The Impact of COVID-19 on Science Education

Early Evidence from California

August 16, 2022

Niu Gao, Kathy DiRanna, and Maria Fay
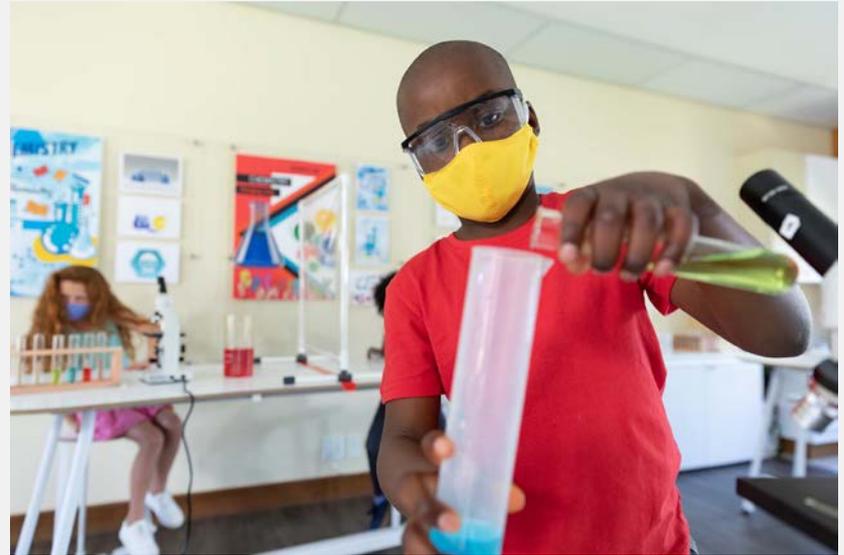
PPIC | PUBLIC POLICY INSTITUTE OF CALIFORNIA

California's K–12 schools need to invest in science education

- Scientific literacy is essential for all students—and crucial for the global competitiveness of California's future workforce

- The United States is behind other developed countries, and California is near the bottom on the National Assessment of Education Progress in science
  - In 2015, only 24% of students in grades 4 and 8 were proficient in science, well below the national average

- Science education in California needs to be more equitable
  - Large achievement gaps based on race/ethnicity and family income

California adopted the Next Generation Science Standards (CA NGSS) in 2013

- The CA NGSS have the potential to transform science teaching and learning

- Pre-pandemic NGSS implementation was uneven across districts and grade levels
  - Implementation was further along in K–8 than in high schools
  - High-need districts were further along than low-need districts

- COVID-19 changed the education landscape abruptly

PPIC examined science education during the pandemic and beyond

- What impact did COVID-19 have on science education?

- How do districts plan to support science education in recovery?

- What can policymakers do to support an equitable science education moving forward?

Our findings are drawn from multiple sources

- Survey of school districts in fall 2021
  - 213 districts serving 50% of K–12 population responded
  - No differences in factors that predict student learning

- Semi-structured interviews
  - More than 40 interviews with educational partners

- 2021–24 Local Control and Accountability Plans (LCAPs)
  - 858 of 1,034 district plans (83%) are posted online

- 2019–20 School Accountability Report Cards (SARCs)
 - A random sample of 376 schools (margin of error of 5%)

