

Virtual Instruction in Elementary School Classrooms during the COVID-19 Pandemic

Freya Kaur, Susan Sonnenschein & Karrie E. Godwin
University of Maryland, Baltimore County



BACKGROUND

Educational contexts shifted drastically in the beginning of 2020 due to the COVID-19 pandemic, with a staggering impact on children's math and reading scores (NAEP, 2022). Understanding the potential contributing factors to the observed learning loss is important for both recovery efforts and improving future preparedness. Using Bronfenbrenner's (1979) ecological model, we draw comparisons between the educational context during the COVID-19 pandemic to pre-pandemic from the perspective of key stakeholders in education, the teachers.

RESEARCH QUESTIONS

- How much instructional time was allocated towards core subject areas (English, Math, Science) during the pandemic vs. pre-pandemic?
- Which instructional formats were utilized in classrooms during the pandemic vs. pre-pandemic?

DESIGN & PROCEDURE

Participants

49 elementary school teachers

- Grades K-5, Related Arts, ESL, Special Education
- Gender: 71% female, 12% male, 16% did not report
- Experience & Training:
 - 76% taught for five years or more
 - 55% held an advanced degree
- School Type & Location:
 - 82% taught in public school, 14% in private school, 4% in public charter school
 - Taught in 7 U.S. states and the District of Columbia
- Instructional Modality:
 - 49% used virtual instruction during Fall 2020
 - Virtual instruction dropped to 33% by Spring 2021
 - Majority of instruction was synchronous across core subject areas
 - Math (85%), English (93%), Science (76%)

Procedure

The online survey was administered in Spring 2021 and included 45 questions asking teachers about their instructional design and duration choices during the pandemic and during in-person instruction pre-pandemic, among other questions. Here we focus on teachers' responses to questions about the instructional modality (e.g., synchronous, asynchronous, hybrid, in-person), format employed (e.g., whole class, small-group, individual), and lesson duration across three core subject areas (Math, English, Science).

ACKNOWLEDGEMENTS

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This poster was presented as part of the APS 2023 Conference on May 28. Please contact the authors with questions or comments, Freya Kaur (fkaur1@umbc.edu), Susan Sonnenschein (sonnensch@umbc.edu), or Karrie Godwin (kgodwin@umbc.edu). This study is now available as a published manuscript: Godwin, K. E., Kaur, F., & Sonnenschein, S. (2023). Teaching and Learning during a Global Pandemic: Perspectives from Elementary School Teachers and Parents. *Education Sciences*, 13(4), 426.

RESULTS

RQ1: How much instructional time was allocated towards English, Math, and Science during the COVID-19 pandemic vs. pre-pandemic?

Lesson Duration During the Pandemic (see Figure 1)

- Significant effect of modality ($p = .01$),
 - Synchronous > Asynchronous ($p = .01$)
- Sig. interaction between modality and subject area ($p = .02$)
 - Synch. Math and English lessons > Synch. Science lessons ($ps \leq .007$)
 - No sig. difference in duration of Synch. Math and English lessons ($p = .06$)
 - Asynchronous instruction ns difference by subject area ($ps \geq 0.19$)

