Playing and Learning Science as a Family with a PBS KIDS App

An evaluation of the PBS KIDS Play & Learn Science app

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We explored the impact of the PBS KIDS Play & Learn Science app1, when used in a supportive context, on

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

The app includes 5 sets of digital and hands-on activities with parent tips:

- Water Games
- Ramp and Roll
- Shadow Play
- Weather Control
- Gear Up

Method

- 2 childcare centers: Northeastern Head Start, Southern private center
- 33 children ages 3-5
- 4-week family intervention
  - Families focus on one set of activities each week
  - We held two family science nights to preview activities and provide supplies
  - Single-group design
  - Pre- and post-experience measures (Exhibit 1).

Exhibit 1. Pre- and post-experience measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Analyses</th>
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<tbody>
<tr>
<td>Child science assessments: performance-based tasks and vocabulary multiple-choice</td>
<td>Repeated-measures general linear model</td>
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<td>Parent survey</td>
<td>Descriptives</td>
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Increased understanding of science content and practices

- Pre- to post-experience gain on researcher-developed performance-based tasks (Exhibit 2).
- Parents reported improved STEM skills.

Increased understanding and use of science vocabulary

- Pre- to post-experience gains on:
  - Researcher-developed vocabulary assessment (Exhibit 3).
  - Use of vocabulary during performance-based tasks (Exhibit 4).
  - Parent-reported vocabulary usage.

Additional parent-reported gains in:

- Child's excitement about STEM.
- Child doing STEM activities.
- Parent and child doing STEM activities.
- Parent confidence in supporting STEM.

Conclusion

- High-quality digital apps with parent supports can spark family inquiry and conversation.
- Multiple exposures to science concepts through digital games and real-world experiences can have a positive effect on children’s science learning.
- These types of experiences may be especially valuable in communities with limited access to high-quality science resources.

Full report here:

https://go.edc.org/rtl
playandlearnsceince

Note: N = 26 children. Error bars represent standard error. * = p < .001.

Note: N = 31 children. Error bars represent standard error. * = p < .001.


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