Equity across types of districts is a key focus

- High-need districts: at least 55% of students are high-need

- High-poverty districts: at least 75% of students are low-income

- High Black/Latino districts: at least 75% of students are Black/Latino

Science became a lower priority in most districts during the 2020–21 school year
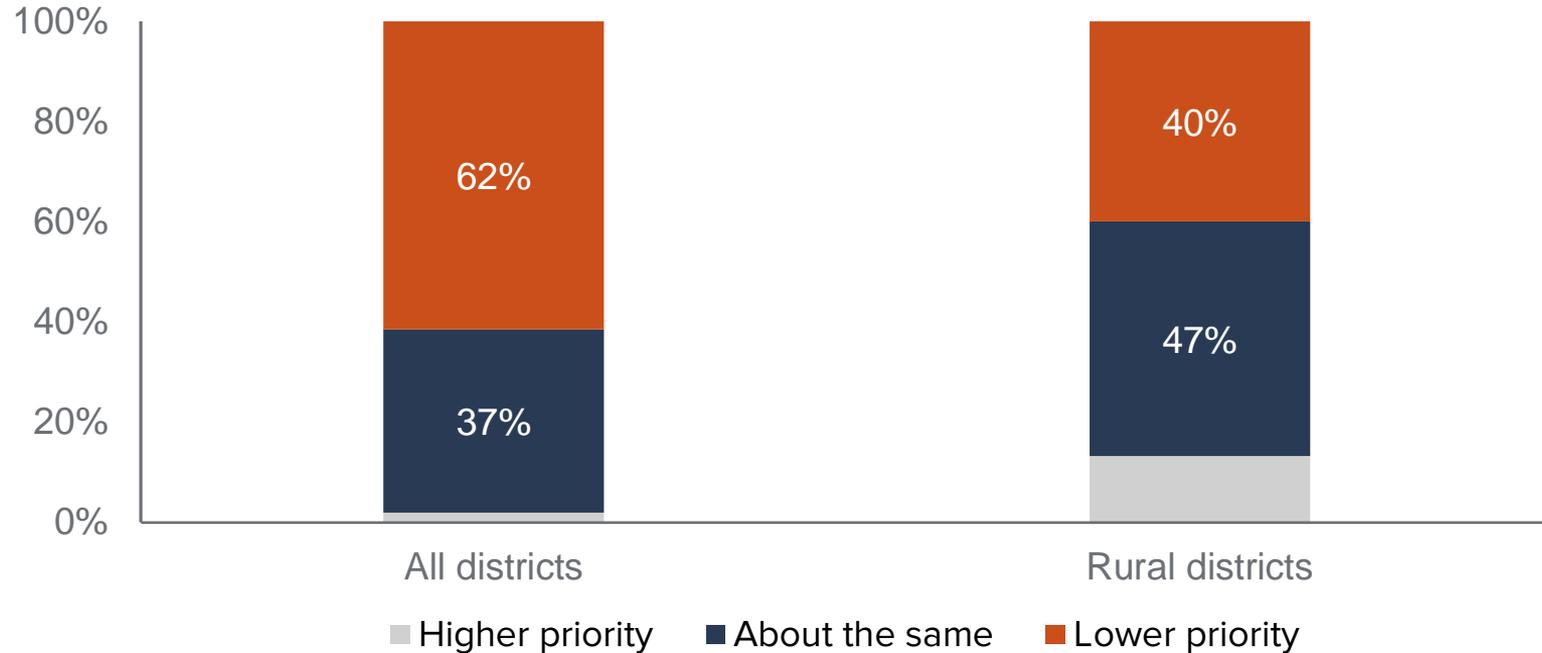
Alignment of science courses with CA NGSS was delayed in 2020–21

Chart showing stacked bar graph. Categories: Delayed the process (orange), No impact (dark blue), Missing response (gray).

Middle school sequence: Delayed the process 74%, No impact 17%, Missing response 9%.

High school sequence: Delayed the process 75%, No impact 18%, Missing response 7%.
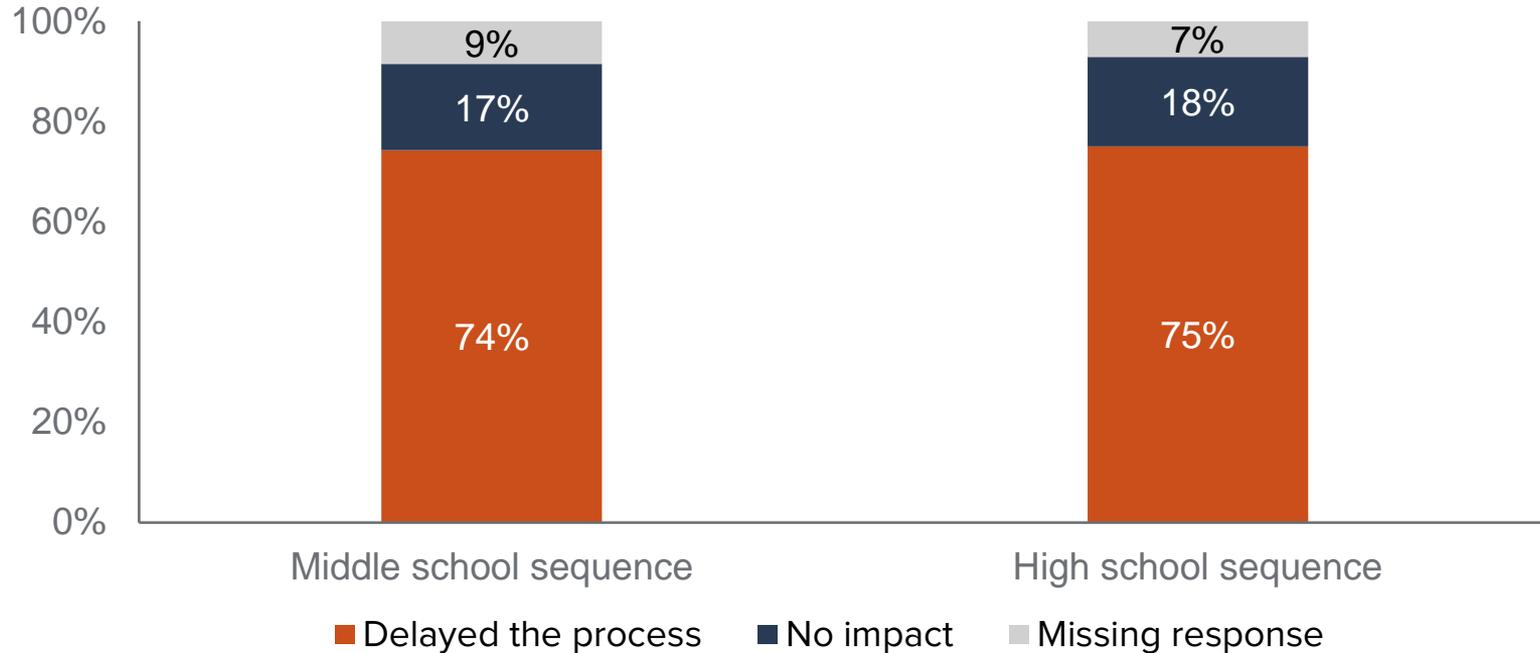
Support for science education has been limited during COVID-19

