

Preschool Teachers Can Use a PBS KIDS Transmedia Curriculum Supplement to Support Young Children's Mathematics Learning: Results of a Randomized Controlled Trial

This research is part of the summative evaluation of *Ready To Learn*, a partnership between the US Department of Education, the Corporation for Public Broadcasting, and PBS, that seeks to develop engaging, high-quality educational programming and supports for two- to eight-year-old children growing up in low-income households. A core aim of the initiative is delivering early mathematics and literacy transmedia resources on new and emerging digital platforms such as tablet computers, interactive whiteboards, and smartphones, as well as better-established technologies such as computers, video displays, and gaming consoles, and to create learning experiences that leverage the unique capabilities of these various technology platforms for young children's learning. For the purpose of this study, transmedia means the use of familiar characters, settings, and narrative themes or stories across different media formats, such as digital video, interactive online games, and interactive whiteboard applications.

This study demonstrated that preschool children who participated in a media-rich curriculum incorporating PBS KIDS transmedia improved significantly in their understanding of key early mathematics skills essential for school success. In addition, teachers who implemented the media-rich curriculum reported significant increases in their confidence and comfort with early mathematics concepts and beliefs about the benefits of teaching with technology.

Study Components

- The study included 966 four year-old children in 87 prekindergarten classrooms in the New York and San Francisco Bay areas that serve economically disadvantaged families.
- Participating centers were randomly assigned to one of three conditions: the PBS KIDS Transmedia Math Supplement condition, the Technology & Media condition, or the Business-As-Usual condition.
- Classrooms in the PBS KIDS Transmedia Math Supplement condition and classrooms in the Technology & Media condition received digital tools (i.e., interactive whiteboards and tablet computers) and instructional support through on-site coaching. Only the PBS KIDS Transmedia Math Supplement condition received a set curricular sequence of curated media-rich and non-media activities that integrated technology.
- Business-As-Usual classrooms were instructed to continue their typical math instructional activities and routines during the study period.

Digital Media and Mathematics

- The PBS KIDS Transmedia Math Supplement integrated video and interactive digital games into a sequenced set of math-oriented activities for early learners.
- Teachers in the PBS KIDS Transmedia Math Supplement condition received a curriculum supplement that introduced math concepts and digital media, and provided a daily and weekly calendar of activities for teachers to implement.
- Teachers in the Technology & Media condition received a simple guiding document that introduced math concepts and pointed to websites where digital media for young children could be found.



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Findings

- Children in the PBS KIDS Transmedia Math Supplement classrooms showed statistically significant gains in the math skills targeted by the program as measured by a Supplement-Based Assessment created by the research team. The gains for an average student in this condition were equivalent to a 9% increase in percentile rank over a child in either the Technology & Media group or the Business-As-Usual group.
- Marginally significant increases in math skills were found for children in the PBS KIDS Transmedia Math Supplement condition using the Research Based Early Mathematics Assessment, a standard measure of young children's mathematics learning, as compared to children in the Technology & Media condition and children in the Business-As-Usual condition.
- Teachers who enacted the PBS KIDS Transmedia Math Supplement increased significantly in their beliefs about their own mathematics knowledge, and the benefits of technology experiences for preschoolers.
- The proportion of teachers who reported using technology to teach mathematics concepts increased significantly more in both the PBS KIDS Transmedia Math Supplement and Technology & Media conditions relative to the Business-As-Usual condition. The use of technology cannot on its own account for the gains in math skills of the Transmedia Math Supplement group relative to the Technology & Media and Business-As-Usual groups.

Interested in more?

For readers interested in a more detailed look at these findings, including: illustrative examples, recommendations, and a detailed description of research methods, the full-length report and executive summary for this study are available:

cct.edc.org/rtl

There you'll also find other current and past *Ready to Learn* summative research studies. And, to speak with the evaluation research team, please contact:



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