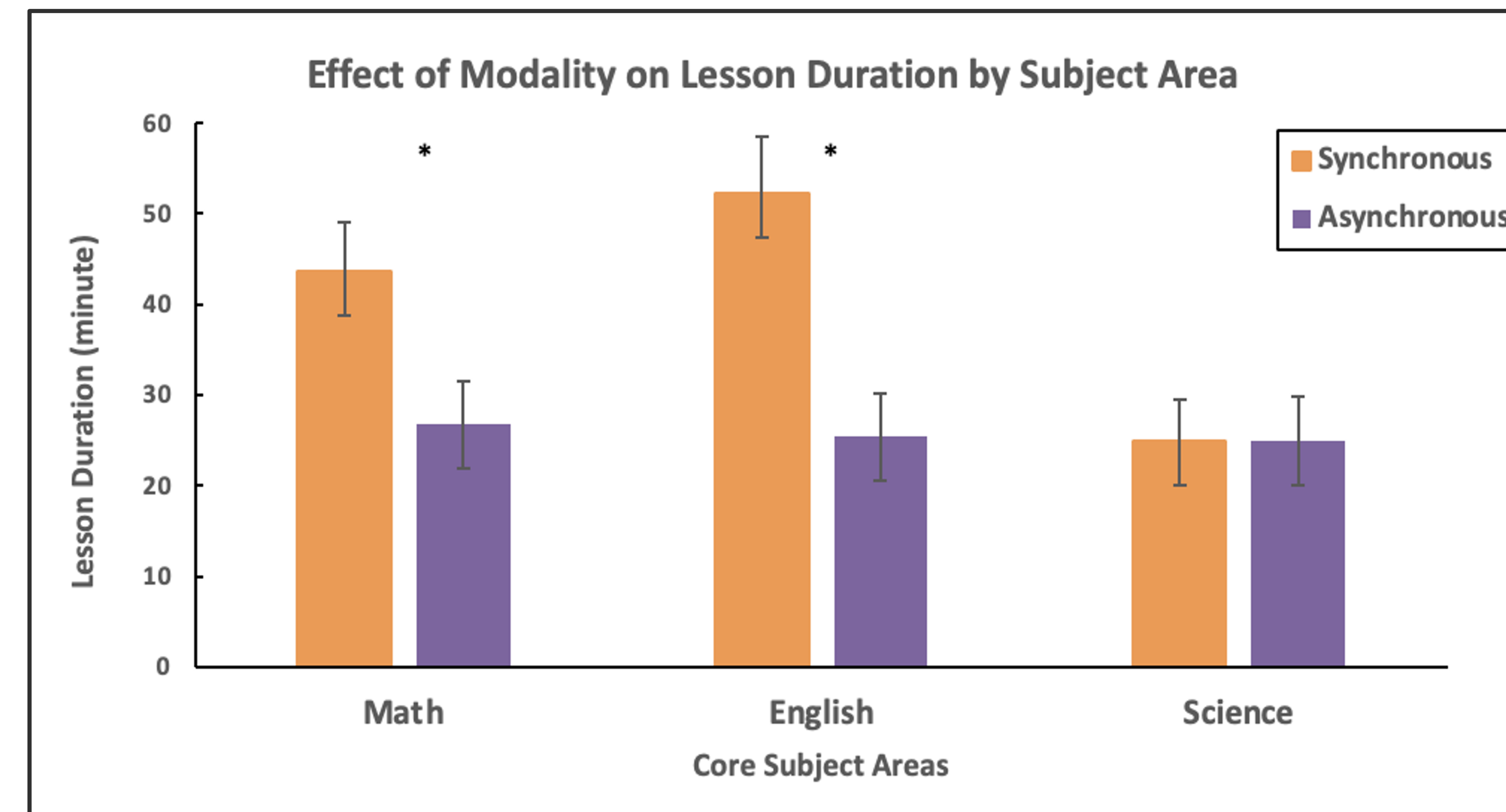


Figure 1. Teacher estimates of lesson duration by subject (Math, English, Science) and modality (Synchronous vs Asynchronous). Note. Error bars represent standard errors of the means; * signifies statistical significance, $p < .05$

During the Pandemic vs. Pre-Pandemic (See Figure 2)

- Significant effect of modality ($p = 0.01$)
 - Importantly, synchronous lesson duration was estimated to be significantly shorter ($M = 45.53$ min) than the duration of in-person pre-pandemic instruction ($M = 57.37$ min; $p = .01$)
- Significant effect of subject area ($p < 0.001$)
 - Across modalities, Math ($M = 55.85$) and English ($M = 67.62$) lessons were longer than a typical science ($M = 30.88$) lesson; both $ps < 0.001$