- Districts provided limited support for science education
  - 60% provided supplemental instructional materials
  - 43% offered summer science programs
  - 40% addressed social-emotional learning
  - 28% assessed student learning
  - 25% provided small-group instruction

- County offices of education received fewer requests for science-related professional learning or technical assistance

Most district recovery plans do not prioritize science education
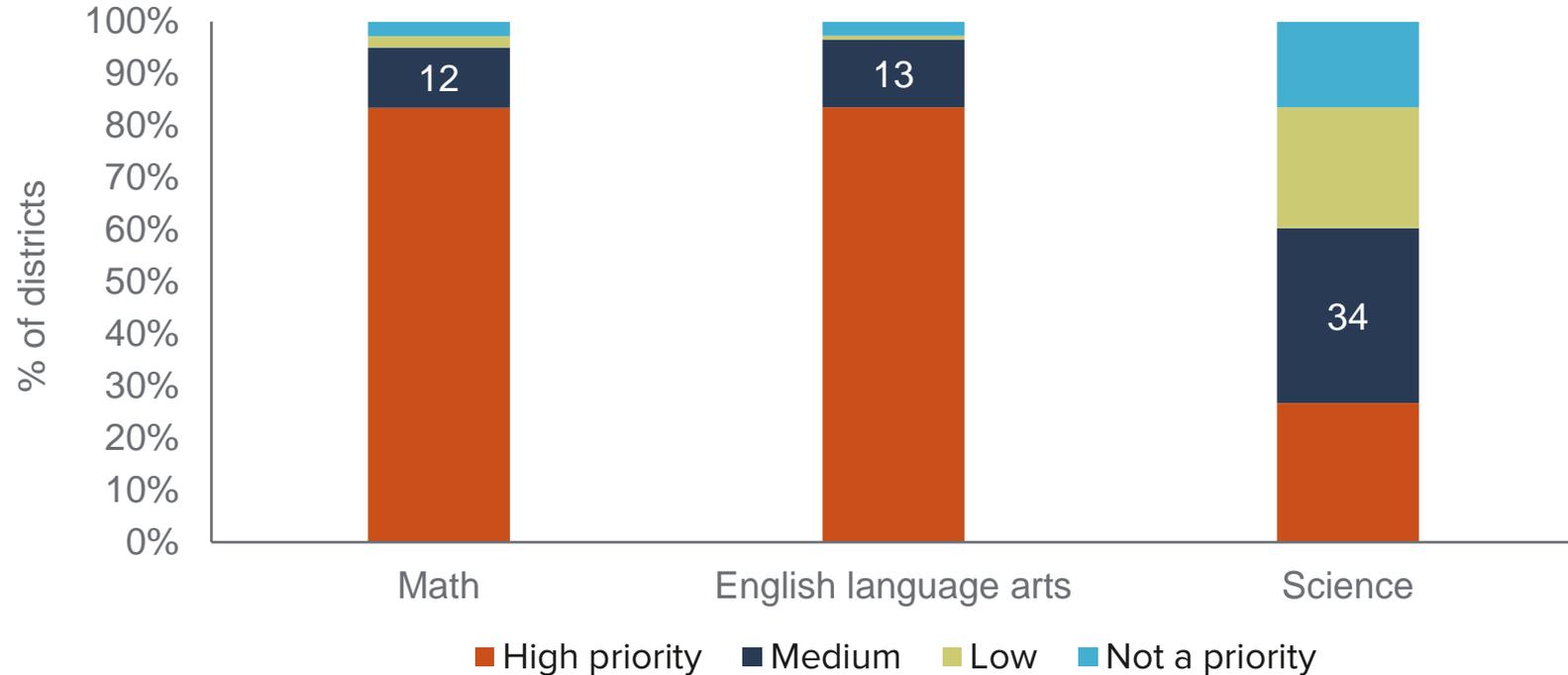
California can take steps to support equitable science education

- Include science in district accountability requirements
  - Include science in guidelines for spending stimulus money
  - Require line items for science education in LCAPs
  - Add science indicators to the state's accountability measure
  - Add science test performance data to the dashboard

- Provide dedicated funding for professional learning in science

- Provide evidence-based strategies to support science learning recovery

- Work with educational partners to build a statewide coalition

Notes on the use of these slides

These slides were created to accompany a presentation. They do not include full documentation of sources, data samples, methods, and interpretations. To avoid misinterpretations, please contact:

Niu Gao (gao@ppic.org; 415.291.4491)

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

Thank you for your interest in this work.