Learning in the Pandemic: What the Research Tells Us We Can Do

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January 14, 2021
Dr. John Bielinski is a psychometrician by training and has led development of educational tests and educational research in the industry for 20 years. Dr. Bielinski began his career in education policy at the National Center on Educational Outcomes and joined FastBridge in 2018. His expertise is in CBM and modeling growth.

Dr. Rachel Brown joined FastBridge in 2015 after teaching at the University of Southern Maine for 16 years. She has experience as a general education teacher, special educator, and school psychologist. Her area of expertise is Multi-Tiered Systems of Support. She splits her time between Alaska and Maine.

Dr. Kyle Wagner is a research associate at Illuminate Education. He has several years of experience as a school psychologist in Texas and Minnesota. He also has several publications and presentations on topics including psychometrics, curriculum-based measures, and academic intervention. Kyle is currently working with the FastBridge suite of products at Illuminate Education.
Attendance
Screening
Vaccines
Online
COVID surge
Overview

The Now  Fall Screening Results  Next Steps
Where We Are Now
• **Not a COVID thing**  
  *(Dolan, 2016; Ercikan et al., 2018; Herond, 2016)*

• **Predictors:**  
  ○ **Socioeconomic Status**  
    *(Auxier & Anderson, 2020; Moore et al., 2018)*  
  ○ **Parent education**  
    *(Auxier & Anderson, 2020)*  
  ○ **Rural locations**  
    *(Dolan, 2016)*
• **Equipment**
  ○ Cell phones = yes
  ○ Computers/tablets = no
Digital Divide

Why This Matters

- School-based learning
  \citep{Huffman2018}

- Homework
  \citep{Dolan2016}

- Extended learning
  \citep{OsborneMorgan2016}

- Attendance
  \citep{SanfordIrving2020} (due to COVID)
Where Is School?
Attendance

COMMUNITY SCHOOL

LOG IN DAILY FOR
REMOTE LEARNING
Findings From Fall Screening
Research Questions

Is there converging evidence across studies?

How does learning growth during the COVID year compare to growth from prior years?

Do the results generalize to students who were not assessed in the fall?
Our Approach To the Research

➔ Computed each student’s fall-to-fall rate of improvement (ROI)

◆ ROI = Gain ÷ Interval

➔ Trimmed data (dropped 1<sup>st</sup> & 99<sup>th</sup> %ile)

➔ Compared ROI from 2019-20 with three prior years

➔ 25k - 60k administrations/grade
Annual (Fall-to-Fall) Performance Gains in Reading

- Based on students tested in consecutive years
- Vertical axis shows the mean gain from fall to fall (daily ROI x 365)
- Horizontal axis shows the start and end grade
- Annual growth decreased during COVID year relative to prior years
- Declines exceeded standard error; indicating that declines cannot be attributed to yearly variation
Annual (Fall-to-Fall) Performance Gains in Math

- Same approach used for reading
- Annual growth decreased during COVID year relative to prior years
- Declines exceeded standard error; indicating that declines are real (cannot be attributed to yearly variation)
- Substantially greater declines beginning in Grade 3/4
What About Students NOT Screened in the Fall?

➔ Compared overall assessment rates to historical averages
  ◆ About 10% fewer students with fall-to-fall scores than prior year

➔ Compared fall 2019 performance of students with 2019 only and students with 2019 and 2020
  ◆ The average score of students with only fall 2019 was slightly lower than students with scores in both years
  ◆ The effect size differences was about 0.10 SD units,

➔ At the school level, the percent of non-White students was 3% higher among students with fall only

➔ Free/reduced lunch rates were the same across samples
# Learning Loss Calculated in FastBridge Research

