Visual Storytelling: The Efficacy of Storyboards on Reading Comprehension and Perceptions

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Abstract

Among the issues that the educational system has yet to adequately address is arts and reading education. The result has been a continued lack of enriched learning experiences and literacy acquisition for many of our students. Thus, this action research study brought the arts into the classroom to examine the impact of arts-integration on literacy. Specifically, this study examined how storyboards, a graphic organizer that combines drawing and writing, may impact the reading comprehension and reading perceptions of 45 fourth grade students. Findings suggest that while there were no significant differences in the students' reading comprehension assessments (W = 30; p = .477), students strongly expressed that the storyboards helped them in competencies that impact their textual understanding. Survey findings also suggest an increase in positive attitudes towards reading and greater reading enjoyment. Engagement in the storyboards, content interest, and the use of effective instructional practices may account for these findings.

Keywords: Arts integration, reading comprehension, reading perceptions, storyboards

Visual Storytelling: The Efficacy of Storyboards on Reading Comprehension and Perceptions

While the existence and thrival of the arts in K-12 schools was already in question amidst district and school budget cuts (Tamer, 2009), the shift to remote learning in response to the global pandemic adds new uncertainty about the use of the arts in K-12 schools in the United States (Hirt, 2020). However, our need for the arts continues to be a pertinent tool for student growth, health, and thrival. Research indicates that the inclusion of arts education can result in improved achievement, increased engagement, positive and meaningful connections between school and the broader community, and long-term learning motivation (DeMoss & Morris, 2001; Reif & Grant, 2010). In particular, the arts may have a positive impact on students' reading abilities and their perceptions of reading (Burger & Winner, 2000). As we continue to see that on average, our students read below grade level (U.S. Department of Education, 2020), it is necessary for educators to use evidence-based practices that work because as indicated by our lack of proficient readers, what has been used thus far has largely proven ineffective for the majority of our diverse learners.

For these reasons, it is worth investigating arts integration strategies by combining reading, writing, and visual art to teach reading comprehension alongside, and through, the arts. Specifically, this arts-based action research study examined how visual storytelling, through the use of a graphic organizer that combines writing and drawing, may impact students' reading comprehension and their perceptions towards reading.

Literature Review

There are three ways the arts are taught in schools: Arts as Curriculum, Arts-Enhanced Curriculum, and Arts-Integrated Curriculum (Kennedy Center, n.d.). While all approaches are

valuable, the latter provides an enriched education that includes exposure to various art forms and a non-traditional approach to learning. An arts-integrated approach may be most beneficial in improving students' academic performance. This is because in an arts-integrated approach, curriculum is viewed as fluid, where the separations between the arts, math, science, literacy, and social studies are blurred. Thus, strengths in one area may be used to help promote growth in other areas. Furthermore, through this approach students are given the opportunity to demonstrate their understanding in multiple ways from a process of learning with, about, in, and through the arts (LaJevic, 2013).

However, an arts-integrated approach is only effective when educators understand why and how the arts should be used in the classroom. Proper implementation consists of using various instructional techniques to support students' needs, as well as exposure to various art forms which may benefit all children in their development (Reif & Grant, 2010). In addition, proper implementation can increase student engagement and achievement as students are given the space to incorporate and use what interests them to make sense of the content and communicate that learning with others in creative forms (DeMoss & Morris, 2001). However, a lack of understanding of how the arts are meant to be used in the classroom to support students' learning can lead to a devaluation of the arts, such as using the arts for decorative purposes (LaJevic, 2013). This belittlement of the arts in relation to the other curriculum(s) hinders students and teachers alike from making meaningful connections across curriculums, such as between reading, writing, and the arts, and with the world around them.

Conceptual Framework for Arts and Literacy Integration

Multiple Intelligence Theory, Cognitive Learning Theory, and Multiliteracies Theory may help explain the link that exists between the arts and literacy and how together they promote

student growth. The link being that, for learning to occur, students must engage in cognitive processes of meaning making that involves multimodal forms of learning. Howard Gardner's Multiple Intelligence Theory identifies seven learning modes, or as he termed, intelligences: visual-spatial, bodily-kinesthetic, musical, interpersonal, intrapersonal, linguistic, and logical-mathematical (Burnaford et al., 2017; Tucker, 2017). While certain intelligences may lend themselves more to specific content areas, such as visual-spatial with the arts and logical-mathematical with mathematics, all intelligences can be present in all disciplines. Furthermore, despite a student's preference for one of these modes of learning over the others, all modes are crucial for deep understanding across curriculums. In other words, when all seven types of learning are present, such as in the visual arts, students are given multiple avenues to demonstrate their learning (McCarthy, 2007 as cited in Tucker, 2017).

Building upon this claim that the visual arts provide students with non-traditional, enriched opportunities to express their knowledge, the visual arts also help facilitate cognitive development. Cognitive Learning Theory embraces the reality that learners play an active role in constructing new information based on the knowledge and skills that they possess (Burnaford et al., 2007). That is, cognitive skills such as interpretation, organization, and categorization play a key role in knowledge construction which often includes a process of separating and connecting ideas and concepts to identify established relationships or create new ones. Thus, artwork may serve as "cognitive landmarks" (p.23, Arthur Efland, 2002, as cited in Burnaford et al., 2007) in cognitive development, as the act of creating art is a process that utilizes the above cognitive skills to construct and convey knowledge and understanding.

