RESEARCH | POSTED APRIL 15, 2019

Understanding and Addressing the Effect of Digital Games on Cognitive Development in Middle Childhood

Social Policy Report Brief, Volume 32, Issue 1

MATERIALS

Published

Monday, April 15, 2019 12:00am

Social Policy Report Brief

Volume 32, Issue 1

Download the brief

PDF 421.33 KB

This brief summarizes a longer Social Policy Report

Digital Games as a Context for Children's Cognitive Development: Research Recommendations and Policy Considerations

READ THE FULL REPORT

Why Does this Matter?

The effects of using interactive media have been well studied among young children and adolescents but remain understudied for middle childhood (ages 6-12 years). Children and youth of this age comprise much of the pre-adult population that uses digital games and apps. The Every Student Succeeds Act says that states must give students access to technology and use evidence-based methods of incorporating technology into curricula and instruction, but doesn't speak to digital games directly. Research on digital games in middle childhood can inform the design of games that teach tech-savvy skills and promote cognitive development.

Digital games and apps are used increasingly in both formal and informal education settings, yet guidance is lacking on what comprises a high-quality game or app that supports children's cognitive development and learning.

Background

Six- to 12-year-olds are exposed to digital media extensively[1]:

- In 64% of the 4,000 U.S. households sampled recently, at least one person played video games three or more hours a week and nearly 30% of these players were 18 years and under.
- Two-thirds of parents in that survey said they played video games with their children weekly and perceived the games as beneficial.
- In a survey of U.S. children under 8, on average, children used interactive games about 25 minutes daily, with little use before age 2. In another survey, interactive game play for children ages 8 to 18 averaged 1 hour, 20 minutes daily.

- In a survey of K-8 teachers, 74% reported using digital games for instruction, with 80% indicating that they primarily used educational games and apps.

Yet little research has studied the effects of digital media at these ages:

- Much of what is known about the impact of media on children's development is drawn from research on television-viewing behaviors.
- In two meta-analyses examining the impact of commercial video game use on information processing, only a few of the studies focused on children and youth from 3 to 17 years.

What the Research Says

Given the limited research on digital media use in middle childhood, we turn to evidence on television viewing in young children and digital media use among older youth:

- From research on young children's television viewing:
    - Content matters, with educational television but not violent or solely entertaining TV associated positively with academic outcomes.
    - Learning from media appears to be related to the emotional ties young children form with media characters.
- Research on adolescents' and young adults' use of digital media:
    - Studies of young adults indicate that cognitively demanding video games can enhance perceptual, motor, and cognitive skills, and this may transfer to behaviors like reading.
    - Adolescents' use of digital media may help strengthen and build friendships with peers, but exposure to violent video games has negative effects.
- From the limited research on digital media in middle childhood:
    - Playing educationally oriented digital games is linked to enhanced executive functions, mental rotation skills, basic math understanding, and problem-solving ability. Such games may enhance selective attention and other abilities used to acquire academic content.
    - Games requiring physical activity may enhance executive functions.

Implications for Policy and Practice

Implications for Practice

- Parents need research-based guidelines to understand how to support their children's learning while using digital media.
- Under-resourced schools need access to digital media and high-speed Internet to integrate educational games into curricula.
- Training for teachers should include best practices for developmentally appropriate instruction when using digital games.

Implications for Policy

- Federal agencies should fund technology, app, and game development aimed at fostering students' academic skills, together with research on effects on cognitive development.
- Passage of legislative proposals such as the Child and Media Research Advancement (CAMRA)
- Act could inform research and policy by providing federal funding to examine impacts of digital media on children's and adolescents' cognitive, physical, social, emotional, and behavioral development.
- Research-based guidance on what constitutes an educational app is needed. The designation of an app as "educational" is largely unregulated and unmonitored, and is rarely based on research.
- Some states include digital games in their curriculum policies. While 22 states have adopted statewide media literacy standards, they vary widely. Research on how and when digital media use in middle childhood benefits children's cognitive development could inform the further development of state standards.

[1]*See the full Social Policy Report for references, including for the surveys that are the sources for the statistics summarized in this section of the brief.*

The brief summarizes a longer Social Policy Report:

Blumberg, F. C., Deater-Deckard, K., Calvert, S. L., Flynn, R. M., Green, C. S., Arnold, D., & Brooks, P. J. (2019). Digital Games as a Context for Children's Cognitive Development: Research Recommendations and Policy Considerations. *Social Policy Report, 32*(1).