

PBS KIDS Play & Learn Science

Executive Summary



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About The Ready To Learn Initiative

The Ready To Learn Initiative is a cooperative agreement funded and managed by the U.S. Department of Education's Office of Innovation and Early Learning. It supports the development of innovative educational television and digital media targeted to preschool and early elementary school children and their families. Its general goal is to promote early learning and school readiness, with a particular interest in reaching low-income children. In addition to creating television and other media products, the program supports activities intended to promote national distribution of the programming, effective educational uses of the programming, community-based outreach, and research on educational effectiveness.

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Executive Summary

The PBS KIDS *Play & Learn Science* app was developed as part of the Corporation for Public Broadcasting (CPB) and Public Broadcasting Service (PBS) Ready To Learn Initiative, funded by the U.S. Department of Education. This study explored the impact of the PBS KIDS *Play & Learn Science* app, when used in a supportive context, on

- » children’s understanding of science concepts and use of science and engineering practices;
- » children’s use of science vocabulary;
- » child and parent-child engagement in science and engineering; and
- » parent confidence supporting their child’s science learning.

PBS KIDS *Play & Learn Science* App and Supports

The *Play & Learn Science* app introduces foundational science concepts and science and engineering practices through five distinct sets of activities: *Water Games*, *Ramp and Roll*, *Shadow Play*, *Weather Control*, and *Gear Up*. Each activity set includes three digital games and a designated parent page that incorporates suggestions for supporting their children’s game play (*Tips*) and their related real-world explorations (*Activities*).

For this study, the research team developed a four-week structured experience to support exploration of the *Play & Learn Science* app. Families were encouraged to focus on one set of in-app and hands-on activities each week. Two family science nights allowed families to preview these activities and receive take-home supplies.

Methods

Participants were recruited from two child-care centers: a private child-care center in the South that accepted child-care fee waivers, and a Head Start center in the Northeast. Sample sizes ranged from 31 to 33 participants by outcome measure. Children’s ages ranged from 37 to 67 months.

This study had a single-group design with pre- and post-experience parent surveys and child assessments. The research team developed non-standardized child assessments for this study, which were tailored to *Play & Learn Science* content. Children participated in pre- and post-experience vocabulary and performance-based assessments. The multiple-choice vocabulary assessment measured children’s receptive English language vocabulary for key words from the *Play*

& *Learn Science* app. The performance-based assessment consisted of five researcher-developed hands-on tasks, each designed to assess focal concepts and skills from one or more *Play & Learn Science* activity sets.

Findings

When used in a supported context, the PBS KIDS *Play & Learn Science* app benefitted both children and their parents.

Child outcomes include

- » gains in understanding of science content and in use of science and engineering practices;
- » increased use and understanding of science vocabulary; and
- » increased excitement about science, technology, engineering, and mathematics.

Parent outcomes include

- » increased parent-child engagement in science- and engineering-related activities; and
- » increased confidence for supporting their child's science learning.

Limitations

This study's single-group design limits our ability to make claims about causation and does not meet What Works Clearinghouse evidence standards (What Works Clearinghouse, 2017). In addition, we cannot claim that these findings would extend to average users of the *Play & Learn Science* app, because this study included additional supports based on the app. Further, the study used researcher-designed assessments aligned to the *Play & Learn Science* app content because no existing assessments were appropriate for this study's content and design. We cannot say whether gains found in this study would translate to standard academic assessments.

Conclusions

As part of the CPB-PBS Ready To Learn Initiative, the PBS KIDS *Play & Learn Science* app is intended to support families in exploring science together. The findings suggest that a high-quality digital app can be a catalyst for real-world science exploration, especially when it incorporates tips for parents about how to mediate children's use of science-focused digital games, explicit guidance for related real-world science activities they can do at home with their children, and specific suggestions

for interacting with their children in ways that stimulate science exploration, thinking, and conversation. Findings also suggest that parents benefit from direct guidance that helps them navigate the app, modeling of the hands-on activities and interaction suggestions in the app, and supports and encouragement for using the app in a structured and sequential manner. These results add to a body of research that demonstrates the potential of educational media to support children's learning, particularly when adults support their children's media use. These findings underscore the value of current CPB-PBS Ready To Learn family-focused science outreach programs and suggest that schools, child-care centers, and other organizations aimed at increasing family engagement in science learning should consider using the app as part of their own family science events.