study worked with 10 third-graders on how to effectively build their comprehension skills using a mix of research-based strategies and technology. The teacher used the strategies as a basis for the program. The READ groups were made of helpful learning tools for students. Students who were involved in this study worked in collaboration groups, used technology, worked independently, and worked alongside the general education teacher to build their knowledge.

The research based-strategies that the teacher used gave students the boost they needed to score better on their comprehension assessments. The students involved in the intervention were able to use the classroom technology to look up connections they were making with the text. The students built their background knowledge of the stories topic by having access to the Internet. Students were able to watch videos, find articles, and look through pictures to make connections. During the intervention process all students were actively working with one another, this fostered

collaboration. Students were able to ask questions to their alike level peers and make connections to the stories. During the weekly intervention, students used multiple vocabulary tablet applications that enhanced their learning of the vocabulary words. When technology was involved students were highly motivated to participate. Another vital part in the intervention process was when students were asked to read aloud multiple times throughout the week; this gave them a clear understanding of the text and its contents. Using research-based learning strategies helped the teacher accomplish a high-need goal in the classroom setting.

The results from the research study are evident when table 2 and table 3 are examined. The data from the study indicates that students who were involved in the weeklong intervention scored better on their comprehension assessments. Students who were a part of the intervention process had an average weekly score of 86.1% on their post-assessment. In comparison, students who did <u>not</u> receive the intervention had an average weekly score of 80.9 %. As a whole the intervention students performed better on the assessments than the non-intervention students. Students who were a part of the intervention had an average gain of 67.9% from their pre-assessment to their post- assessment. In comparison, students who were not part of the intervention only had an average gain of 60.3%. An interesting discovery was made after further analysis of the data table. The students who were not a part of the intervention out performed the intervention students on the pre- assessment. Students who were not part of the intervention had an average score of 20.4% on their pre-assessment. In contrast, students who did have the intervention had an average pre-assessment score of 18.6%.

The data from tables 2 and 3 indicates that with the right tools, access to technology, and a chance to learn through research-based strategies, students' reading comprehension skills can improve over time. The ten-week intervention process was beneficial to the teacher and the

classroom setting. The students were learning the material, connecting with the story, and

comprehending the contents of the story. The teacher was able to meet with students and assess

their individual needs more clearly. The intervention process took time to set up, but the benefits

were worthwhile to the classroom environment.

Conclusion

Reading comprehension is a critical skill for students to learn at an early age. Students

need the skill of comprehending in order to make since what is being read. The skill of reading

comprehension is getting harder and harder for students because their learning styles are

changing into 21st century learning styles. Reading comprehension is getting harder and harder

for teachers to teach because traditional students are now 21st century students. Students are

struggling to learn without technology, collaboration, and background knowledge. Teachers can

help guide their students to success by providing them with the tools and skills they need in order

to succeed in the 21st century. Research-based learning strategies are crucial in helping our

students succeed academically. Reading comprehension is an important skill.

Helping students succeed by using research is one way teachers can manage with 21st

century learners. Students need to have multiple chances to build background knowledge of a

story, access to vocabulary terms and meanings, time for collaboration with alike-leveled peers,

multiple chances to read aloud, and access to multiple technology avenues. Using a research

based intervention program can provide the students with the tools they need in order to be

successful academically.

In conclusion, building strong academic learners is the goal of every teacher; with the

correct tools and research, this is possible. The qualitative data of this research study proves that

students need the tools and teachers need the research. This program allowed students to use the

tools to build their reading comprehension skills. In return, the teacher gained more time with the students, strong results from the weekly assessments, and was able to enhance the students learning abilities. In order to build comprehension students must have access to multiple tools.

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