

# Impact of Kindles4Covid Virtual Reading Buddies Program on reading frequency and social connections

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## SUMMARY

The summer reading gap affects children throughout the United States every single year, and with the COVID pandemic, the issue has heightened. As part of the ByKids4Kids organization, we developed the Kindles4Covid Virtual Reading Buddies Program to combat potential reading regression and social isolation in youth during the COVID-19 pandemic in the fall and winter of 2020. The program consisted of groups of two or three reading buddies, along with a facilitator (a high school or college student) who coordinated meetings for the buddies and assisted in choosing a piece of literature to read during the meetings. The participants completed pre- and post-program surveys consisting of short-answer and multiple-choice questions that we assessed to determine whether the students achieved the program goals of improved reading frequency and connections with peers. We hypothesized that routine, weekly contact with other youth and increased exposure to reading materials would help achieve these goals. Our data analysis suggests that our program was able to achieve its goals of increasing reading frequency (37.5% vs. 100%, pre vs. post intervention) and forming connections (37.5% vs. 87.5%, pre vs. post intervention). This work indicates that a structured and routine reading buddies program successfully addressed some challenges brought on by isolation during the pandemic.

## INTRODUCTION

Throughout the COVID-19 pandemic, youth around the United States have been at the risk of losing out on the development of essential skills such as reading (1). In addition, prolonged physical distancing guidelines and online learning have led to the inability of youth to form meaningful connections with their peers (1). Recent work by Domingue has shown that the absence of growth in summer and spring means that students fall behind around one third of a year where they are supposed to be in reading development (2). According to the Children's Literacy Network, more than 80% of the reading achievement gap is acquired during the summer months (3). While the summer reading gap is an issue during traditional in-school learning, it is possible that the disruption brought about by changes in normal school routines when moving to remote learning during the pandemic contributed to

widening this gap, therefore calling for innovative strategies to address reading support.

A recent systematic review of learning during the pandemic identified that differences in math and reading skills occurred among younger students who struggled more with online classes but who presented enthusiasm with more interactive online materials (4). To address these pandemic-related reading problems, the non-profit organization ByKids4Kids created a 12-week-long interactive virtual reading buddies program, Kindles4Covid, for middle school-aged children. The purpose of the program was to reduce the summer gap by encouraging reading, improving youth literacy skills, and helping to create friendships as students interacted with others online around reading. We hypothesized that by participating in the Kindles4Covid program, youth will feel as though they formed friendships, meet buddies who they otherwise would not have the chance to meet, and will have someone to talk to during these socially distant times. We also predicted that the availability of literature (through Amazon Technology Inc. Kindle® devices provided to the students by the program) and reading with other youth will encourage the participants to read more. We were not aware of similar reading programs in the local community. We hoped to learn more about how the program was perceived by the participants and to share our findings with other educators.

In the program, we created groups of two or three participants (based on preferences in the enrollment form) to meet using video conferencing. The groups were assigned a facilitator and asked to choose a piece of literature to read together. This included fiction books, news articles, novels, and other texts. Every week, the group met over video for 30-40 minutes at a mutually convenient time and used the allocated time to discuss or read the book. Moreover, the student buddies participated in activities with one another and connected with each other through ice-breaker questions asked by facilitators on the kickoff day of the program.

To analyze the success of our program, we conducted pre- and post-surveys that were used for data analysis and feedback. Our hypotheses of increasing reading frequency and connectedness among participants were supported by analysis of the data. We found that the self-reported connections with peers increased from 37.5% to 100%, pre- to post-program. In terms of reading, all (100%) responding participants stated that their reading had either "increased a

little bit” or “dramatically” after the program’s conclusion. The results were analyzed using a McNemar’s Test with a Yates correction of 0.5, and we found that the data was significant. These prove that social isolation can provide the means for students to stay active in reading in order to counter the typical summer reading gap.

