WestEd Year 4 Ready To Learn Research and Evaluation Summary Report
A Report to the CPB-PBS Ready To Learn Initiative

WestEd

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Overview of Year 4 Research

This report describes WestEd’s formative evaluation activities for the CPB-PBS Ready To Learn Initiative from October 2013 to September 2014. Funded by the U.S. Department of Education, the CPB-PBS Ready To Learn Initiative supports the development of educational television and digital media targeted at preschool and early elementary school children and their families. The goal of the CPB-PBS Ready To Learn Initiative is to promote early learning and school readiness, with a particular interest in reaching children from low-income communities. In Year 4 of the 5 year Ready To Learn effort, WestEd’s formative evaluation efforts supported Ready To Learn joint awardees, the Corporation for Public Broadcasting (CPB) and the Public Broadcasting Service (PBS), as they created and delivered a next-generation educational ecosystem of integrated transmedia content in literacy and numeracy that is aligned with rigorous academic frameworks and research.

During Year 4 of the Ready To Learn Initiative, WestEd conducted a series of research studies, which included:

- **Study of PBS KIDS Transmedia Content in Preschool Homes Course**
  
  WestEd conducted a study of PBS KIDS mathematics transmedia suites in preschool homes. The focus of the study was on the efficacy of five PBS KIDS transmedia suites (*Peg + Cat, The Cat in the Hat Knows A Lot About That, Curious George, Dinosaur Train, and Sid the Science Kid*) and their accompanying parent support materials in increasing preschoolers’ mathematics skills and enhancing their parents’ ability to support their children’s mathematics learning in the home environment. The work also continued to build a facilitation model for preschools to implement a PBS KIDS Lab-based parent support program in their preschools.

- **Curious George’s Busy Day: Transmedia Learning in the Preschool Classroom**
  
  WestEd conducted a classroom-based study during the summer of 2014 in order to investigate the effectiveness of the *Curious George’s Busy Day* transmedia suite in supporting children’s largely unmediated mathematics learning in the preschool classroom environment. In addition, the study examined the feasibility of using the suite in the preschool classroom environment as well as the types of learning interactions that occur during classroom use of the suite.

- **Formative Evaluation of PBS KIDS Transmedia Suites: Alpha Reviews**
  
  WestEd conducted a formative evaluation during the summer of 2014 to pilot test eight newly created PBS KIDS transmedia games from the *Peg + Cat* suite, and five newly created PBS KIDS transmedia games from the *Odd Squad* suite. WestEd tested alpha versions of the individual games with teachers in order to provide feedback on the games’ academic content, appropriateness for the respective age groups, and utility in the classroom environment. A cognitive scientist also reviewed alpha versions of the games to evaluate
how the games’ intended learning goals aligned with academic standards and to explore any pedagogical and/or usability issues presented during game play.

**Summary of Year 4 Studies**

**Study of PBS KIDS Transmedia Content in Preschool Homes**

WestEd conducted a study addressing the promise of five *Ready To Learn* PBS KIDS transmedia suites, *Peg+ Cat, The Cat in the Hat Knows A Lot About That, Curious George, Dinosaur Train* and *Sid the Science Kid*, in increasing preschoolers’ mathematics skills and enhancing parents’ ability to support their children’s mathematics learning in the home environment. The suites focus on improving core literacy and numeracy skills for children through the coordinated use of multiple media platforms. The purpose of this study was to explore the promise of five PBS KIDS transmedia suites and their accompanying support materials in increasing preschoolers’ mathematics skills. The study also explored (1) changes in parents’ awareness and support of their young child’s mathematics learning in the home environment through their participation in the program; (2) effects of differences in income levels on participants’ outcomes, and (3) the ability of early childhood educators to facilitate parent meetings related to the program.

**Study Design and Methodology**

The study used a quasi-experimental design. A total of ten preschool sites were recruited to participate in this study. One hundred and ninety-six families were recruited to take part in the study, half for the treatment group and half for the comparison group. The treatment group was comprised of families from four of the preschool sites. Children’s demographic data (e.g., age, home language, ethnicity) were used as matching variables to form a comparison group. The comparison group included families from the other six preschool sites. Parents and children in the intervention group participated in an eight-week program that was based on the five aforementioned PBS KIDS transmedia suites. The study encouraged parents to attend weekly parent meetings at their child’s preschool that were conducted by trained preschool teacher facilitators. The eight-week program involved parents and children working together on PBS KIDS transmedia activities for 30 minutes per day for four days per week. Children were pre- and post-tested with the Test of Early Mathematics Ability (TEMA-3) and one selected item from the Child Mathematics Assessment (CMA).

