

Exploration of a Blended Learning Approach to Reading Instruction in Second Grade

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Abstract: This study explores a blended learning approach, utilizing both online and offline materials, for reading instruction within general education second grade classes in a California elementary school receiving Title I funds. The blended learning program was implemented in two classes, with an additional class in the same school serving as a control. The study was carried out during the second half of the school year from February through May 2015. There were no significant differences between groups on the DIBELS® Next reading assessment at the start of the study, however, the intervention group significantly outperformed the control group on DIBELS Next at the end of the school year. These results support the use of a blended learning approach to reading instruction in general education, Title I second grade classes.

Introduction

Historically, in the area of beginning reading, the literature on computer-assisted instruction (CAI) found technological tools to be a valuable supplement to support reading acquisition, particularly for struggling students (Cheung & Slavin, 2012; MacArthur, Ferretti, Okolo, & Cavalier, 2001). However, researchers noted the need for additional studies to validate the effectiveness, generalizability, and areas of impact of technology-based educational interventions (Chambers et al., 2008). More recently, due to an increase in affordable new technologies, combined with educational budget cuts, teacher shortages, and a focus on individualized student progress, the concept of blended learning has come more to the forefront, especially in grades K-12 (Staker & Horn, 2012).

Instead of focusing solely on the effectiveness of teacher-led instruction or the effectiveness of technology-based intervention programs, blended learning is an innovative approach to K-12 education which combines student-led online with teacher-led offline instruction and represents a cultural shift in the classroom (Staker, 2011; Powell et al., 2015). Blended learning provides independent, personalized practice that may not be possible within a traditional classroom setting without technological support (Johnson, Perry, & Shamir, 2010) and re-envision the

role of the teacher to be more that of a mentor, coach, and guide instead of solely a lecture-based role (Powell et al., 2015). Blended learning creates a way to focus on individual student's strengths, weaknesses, and learning needs, matching students with the right, personalized content, at the right time (Powell et al., 2015). Through the data provided in digital components of blended learning programs, teachers are able to quickly assess student needs and personalize instruction for students (Hilliard, 2015) which allows teachers to focus on small group or one-on-one instruction instead of whole-class lectures (Freeland, 2015).

Building on the need for additional studies on the effectiveness of blended learning, especially in elementary classrooms, this study examines a blended learning approach to reading instruction as part of an English Language Arts (ELA) curriculum. This study incorporates innovative educational strategies combined with a research-based and research-proven digital tool (Schechter, Macaruso, Kazakoff, & Brooke, 2015) to better understand if a blended learning approach could positively impact reading instruction practices in a diverse US elementary school. Specifically, this study used Lexia Reading[®] Core5[®] (Core5) as a blended learning literacy program in general education, second grade classes. A within-school comparison of reading skills (using DIBELS Next) was conducted using randomly-assigned intervention classes that used Core5 compared to control classes that did not integrate Core5 into the ELA curriculum.

Method

This study was conducted with second graders in a Title I California school from February - May 2015. The school principal organized the study to explore the benefits of a blended learning approach to reading instruction within the school. Title I supports elementary and secondary schools with a high percentage of students from low socioeconomic households by providing federal financial assistance for academic programming targeted to support students' educational growth. If a school has over 40% of the student population from low socioeconomic households, Title I funds may be used for school-wide programs that impact the entire student body.

Sample

Included in the following analyses are 74 second graders, 49 in two intervention classes and 25 in one control class. The three second grade classes were randomly assigned to two intervention classes and one control class. For the 2013-2014 school year (the most recent data available) this school's population was 96% Hispanic, 77% English Language Learners, and 93% socioeconomically disadvantaged. Teachers in the intervention and control classes are considered to be highly qualified. The two intervention teachers had more than 10 years of teaching experience and the control teacher had over 15 years of teaching experience.

Measures

Lexia Reading Core5 (Core5)

Lexia Reading Core5 (Core5) was used in the intervention classes in conjunction with the school's existing core curriculum for English Language Arts (ELA), Houghton Mifflin Reading (Medallion Edition). Control classrooms used the same core ELA curriculum without Core5. Core5 supports a blended learning approach to reading instruction. It is an adaptive reading program, combining student-led online lessons with teacher-led offline instruction, designed to support an interactive and collaborative model of personalized learning.