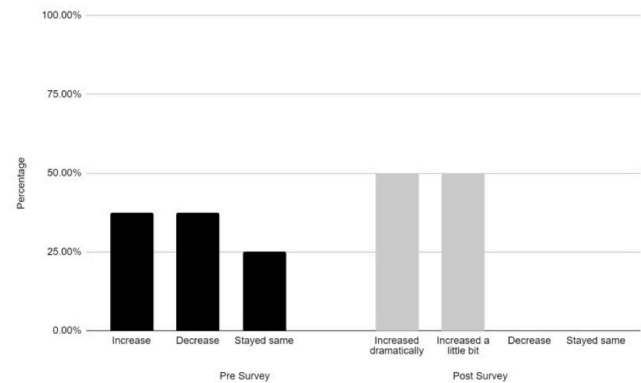
One way this study might have an impact is by informing ways to help novice readers with reading skills outside of school. Reading specialists note the importance of supporting novice readers through an apprenticeship process where a more proficient or experienced reader, like a reading buddy, is present to support and encourage the beginning reader (5). Successful reading encouragement programs rely on a learning environment that develops students’ confidence as readers using different kinds of text and supportive interactions between the students and the teachers. A successful reading environment relies on skill development, but just as important is supporting the social and personal dimension of reading. More experienced readers engage the beginners in sharing ideas about the text to support the development of a reader identity (5). Running a reading buddy program beyond the pandemic can provide experiences for novice readers outside of school, where the technology-mediated social interactions can help beginning readers stay connected to texts in ways that contribute to their developing confidence with books beyond the school hours.

## RESULTS

We obtained data from online surveys that were part of the program feedback for the Kindles4Covid Virtual Reading Buddies Program. Before the program started and at the conclusion of the survey, youth who had signed up to participate in the Kindles4Covid program were asked to complete a pre- and post-survey (n=13 for both pre and post). These surveys consisted of multiple choice and short-answer questions. From participants’ responses, percentages were calculated from multiple choice questions and common words were chosen from short-answer questions. Eight participants were common to both surveys with an age range of 6-17. The mean age of participants was 12 ± 3 years.

When asked on the pre-survey how the amount of reading of participants changed since switching to virtual school, 37.5% of participants stated an increase in reading, while 37.5% of participants stated that their reading remained constant, and 25% of participants stated a decrease (Figure 1). In contrast, when asked the same question on the post-survey given after the program, 100% of participants stated that their reading levels either “increased a little bit” or “dramatically” (Figure 1).

When asked to report feelings of connectedness, only 37.5% felt connected to their peers on the pre-survey (Figure 2). Communication with friends and participation in sports were common themes on the pre-survey when participants were asked to explain how they were able to connect to peers (Table 1). On the post-survey, 87.5% of participants formed

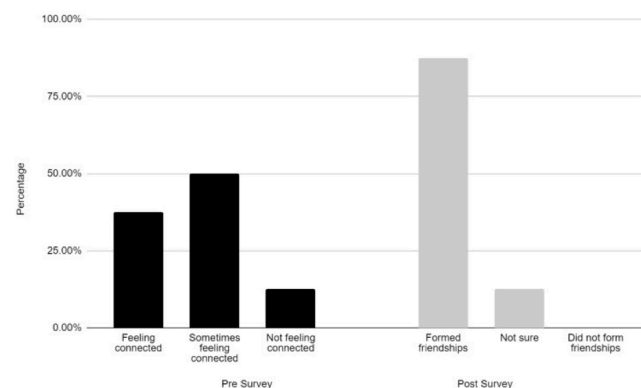


**Figure 1. Reading increase measurement pre-survey and post-survey (n=8).** Black bars show the percentage of the participants’ self-assessed amount of reading after school went online (pre) and the gray bars show the percentage of the participants’ self-assessed reading at the program’s end (post). Online surveys were used to collect data and after data was made anonymous, frequencies for each choice were calculated.

friendships with their buddies (Figure 2).

When asked to report how many times a week participants read their books, 50% stated that they read 5 or more times a week on the pre-survey (Figure 3). The percentage of participants that stated they read 5 or more times a week remained the same at 50% on the post-survey (Figure 3). The percentage of participants that read 3-4 times a week on the pre-survey was 25%. In the post-survey, 34% of participants read 3-4 times a week. This may demonstrate that participants were already reading many times a week prior to the start of the program.

To assess the success of the program, the variables we used for the test were the amount read (increase or constant/decrease) and connections built (yes or no). Using the McNemar’s test, we found that there was a significant difference in the pre- and post-survey results ( $p = 0.044$ ) for reported increases in participants’ amount of reading. There



**Figure 2. Measure of connectedness pre-survey and post-survey (n=8).** Black bars show the percentage of the participants’ self-assessed feelings of connections after school went online (pre) and the gray bars show the percentage of the participants’ self-assessed feelings of connections after the program’s culmination (post). Online surveys were used to collect data and after data was made anonymous, frequencies for each choice were calculated.