Literacy and the Arts

Meaning making in literacy, like in the arts, is made possible through multimodal forms of learning. Multiliteracies Theory is a more comprehensive approach to literacy that acknowledges that literacy is influenced by the social and cultural environment and changes to that environment (Landay & Wootton, 2012). It is therefore necessary for literacy to be explored in creative ways via multimodal learning so learners in these culturally and linguistically diverse spaces can thrive. A multiliteracies-art blend may therefore not only support emerging readers' experiences with learning to read, but it may also support their ability to read and connect to the world (Burger & Winner, 2000).

While literacy is complex and dynamic, it also comprises four main reading constructs: comprehension, oral reading fluency, alphabetic principle decoding, and phonemic awareness (Amendum et al., 2015). To limit the scope of this research, the present study focuses on the connection between the arts and reading comprehension.

Factors that Influence Reading Comprehension

A learner's reading comprehension is impacted by their reading competencies and further impacted by the type of text (Honig et al., 2013). Reading competencies that impact reading comprehension include reading fluency and general world knowledge (Honig et al., 2013) as well as vocabulary and sentence understanding (Duncan et al., 2020). The degree to which these competencies are required varies with text type as a result of the qualitative and quantitative aspects of the text that makes the text more difficult to understand (Common Core State Standards Initiative, 2021). The qualitative text complexity includes levels of meaning, structure, language use, and knowledge demands and the quantitative text complexity involves word and sentence length (Common Core State Standards Initiative). These qualitative and quantitative elements then vary for literary and expository text types where oftentimes the latter is more

difficult to comprehend because of the cognitive skills like planning and organization that the text demands (Wu et al., 2020). Another competency that influences reading comprehension is text structure because learners who can readily identify the organization of the text, or the text type, are more likely to grasp key ideas (Amendum et al., 2015).

A graphic organizer is a visual learning tool that may support text structure understanding, and reading comprehension broadly (Sousa, 2014). In particular, storyboards, or story mapping, is a form of graphic organizer that utilizes the arts via drawing to support reading comprehension.

Reading Comprehension Through Storyboards. While sparse, current research on the use of storyboards provides insight into the ways in which storyboards have been used and the potential efficacy of storyboards on reading comprehension. For instance, Narkon and Wells (2013) utilized a typical storyboard template consisting of illustration boxes and text lines so students could map, through their drawings and writing, story elements, such as setting and main events. Narkon and Wells' study suggests that story mapping can improve reading comprehension because of the organizational and visual support that the template provides to learners who struggle to read and write.

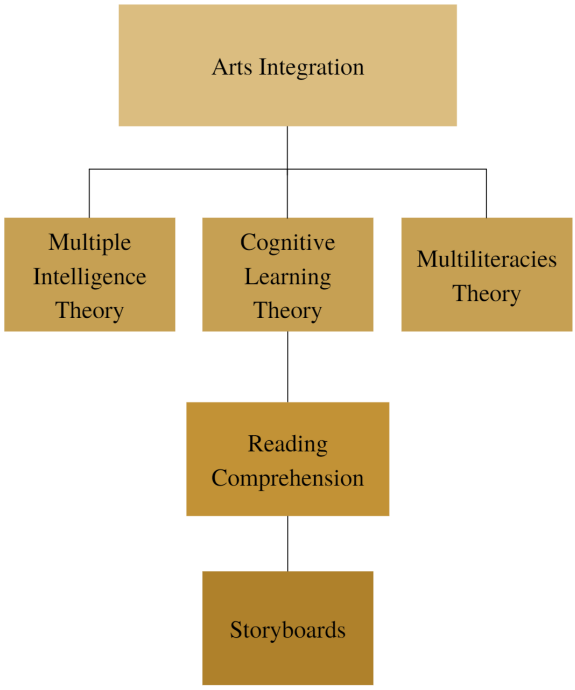
As another example, Rubman and Waters (2000) adopted an interactive and hands-on approach to storyboards to help improve reading comprehension through a focus on detecting text inconsistencies. Rubman and Waters had participants use cut outs that represented story elements like characters and setting as they reread a text that purposefully contained inconsistencies. Rubman and Waters found that participants who used the cut outs to recreate what they read were more successful in detecting the inconsistencies and thus understanding the text.

Finally, Naar (2013) utilized storyboards as a nonlinguistic representation of story structure to support the reading comprehension skills of six mixed-grade, newcomer, emerging English speaking middle school students. Naar found that the storyboards had a positive impact on student reading comprehension and the storyboard helped the students understand a 137-page fictional novel that was beyond their previous reading capabilities.

In the context of arts integration, the present study views storyboards as an artwork for mapping knowledge with the hope of improving reading comprehension specifically, and enriching student learning broadly. Below, Figure 1 illustrates this conceptual framework for the integration of the arts and literacy and the connections that exist between the theories that informed this study, and the two variables the researcher examined. Although Naar's (2013), Narkon and Wells' (2013) and Rubman and Waters' (2000) studies are examples of the impact that storyboards have on literacy achievement, there are very few additional studies that substantiate their findings despite the common use of storyboards in the classroom. Thus, the purpose of the present study was to determine the influence that storyboards have on a student's reading comprehension and their general relationship to reading. Therefore, this study sought to answer the following research questions: How does the use of storyboards impact fourth grade reading comprehension? And how does the use of storyboards influence students' perceptions of reading?