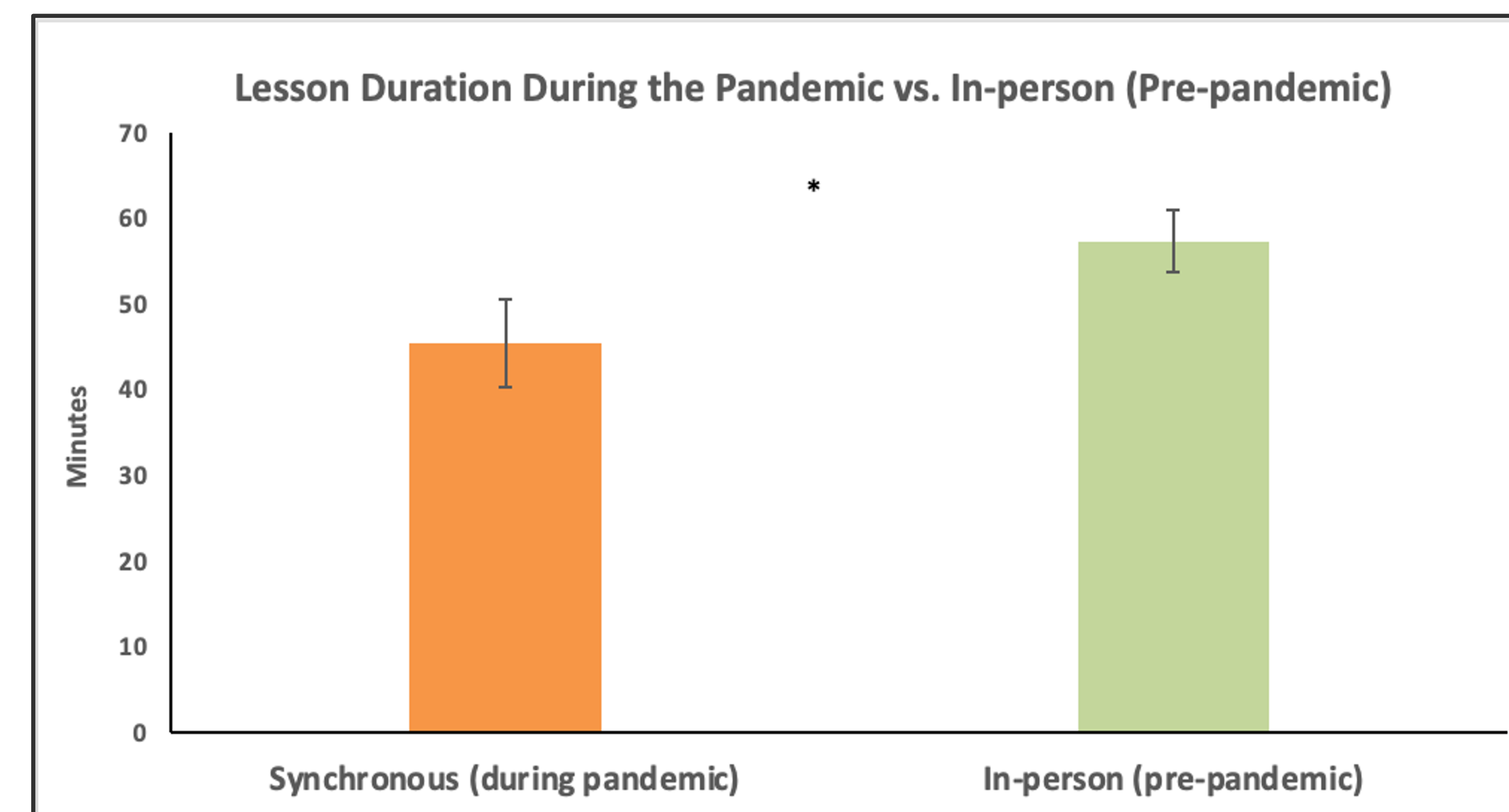


Figure 2. Teacher estimates of lesson duration during the pandemic vs. in-person (pre-pandemic). Note. Error bars represent the standard errors of the means; * signifies statistical significance, $p < .05$

RESULTS CONTINUED

RQ2: Which instructional formats were utilized in the classroom during the COVID-19 pandemic vs. pre-pandemic?

- Significant effect of modality ($p = 0.03$)
- Significant effect of format ($p < 0.001$)
- Significant interaction between instructional modality and format ($p < 0.001$)
- See Figure 3

Instructional Format During the Pandemic

- During synchronous instruction, a greater percentage of instruction occurred in the whole-class format ($M = 64.02\%$) than in either small-group ($M = 21.50\%$) or individual ($M = 14.48\%$) formats; both $ps < .001$

Instructional Format In-Person Pre-pandemic

- Teachers favored whole-class instruction ($M = 47.66\%$) more than small-group ($M = 28.41\%$) and individual formats ($M = 13.93\%$); both $ps \leq .002$
- Small group instruction > individual format ($p = 0.004$)

Instructional Format During the Pandemic vs. Pre-pandemic

- Teachers utilized the whole-class format *more* during synchronous instruction than during in-person instruction pre-pandemic ($p < .001$).
- Small-groups were used *more* during in-person instruction pre-pandemic than during synchronous instruction ($p = .02$)