<i>"I have been able to see others through sports activities."</i>
<i>"Friends in my virtual classroom"</i>
<i>"I've been lucky enough to still have sports."</i>
<i>"I have been talking to my friends"</i>

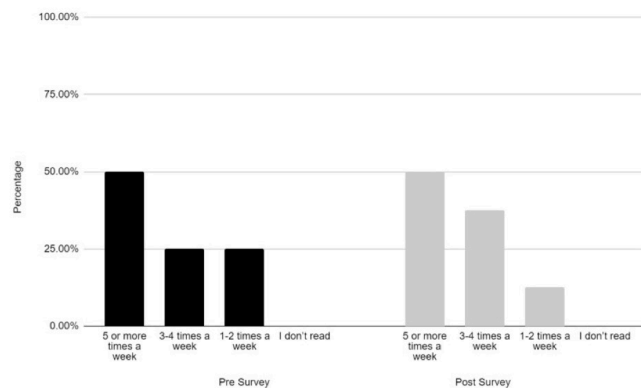
**Table 1. Example comments from the open ended question results pre-survey.** The open ended question associated with the results was "Please elaborate on your connectedness during the pandemic."

was a significant difference in pre and post-survey results ( $p = 0.044$ ) for participants' feelings of connectedness.

Apart from the cohort of responders common to pre- and post-surveys, we also assessed the overall friendships on the post-survey, where 85% or 11/13 participants stated they formed new friendships. When asked to elaborate on the reason for developing or not developing friendships, we noticed that bonding over books was a common theme in the comments (Table 2). Participants who did not develop friendships stated in their response that age difference between the buddies was a barrier.

### DISCUSSION

The virtual reading buddies program appears successful with its two major goals: increasing reading and forming connections to help counter the social isolation imposed by the pandemic. Apart from providing program feedback, the survey



**Figure 3. Frequency of reading pre-survey and post-survey (n=8).** Black bars show the percentage of participants' reading frequency each week before the program (pre) and the gray bars show the percentage of participants' reading frequency each week after the program's culmination (post). Online surveys were used to collect data and after data was made anonymous, frequencies for each choice were calculated.

<i>"I was able to develop friendships because my buddy and I shared common traits like: interest in basketball/current events."</i>
<i>"We made a friendship over our interest in reading the book."</i>
<i>"Age difference"</i>
<i>"I liked to talk to my buddy. She was nice. We were friends because we read a book."</i>
<i>"Maybe because we read different kinds of books"</i>

**Table 2. Example comments for the open ended question post-survey.** The open ended question associated with these results was "Please describe why you did or did not develop friendships?"

also gave insights and directions for future improvement. A qualitative analysis of the short answer questions represents certain themes in participants' responses. When asked to elaborate on the reason for developing or not developing friendships post-program, bonding over books was a common theme associated with developing friendships. Participants stated that they "made a friendship over our interest in reading the book", and that they became "friends because we read the book" (Table 2). Although books were an integral part of forming the friendships, they also could be a slight barrier. One respondent, who was not sure if they developed a connection with their reading buddy, responded that they felt the reason was, "Maybe because we read different kinds of books." The other participants who did not develop friendships stated that age difference was a contributing factor.

All participants stated that their time spent reading either "increased a little bit" or "dramatically." From this, it is evident that our program achieved the goal of increasing reading frequency among youth during the pandemic, which is a key behavior for avoiding academic regression in reading development. The connections that participants felt after the program represented a significant pre to post program difference. Reviewing the post-survey, the elements participants enjoyed the most about the program were reading and meeting their buddies. From the survey results, the participants seemed appreciative of the connections formed through literature. This is encouraging, as it promotes the importance of using social interactions as a means of supporting summer reading. These results suggest that the discussion with reading buddies could be the interactive component to help increase reading.