Figure 1

Arts and Literacy Framework



Method

This action research study utilized a mixed method, quasi-experimental approach to determine the impact of storyboards on fourth grade reading comprehension and reading perceptions. Participants were selected using convenience sampling as they were recruited from the researcher's student teaching placement. This study occurred over the course of three weeks where classroom activities in the language arts class consisted of reading informational texts, designing storyboards, reflecting, and writing summaries on the informational text. Questionnaires, tests, and student reflections were used to answer the research questions.

School Site

Participants attended Manuel Elementary School (pseudonym), a public charter elementary school in the Southwest region of the United States during the academic year of 2020-2021. In the prior academic year, 474 students attended Manuel ranging from Early

Childhood Education to 5th grade. Racial minority enrollment was 69% of the student body with 29% Latinx, 28% Black, 6% Asian, 6% Native American, and 0.30% multi-racial. In addition, English Language Learner (ELL) enrollment was 29%. Lastly, 55% of the student body qualified for Free and Reduced Lunch (FRL).

Participants

Three classes of 4th grade students ($N = 45$) were included in this study after obtaining written parental consent and students' assent. The majority of participants were Black (33%) followed by Latinx (22%), White (22%), Asian (11%), and multi-racial (11%). Fifty-five percent of participants were female and 44% male. Twenty-four percent of participants received ELL services.

Procedures

The present study was a three-week literacy and arts integrated unit that took place in the spring of the 2020-2021 academic year. This unit adhered to the Common Core Reading Standard: CCSS.ELA-LITERACY.RI.4.2 "Determine the main idea of a text and explain how it is supported by key details; summarize the text". Following a unique A-B-C block schedule, the researcher taught nine 100-minute lessons over the course of the three weeks. The A-B-C schedule consisted of two blocks each day so that the three classes were rotated. For example, on A day, Class 1 then Class 2 would be taught the first lesson. Then, on B day, Class 3 would receive the first lesson and Class 2 would receive the second lesson. On C day, Class 1 then Class 3 would receive the second lesson. Therefore, depending on where in the rotation a week started on, three to four lessons were taught each week to each class.

During these nine lessons, participants learned about and read biographical texts on six famous Black figures; completed a storyboard for each informational text; wrote accompanying

summaries; engaged in whole-class and partner reflections through Do Now questions, engaged in individual reflections through learning logs and surveys; and completed two reading assessments.

Table 1 highlights the components of the unit that were critical to this study. The individual about whom students learned in each lesson constituted the content of the informational passage and the focus of each storyboard and summary. One of the most common activities included watching a short 4-5 minute video on each figure prior to reading the informational passage to help provide context for the text. The other common activities consisted of reading the passage (approximately 20-22 sentences in length); text annotation where participants identified keywords in the text that related to the main idea provided by the researcher; completion of the storyboard; completion of the five-sentence summary of the main idea and supporting details; completion of the learning logs; and class reflections of what students learned about the famous figures. Readings were always done as a class where either the researcher read the passage or students who volunteered read the passage. As the lessons progressed, text annotations and storyboards were completed less as a whole class and more with a partner or independently.

Table 1

Key Unit Components Separated by Lesson

Lesson	Component		
	Person of Focus	Activity	Assessment
1	Martin Luther King Jr.	Pre reading perceptions survey Text reading Storyboard	Pre CORE Reading Maze Comprehension Test

Lesson	Component		
	Person of Focus	Activity	Assessment
2	Marian Anderson	Video Text reading Text annotation Storyboard Learning log Whole-class reflection	
3	Misty Copeland	Video Text reading Text annotation Storyboard Learning log Whole-class reflection	
4	Misty Copeland	Text summary	
5	Common	Video Text reading Text annotation Storyboard Learning log Whole-class reflection	
6	Common Maya Angelou	Text summary of Common Video on Angelou Text reading Text annotation Storyboard Learning log Whole-class reflection	
7	Maya Angelou Willard Wigan	Text summary of Agelou Video on Willard Text reading Text annotation Storyboard Learning log	

Lesson	Component		
	Person of Focus	Activity	Assessment
8	Willard Wigan	Text summary	
9	All individuals	Post reading perceptions survey Storyboard perceptions survey Independent and whole-class reflections on the connections between the people of focus Whole-class reflections on the unit	Post CORE Reading Maze Comprehension Test

Intervention

The storyboard graphic organizer consisted of a text box at the center to write the main idea. Surrounding this text box were four empty squares and text lines to be filled with the students' drawings and writings of four details that support the main idea (See Appendix). The researcher did not collect data from the storyboards as they were the teaching tool for students' learning.

Measures

To examine the impact of storyboards on reading comprehension, participants completed a pre and post-intervention reading comprehension assessment, five learning logs throughout the study, and a survey on storyboard perceptions at the end of the study. To examine the impact of storyboards on reading perceptions, participants completed a pre and post-intervention reading perceptions survey. The researcher designed the surveys, storyboard graphic organizer, and learning log template, guided and inspired by resources found online (Naar, 2013).