Students begin the program by taking an auto placement assessment, which assigns them to the appropriate start level in the program's scope and sequence based on their reading performance rather than age or grade. Students then progress through the online component of the program at their own pace, using mastery-based learning (i.e., students need to perform with 90% or 100% accuracy in order to move on in the program). Core5 adapts to each student's unique learning needs, personalizing the intensity of instruction based on a student's response. In Core5, an Assessment Without Testing[®] algorithm predicts, on a monthly basis, a student's likelihood of reaching end-of-year, grade-level benchmark in the program. The contents of Core5 align with recommendations from the National Reading Panel (National Institute of Child Health, & Human Development, 2000) and the English Language Arts Common Core State Standards (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010) to provide systematic instruction in six strands of reading skills: phonological

awareness, phonics, structural analysis, fluency, vocabulary and comprehension. Program activities are organized into 18 levels: preschool (Level 1), kindergarten (Levels 2-5), first grade (Levels 6-9), second grade (Levels 10-12), third grade (Levels 13-14), fourth grade (Levels 15-16) and fifth grade (Levels 17-18). Each level consists of five activities (four in Level 1) with multiple units designed to address various combinations of skills in the six strands listed above.

DIBELS Next Oral Reading Fluency (DORF)

The Dynamic Indicators of Basic Early Literacy Skills (DIBELS Next) (www.dibels.org) consists of a set of fluency measures designed to assess students' literacy skills in kindergarten through sixth grade. DIBELS Next can be used as a progress monitoring tool to determine students' growth throughout the school year as well as a screening/benchmarking assessment administered at the beginning-, middle-, and end-of-year. The DIBELS Next Oral Reading Fluency (DORF) subtest was used as an indicator of reading proficiency for the second grade students in this study. DORF measures the number of words a student can correctly read aloud in a passage within one minute. Any hesitations, delayed self-corrections, skipped or incorrect words are calculated as errors; the number of correctly read words represents the student's oral reading fluency score.

Procedure

Students in the intervention and control classes received the same amount of overall reading instruction, including 120 minutes per day for standard ELA Instruction and 30 minutes per day for reading intervention. For the intervention classes, Core5 was used as part of the daily intervention time. Intervention students were assigned use of the online component of Core5 based on a Prescription of Intensity with recommended minutes (20 to 80 per week, depending on the student's risk of not reaching end-of-year benchmark in Core5). As a measure of implementation fidelity, all intervention students included in this analysis used Core5 over the sixteen-week intervention period and met their recommended usage for at least 10 weeks. All students in the intervention and control classes were pretested in January and posttested in June with DIBELS Next DORF.

Data were collected on participants' usage of the online component of Core5. These data include information about a student's time using the online program, the initial and final grade level of reading skills a student worked on in the program, the number of activities completed, and the student's rate and accuracy performance for each activity. The Core5 program reports real-time data for each student as he/she progresses through the program. In addition, DIBELS Next DORF pretest and posttest scores were analyzed for the intervention and control students to evaluate reading gains. The principal, an instructional specialist, and district administrators observed intervention and control classes to monitor fidelity of ELA instruction, including Core5 use.

Results

An independent sample *t*-test revealed no significant difference between students in the intervention group and the control group on DIBELS Next DORF mean scores at pretest (see Table 1). A comparison of gain scores (posttest -- pretest) showed a greater mean gain on DIBELS Next DORF for the intervention group (12.1) than the control group (3.3). An analysis of covariance revealed a significant group difference at posttest, using pretest scores as covariates, $F(1,71) = 4.7, p < .04$.

Group	Pretest Mean	SD	Posttest Mean	SD
Intervention (N=49)	76.5	40.3	88.6	42.1
Control (N=25)	69.1	30.9	72.4	37.1

Table 1: Second Grade DIBELS Next DORF Mean Scores

A similar outcome was obtained when comparing mean percent growth for the two groups. The mean percent growth for the intervention group was 24.9% compared to 6.4% for the control group. This difference in mean percent growth was significant, $t(72) = 2.0, p < .04$.