<table>
<thead>
<tr>
<th>Grade</th>
<th>Difference</th>
<th>Effect Size</th>
<th>Monthly Loss</th>
<th>Difference</th>
<th>Effect Size</th>
<th>Monthly Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>KG-1</td>
<td>-3.71</td>
<td>-0.13</td>
<td>&lt;1 Mo</td>
<td>-0.48</td>
<td>-0.06</td>
<td>&lt;1 Mo</td>
</tr>
<tr>
<td>1-2</td>
<td>-2.15</td>
<td>-0.08</td>
<td>1 - 2 Mo</td>
<td>-0.84</td>
<td>-0.11</td>
<td>1 - 2 Mo</td>
</tr>
<tr>
<td>2-3</td>
<td>-1.68</td>
<td>-0.07</td>
<td>1 - 2 Mo</td>
<td>-1.20</td>
<td>-0.16</td>
<td>2 - 3 Mo</td>
</tr>
<tr>
<td>3-4</td>
<td>-2.70</td>
<td>-0.12</td>
<td>2 - 3 Mo</td>
<td>-1.80</td>
<td>-0.22</td>
<td>2 - 3 Mo</td>
</tr>
<tr>
<td>4-5</td>
<td>-3.35</td>
<td>-0.15</td>
<td>2 - 3 Mo</td>
<td>-2.28</td>
<td>-0.24</td>
<td>3 - 4 Mo</td>
</tr>
<tr>
<td>5-6</td>
<td>-3.44</td>
<td>-0.15</td>
<td>3 - 4 Mo</td>
<td>-2.28</td>
<td>-0.21</td>
<td>3 - 4 Mo</td>
</tr>
<tr>
<td>6-7</td>
<td>-2.55</td>
<td>-0.11</td>
<td>2 - 3 Mo</td>
<td>-1.68</td>
<td>-0.15</td>
<td>3 - 4 Mo</td>
</tr>
<tr>
<td>7-8</td>
<td>-2.87</td>
<td>-0.13</td>
<td>2 - 3 Mo</td>
<td>-1.32</td>
<td>-0.12</td>
<td>~ 3 Mo</td>
</tr>
</tbody>
</table>

- Column 1 “**Difference**” is the drop in the annual gain in Scale Score points.
- Column 2 “**Effect Size**” is the Column 1 value divided by the within-grade SD.
  - In experimental design literature, an effect size < 0.3 is considered small.
- Column 3 “**Monthly Loss**” is the Column 1 value divided by the median national growth rate (fall to spring).
  - Monthly losses greater in math than reading; and losses increase with grade.
Is the Evidence Converging Across Studies?

<table>
<thead>
<tr>
<th>Grade</th>
<th>FastBridge aMath</th>
<th>NWEA MAP Math</th>
<th>i-Ready Math</th>
<th>Renaissance Learning STAR Math</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>--</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Minimal learning loss**
- **Small to moderate learning loss**
- **Moderate to large learning loss**
Growth and Demographic Variables?
Research Questions

- Does an interaction between the two exist in relation to the effects of school disruption caused by COVID?
- How might % of students on free and reduced lunch in a school moderate the effects of school disruption caused by COVID?
- How might urbanicity of a district moderate the effects of school disruption caused by COVID?
Our Approach

- Compare student scores and growth across years with and without the COVID disruption
- All students in sample had data points for fall, winter, and the following fall
- We also filtered out students in the 1st and 99th percentiles
- Scores and distributions for students in the sample and students who were filtered out were very similar

<table>
<thead>
<tr>
<th>Sample</th>
<th>Fall 1</th>
<th>Winter 1</th>
<th>Fall 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>COVID Sample</td>
<td>Fall 2019-2020</td>
<td>Winter 2019-2020</td>
<td>Fall 2020-2021</td>
</tr>
</tbody>
</table>
## Sample of Data Collection

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>KG</td>
<td>5,359</td>
<td>4,160</td>
<td>6,667</td>
<td>4,727</td>
</tr>
<tr>
<td>1</td>
<td>16,904</td>
<td>18,611</td>
<td>23,014</td>
<td>22,268</td>
</tr>
<tr>
<td>2</td>
<td>32,365</td>
<td>43,949</td>
<td>41,893</td>
<td>54,380</td>
</tr>
<tr>
<td>3</td>
<td>34,851</td>
<td>46,332</td>
<td>44,488</td>
<td>57,747</td>
</tr>
<tr>
<td>4</td>
<td>34,634</td>
<td>46,877</td>
<td>44,757</td>
<td>56,767</td>
</tr>
<tr>
<td>5</td>
<td>28,977</td>
<td>36,825</td>
<td>37,379</td>
<td>45,089</td>
</tr>
<tr>
<td>6</td>
<td>19,402</td>
<td>29,096</td>
<td>23,344</td>
<td>37,363</td>
</tr>
<tr>
<td>7</td>
<td>19,402</td>
<td>26,373</td>
<td>17,209</td>
<td>33,466</td>
</tr>
<tr>
<td>8</td>
<td>2,364</td>
<td>4,873</td>
<td>3,915</td>
<td>7,237</td>
</tr>
</tbody>
</table>
Variables of Interest