Reading Comprehension

Pre and Post Assessment. A three-minute CORE Reading Maze Comprehension Test (Milone, n.d.) was administered at the beginning of the study and again at the end of the study for a pre and post assessment of reading comprehension. This is a multiple-choice assessment

that assesses students' basic comprehension as students silently read a story of approximately 30 lines. After the first sentence, every seventh word is grouped in parentheses with two distractor words that do not make sense in the passage. Students must circle the correct word from each of the approximate 30 groupings. Participants completed passage 4A titled "Playing the Game" as the pre-assessment and passage 4B titled "The Picture" as the post-assessment. The student's number of items correct on the passage must then be evaluated against the grade level expectations (i.e. items correct) to determine the student's level of performance. Thus, participants' level of performance was either intensive (≤ 9) meaning below proficiency, strategic (10 - 14) meaning approaching proficiency, or benchmark (15 - 19) meaning at proficiency.

Learning Logs. Learning logs were used to assess reading comprehension but from the perspective of the student. Meaning, after the completion of each storyboard, students responded whether they believe the storyboards helped them comprehend the informational text. The learning logs consisted of two parts: a yes/no survey item and a space for students to expand on their responses in writing.

Survey. While students completed the learning logs throughout the study, they also completed a two item survey to gauge their summative perceptions of storyboards at the end of the three week unit. Students answered the following two questions:

- Do you think the storyboards helped you understand the main idea and details of the text? Why or why not?
- Do you think the storyboards helped you summarize the text? Why or why not?

Together, the learning logs and this survey provided a greater understanding of whether students thought the storyboards were useful.

Reading Perceptions

Participants completed a pre and post reading perceptions survey that examined students' reading attitudes and reading enjoyment. The survey consisted of the following two questions:

- What 2-3 words would you use to describe reading?
- Do you enjoy reading? Why or why not?

The first question examined students' reading attitudes while the second examined students' reading enjoyment.

Results

Findings suggest that despite the lack of significant differences in the students' standardized assessments, according to the students' learning log and survey responses, the storyboards helped them process the content and to a lesser extent the storyboards helped them with organization, engagement, and communication of their learning which helped them comprehend the text. Findings also suggest that students' reading perceptions changed. There was an increase in positive attitudes towards reading and reading enjoyment. In addition, there were shifts in the students' responses that indicated a stronger positive perception of reading and a greater evaluation of how reading impacts their lives.

Preliminary Analyses

An independent-measures one-factor Analysis of Variance (ANOVA) was conducted on the pre-assessment CORE Reading Maze Comprehension levels of performance to determine if there were any significant differences between the three classes. Students who exceeded grade-level expectations (≥ 20) were grouped with the benchmark level of performance as the test only categorizes students' scores as intensive (≤ 9), strategic (10 - 14), or benchmark (15 - 19). There

were no significant differences between the three classes for pre-assessment levels of performance ($f = 1.760$; $p = .185$), thus, scores across classes were combined for analyses.

Pre-assessment results from the three classes were also tested for normality using the Kolmogorov-Smirnov Test of normality. The pre-assessment levels of performance were not normally distributed ($p = .002$) so a Wilcoxon Signed-Ranks Test was used to compare changes in pre and post assessment performance levels.

Reading Comprehension (RQ1)

According to the pre and post-intervention assessment, storyboards did not improve reading comprehension. However, according to the students, as measured by the learning logs and survey, the storyboards did improve students' reading comprehension.

Objective Perception of Storyboard Efficacy

Table 2 shows the pre and post assessment percentages of students who performed at each reading comprehension level. There were no significant differences between the pre and post assessment levels of performance ($W = 30$; $p = .477$). Most participants were proficient (i.e. at benchmark) pre and post-intervention (Table 2). Only 12 students had a change in performance level. Eight of these students went up a level, three went down a level, and one student went down two levels.

Table 2

Pre and Post Percentage of Students at Each Reading Comprehension Level

Level of Performance	Students at Each Level	
	Pre-Assessment (%)	Post-Assessment (%)
Intensive	14	9
Strategic	14	16

Level of Performance	Students at Each Level	
	Pre-Assessment (%)	Post-Assessment (%)
Benchmark	72	74

Note. $n = 43$.

Subjective Perceptions of Storyboard Efficacy

However, when students were asked their personal opinion of the utility of the storyboards for their own comprehension, the students' learning logs indicated overwhelmingly affirmative perceptions of its efficacy, particularly in logs two and three (Table 3). A tally and descriptive analysis of the completed yes/no entries ($n = 193$) for the question on whether storyboard helped the students understand the main idea and details of the text revealed that 179 (92.7%) responses were yes and 14 (7.3%) responses were no.

Table 3

Frequency Distribution of Learning Log Entries

Learning Log	Type of Response	
	Yes (%)	No (%)
1	75.6	11.1
2	82.2	6.7
3	88.9	2.2
4	77.8	8.9
5	73.3	2.2

Note. Missing or incomplete entries ($n = 32$) were not included in the descriptive analysis. However, percentage distribution is based on the total number of possible responses ($N = 45$) for each learning log to account for incomplete entries.

The learning logs and final survey written responses helped explain why students thought the storyboards were useful. The logs and survey items were thematically coded by hand using an inductive coding approach (Johnson & Christensen, 2017). That is, codes were defined during data analysis. The learning log and survey responses were initially coded separately but then merged together in the third coding phase so as to provide a more comprehensive understanding of students' storyboard perceptions. The four reasons students commonly gave for why the storyboards were useful were the storyboards' role in helping process content (48.3%), with organization (23.6%), staying engaged (20.6%), and with communicating learning (9.1%).