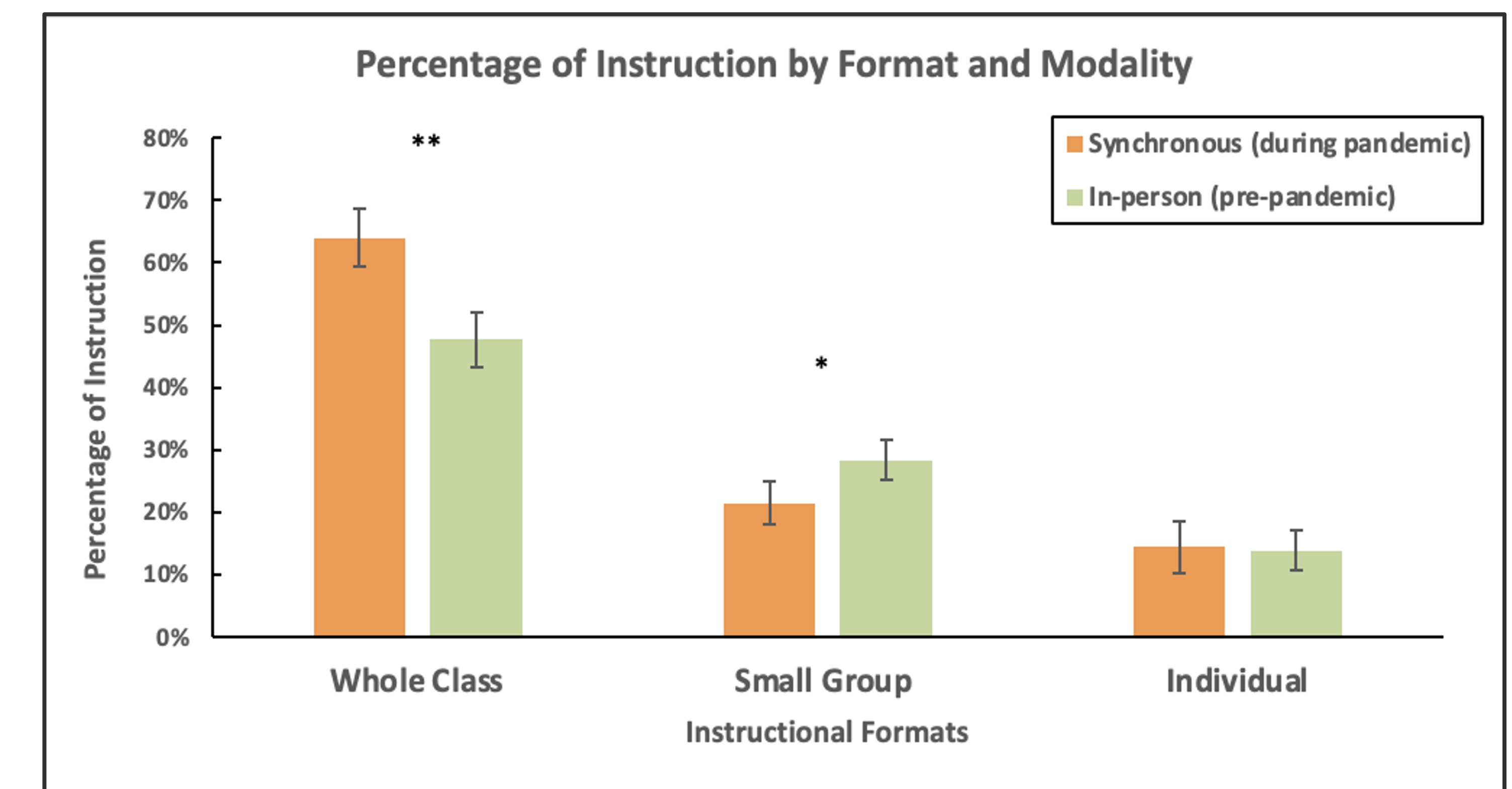


Figure 3. Teachers' estimate of the percentage of instruction by format type in-person (pre-pandemic) vs. synchronous (during the pandemic). Note. Error bars represent the standard errors of the means; ** = $p < .001$ and * = $p = .02$

CONCLUSIONS

Key Findings:

- Instructional duration was estimated to be less during virtual instruction than during in-person instruction pre-pandemic
- Synchronous and In-person instruction largely occurred in a whole class format
- Teachers tend to leverage small-group instruction more during in-person instruction than during virtual instruction suggesting a potentially missed opportunity to capitalize on the benefits of virtual platforms to support small group and individualized instruction during online learning
- The findings might point to potential contributing factors to children's learning loss following the COVID-19 pandemic
- Further research should investigate other aspects of virtual instruction such as quality and student engagement that may also contribute to children's diminished learning progress during the pandemic