

Parent-child Joint App Use and Early Numeracy Development

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Abstract

This qualitative case study was conducted to explore parent-child interaction in intergenerational play of numeracy-related Apps. A Chinese mother and her preschool-age son in a Midwestern university town were observed using several numeracy-related mobile game apps together. Our analysis of the observations and the interview with the mother revealed that parents might mediate preschooler's App play, but their engagement might take a different shape than what Joint Media Engagement theory envisions. It provided insights about designing good App number-related games for parents and children to engage together.

Introduction

In the past decade, new technologies, such as iPad, have changed young children's learning experience. However, few studies have investigated the intergenerational use of digital tools in early numeracy activities, which serves as the most critical learning environment before formal schooling. This qualitative case study was to explore, in a cross-cultural context, parent-child interaction around play of commercial, numeracy-related mobile game apps. The guiding question was: how do parents influence children's numeracy development through playing numeracy-related apps together? This study was conducted in the context of a larger research project on cross-cultural perspectives on parental involvement in numeracy activities. In this paper, we suggest that, while parents mediate preschooler's numeracy-related App use, sometimes parental engagement may be different than ideals of intergenerational play.

Theoretical framework

Joint Media Engagement (JME) research shows that adults may increase children's media engagement by a) allowing children the opportunity to initiate and guide the media interaction; and b) being co-participants in media activities (Takeuchi & Stevens, 2011). Studies of parent-child play suggest that collaborative intergenerational activities are beneficial for children's learning (Siyahhan et al., 2010).

In numeracy development, children's early indirect experiences with numbers, especially in the context

of games, were found to be important contributors to their numeracy skills (LeFevre et al., 2009). Based on JME theory, we can assume that engaging parents in children's app play potentially enhances early numeracy development, provided parents support children's learning in a suitable way. Thus, it is reasonable to explore how parents interact with their preschoolers when playing App games together, and how such interactions would influence preschooler's numeracy experience from the JME perspective.

Methods

The participants were a Chinese mother and her 4-year-old son in a Midwestern university town. Data were collected through two naturalistic observations and a semi-structured interview. In the first observation, the mother and the son played the game app "Teach Me: Kindergarten", which they often used together at home. In the second observation, we provided them two game apps, "Team Umizoomi Math: Zoom into Numbers" and "Monkey Math School Sunshine". The interview with the mother concerned her opinions about early math learning apps, home numeracy experiences, and mother-child interaction in these experiences. The data were transcribed and analyzed using Merriam's (2014) step-by-step process. Through analytical coding, we came up with two major themes.

Findings

Theme 1: Mother mediating child's App use

In their joint use of game apps, the mother thoroughly mediated her son's play and actions, determining how her son interacted with the tool, in three ways. First, the mother paid attention to the content of each game app and chose what she believed beneficial. In giving instructions, the mother controlled the materials with which the boy interacted. For instance, there were different number-related mini-games in the "Team Umizoomi Math" App. The mother played the leading role in the following way:

"You have played the counting game and the car racing game. Let's see what else you can play here. You can go back to the city and play something else." She clicked the back button and chose an addition game. "That seems interesting." (Observation 2)

Second, the mother provided indirect, yet competent, assistance for the boy when he had a hard time or made a mistake, which could be viewed as the scaffolding. During these occasions, the mother gave him a hint instead of telling the right answer directly. For example:

When playing "Monkey Math School Sunshine", the boy could not figure out a pattern problem. The mother did not show the correct answer. Instead, she said, "Look at the first one. What's that?" "Seahorse." "Great! What's after the seahorse?" "Jellyfish." "Good! So here is a seahorse again. What should follow?" "Hmm, jellyfish!" (Observation 2)

Third, outside the game the mother sometimes initiated other numeracy-related activities for the boy. For instance, she asked the boy to count how many badges he won, which was not a required task in the game.

Theme 2: Mother's partial engagement in the app play

During the observations, the mother did not seem to be very interested in playing the game apps. For example, after the boy understood how to play the different games in a new app, the mother took out her phone and started reading news. In the interview, the mother to describe how they used iPad together at home,

“I think it's important for me to see what App he is playing with. So when he uses the iPad to learn, I always sit next to him, like here, and pay attention to his learning process. Sometimes I'm busy doing my housework at home. I will ask him to sit in a place closed to me so that I can monitor him.” (Interview)

It seemed that the mother regarded herself more as a monitor than as a joint player. She used the Apps with her boy just because she wanted to know what learning materials he was exposed to. She was not motivated by the Apps itself. Her engagement in using the numeracy-related Apps was not enough.

Conclusion and significance

The findings supported our argument that parents might mediate preschooler's numeracy-related App use, but the parental participating in Joint Media Engagement might only be partial. The mother's leading role determined what contents or stimulus the child was exposed to when using the Apps. Her scaffolding facilitated the child's interaction with the Apps as well as his numeracy understanding. However, the mother's partial engagement would influence the quality of JME. The current early math game App designs usually only focus on the children and ignore the parents. The addition of game mechanics that keep parents engaged, and different roles for parents and children, could facilitate joint engagement.

References

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