Students whose responses indicated that the storyboards helped them process content, commonly expressed that the visuals helped them better understand the people we learned about. One student wrote, "when I drew the pictures it helped me better understand what the person had been through and how successful they were or are now." Another student reflected, "pictures help you break down what the words are telling you" while another wrote, "I could draw the people and it helped me imagine the people's life." Students also spoke of how their visuals alone or the combination of visuals and writing in the storyboards helped them recall because the storyboards made the content readily accessible, especially when it came to summarizing the text. For instance, one student wrote in their log, "the pictures show the detail better so I can remember." Another wrote on the survey, "I can look at the main idea then the details and then I picture it in my head and I remember what happened" while others wrote, "it helps me when I need to write again. I can look back at my storyboard" and "I don't need to go and get the text."

Student responses also indicated that the storyboards supported their organization, and expressed that the storyboards were efficient and provided ease, clarity, and structure. Students shared that the storyboard, "made it easy for me to do it myself", "when I look at a storyboard I

can easily turn a caption into a paragraph", "it's really hard for me to find the main idea when we did not have the storyboards", "it helped me think more clearly", and "it helps me organize the stuff I have to write down."

Students less frequently expressed that they believed the storyboards helped their reading comprehension by staying engaged. Students were engaged because they enjoyed the storyboard making process and believed the storyboards helped them achieve a state of mind conducive for learning. Students wrote, "fun things help me pay attention and learn and drawing is fun","it made it more fun so I wanted to do it and not guess", "it calms me sometimes to draw", "it makes me not worry", and "I focus for it."

Finally, students expressed that the storyboards helped them communicate their understandings. These responses highlighted how the storyboards were a tool that assisted with text summarization and explanation of the main idea and details. In addition, the storyboards helped the students express what they had learned via visual representation. Students shared, "I saw the details and then I wrote about them using my own words because we drew", "you have details on the storyboard box and the pictures help explain", "it let me retell the story", "I could draw pictures about what I was imagining", and "it helped me show what I was thinking and what was happening".

Reading Perceptions (RQ2)

Student responses on the pre and post reading perceptions survey were thematically coded by hand in five phases using an inductive coding approach. Theme percentages from each survey question were compared from pre to post-intervention. In addition, the words students used to describe reading were tallied to determine which words were most often used within each theme. Results suggest that the storyboards changed students' reading perception, in particular,

their attitudes towards reading and their reading enjoyment. There was an increase (4.3%) in words that expressed a positive attitude towards reading, a decrease (4.1%) in words that expressed a negative attitude towards reading, and a minor increase (0.3%) in words that expressed a neutral attitude towards reading (Table 4). In addition, there was an increase (24%) in responses that indicated the participants enjoyed reading, a decrease (22%) in responses that indicated conditional reading enjoyment, and a slight decrease (1.9%) in students who expressed they do not enjoy reading (Table 4).

Table 4

Pre and Post Reading Perceptions

Reading Perception	Theme Percentage Breakdown			
	Theme	Pre-Intervention (%)	Post-Intervention (%)	Change (%)
Reading Attitude	Positive	69.3	73.6	+ 4.3
	Neutral	12.9	13.2	+ 0.3
	Negative	17.3	13.2	- 4.1
Reading Enjoyment	Positive	64.4	88.4	+ 24
	Conditional	26.7	4.7	- 22
	Negative	8.9	7	- 1.9

Note. All participants ($N = 45$) completed the pre-intervention survey while only partial participants ($n = 43$) completed the post-intervention survey.

Reading Attitudes

In addition to percentage changes from pre to post intervention in words that expressed a positive, neutral, or negative attitude towards reading, there was also a shift in the words used

within each attitude level. Initially, when the students were asked the question, “what 2-3 words would you use to describe reading?”, they used positive words like “fun”, “interesting”, “calming”, and “good.” Post-intervention the new positive words that emerged were “cool”, “exciting”, “joyful”, “best subject”, and “inspiring.” Pre-intervention the neutral words used were “easy”, “hard”, and “okay.” However, post-intervention the new neutral words that emerged were “educational”, “needed”, and “active.” Lastly, pre-intervention the negative words used were “boring”, “tricky”, “weird”, and “sleepy.” Post-intervention the new negative words used were “long” and “slow.”

Reading Enjoyment

Over the course of the intervention, there were shifts from pre-intervention to post-intervention in the most common types of explanations given for reading enjoyment. Students’ explanations for why they enjoyed reading not only increased but also shifted from a common view of reading as entertaining to a new view of reading as a positive contributor to their lives and an increased view of reading as educational and imaginative. There was a decrease in students who wrote of factors that impacted their reading enjoyment and a shift from the factors of preference, difficulty, and mood to solely mood and the desire for visuals. There was a decrease in students who stated they do not enjoy reading and a shift from initially expressing disinterest to viewing reading as inconvenient or limiting.

Enjoyment. Students most commonly (62%) expressed that they found reading entertaining. For instance, one student wrote, “you can get caught up in the book. You end up reading it with a blink of an eye” and another wrote, “I’m not the best at reading but I do think it is fun.” The remaining 38% of pre-intervention responses related to the educational and

imaginative qualities of reading. Students said things like, “I learn new things while reading”, “you get a lot of knowledge”, and “it opens up my imagination.”