Further analyses were performed to examine changes from pretest to posttest in Instructional Categories on DIBELS Next based on DORF scores. Students could be categorized as needing Core Instruction, Strategic Instruction, or Intensive Instruction. As shown in Table 2 and Figure 1, 27% of students in the intervention group demonstrated an improvement in Instructional Categories (i.e., moved from Strategic to Core or moved from Intensive to Strategic/Core). In contrast, none of the control students improved in Instructional Categories. This difference in percent improvement is significant, $X^2(1) = 4.3, p < .04$.

	Pretest			Posttest
	Core Instruction	Strategic Instruction	Intensive Instruction	Improved Support Level
Intervention (N=49)	27	7	15	27% (6 of 22)
Control (N=25)	12	4	9	0% (0 of 13)

Table 2: Second Grade DIBELS Next DORF Instructional Categories

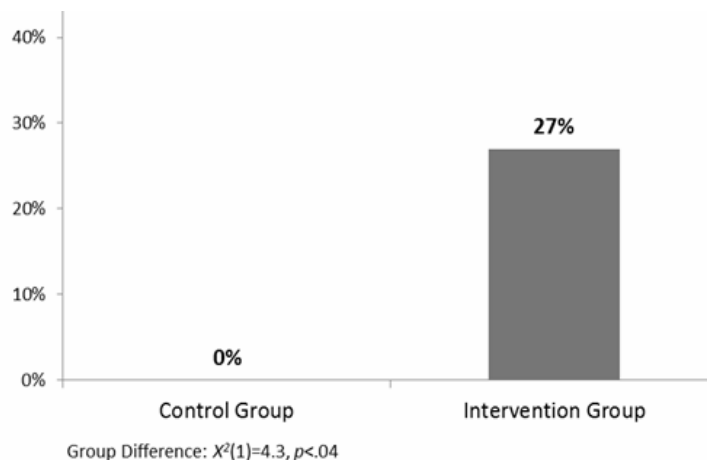


Figure 1: Improvement in DIBELS Next Instructional Categories

Regarding performance in Core5, 84% of the intervention students began the study one or more grade levels behind in the program. By the end of the study, 29% of the intervention students reached end-of-year benchmark in Core5 by completing all grade level material, and an additional 41% were working in their grade level material. These findings indicate that, in general, intervention students made substantial progress in Core5.

Reaching benchmark in Core5 was found to be closely associated with performance on DIBELS Next. End-of-year benchmark status showed a significant correlation with DIBELS Next DORF posttest scores ($r=.60, p < .01$). In fact, 100% of intervention students who met end-of-year benchmark in Core5 were categorized as Core

Instruction on DIBELS Next compared to only 34% of intervention students who did not reach end-of-year benchmark in Core5.

Discussion

It should be noted that this study was conducted for less than half of the school year. Despite the limited amount of time, it was found that second grade students in the intervention classes made significantly greater gains in reading compared to control students. Most of the intervention students began the study behind grade level in reading skills in Core5, and approximately half of the students in both the intervention and control classes were categorized as needing Intensive or Strategic Instruction based on DIBELS Next scores. Following participation in the blended learning program, intervention students made four times the reading gains on DIBELS Next than control students and a significantly greater percentage of intervention students moved up Instructional Categories on DIBELS Next than control students. These results suggest that consistent use of a blended learning approach to reading instruction can lead to significant advances in reading skills. Future studies should examine the use of blended learning programs for reading instruction with full-year implementation and include additional grades.

Conclusion

We are still in the beginning stages of innovative integration of technology in U.S. classrooms. It is important to note that a blended learning approach to reading instruction is not solely about the technology. Instead, blended learning is personalized learning, using evidence-based curricula and pedagogy, combined with actionable, real-time data, to meet individual student's learning differences. The shift from traditional to blended learning approaches requires effective implementation of technology-based programs (Powell et al., 2015). This study explored the implementation of a blended learning approach to reading instruction, comparing second grade intervention and control classes in a school containing a high percentage of students from low socioeconomic households. It was found that students in the intervention classes made superior reading gains compared to students in the control class, providing evidence for the effectiveness of a well-implemented blended learning approach to reading instruction.

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Acknowledgements

The authors would like to thank Peter Dougherty, Lexia Account Executive, for his invaluable training and support leading up to and during this study, as well as Elsie Briseño Simonovski, Ph.D from Orange Unified School District. This study was funded by Lexia Learning, A Rosetta Stone Company.