**Key Findings**

The Study of PBS KIDS Transmedia Content in Preschool Homes is still in progress. Data will be analyzed and key findings will be reported following the conclusion of the study early in Year 5.
Curious George’s Busy Day: Transmedia Learning in the Preschool Classroom

WestEd conducted a classroom-based study during the summer of 2014 in order to investigate the effectiveness of the Curious George’s Busy Day transmedia suite in supporting children’s mathematics learning in the preschool classroom environment. In addition, the study examined the feasibility of using the suite in the preschool classroom environment as well as the types of learning interactions that occur during classroom use of the suite. The study included an intervention developed by teachers and researchers that included all aspects of the suite (digital games, video episodes and hand-on activities) and allowed for a relatively unmediated blended (digital and hands-on) learning experience that was integrated into a typical instructional day at a preschool in the San Francisco Bay Area.

Study Design and Methodology

The intervention consisted of interactions with the Curious George’s Busy Day mathematics intervention content including digital games, as well as hands-on classroom activities and video episodes. As part of the intervention, each child was encouraged to interact with the Curious George’s Busy Day mathematics intervention classroom content (digital games and hands-on activities) for a minimum of 30 minutes a day for a minimum of six days over a four-week period with minimal teacher mediation. In addition, parents were asked to play the Curious George’s Busy Day video episodes for their children at home. Classroom activities for the intervention took place in exploratory learning stations implemented in three preschool classrooms at the intervention preschool. Students were assessed before and after the four-week intervention using a modified version of the Test of Early Mathematics Ability (TEMA-3). Sixty children were recruited to participate in the study, and complete pre and post assessment data were collected for 51 students. In addition, head teachers were interviewed at the end of the study in order to gather data on student learning, feasibility of use and types of learning interactions that occurred during the intervention.

Key Findings

• Over the course of the classroom program, children’s knowledge in mathematics increased significantly, as measured by selected items from the TEMA-3 (Pre M = 21.04, Post M = 23.75, p<0.01).

• In particular, children showed significant and positive pre and post changes on mathematical skills related to number comparison (Pre M = 5.98, Post M = 7.06, p<0.05) and informal concepts (Pre M = 0.86, Post M = 1.12, p<0.05).

• Teachers felt their students were learning mathematics from the transmedia experience: playing the digital games, interacting with the hands-on activities and watching the video episodes.

• Teachers found that the Curious George’s Busy Day games and materials were aligned to their preschool curriculum and felt that they reinforced content they were currently
• Teachers and parents felt the blended learning environment (digital and hands-on learning) enhanced students’ technological literacy and better prepared them for kindergarten. Teachers reported that many of their students did not have regular access to technology.

• Parents appreciated the opportunity to view the video episodes at home with their children. They asked teachers where they could access more Curious George’s Busy Day video episodes and how they might access additional Curious George’s Busy Day digital games.

• Teachers reported that the intervention was feasible for implementation during their school day and that they would eventually like to implement the intervention on their own. However they felt they would need professional development to learn how to deliver it effectively.

Formative Test of Newly Created Transmedia Products: Peg + Cat and Odd Squad Online Games

WestEd conducted a formative evaluation during the summer of 2014 to pilot test eight newly created PBS KIDS transmedia games from the Peg + Cat suite, and five newly created PBS KIDS transmedia games from the Odd Squad suite. The Peg + Cat transmedia suite is designed to improve core numeracy skills for preschool students through activities that feature a connected narrative across multiple media platforms, such as computers and televisions. The Odd Squad suite is designed to provide opportunities for early elementary school students to problem solve, experiment, and explore their understanding of relevant math skills in an interactive environment. WestEd tested alpha versions of the individual games with teachers in order to provide feedback on the games’ academic content, appropriateness for the respective age groups, and utility in the classroom environment. A cognitive scientist also reviewed alpha versions of the games to evaluate how the games’ intended learning goals aligned with academic standards and to explore any pedagogical and/or usability issues presented during game play. Both teachers and the cognitive scientist provided suggestions to enhance overall game play and increase the potential for student learning. Four teachers were recruited from underserved communities in the San Francisco Bay Area and Cleveland, Ohio, to participate in the formative evaluation.

Measures and Data Collection

Data collection measures included written teacher feedback and a cognitive task analysis. The written teacher feedback included reviews by experienced teachers who played the alpha versions of the games and reviewed the games for educational content, appropriateness for the age group, and utility in the classroom. Teachers provided feedback on how to enhance the games for greater student learning. For the cognitive task analysis, the cognitive scientist played the games and examined how the games’ intended learning goals aligned with the academic standards for that grade level. Suggestions to improve usability issues and potential for student learning were noted.
Key Findings and Recommendations

- The majority of the alpha versions of the games were considered to be useful instructional tools and teachers would use the games to review and practice early mathematics skills in the classroom.
- Most alpha versions of the games were aligned to the teachers’ mathematics curricula and Common Core Mathematics Standards.
- The tone and context of most of the alpha versions of the games were appropriate for the age group.
- Some of the alpha versions of the games had usability issues such as a lack of scaffolding to support students on how to play the games, and pedagogical concerns such as a lack of independent problem solving involved in some of the games.