However, post-intervention, students most commonly (31%) expressed that reading plays a pivotal role in helping them achieve their goals. For example, a few students shared, “I read so I can write and type better”, “if you want to accomplish your dream you have to read”, and “it matters in my future and it is my job/responsibility to study and understand it.” The perception of reading as educational increased to 27%. One student shared, “it helps me learn and I love to learn” while another shared, “I get to learn new stuff like about Dr. Willard, I didn’t know you can make art that small.” While entertainment remained as one of the explanations (21%) with students saying, “I have a lot of fun” and “it’s fun and I never know what happens next”, there was an increase in the belief that reading is imaginative. For instance, students expressed, “it opens up a whole new universe” and “when you open a book and start reading you get sucked into an imaginary/realistic world.”

Conditional Enjoyment. Pre-intervention, the most frequent (33.3%) factor that impacted reading enjoyment was preference as one student wrote, “if we are reading an adventure book then I am into it” and another wrote, “I like to read if it is something I like.” A less common (25%) factor was level of difficulty, as one student shared they “kind of [enjoy reading] because some words are long and hard to understand.” A less frequent (16.7%) factor was mood as one student wrote, “I enjoy it sometimes just depending on what we are doing that day and if I am tired I probably [will] not enjoy it. But if I am happy I will enjoy it.”

Post-intervention, only two students expressed that their enjoyment was conditional. One student expressed that their mood impacts whether they enjoy reading, as they shared, “sometimes I want to read and other times I don’t.” The other student wrote about the lack of

visuals in books as a contributing factor, as they wrote, “I only dislike it when some books have no pictures and it’s hard for me to picture the words.”

Lack of Enjoyment. Pre-intervention, students indicated they did not enjoy reading because they were disinterested as one student wrote, “it’s boring, but I just do it.” Post-intervention students no longer said reading was boring but rather inconvenient or limiting. Students wrote, “it just takes most of my time when I could really just look up what I need to write”, “it is hard and you have to read”, and “I have the same books all the time.”

Discussion

The purpose of this study was to explore how arts integration might benefit elementary students. Specifically, this study examined how the use of storyboards may impact 4th grade students’ reading comprehension and perceptions of reading. This study found that, according to the students, the storyboards improved their reading comprehension by helping them build skills embedded within reading comprehension. In addition, this study found that the storyboards influenced the students’ reading attitudes and reading enjoyment. In particular, students expressed a greater appreciation for reading for the positive impact that it has on their lives academically and beyond.

Reading Comprehension (RQ1)

This study found that while objectively speaking there were no significant changes in students’ reading comprehension on the assessment, students overwhelmingly expressed that the storyboards supported their reading comprehension. One factor that may be attributed to this lack of congruence is a ceiling effect with respect to the benchmark reading comprehension level. In this study, most (72%) of the participants were already at that highest level on the CORE Reading Maze Comprehension Test. So even if there was growth as a result of the intervention,

there would have been no change on the assessment. In fact, about half of the students--46.5% pre-intervention and 53.5% post-intervention-- scored well above the benchmark range (15-19) of correct items by identifying up to 33 correct items. However, because of the lack of a fourth reading comprehension level of 'advanced' or 'above-grade level expectations' on this assessment, there is potential change that was not measured. Furthermore, there were only 12 students (28%) who had a change in items correct that was great enough for them to move to a different reading comprehension level. So while there may have been changes in the number of items correct for the other 72% of students, we are limited to mere changes in level. Therefore, though students may have felt that they made growth in their reading comprehension, this was not reflected in their assessment scores.

The misalignment between the objective and subjective measures may also be a result of a difference in the magnitude of reading comprehension that each measure captured. The CORE Test was designed to assess students' basic reading comprehension (Milone, n.d.), that is, reading comprehension broadly construed. Furthermore, this assessment does not control for prior achievement that may be a result of factors like literacy acquisition by the third grade (Fiester, 2010), especially the mastery of early literacy skills like letter naming fluency (Stanley et al., 2018), or learning differences like dyslexia (Sousa, 2014) among many others, that continued to impact students throughout the intervention. Thus, this broad measure of reading comprehension captured more than just the storyboards.

Conversely, the subjective measures of learning log and final survey were specifically about the storyboards. Students were asked if they believed the storyboards affected their reading comprehension in terms of helping their understanding of the main idea and key details of the informational text read in class and their ability to summarize that text. However, students'

responses may help explain their post assessment scores and the lack of significant change that occurred.

Students expressed that they could now understand and summarize text because the storyboards helped them better process, organize, and engage with the content, and to a lesser extent communicate that content learning. These findings are consistent with research that found that graphic organizers promote the cognitive skills (Roehling, 2017) and engagement (Mahdavi & Tensfeldt, 2013) needed to understand informational text, as well as helping students communicate their understanding (Rapp, 2014) which may then appear as greater reading comprehension. Thus, the storyboards may have helped the students with elements that are embedded within reading comprehension, but that does not necessarily mean there was an improvement on their overall reading comprehension. Therefore, any growth in these elements that students experienced may have gone undetected on the objective measure of their global reading comprehension.