There are some limitations to the study. First, there are two ways in which the survey could be improved. One is to standardize the pre- and post-survey so that participants are asked the same questions prior to beginning the program and after the program ends. The two surveys would check on the same key dimensions: time spent reading and measure of connectedness. The second is to use questions with an ordinal or interval scale to ask participants about their specific reading time per week before the program and then during their time in the program. In addition, an interval scale could be used on the post-survey to have participants identify their time interacting with their buddies, and a more detailed categorical scale could be used to capture the kinds of interactions with their buddies. This data could be supported by asking participants to keep a log of their reading time and interactions to help them track their reading habits. The sample size in this work is small, because relatively few participants responded. This could have led to a skewed interpretation of the data because of the absence of participants' feedback. Some participants responded to only the pre- or post-survey, although in the Results section, to prevent misinterpretation, we only compared those participants who completed both surveys. There may have also been a subconscious bias in the participants to provide positive feedback on the surveys.

Additionally, we did not assess the participants' reading skills and relied only on perception. Finally, the strength and long-lasting nature of the connections between participants was not assessed in this study. However, as stated earlier, this was a preliminary study to assess the potential benefit of this program and could encourage the conduct of future larger studies with long-term components.

To extend our analysis of this program, literacy tests and oral feedback from participants could better highlight the program's strengths and weaknesses. In the future, instead of Zoom™ or other virtual communication apps, the program could consist of in-person engagement. However, virtual engagement could be utilized to maintain friendships among buddies and to pair buddies who live far from one another. This potential program would keep the structure of the virtual program and highlight in-person interaction among participants. In a future study, one could compare the results of the in-person program and the virtual program.

## MATERIALS AND METHODS

### Program Design

A total of 80 people engaged in the Kindles4Covid Virtual Reading Buddies Program. The program took place in the academic fall and winter of a single school year. The age range of participants that responded to the pre and post-survey was 5-21 years. Participants in the evaluation study were recruited as volunteers from the Kindles4Covid Virtual Reading Buddies Program and were invited to participate through an email with information and a digital flyer, which were sent to the families of participants. If interested, the participant's parent or guardian was asked to email back "Yes," and sign a digital version of the Human Informed Consent Form. The form contained the purpose of our study, what they should expect if they consent, a brief synopsis of the program, and information for contacting the members of the evaluation study. Participants and their parents were asked to provide permission with the assurance that records of their permission will be stored in a protected folder separate from the data, with secured access.

At the start of the program, teams were formed based on stated preferences for buddies. Each team included two to three participants, including familiar and unfamiliar buddies. Each team included a facilitator to help with interactions at meetings. Kindle® e-reader devices were given to participants who requested them, and using library cards, participants ordered books online to read. Participants met on Zoom™ for approximately 30 minutes every week to read, starting September 21st and ending December 6th. Each session lasted 30 minutes to ensure engagement and attention of the participants. The amount of texts read in each session varied based on individual or group choice.

### Survey Design

We collected study data using a pre-survey with 5 questions sent a week prior to the program, and a post-

survey administered towards the end of the program. Each survey included multiple choice and short answer questions to gather data on reading time and making connections. Note that data on the amount of participation was not collected from participants. Thirteen out of 64 total participants responded to the pre- and post-surveys, with eight participants completing both a pre and post-survey for analysis. Survey respondents ranged from 6–18 years, where the mean age of participants was  $12 \pm 3$  years. The Kindles4Covid Virtual Reading Buddies Program team, with support from advising adult mentors, developed and reviewed the feedback surveys. At the program's end, the team worked to organize and analyze the data. Study data was made anonymous by associating data with a code instead of participants' names. The code includes numbers and words chosen by the adult lead to help maintain confidentiality and a fair analysis of data. We stored all data on Google Sheets in a secure folder where only those analyzing the study had access to the data.

### Analysis

Comparison of the amount of reading and social connections from pre- and post-survey data was done using McNemar's test with a Yates' correction of 0.5 (Figures 2, 3). McNemar's test was used because paired data is being compared between pre and post-surveys and the dependent variable is dichotomous (increase/decrease). The Yates correction was used because of our small sample size. An online calculator (SciStatCalc) was used. The null hypothesis was that there was no difference in the reading amounts or in connections made prior to the program compared to the conclusion. This McNemar's test was done using an  $\alpha$ -level of 0.05. The answers to the open-ended response questions were reviewed and analyzed using a constant comparative qualitative research approach that allowed us to identify themes in the data. The analysis methodology included first reviewing the written responses for the open-ended questions and documenting identified phrases into a table. Each line of text in the analysis table was then reorganized and clustered based on identifying similarities or differences in expressions. Comparisons across these themes were made and self-checked by the researchers.

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