- FRL rate as measured by percentage of students in the school on free or reduced lunch
- Winter Scores
- Urbanicity of the district (Urban/Suburban/Rural)

We want to know how these variables might influence aReading and aMath scores differentially in typical years compared to years where schools were disrupted by COVID.
Counts of Schools and Districts Based on Urbanicity

<table>
<thead>
<tr>
<th>Metro Status</th>
<th>aMath School Count</th>
<th>aMath District Count</th>
<th>aReading School Count</th>
<th>aReading District Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>297</td>
<td>43</td>
<td>385</td>
<td>48</td>
</tr>
<tr>
<td>Suburban</td>
<td>303</td>
<td>76</td>
<td>382</td>
<td>93</td>
</tr>
<tr>
<td>Rural</td>
<td>942</td>
<td>480</td>
<td>1,051</td>
<td>522</td>
</tr>
<tr>
<td>Not Listed</td>
<td>157</td>
<td>86</td>
<td>176</td>
<td>93</td>
</tr>
<tr>
<td>Findings Based on Urbanicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>aMath</strong></td>
<td><strong>aReading</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-level models</td>
<td>2-level models</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10% of variance at school level</td>
<td>15% of variance at the school level in the Non-COVID Year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2% of variance at district level</td>
<td>3% of variance at the school level in the year disrupted by COVID</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
aMath

1st Grade

3rd Grade

5th Grade
1st Grade

3rd Grade

5th Grade
aReading

1st Grade

5th Grade

3rd Grade
Next Steps

- Safety & Wellness
- Best Practices
- Collect Data
Safety and Wellness

Safety
• Communication
• Cases still surging
• Changes likely through spring

Wellness
• Model for students
• Daily check-ins
• Mindfulness practices
Transitioning to Online Instruction
Research Says

Presence  Engagement  Community
Online Instruction: Presence

- Teacher practices matter *(Mayer, 2018)*
- Regular schedule of meetings and activities
- Teacher is accessible *(Sun & Chen, 2016)*
- Build online community *(Ryan et al., 2015)*
Online Instruction: Engagement

- Frequent student practice
  - Every 5-10 minutes
    (Borup & Evmenova, 2019)

- Select methods that students can access
  (Mayer, 2018)

- Model engagement and praise students when they participate
Online Instruction: Feedback

- Provide feedback with every session and assignment (*Ryan et al.*, 2015)
- Use accessible formats, text and audio (*Mayer*, 2018)
- Solicit student suggestions
Addressing Learning Gaps

● Direct and systematic instruction has the strongest research base (Stockard, Wood, Coughlin, & Khoury, 2018)

● Resources for online direct instruction are available
  ● National Center on Intensive Intervention

● Adjust instruction time in relation to your students’ data
  ● More math, less reading?

● Collect data!
Collect and Review Data

Collect by

• Regular screenings
  ○ Winter
  ○ Spring

• Progress monitoring for selected students
  ○ Online tools available

Review for

• Instructional changes
  ○ Whole group
  ○ Small group

• Resource allocation
  ○ Time
  ○ Staff
  ○ Materials
Key Recommendations

- Screen all students
- Identify priority learning needs
- Allocate time for online instruction planning
Questions & Answers

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Research Associate
Illuminate Education

Join the Innovation in Education community: www.edweb.net/leadingchange
THE ILLUMINATE SOLUTION

Turn Whole Child Data into Actionable Insights

School

Illuminate Experience

Real-time Dashboards

Streamlined MTSS and RtI Management

Comprehensive Assessment

Whole Child Insights

SEL  Behavioral  Academic  School Climate  Attendance  Intervention
THE ILLUMINATE SOLUTION

Screening and Progress Monitoring
Research-based universal screening and progress monitoring for academics and behavior with intervention recommendations and built-in coaching
FastBridge

MTSS and RtI Management
Interactive district-level to whole-child data management that strengthens MTSS implementations, including student need identification and intervention effectiveness
eduCLIMBER

Assessment Creation and Administration
Highest-quality, standards-based assessments with instant scoring, formative feedback, interactive reporting, and targeted activities
DnA and Inspect

Real-Time Dashboards
Timely data visualizations that enable administrators to view key data, monitor initiatives, and share easy-to-understand information with stakeholders
Achievement Dashboard