While the learning logs provided insight into the reading growth that students stated they experienced, the learning logs also highlighted the shift in students' storyboard perceptions that occurred over the course of the study. In particular, we see that on logs two and three there was a greater percentage of students who expressed that the storyboards were useful for their textual understanding (Table 2). One possible explanation is the content. While the entire unit centered on informational text of individuals that embodied Black excellence, the content of each text shifted over time. So, students may have been more interested in the content explored on the days they completed learning logs two and three. In fact, an interesting type of response that students provided on their learning logs was about how they were impacted by the people we read about. For instance, on learning log two, one student wrote, "I learned how to be confident

and determined" and another wrote, "it inspired me to never give up." Similarly, on learning log three, students wrote the following, "I learned that I can do anything even if I am Black", "Common inspired me because he helped mental health", and "I learned how you can change the world." So the surge in learning logs two and three of affirmative responses in combination with the above statements from these logs may show that, at least for some students, what is more useful for their reading comprehension is their interest in content that has some form of meaningful takeaway for their lives. This is in line with research that found that students experience general academic success when they can engage with curriculum in ways that are meaningful to them (Aviña, 2016), and specifically experience reading comprehension growth when they are interested in the content (Pittman & Honchell, 2014; Pečjak & Podlesek, 2011). Thus, these results suggest that perhaps content engagement is just as useful, if not more useful than the activity itself when it comes to students' reading comprehension.

On the other hand, these results perhaps show that the storyboard was the tool that allowed the students to relate to the text through drawings that made the text easier to digest which then helped them better comprehend the text. However, it is also important to note that there were 32 incomplete learning log entries, particularly for logs one (n = 6), four (n = 6), and five (n = 11). These missing logs may account for the higher percentage of affirmative responses on logs two and three; however, the impact of the content may remain because throughout the five learning logs, and not merely in logs two and three, there were student responses that focused on the content.

As student responses indicated that content interest may be useful for reading comprehension, student responses also indicated that there may be other factors that they find to be just as useful as the storyboards. For instance, several students wrote things like, "I had

someone help me", "it was easy with partners and teachers", and "I got to work with everyone and then partner work and then independent work." Students also said things like, "they told me about Maya's past" and "it let me know all about Willard Wigan." In these latter two instances, it is likely that students were referring to the videos we watched on each individual. Thus, these students attributed their textual understanding to group and partner work, general support from the teacher, and the videos. The students' notation of the importance of discussions for their understanding is consistent with research that suggests that dialogue can promote reading comprehension (Lightner & Wilkinson, 2017), in particular, when dialogue is coupled with reading strategies and prior knowledge (Pittman & Honchell, 2014).

It was important that students had the opportunity to express in their own words whether they believed they experienced growth in their comprehension, as the standardized assessment alone may not have captured the students' learning processes. This process is arguably more important than the product because while it is useful for instructional purposes to assess and determine where a student may be in their general reading comprehension, it is more beneficial to know what growth the students believe they made and the 'why' that they attribute to that growth which may shift and vary throughout the intervention, as observed in this study.

Reading Perceptions (RQ2)

The findings of this study suggest that students' reading perceptions changed as a result of the intervention. Most notably, there was a drastic increase in reading enjoyment from 64.4% to 88.4% (Table 4). One potential reason why students' enjoyment changed so drastically is students saw the storyboards as a fun activity. Students frequently expressed in their written responses and in class that they thought it was fun to draw the details of the text. Researchers have found that students really enjoy completing graphic organizers as it makes learning

interactive (Pang, 2013), so this may explain why the students' enjoyment increased after they learned how to use the storyboards.

Similarly, student enjoyment may have changed because students now saw their entire reading block as enjoyable. It was common throughout the unit for the students to exclaim "yay!" whenever the researcher mentioned the activities they would engage in that day. This was not limited to completing the storyboards, as students often got very excited about watching the videos prior to reading the texts and the opportunity to share with a partner what they had learned so far or to share what they drew and wrote on their storyboard. For instance, a student said, "it is cool to listen and know all about Maya" in reference to the BrainPOP video we watched. Similarly, when students watched the music video of the song Glory by Common and John Legend prior to reading the informational text on Common, the students begged the researcher to play the video again. In addition, there was one student in particular who frequently mentioned in class how much they loved partner work, and one class in particular with students who always asked, "will we work with partners today?" Thus, the increase in student enjoyment was perhaps a result of a combination of interactive activities that the students enjoyed and engaged with on a regular basis throughout the unit. Student enjoyment of the various interactive activities may also explain why post-intervention, students commonly used words that possessed a stronger positive connotation to describe reading such as "joyful", "inspiring", and "best subject."

Another potential explanation for this surge in reading enjoyment is that students enjoyed the informational text content because they learned about important figures throughout history and how these figures used literacy in authentic ways. For example, in class, a student shared, "I got an idea of what it was like," in reference to the discrimation that Marian Anderson

experienced as a Black female singer. So students realized that by reading they can learn about new people and life experiences that they may be unfamiliar with, but may be able to relate to in some way. Students also expressed on the last day of the unit that they liked the readings because, “we learned of history and people”, and they specifically enjoyed, “learning more about Black history” and “Black accomplishments and what they did.” Several of the figures we studied were writers of some form, whether memorists, poets, or songwriters. Students were moved by the figures’ written work as one student shared, “Maya wrote many poems that inspire me to do it too” and another said, “Maya was good in reading and that makes me happy.” The impact of the informational text content may also explain why there was an increased view of reading as beneficial to students’ educational and career aspirations. This is because just as students were able to see how literacy played or plays a role in the lives of the figures they studied, they were also able to reflect on how literacy plays a role in their own lives.

Conclusions

This study demonstrated that within a three week span, the storyboard intervention, along with other interactive activities, shifted students towards better reading comprehension. So while storyboards may have not had an impact on students’ reading comprehension broadly, student testimonials suggest that storyboards are effective in improving the skills that underlie reading comprehension. As the time constraints of this study did not allow the researcher to observe a significant shift in the broad construct of reading comprehension, it is suggested that future research in this area be conducted over the course of an entire semester or school year.

Furthermore, student responses indicated that graphic organizers alone do not lead to improved reading comprehension. Student interest in the content as well as effective instructional practices like multimodal resources, grouping, discussions, and individual support from the

teacher are also important factors that help shift students towards better reading comprehension. These factors are also tools that get students excited about reading which may lead to earnest positive reading attitudes, increased reading enjoyment, and greater understanding of the role that reading plays in their lives. In particular, the content of the informational text allowed students to make connections with the informational texts specifically, and connections with reading in general. Thus, in addition to an extended period of the storyboard intervention, it is recommended that students be exposed to multimodal resources and individual, partner, and group work on a regular basis, throughout the entire academic year.

Limitations

Limitations of this work that were not already stated include the block schedule, school day interruptions, poor or inconsistent student attendance, class size, and the researcher as the sole data analyst. The A-B-C schedule may have minimized student outcomes because not only were some classes seen every other day, but the time of day that a class was seen also varied. The change in time of day may have impacted student performance on the post-assessment. These gaps were further exacerbated by snow days and asynchronous days. For instance, one class received lesson two on a Thursday but did not receive lesson three until the following Tuesday afternoon. There were also several students who had very poor attendance who missed almost every lesson and were only present in the beginning and at the very end. The impact of the intervention may have been weakened for these students because of their inconsistent attendance.

Class size also proved to be a limiting factor because although only 45 students were research participants, the researcher actually taught a total of 63 students. The difficulty of trying to teach these large class sizes was further exacerbated by behavioral disruptions such as work avoidance that manifested as student outbursts or unresolved student conflicts from recess that

impacted how the students behaved with one another and participated in the learning experiences. Thus, it was often difficult to not only provide all students with individual support but it was also challenging to get through the lesson objectives in a timely manner so some activities had to be extended while others had to be taken out which resulted in the completion of only five storyboards in the nine lessons.

Lastly, in reference to the data analysis, as the researcher was the sole data analyst a potential bias or oversight is that the researcher included or left out certain codes or themes that perhaps another researcher would have evaluated differently.

Action Plan

Perhaps the greatest or overarching pedagogical implication of this study is the need for learning tools or strategies that adhere to the Universal Design for Learning (UDL) principles so that students may experience growth in the skills that underlie reading comprehension and in their reading perceptions. I plan to continue to implement UDL strategies into my curriculum planning. In this way, providing students with multiple ways to take in, process, and express knowledge will become the norm of my classroom. A text that I will continue to use in the future is *Universal design for learning in action: 100 ways to teach all learners* by Rapp (2014). Some specific strategies that I plan to use on a regular basis that she mentions in her book are the arts, visual input, graphic organizers, and grouping. These are tools the study participants either directly or indirectly mentioned in their responses that helped them with textual understanding and that they genuinely enjoyed. For instance, I will continue to utilize videos as text that makes content easier to understand. These videos will be paired with partner and whole class reflections as dialogue may help comprehension. In addition, I will continue to encourage my students to express their learning through visuals alone or in combination with their writing.

Furthermore, I would like to use storyboards in my classroom to gain a better understanding of its effectiveness, especially over an entire academic year. I plan to use the storyboards with both narrative and expository texts as I personally have only used them with expository text but in the research they are commonly used with narrative text (Naar, 2013; Narkon & Wells, 2013; Rubman & Waters, 2000). To assess the storyboard's effectiveness, I plan to once again use objective and subjective measures. However, in addition to the CORE Reading Maze Comprehension Test, I would like to use a standardized assessment that will better control for prior achievement and will evaluate specific reading comprehension skills rather than reading comprehension broadly construed.

While not the majority, there were students who expressed they did not find the storyboards helpful for their reading comprehension. Scaffolding the completion of the storyboards seemed to help the students who initially expressed confusion which indicates the storyboards were perhaps useful. However, I do not know what other factors led students to say the storyboards were not helpful. Thus, in my future implementation, I plan on dedicating time to speak specifically to these students because if I have students who say it's not effective, then I need to figure out why that is and make improvements accordingly.

Another important plan is to continue to provide content that I know will interest my students that will also help them create those meaningful connections between what is learned in the classroom and with their lived experiences. It is especially important that my marginalized students are able to make those connections because schools are often non-affirming spaces for the culturally and linguistically diverse (Portes & Salas, 2015) where they are academically left behind (Hung et al., 2020) if the educators do not apply an asset-based approach to teaching (Chan, 2006).

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Appendix

Storyboard Template